UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

June 11, 2013

EA-13-096

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

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT, NRC INSPECTION REPORT 05000263/2013008; PRELIMINARY YELLOW FINDING

Dear Mr. Schimmel:

This letter refers to the inspection conducted from September 24, 2012 through May 15, 2013 at your Monticello Nuclear Generating Plant. The purpose of the inspection was to follow up on issues identified during the Temporary Instruction (TI) 2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walk Downs." The objective of this TI was to independently verify that the licensee's external flood protection walkdown activities were conducted using walkdown methodology endorsed by the U.S. Nuclear Regulatory Commission (NRC). The enclosed report documents the results of this inspection, which were discussed on May 15, 2013 with you and other members of your staff.

Based on the results of this inspection, the NRC has identified a finding that has been preliminarily determined to be a Yellow finding with substantial safety significance that will result in additional NRC inspections and potentially other NRC action. As described in Section 4OA5 of this report, the finding is associated with the failure to maintain a flood plan to protect the site from external flooding events. Specifically, the site failed to maintain flood Procedure A.6, "Acts of Nature," such that it could support the timely implementation of flood protection activities within the 12 day timeframe credited in the design basis as stated in the updated safety analysis report (USAR).

The finding is not a current safety concern. On February 15, 2013, actions were completed to reduce the flood mitigation plan timeline to less than 12 days by developing an alternate plan for flood protection features, pre-staging equipment and materials, improving the quality of the A.6 procedure, and preplanning work orders necessary to carry out Procedure A.6 actions.

This finding was assessed based on the best available information, using the applicable significance determination process (SDP). The basis for the NRC's preliminary significance determination is described in the enclosed report. This finding is also an apparent violation of NRC requirements and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html.

In accordance with NRC Inspection Manual Chapter (IMC) 0609, we intend to complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of the date of this letter. The significance determination process encourages an open dialogue between the NRC staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination. Before we make a final decision on this matter, we are providing you with an opportunity (1) to attend a Regulatory Conference where you can present to the NRC your perspective on the facts and assumptions the NRC used to arrive at the finding and assess its significance, or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of your receipt of this letter. If you decline to request a Regulatory Conference or submit a written response, you relinquish your right to appeal the final Significance Determination Process determination, in that by not doing either, you fail to meet the appeal requirements stated in the Prerequisite and Limitation sections of Attachment 2 of Inspection Manual Chapter 0609.

Please contact Mr. Kenneth Riemer at 630-829-9628 and in writing within 10 days from the issue date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision. The final resolution of this matter will be conveyed in separate correspondence.

Because the NRC has not made a final determination in this matter, no Notice of Violation is being issued for the inspection finding at this time. In addition, please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

This report also documents one additional NRC-identified finding of very low safety significance (Green). This additional finding was determined not to involve a violation of NRC requirements.

If you contest the subject or severity of this Green finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Monticello Nuclear Generating Plant. In addition, if you disagree with the cross-

cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Monticello Nuclear Generating Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if you choose to repsond) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Steven A. Reynolds, Director
Division of Reactor Projects

Docket No. 50-263
License No. DPR-22

Enclosure: Inspection Report 05000263/2013008,
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ™

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-263
License No:	DPR-22
Report No:	05000263/2013008
Licensee:	Northern States Power Company, Minnesota
Facility:	Monticello Nuclear Generating Plant
Location:	Monticello, MN
Dates:	September 24, 2012 through May 15, 2013
Inspectors:	S. Thomas, Senior Resident Inspector P. Voss, Resident Inspector D. Passehl, Senior Reactor Analyst F. Ferrante, Reliability & Risk Analyst, NRR
Approved by:	K. Riemer, Branch Chief Branch 2 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000263/2013008; 09/24/2012 – 05/15/2013; Monticello Nuclear Generating Plant, Flood Protection

This report follows up on issues identified during the Temporary Instruction (TI) 2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walk Downs." The NRC staff identified one finding, preliminarily determined to be Yellow, or a finding of substantial safety significance and one Green finding with very low safety significance. The preliminary Yellow finding is associated with an apparent violation of NRC requirements. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. The cross-cutting aspect is determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Preliminary Yellow: The inspectors identified a preliminary Yellow finding with substantial safety significance and associated apparent violation (AV) of Technical Specification 5.4.1 for the licensee's failure to maintain a flood plan to protect the site from external flooding events. Specifically, the site failed to maintain flood Procedure A.6, "Acts of Nature," such that it could support the timely implementation of flood protection activities within the 12 day timeframe credited in the design basis as stated in the updated safety analysis report (USAR.)

  The inspectors determined that the licensee's failure to maintain an adequate flood plan consistent with the USAR was a performance deficiency, because it was the result of the failure to meet the requirements of TS 5.4.1.a, "Procedures;" the cause was reasonably within the licensee's ability to foresee and correct; and should have been prevented. The inspectors screened the performance deficiency per Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, dated September 7, 2012, and determined that the issue was more than minor because it impacted the 'Protection Against External Factors' attribute of the Mitigating Systems Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, if the necessary flood actions cannot be completed in the time required, much of the station's accident mitigation equipment could be negatively impacted by flood waters.

  The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The inspectors answered "No" to all the questions in Section A, "Mitigating SSCs and Functionality," Section C, "Reactivity

Control Systems," and Section D, "Fire Brigade." The inspectors answered "Yes" to the Section B, "External Event Mitigating Systems," question because the finding involved the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors).

Using IMC 0609 Exhibit 4, "External Events Screening Questions," the inspectors answered "Yes" to the External Event Screening Questions in Exhibit 4, "Does the finding involve the total loss of any safety function, identified by the licensee through a probabilistic risk assessment (PRA), individual plant examination of external events (IPEEE), or similar analysis, that contributes to external event initiated core damage accident sequences (i.e., initiated by a seismic, flooding, or severe weather event)?", since the failure to implement flood protection measures could directly lead to the inability to add coolant inventory and/or remove decay heat from the reactor core. Therefore, a detailed risk evaluation was performed.

This risk evaluation was performed using IMC 0609 Appendix M, "Significance Determination Process Using Qualitative Criteria," dated April 12, 2012. A Significance and Enforcement Review Panel (SERP) preliminarily determined this finding to have substantial safety significance (Yellow).

The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting area of Human Performance, having decision-making components, and involving aspects associated with using conservative assumptions in decision making, verifying the validity of the underlying assumptions, and identifying possible unintended consequences. [H.1(b)]. (Section 4OA5)

- Green. The inspectors identified a finding of very low safety significance for the site's failure to perform adequate procedure walkthroughs to comply with NRC endorsed NEI 12-07, "Guidelines for Performing Walk-downs of Plant Flood Protection Features." Specifically, the licensee failed to perform flooding procedure walk-throughs necessary to verify that flood protection actions were achievable, and could be completed within their credited timeline. As a direct result, the licensee failed to verify that necessary resources for levee construction and other flood protection activities were adequately pre-staged or available to ensure that the site could meet its credited flood mitigation timeline.

  The inspectors determined that the licensee's failure to adequately validate that external flood protection actions and timelines were achievable was a performance deficiency, because it was the result of the failure to meet the standards of NEI 12-07; the cause was reasonably within the licensee's ability to foresee and correct; and should have been prevented. The inspectors screened the performance deficiency per Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, dated September 7, 2012, and determined that the issue was more than minor because, if left uncorrected, failure to adequately validate levee construction and equipment pre-staging timelines has the potential to lead to a more significant safety concern. Specifically, if the site fails to account for the time and effort necessary to acquire flood mitigation resources prior to the flood, and the time and activities necessary to construct the ring levee, the site may not be able to complete their flood protection measures in time to mitigate floods on the design basis scale. The inspectors determined the finding could

be evaluated using the SDP in accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Initial Characterization of Findings,” dated June 19, 2012, and Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012. The inspectors answered “No” to all the questions in Section A, “Mitigating SSCs and Functionality,” Section C, “Reactivity Control Systems,” and Section D, “Fire Brigade.” The inspectors answered “No” to the Section B, “External Event Mitigating Systems,” question because the finding did not directly involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors). Therefore, the inspectors determined the finding to be of very low safety significance.

The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting area of Human Performance, having decision-making components, and involving aspects associated with using conservative assumptions in decision making, verifying the validity of the underlying assumptions, and identifying possible unintended consequences. [H.1(b)]. (Section 4OA5)

B. Licensee-Identified Violation

None

REPORT DETAILS

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

4OA5 Other Activities

.1 Selected Issue Follow-Up Inspection: Review of the Site's Flooding Protective Plan for the Probable Maximum Flood as identified during the NRC Temporary Instruction (TI) 2515/187: Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns

a. Inspection Scope

This review supplements the inspection of this TI as documented in NRC Inspection Report 05000263/2013002

The inspectors reviewed the licensee's flooding actions associated with the A.6, "Acts of Nature," procedure to determine if a reasonable simulation was performed. The inspectors also performed an independent walkdown and review to verify that the licensee could adequately construct a ring levee around the site as a design basis flood protection feature. As part of this walkdown, the inspectors reviewed Engineering Evaluation EC-19415 "MNGP External Flooding Plan Update: Alternative Analysis and Final Design Report," in order to assess the licensee's levee construction plan. The inspectors also reviewed portions of the licensee's optional backup mitigation plan, in order to assess the timeliness and feasibility of those actions.

The inspectors verified that noncompliances with current licensing requirements, and issues identified in accordance with the 10 CFR 50.54(f) letter, Item 2.g of Enclosure 4, were entered into the licensee's Corrective Action Program (CAP). In addition, issues identified in response to Item 2.g, that could challenge risk significant equipment and the licensee's ability to mitigate the consequences will be subject to additional NRC evaluation.

b. Findings

.1 Failure to Maintain an Adequate Flood Plan Consistent with Design Requirements Introduction

The inspectors identified a preliminary Yellow finding with substantial safety significance and associated apparent violation (AV) of Technical Specification 5.4.1 for the licensee's failure to maintain a flood plan to protect the site from external flooding events. Specifically, the site failed to maintain flood Procedure A.6, "Acts of Nature," such that it could support the timely implementation of flood protection activities within the 12 day timeframe credited in the design basis as stated in the updated safety analysis report (USAR.)

Description

Monticello Nuclear Generating Plant (MNGP) was built with plant grade at the 930 ft. elevation, with the exception of the site's intake structure and screen house, which reside at approximately the 917-919 ft. level. The current licensing basis flood, described in Appendix G of the USAR, is a probable maximum flood derived from rain and snow melt estimations, and was determined to result in a flood elevation of 939.2 ft. at the site. The licensee's flood protection procedures direct the site to build a ring levee around a significant portion of the protected area, including the turbine and reactor buildings; the control building; the maintenance warehouses; and the radwaste building; among other buildings. The ring levee would interface with the intake structure in such a manner that as the river rises, the intake wall closest to the river would serve as a portion of the outer flood barrier, in addition to the levee. The levee would terminate in two points at the independent spent fuel storage installation (ISFSI) storage pad area, which is located at an elevation approximately 2 ft. above the design basis flood (941 ft.). Design drawings show that the ring levee would create a 'U' shape, with the ISFSI area forming the west boundary, and the intake structure wall forming a small portion of the northern barrier. To extend the intake structure wall boundary to 941 ft., the site would install steel plates along the walls, extending above the top of the intake structure. The berm portions built at the site grade of 930 ft. would consist of earthen levee material. To ensure that levee fill material does not pose a hazard to the intake structure, and to ensure the berm is adequately sealed at the tie in with the intake structure, the berm at the 917-919 ft. levels located near the intake structure would consist of specially fabricated and constructed bin walls that would be filled with earthen material. While the berm construction plan was developed in 2001, the usage of bin walls near the intake structure came from a February 2012 modification to increase the reliability of the ring levee in this location.

The licensee's flood protection procedure also describes an optional defense in depth measure, which contains the steps the site had previously used to protect against flooding, prior to the 2001 development of the ring levee plan. This was the method described in their design basis documents, and it involved placing sandbags and steel plates over doors and openings vulnerable to water intrusion. The licensee's walkthrough, performed in response to the NRC's 50.54(f) letter regarding Fukushima, determined that these steps alone would not protect all necessary plant equipment, and that levee construction was necessary to protect the plant from floods above the 930 ft. level.

Current Monticello licensing basis, in accordance with the USAR, specifies that 12 days are allotted for completion of flood protection activities. In addition, the USAR describes the probable maximum flooding levels which the site is required to be protected against. As previously noted, USAR, Appendix G, describes the methodology used to calculate the peak flooding levels. The calculation's initial conditions included a thaw/freeze period during the winter and heavy snow pack accumulation equivalent to a 100-year snow fall. The initiating events for the probable maximum flood (PMF), which would begin on day one of the twelve day clock, included a five day period of high temperatures followed by a probable maximum storm taking four days to deposit its total rainfall. The following excerpts from the USAR describe the PMF event and the site's flood protection requirements:

- USAR, Appendix G states, under the heading *Runoff Sequence*, “The most critical sequence of events leading to a major flood would be to have an unusually heavy spring snowfall and low temperatures after a period of intermittent warm spells and sub-freezing temperatures has formed an impervious ground surface and then a period of extremely high temperatures followed by a major storm. This sequence of events is not unusual in the study area and the maximization of rainfall, snow-cover, and temperature would produce a probable maximum flood.”

- USAR, Appendix G states, under the heading *Probable Maximum Flood*, “The probable maximum flood at the project site was determined to be 364,900 cubic feet per second and to have a corresponding peak stage of 939.2 ft. MSL. The probable maximum flood hydrograph is shown on Exhibit 9. The occurrence of the sequence of events described in Chapter III would cause the flood to reach its maximum level about 12 days after the beginning of high temperatures and would remain above elevation 930.0 for about 11 days.”

- USAR, Section 2.4.1, *Surface Water,* states, “The probable maximum discharge was determined to be 364,900 cubic feet per second and to have a corresponding peak stage of elevation 939.2 ft. MSL. The flood would result from meteorological conditions which could occur in the spring and would reach maximum river level in about 12 days. It was estimated the flood stage would remain above elevation 930.0 ft. MSL for approximately 11 days. Using this data, a study (See Section 12.2.1.7) was performed to identify flood protection requirements.”

- USAR, Section 12.2.1.7.1, *External Flooding,* states “All openings below elevation 939.2 ft. MSL were recorded during the original study and the subsequent Design Basis Document Development Program (Reference 24). Certain personnel doors, truck openings, and the openings at or above grade will require sandbagging or steel plates. Modifications such as sandbagging would be done at the time of the flood since the modifications are minor and about 12 days are available before peak stage would be reached. Suitable steel plates are stored at the plant for possible future use.”

- Regarding the Control Building and Cable Spreading Structure, USAR Section 12.2.2.3.2, *Seismic Analysis and Design,* states, “The flood protection design and procedures address floods to the 939.2 foot elevation. The control building was designed to resist hydrostatic loading and buoyancy. Any openings in the building below 939.2 are to be covered by steel plates or sand bagged to prevent inflow of water within 12 days.”

- USAR, Section 1.3.1.4, *Hydrology,* states, “the ‘probable maximum flood’ criterion as defined by the U.S. Corps of Engineers was used to establish the maximum flood level. Using this criterion, the flood analyses predicted a probable maximum flood peak stage at the site of approximately nine feet above plant grade. The peak level at the site would be reached in about 12 days from the onset of the worst combination of hydro meteorological, hydrological and climatic conditions resulting in the probable maximum flood.” In addition, Section 1.3.1.4 states, “The plant design and construction (including radioactive waste control

systems) and contingency procedures take into consideration the extremes of river flow and stage (i.e., the PMF)."

The licensee performed a walkthrough of the site's flooding procedure in response to the NRC's 50.54(f) "Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," letter which requested flood area walk-downs and procedure walk-throughs. In order to combat flooding events, the licensee utilizes Procedure A.6, "Acts of Nature." Procedure A.6 directs specific flood protection actions, including levee construction, sand-bagging activities, and facility-sealing actions, based on both predicted and actual flood levels. The inspectors observed the "Acts of Nature" procedure walkthrough. This walk-through was focused on validating that the flooding section of the A.6 procedure could be performed as written and within the credited 12 days. The inspectors observed that rather than performing a walkthrough of procedure Step 5.2.11.Q levee construction activities, the site referenced an evaluation performed by an engineering firm, which they believed had previously verified that the levee could be constructed within 12 days. The inspectors noted that performance of walk-through activities would have presented valuable opportunities for the licensee to identify vulnerabilities and inconsistencies in their flood plan.

Upon review of the evaluation, the inspectors noted that the levee construction timeline included in the evaluation was 15 days, with the bin wall construction being the most time intensive activity. The evaluation also specified a total time of 25 days for bin wall construction including procurement of bin wall material. Specifically, EC-19415 "MNGP External Flooding Plan Update: Alternative Analysis and Final Design Report," Section 4.1 *Construction Materials and Construction Time Period* stated that "the lead time to obtain the bin wall materials is approximately 10 days." This section also stated that "two crews could assemble and fill the bin walls in approximately 15 days, if they are experienced with the system. Therefore, it is recommended that the bin wall materials be purchased in advance and assembled in modules that can be moved around the site, lifted into place with a crane, and installed in a shorter duration. The time frame could be reduced to less than 12 days with two crews operating." The inspectors noted that the licensee had not taken these actions to reduce their timeline to 12 days.

The inspectors also noted that Section 4.1 of EC-19415 stated, "To ensure the recommended plan could be constructed in a 12 day period, materials should be purchased in advance and stored on site. Sources of levee fill are not abundant in the area and would be difficult to obtain during an emergency in the quantities required to construct the levee." The same section stated, "in our experience, identifying sources of levee fill and ensuring trucks are available during an emergency have caused the most significant delays in construction of temporary barriers. Therefore, it is highly recommended that the levee fill be acquired and stored on or near the site." At the time of the inspection, the inspectors noted that the site had not incorporated these recommendations.

Following the licensee's 50.54(f) submittal, the inspectors noted that the licensee did not establish a timeline which incorporated all levee build and A.6 related activities together to demonstrate that the activities were achievable in the credited time. In response to inspector questions, the licensee developed a timeline which included the time necessary to procure required flood protection materials, and an accurate representation of the information contained in the levee evaluation that had previously been performed. After several revisions of timelines, the site developed a final timeline delineating how

long they believed it would actually take for them to perform their A.6 procedure. Based on this timeline, the inspectors observed that while the licensee had previously failed to recognize that bin wall activities would take 15 days total to install, the licensee had also failed to account for the fact that portions of the bin walls must be started 4.5 days prior to day one of the flood in order to finish the necessary sections in time.

In addition, in order to extend the height of the intake structure wall which would serve as part of the outer flood barrier up to the necessary 941 ft., the site must erect steel plates along the sides of the intake structure. The inspectors noted that the site's timeline listed 12 days for this activity to be completed. The inspectors also noted that if the activity requires 12 days of construction work, it must be started 3 days prior to the first day of the flood in order for it to be completed by the time the flood waters reach intake structure roof level. Therefore, unless additional actions were taken to shorten the timeline of this activity, if it were performed at the time of the flood (beginning on day 1 of 12), it may not be completed by the time necessary to mitigate the flood. Specifically, according to the licensee's overall timeline, the 933 ft. level is reached at the end of day 9. The intake structure roof is at approximately the 934 ft. elevation, and at the beginning of day 10, when this elevation is reached, it would make steel plate installation very difficult. At the end of day 10, the river level is estimated to be at 935.5 ft., which would further complicate steel plate installation, and at the end of day 11, when river level is predicted to be 938.1, approximately 1 ft. below the maximum PMF flood height, installation of these steel plates would not be practical. The inspectors determined that this activity presented an example of an activity where time would be tight, and success would be dependent on several assumptions.

Overall, the inspectors noted that based on the site's timeline, 14.5 days would be required prior to the occurrence of the flood to ensure that the necessary equipment/materials could be procured and the necessary portions of the bin wall would be in place in time to protect against the flood. The inspectors observed that this time was important because at the end of day three of the flooding event, flood waters in the bounding design basis event would exceed the 917 ft. level. After this point, installation of the bin wall barrier, and ultimately the ring levee as a whole would not be possible using the site's existing plan. The inspectors concluded that the overall process of flood preparations would take approximately 26.5 days, from the first day on which flood preparations would need to begin, to the time that the design basis flooding event would reach its peak. This timeline exceeded the 12 days credited in the licensee's design basis.

In addition to observing the A.6 procedure walk-through, the inspectors reviewed the A.6 procedure. Following both the review and walk-through observations, the inspectors were concerned with the viability of the site's mitigation strategies. Specifically, the inspectors were concerned with a lack of detailed procedure guidance, a lack of clarity in the steps provided, a lack of pre-staged equipment and materials, and the presence of several assumptions inherent in the strategy. In addition, the inspectors noted that plant staff was not trained on the procedures despite the complexities of the strategy, and in many cases the licensee was relying on work orders that would be developed at the time of the flooding event to specify important details for carrying out A.6 actions. Specifically, in addition to many other steps, the procedure contained the following guidance:

1. In Section 5.0 of A.6, for external floods, under the heading "WHEN river levels are predicted to exceed elevation 930 feet, THEN perform the following (see

Figure 13.9):" Step 5.2.11Q stated, "Construct a ring levee to the predicted river elevation plus 2 ft. of freeboard…See 5.5.1.6 and 5.5.17 for contractors able to provide the levee material (30,000 CY of fill for the worst case scenario) and construct a levee within the 12 day timeframe." A.6 Step 5.2.11B stated, "When river level is predicted to exceed elevation 930 ft. and potentially reach the design basis flood level of 939.2 ft., consider building a levee that rings the entire facility. Refer to the Army Corps of Engineers Flood-Fight Handbook (Reference 5.4.10) and Figures 13.2 through 13.5 of this procedure for details. Install the Bin Walls and a portion of the levee before the river level exceeds the elevation of 917 ft. (see 5.4, Reference 5.4.9)."

The inspectors noted that these procedure steps and general references could be useful information for construction of the levee. However, as previously noted, the inspectors also determined that the licensee did not have the resources available to perform these actions within the specified timeline. The inspectors concluded that because the site's flood plan did not provide the means to perform the procedure steps as written, these steps represented important "Acts of Nature" procedural inadequacies. The inspectors also noted that because licensee staff did not receive training on the procedure, directing and supervising the contract personnel that would build the levee would likely be made more difficult. In addition, the lack of training would make performing the many required flood preparation actions unrelated to the levee more difficult, due to the staff's lack of familiarity with the steps and timeline necessary.

2. The 'Discussion' section of the A.6 procedure stated, "procedure A.6 outlines actions to be taken in the event flood waters are predicted to exceed elevation 918 ft. Action levels will progress to 919 ft., 921 ft., 930 ft., 934 ft., and 938 ft. depending on flood level predictions as determined by the Site External Flooding SME. If conditions exist as referenced in Chapter 3, Appendix G of the USAR, contingency planning for a probable maximum flood will begin. Additional materials and equipment such as sandbags (100,000), excavating equipment, pumps, and grout will be ordered as directed in this procedure for the construction of temporary protective barriers within a 12 day window." The 'Discussion' section also stated, "individual resourcefulness is a key element in successful external flood protection. The main consideration during extreme flood conditions is to maintain the plant in a safe standby condition where it may be rapidly returned to service when the flood subsides. The main service requirement for the plant is an adequate supply of cooling water for the RHR heat exchangers and vital plant equipment."

   The inspectors observed that there was a significant amount of resources that were not staged onsite, which would be required for implementation of the flooding procedure. The inspectors also noted that for the strategy described in A.6 to be successful, it must be assumed that all necessary resources would be available. This assumption was made for many of the required resources and the workforce necessary for A.6 implementation, despite the lack of a robust contract or agreement designating that these items would be available and reserved for Monticello in the case of an emergency. The licensee believed that they would have warning of the flooding conditions well in advance of the first day of flooding due to the site's flood prediction procedure. The licensee contended that this prediction would allow the site to predict the occurrence of

the flood and procure materials and a workforce early. However, the inspectors again noted that the site's credited flood response time was 12 days, and the site was required to meet this timeline. In addition, based on a review of the flood prediction procedure and process, the inspectors concluded that this process would not guarantee a warning in advance of the initiating events described in USAR Appendix G. The inspectors concluded that these assumptions were inappropriate. The inspectors also noted that the reliance of the site on "individual resourcefulness" as a "key element in successful external flood protection" was inappropriate. Specifically, the inspectors noted that the site should instead be relying on an effective, detailed, validated plan to achieve successful flood protection, as is required for licensee responses to design basis events.

3. The 'Bases' section stated in part, "The preferred method of protection when water levels are predicted to exceed 930 ft. would be to construct a ring levee around the entire facility. Installation would require less labor and it would be more secure." In addition, this section stated, "at Monticello, it was determined that it is feasible to ring the entire facility with a levee. Preparations such as reserving earthmoving equipment and excavators would need to begin as soon as possible when environmental conditions indicate the potential for a Probable Maximum Flood. The levee to the West and East of the Intake Structure must be installed prior to floodwaters reaching 917 ft. The remaining areas of the levee must be installed prior to the floodwaters reaching 930 ft. It is estimated that 18 dump trucks and 3 excavators working around the clock could complete a levee in 12 days."

   The inspectors again noted that these procedural sections provided additional guidance for construction of the ring levee. However, as previously noted, the flood plan failed to provide the means to carry out the levee-related actions described in the procedure in the credited 12 days, and in advance of each of the flood stages anticipated during those 12 days.

4. Regarding the optional backup method of flood protection, the 'Bases' section stated, "leak sealing, drain plugging, installation of steel plates, and sandbag instructions are still included in this procedure to provide additional flood protection options. These instructions may be used as a defense in depth measure when river levels are expected to exceed 930 ft."

   The inspectors reviewed the steps associated with the back-up method of flood protection described in this section of the procedure and observed several instances where the directed actions were poorly sequenced or lacked detail. For instance, inspectors questioned whether the optional steps should have guidance on when they should be used to back up the levee, or whether these steps should be required to back up the levee, to mitigate the potential for levee failure. In addition, the inspectors questioned whether a seemingly complicated step being used to retain offsite power access should have more detail, or reference a prepared, approved procedure. Specifically, Step 5.2.11AQ stated "IF 1R transformer is to be protected by the plant ring levee, THEN work with Xcel to install jumpers from the Liberty 115 KV line to 1R. Isolate transmission line and transformer before installing jumpers." Following the licensee's 50.54(f) response submittal and the inspectors' questions, the licensee identified

that this action would defeat required design basis protective functions for the transformer, and had to be removed from the procedure. In addition, the inspectors observed that some of the backup steps may be necessary even if the levee option was utilized. This included transferring a backup portable gas engine driven oil pump and hose reel from the warehouse to an area protected from the flooding, and steps to protect the substation control houses to ensure offsite power to the plant could be restored in a minimum amount of time. Inspectors noted that this sequencing and lack of detail in procedure steps could result in staff failing to perform actions, or performing prohibited actions and represented procedural vulnerabilities.

5. Regarding actions that would be taken in A.6 regardless of whether the levee was constructed, inspectors noted additional procedure steps that were unclear or lacked detail. Section 5.2.9 H stated, “Ensure the open electrical and piping penetrations in the Intake Structure are steel plate closed or sealed with grout (see detail H, DWG. NH-178639).” Inspectors noted that this procedure step did not identify specific penetrations or locations within the intake structure to seal. Inspectors questioned whether this step contained the appropriate amount of detail to ensure all penetrations were appropriately sealed. Intake structure walk-downs identified several penetrations that were not sealed, and inspectors noted that without adequate tracking of penetrations requiring closure, the licensee may risk missing some needing to be sealed. In addition, inspectors noted that power source connections were not specified for the electrical sump pump usage. Inspectors also noted that procedure 5.2.10 C directed staff to “locate and rent 2, 3200 gpm backup diesel water pumps to be used for an alternate water supply to the intake structure” in case of intake screen plugging. This step was designated to occur “when the river level elevation reached 921 ft.” and predictions were for higher levels. Inspectors noted that by procedure, that action would occur several days into the flooding event, and pump procurement should be performed earlier to ensure availability.

   In addition, the licensee staff performing the A.6 procedure walkthrough identified several instances where workers would need more detail to perform the many flood mitigation steps unrelated to levee construction. The licensee concluded that this level of detail would be developed and placed into flood plan work orders that would be generated at the time the flood was predicted. When completed, these work orders would include a few hundred pages of information required to perform the actions in A.6. In addition to necessary detailed instructions, these work orders would have to include excavation permits, clearance orders, and welding permits, among other items. Both inspectors and licensee staff found instances where plant drawings which designated methods to seal penetrations and structural gaps, or install steel plates, were inadequate or required additional components to ensure the actions could be adequately performed. Overall the inspectors concluded that the lack of detail and procedural inadequacies would impact the plant staff’s ability to complete the steps adequately and in a timely manner.

Based on their review, the inspectors determined that the licensee had failed to maintain an adequate flood plan to ensure that flood protection activities could be completed in 12 days, as credited in the licensing basis. The inspectors noted that if the licensee failed to construct the bin walls in time to mitigate the flood, flood waters would begin to impact safety related equipment at approximately the 930 ft. elevation. This assumes that the

licensee would be successful in using their A.6 flooding procedure to harden the exterior walls of the intake structure, which was located at lower elevations. The inspectors determined that the violation existed between February 29, 2012, and February 15, 2013. On February 29, 2012, the licensee approved a revision to A.6 which incorporated bin wall construction into their flooding plan. On February 15, 2013, the licensee completed their actions to reduce their flood mitigation plan timeline, by revising their A.6 procedure to include a contingency plan to build an earthen barrier with additional structural enhancements near the intake structure, rather than the planned bin walls. In addition, the licensee completed preplanning of work orders necessary to carry out A.6 actions, prestaged materials necessary to complete levee construction within the 12 day timeframe (including acquiring the bin wall materials), and improved the quality of their A.6 procedure. Since February 15, 2013, the licensee has continued to acquire additional flood mitigation materials for storage onsite in order to assure availability during a PMF flooding scenario. The licensee has also continued to review and improve the quality of their A.6 procedure to identify and eliminate vulnerabilities.

Analysis

The inspectors determined that the licensee's failure to maintain an adequate flood plan consistent with the USAR was a performance deficiency, because it was the result of the failure to meet the requirements of TS 5.4.1.a, "Procedures;" the cause was reasonably within the licensee's ability to foresee and correct; and should have been prevented. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting area of Human Performance, having decision-making components, and involving aspects associated with using conservative assumptions in decision making, verifying the validity of the underlying assumptions, and identifying possible unintended consequences. [H.1(b)]

The inspectors screened the performance deficiency per Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, dated September 7, 2012, and determined that the issue was more than minor because it impacted the 'Protection Against External Factors' attribute of the Mitigating Systems Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, if the necessary flood actions cannot be completed in the time required, much of the station's accident mitigation equipment could be negatively impacted by flood waters.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The inspectors answered "No" to all the questions in Section A, "Mitigating SSCs and Functionality," Section C, "Reactivity Control Systems," and Section D, "Fire Brigade." The inspectors answered "Yes" to the Section B, "External Event Mitigating Systems," question because the finding involved the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors).

Using IMC 0609 Exhibit 4, “External Events Screening Questions,” the inspectors answered “Yes” to the External Event Screening Questions in Exhibit 4, “Does the finding involve the total loss of any safety function, identified by the licensee through a probabilistic risk assessment (PRA), individual plant examination of external events (IPEEE), or similar analysis, that *contributes to external event initiated core damage accident sequences* (i.e., *initiated* by a seismic, *flooding*, or severe weather *event*)?”, since the failure to implement flood protection measures could directly lead to the inability to add coolant inventory and/or remove decay heat from the reactor core. Therefore, a detailed risk evaluation was performed.

This risk evaluation was performed using IMC 0609 Appendix M, “Significance Determination Process Using Qualitative Criteria,” dated April 12, 2012. Appendix M was an appropriate tool to assess the risk because existing PRA tools are not well suited for fully characterizing the uncertainty in the risk estimates.

Per Procedure A.6, with flood waters at elevation 930 ft., the initial conditions for this analysis have the plant in a Cold Shutdown condition under an Emergency Plan “Alert” declaration. Flooding above plant grade is assumed to always lead to a station blackout since Procedure A.6 directs de-energizing the substation equipment when water levels exceed the 930 ft. elevation. Emergency power is assumed lost because the procedure does not have any steps leading to successful protection of the diesel fuel oil storage tank other than the ring levee/bin walls. Also, the procedure says that the diesel fuel oil storage tank was evaluated for hydrostatic forces up to the 930 ft. elevation and that the ring levee/bin walls (assumed missing in the deficient case) would protect the tank beyond this level.

The inventory control option available during an extended blackout is by use of reactor core isolation cooling (RCIC). The decay heat removal option available is via use of the hard pipe vent. Both the use of RCIC and the hard pipe vent are discussed in plant procedures, which were instituted at the site several years ago as a result of internal flooding studies. The failure to run of RCIC is judged to be high given the increased mission time of a flooding event compared to an internal event. Failure to control inventory with RCIC or decay heat removal with the hard pipe vent is assumed to result in core damage.

With flood waters above the reactor building elevation of 935 ft., plant initial conditions are the same as for elevation 930 ft. However, at this level flooding of the Reactor Building contributes to the risk increase absent levee protection if the Reactor Building is not protected. If the Reactor Building can be kept dry then use of RCIC is the inventory control option available with the hard pipe vent for decay heat removal. If the Reactor Building is flooded then the scenario is assumed to lead to core damage.

For this performance deficiency the increase in risk or change in core damage frequency (ΔCDF) is dependent on the change in the probability of core damage given failure to install the levee/bin walls prior to flooding. This analysis was performed as a conditional analysis with an exposure time of 352 days, from February 29, 2012, to February 15, 2013. The exposure time began when the licensee approved a revision of Procedure A.6, “Acts of Nature,” which included the use of bin walls in levee construction and exceeded the 12-day levee construction timeline. The exposure period ended when the licensee completed their actions associated with a revision of the A.6 procedure, which reduced their levee construction timeline to less than 12 days by pre-staging of

materials and equipment and allowed use of either reinforced earthen barrier or bin wall construction.

The Region III Senior Reactor Analyst (SRA) developed a simple event tree model to perform a bounding quantitative evaluation. The model represented an external flood event that exceeded grade level elevation (930 ft.) and required implementation of the flood procedure, A.6 “Acts of Nature.”

Flood frequencies above the 930 ft. elevation were partitioned into two bins to define discrete external flood initiating event scenarios. The first bin was driven by an externally-induced flood of elevation 930 ft. to 935 ft. (i.e., above from plant grade, below Reactor Building floor elevation). The second bin was driven by externally-induced floods beyond the 935 ft. elevation (i.e., above Reactor Building floor elevation). The risk of external flooding below the 930 ft. elevation was assumed to have negligible contribution due to the performance deficiency. However, a portion of the levee needs to be installed before the river level exceeds the 917 ft. elevation (i.e., success of the flood mitigation procedure at plant grade and above is dependent on earlier actions), despite the fact that the risk “delta” is computed above the 930 ft. elevation (approximate plant average grade).

Flood frequencies of 6.65E-5/yr (930 ft. – 935 ft.) and 2.72E-5/yr (>935 ft.) were used to represent floods at the elevations associated with the two bins. These frequency estimates were derived using a curve fit technique with data from the Monticello USAR and IPEEE. Although there are no standard techniques or consensus methods to extrapolate flood frequencies, the method employed to obtain the frequencies are based on judgment and the values are adequate for a bounding quantitative assessment.

After determination of flood frequency the next step was to evaluate the human interactions to implement the site-wide flood mitigation strategies. The NRC’s Senior Reactor Analysts (SRAs) used the SPAR-H Human Reliability Analysis Method (NUREG/CR-6883) to estimate the human error probabilities associated with these actions. Like flood frequency, uncertainty is inherent in these human failure probability estimates since under flooding circumstances procedures are less developed or practiced and plant configurations will change over time. It is also recognized that Human Reliability Analysis (HRA) methods for evaluating such actions are not well-established and that the focus of SPAR-H is on control room crew performance. However, in the absence of any specific alternatives, the SPAR-H framework was used to provide an estimate that accounts for issues such as timeliness, ergonomics, and stress while performing these actions.

The SPAR-H method normally involves both a diagnosis and an action component. For this analysis the SRA assumed that the probability of failure to diagnose an incoming flooding event is on average small relative to the failure probability of actually performing flood mitigation actions.

The human error probability (HEP) for plant workers failing to install levee/bin wall flood barriers was assumed to be 1.0 (always failed) for the deficient (PD) case, which is bounding. The HEP for plant workers failing to install levee flood barrier was 0.11 for the base or non-PD case. The other HEPs are not affected by the proposed PD and include the following: The HEP for failing to protect the reactor building from flooding via alternate means (such as sandbagging) was 0.11. The human error probability for

manual operation of RCIC and the hard pipe vent during extended station blackout was 0.43.

The core damage sequences were in order of significance:

- Flooding the 930 ft. – 935 ft. elevation, failure of the levee/bin wall system, station blackout, and failure of RCIC/hard pipe vent strategy.

- Flooding the 935 ft. elevation or greater, failure of the levee/bin wall system, station blackout, successful flood protection of the reactor building, and failure of the RCIC/Hard Pipe Vent strategy.

- Flooding at the 935 ft. elevation or greater, failure of the levee/bin wall system, station blackout, and failure of flood protection of the reactor building.

The large early release frequency (LERF) risk for this issue was qualitatively judged to be no more significant than the CDF-based risk. The plant would be placed in cold shutdown when flood waters were expected to reach the 921 ft. elevation and an Alert would be declared at that same level. As water levels continued to rise and plant conditions worsen, most of the population would likely be evacuated. Further, since venting would be performed through the torus there would be some fission product scrubbing.

Sensitivity studies were performed to evaluate the influential assumptions. The calculated ΔCDFs for the quantitative risk evaluation range from 8.1E-7/yr to 9.4E-5/yr. The best estimate was 3.6E-5/yr.

Regarding qualitative insights into the risk, the NRC staff determined this finding reduced the defense in depth of the site's flooding protective strategy which in turn decreased the safety margin for protection against external flooding events. Specifically, the licensee failed to maintain a flood plan to ensure that flood protection activities could be completed in 12 days, as credited in the licensing basis. If the necessary flood actions cannot be completed in the time required, much of the station's accident mitigation equipment could be rendered unavailable by flood waters. Procedure A.6 described optional defense in depth measures, which included steps the site had previously used to protect against flooding, prior to the development of the ring levee plan. This method is described in Monticello design basis documents, and involved placing sandbags and steel plates over doors and openings vulnerable to water intrusion. The licensee's evaluation of the Procedure A.6 walkthrough, in response to the NRC's 50.54(f) letter regarding Fukushima, determined that these steps alone would not protect all necessary plant equipment, and that levee construction was necessary to protect the plant from floods above the 930 ft. level. However, the NRC observed that instead of a walkthrough, the licensee referenced an evaluation performed by an engineering firm, which they believed had previously verified that the levee could be constructed within 12 days. The inspectors observed that there were a significant number of resources that were not staged onsite, which would be required for implementation of the flooding procedure. The licensee did not establish a sufficient contract or agreement with outside firms designating that these items would be available and reserved for Monticello in the case of an emergency. The inspectors reviewed the steps associated with the back-up method of flood protection described in Procedure A.6 and observed several instances where the directed actions were poorly sequenced or lacked detail. This lack of

sequencing and detail increased the chance of staff failing to perform actions, or performing prohibited actions.

The NRC staff determined this performance deficiency is assumed to result in failures of redundant trains and would not be limited to a single train or division and increased the potential for flood waters rendering safety equipment unavailable

The likelihood that the licensee's recovery actions would successfully mitigate the performance deficiency was assessed during the significance determination of this finding. During a walkthrough performed in response to the NRC's 50.54(f) letter regarding Fukushima, the NRC inspectors determined that the steps in Procedure A.6 alone would not protect all necessary plant equipment, and that levee construction was necessary to protect the plant from floods above the 930 ft. level. In addition to observing the walk-through, the inspectors reviewed the A.6 procedure.

Following both the review and walk-through observations, the inspectors were concerned with the viability of the site's mitigation strategies. Specifically, the inspectors were concerned with a lack of detailed procedure guidance, a lack of clarity in the steps provided, a lack of pre-staged equipment and materials, and the presence of several assumptions inherent in the strategy. In addition, the inspectors noted that plant staff was not trained on the procedures despite the complexities of the strategy, and in many cases the licensee was relying on work orders that would be developed at the time of the flooding event to specify important details for carrying out A.6 actions.

The inspectors noted that these procedure steps and general references could be useful information for construction of the levee. However, as previously noted, the inspectors also determined that the licensee did not have the resources available to perform these actions within the specified timeline. The inspectors concluded that because the site's flood plan did not provide the means to perform the procedure steps as written, these steps represented important "Acts of Nature" procedural inadequacies. The inspectors also noted that because licensee staff did not receive training on the procedure, directing and supervising the contract personnel that would build the levee would likely be made more difficult. In addition, the lack of training would make performing the many required flood preparation actions unrelated to the levee more difficult, due to the staff's lack of familiarity with the steps and timeline necessary.

Finally, the NRC staff evaluated additional qualitative circumstances associated with this finding. There is some potential for flood response actions that were not incorporated into plant procedures during the exposure period of the finding, and therefore not credited in this analysis. These actions could provide potential for additional flood mitigation response alternatives to prevent core damage. An example would be providing makeup fuel oil to the emergency diesel generator (EDG) day tanks using alternate means. Given the potential extensive flooding at the site, which may include debris from river flooding, it is challenging to assess the amount of credit that can be provided to these actions for those scenarios.

Monticello had established a number of routine (e.g., daily, weekly, annual) predictive flood measures that could potentially allow them to predict a potential threat in advance of the 12-days. These activities are largely not addressed in plant procedures and were therefore not credited in the quantitative analysis. The inspectors determined that

predicting weather more than a day or two in advance in order to alert the licensee to a coming PMF could not be done reliably. The licensee would need to be able to predict the five day temperature sequence followed by the four day maximized precipitation event, at least 14.5 days in advance of the weather sequence in order to be successful. Also, NRC inspectors identified several lengthy lead times necessary to acquire required material for specific actions in the A.6 procedure. These specified lead times did not necessarily represent actual time required to acquire materials; at the time of inspection, actual material lead times were unknown, aside from the bin wall material estimated lead time. These lead times represented the amount of warning the site believed they could give to vendors before needing the materials. Lead times included 4 weeks (diesel fuel oil, a fuel oil tanker, and grout), 6 weeks (diesel water pumps and sump pumps), and 8 weeks (sandbags (95,000), sand, culvert piping (150 ft.), and levee related materials/ resources). The inspectors noted that even if additional time outside of the 12 days was available for procurement of materials, equipment, and workforce, it would be difficult to conclude that the site would have up to 8 weeks of warning prior to the flooding event.

It should also be noted that the licensee includes a scenario where the bin levee/wall construction is initially successful and then fails. This scenario represents an additional risk contribution that could potentially decrease the likelihood of success of optional flood protection activities (e.g., installation of steel plates, sandbagging). While not included in this evaluation, since it is assumed that the bin levee/wall constructions are 100 percent unsuccessful, it is recognized that this is a possible scenario given the performance deficiencies associated with Procedure A.6.

Also, given that there is a threat for significant flooding, the licensee could proceed with traditional levee construction if bin wall materials were not available in time. This too was not addressed in plant procedures. Success of this strategy would depend on a number of factors, such as how long would it actually take to obtain the materials, the rate of flood rise, etc. The inspectors noted that the traditional earthen levee construction method was removed from the A.6 procedure and levee construction plans in February 2012, when the bin walls plans were added. This was done based on concerns about backfilling of the river near the intake structure with earthen material, and potential clogging of the intake structure as a result; and concerns about the adequacy of the intertie between the earthen barrier and the intake structure walls. It should also be noted that even the backup methods of flood protection (e.g., installation of steel plates, and sandbag instructions) are included in this procedure as optional actions to provide flood protection. It is unclear how the optional nature of these actions would have been impacted during an actual flooding event with the performance deficiencies identified during the walkdown.

With regard to the basis for the 100, 500 and 1000 year flood levels/flows, although there are numerous references to these values in plant documents, Monticello has not been able to locate a fundamental basis for them. All three values are presented in Figure 2.4-3 of the USAR.

Enforcement

Technical Specification 5.4.1. states, "Written procedures shall be established, implemented, and maintained covering the following activities: (a) The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." NRC Regulatory Guide 1.33, Appendix A, Section 6 addresses "Procedures for Combating Emergencies and Other Significant Events" and Section 6.w addresses "Acts of Nature (e.g., tornado, flood, dam failure, earthquakes)." From February 29, 2012, to February 15, 2013, the licensee failed to maintain a flood plan to protect the site against external flooding events. Specifically, the site failed to maintain flood Procedure A.6, "Acts of Nature," such that it could support the timely implementation of flood protection activities within the 12 day timeframe credited in the design basis as stated in the USAR. This is an apparent violation of Technical Specification 5.4.1.a. The licensee entered the levee timeline issues into the corrective action program as CAP 01378062. On February 15, 2013, the licensee completed their actions to reduce their flood mitigation plan timeline to less than 12 days by developing a plan for a bin wall alternative, pre-staging equipment and materials—including bin walls and earthen levee fill materials, improving the quality of their A.6 procedure, and preplanning work orders necessary to carry out A.6 actions. These issues are being characterized as an apparent violation in accordance with the NRC's Enforcement Policy, and its final significance will be dispositioned in separate future correspondence.
(**AV 05000263/2013008-01; Failure to Maintain an Adequate Flood Plan Consistent with Design Requirements)**

.2 Inadequate TI-187 Procedure Walk-Through

Introduction

The inspectors identified a finding of very low safety significance for the site's failure to perform adequate procedure walkthroughs to comply with NRC endorsed NEI 12-07, "Guidelines for Performing Walk-downs of Plant Flood Protection Features." Specifically, the licensee failed to perform flooding procedure walk-throughs necessary to verify that flood protection actions were achievable, and could be completed within their credited timeline. As a direct result, the licensee failed to verify that necessary resources for levee construction and other flood protection activities were adequately pre-staged or available to ensure that the site could meet its credited flood mitigation timeline.

Description

The inspectors observed the licensee's flooding walk-downs and procedure walkthroughs associated with flooding reviews being performed in accordance with NEI-12-07 "Guidelines for Performing Walk-downs of Plant Flood Protection Features" at MNGP in response to a letter from the NRC to licensees, pursuant to 10 CFR 50.54(f).

The inspectors observed the walk through of the licensee's flooding procedure, A.6, *Acts of Nature*. To facilitate the A.6 walk through, licensee staff developed an agenda which included guidance and instructions for the walk through process. The agenda specified that the purpose of the walk through was to "verify A.6 "Acts of Nature" procedure section 5.0 can be implemented in the required 12-day time period."

For their A.6 procedure walk through, the licensee created a table divided into 11 days to validate that they could complete their flood protection activities within 12 days. The inspectors noted that this effort did not include a timeline or review of the necessary actions to procure flood protection materials and equipment. Instead, the licensee took inventory of the few items they had stored onsite. These items included approximately 5,000 of the 100,000 sandbags necessary, and several 4x8 steel plates, which were stored onsite to support the flood protection method in place for the licensee up until the levee plan was developed in 2001. The licensee's Design Basis Document, which was described in the USAR, noted that these steel plates were stored onsite to resolve a 1969 ACRS concern that steel plates may not be available when needed at the time of the flood.

Inspectors noted that during the kickoff -brief for the A.6 walk-through, one participant questioned if they should evaluate whether materials were adequately pre-staged or available during their procedure step walk-downs. The staff leading the pre-brief indicated that they felt the site had plenty of time in advance of the flooding event to procure materials not already onsite, and that a CAP document generated in 2011 (CAP 01276715) had already addressed adequacy and pre-staging of materials. In addition, the plant staff leading the pre-brief indicated that they believed they had plenty of time to plan the necessary work orders which would be needed to perform the work associated with the flooding plan. As a result, walk through participants were directed not to focus their attention on these areas. The inspectors noted that the additional time needed to procure materials and/or plan work was not explicitly accounted for in any of the licensee's processes or procedures.

During the A.6 procedure walk-through, the inspectors observed that the site failed to determine how long it would take to stage necessary materials. Instead, as previously noted, the A.6 walkthrough table stated that a 2011 CAP had previously evaluated the necessary pre-staging of materials and equipment availability. The inspectors reviewed the CAP 01276715, entitled "IERL1-11-1 Support equipment for A.6 proc not assured available." This CAP directed staff to "either acquire the equipment and supplies, or reach an agreement with the suppliers to provide them within a notification period that supports the site's needs for the scenario where it would be required." To support this direction, an action was completed to "provide a list of the equipment needed for external flooding mitigation that would have to be rented or procured from offsite…along with the amount of notice that would be given prior to needing each piece of equipment. This supports Supply Chain's efforts to assure a guaranteed availability of this equipment." Based on this information, the action to acquire equipment and supplies or reach an agreement to assure their availability was completed. The completion notes stated "materials needed for the initial stages of the event are in stock in the WH, i.e. sandbags and steel plate. An open contract has been created…for rental of emergency equipment. There is an open contract through Xcel Energy fuels department for obtaining EDG fuel oil and we have a 3rd party logistics contract that could be used to obtain tanker trailers if needed. Based on the timeline in Action 3 there is sufficient time to obtain the other needed items in the case of a flood." The inspectors noted that the

open contract created for rental of emergency equipment was specific to rental of portable sump pumps and portable generators. As a result of their review, the inspectors concluded that minimal action was taken to assure the availability of much of the materials and equipment that would be necessary to implement the A.6 procedure.

The inspectors reviewed the completed Action 3 which served as the basis for the determination that contracts were unnecessary, and noted several lengthy lead times necessary to acquire required material. These specified lead times represented the amount of warning the site believed they could give to vendors before needing the materials. Lead times included 4 weeks (diesel fuel oil, a fuel oil tanker, and grout), 6 weeks (diesel water pumps and sump pumps), and 8 weeks (sandbags (95,000), sand, culvert piping (150 ft.), and levee related materials/resources). The inspectors noted that even if additional time outside of the 12 days was available for procurement of materials, equipment, and workforce, it would be difficult to conclude that the site would have up to 8 weeks of warning prior to the flooding event. Following review of the CAP actions, the inspectors concluded that the licensee's assumptions used to review the adequacy of pre-staging were inappropriate.

During their review of flood protection activities, the inspectors noted that the licensee had a procedure in place, 1478, *Annual Flood Surveillance*, which was performed annually and directed the site to "determine the potential for flooding at Monticello and record a predicted river crest." The licensee stated that this procedure was sufficient to provide warning well in advance of a flooding event on the design basis scale at Monticello, and as a result, the 12 day credited timeline was insignificant. In addition, they believed the advance warning provided by the 1478 procedure made walking through specific timelines for pre-staging and procurement unnecessary. The 1478 procedure directed staff to perform the prediction by contacting the National Weather Service. The inspectors also noted that the bases section in the procedure stated, "peak Mississippi River water levels (>913 feet above sea level) occurred at the MNGP site in 1965, 1997, 2001, and 2009. The calendar date was anywhere from March 27th through May 4th. The determination for potential flooding should occur between February 15th and March 15th."

The inspectors concluded that the 1478 procedure increased the likelihood that the site would have time in advance of a flooding event to prepare for that event. However, the inspectors noted that considering the timing of these recent flooding events, performing this procedure on March 15 would only guarantee 12 days to prepare for a flood that would peak on March 27. The inspectors also noted that this surveillance procedure would not guarantee more than a 12 day timeline to prepare for a flooding event on the scale of a PMF if the spring thaw occurred earlier than expected, or if the 1478 flooding predictions occurred too early, before all snow accumulation had finished. Aside from listing sources of flood prediction information, the 1478 procedure did not delineate specific steps on exactly how to make the prediction. The licensee stated that in practice, the prediction was made by using the 10 percent probability river level crest. The inspectors concluded that since the probability of the 5 day high temperature sequence and probable maximum precipitation event described in the USAR PMF evaluation were extremely low, the 10 percent probability river level crest may not adequately predict the design basis PMF river levels. In addition, the inspectors noted that the PMF was analyzed as a bounding event. Although snow melt would not likely contribute to a flooding event that could occur at other times of the year, the inspectors noted that since the PMF event is bounding, the licensee would be

required to be prepared for a flooding event on the scale of a PMF at all times. Because the 1478 procedure was performed annually, and was intended to predict spring flooding, it may not grant any advance warning for floods on the PMF scale if they occur at other times of the year.

As a result of their review, the inspectors concluded that the licensee's walk-through activities were not meeting the NEI 12-07 objective to "verify that specified equipment/tools are properly staged and in good working condition."

The inspectors also observed actions associated with verification of necessary ring levee activities. While the licensee had originally planned to walk through the levee activities to some extent during the A.6 procedure walk through, the inspectors noted that the A.6 procedure steps associated with levee construction had been excluded. Specifically, the inspectors noted that the procedure walk-through form designated that the levee related procedure steps were achievable, and the note that "berm construction was validated under EC-19415." The licensee had concluded that their engineering modification document, which was prepared at the end of 2011, had met the NEI guidance exception for verifications completed since March 2011. Specifically, NEI 12-07, Section 5.1, *Develop Walk-down Scope,* states, "for temporary flood protection features and incorporated or exterior features that require operator action, the walk-down shall also include verification through Reasonable Simulation that the procedures that cover implementation of the protection strategy can be implemented as written. Verifications completed since March 2011 are acceptable provided they meet the guidance in this document and appropriate documentation can be obtained to support the conclusion." As a result, the licensee did not walk down or walk through the most critical, resource intensive, and time consuming activities associated with their design basis flood mitigation procedure.

After reviewing EC-19415, the inspectors noted that the construction timeline for the levee was 15 days. Including procurement of materials, the timeline specified in the evaluation extended to 25 days. In addition, the inspectors observed that several recommendations were provided by the consulting company which would have allowed the licensee to reduce their timeline to 12 days. These recommendations had not been implemented at the time TI-187 was performed. As a result, the inspectors viewed this engineering modification as a proposed plan, rather than a verification that the levee procedure steps could be performed as written in the credited amount of time. The inspectors also concluded that the evaluation did not address all of the aspects specified in NEI 12-07.

The inspectors concluded that in accordance with the NEI guidance, the licensee should have walked through this activity because it was complex, the individuals who would be supporting the activity were not involved in the 2011 evaluation, and not all reasonable simulation aspects were addressed in the engineering evaluation performed by the external consulting company. NEI 12-07, Section 5.5.6, *Procedure Walk-through and Reasonable Simulation, states*, "to ensure that logistics associated with implementation of the procedures are properly considered, personnel/departments that have responsibility for supporting or implementing the procedure should participate in the simulation effort." The inspectors noted that the A.6 procedure walk-through would have served as an excellent opportunity to walk through the levee activity with individuals from work groups that would be supporting the activity.

The inspectors noted that the evaluation did not verify that the site could implement ring levee activities within the 12 day timeframe described in the licensing basis and required by Step 5.2.11Q of the A.6 flood procedure. The 2011 evaluation also did not verify that all resources needed to complete the levee actions would be available. Rather, as previously noted, the evaluation contained several recommendations for actions that the licensee needed to take in order to ensure availability of materials, and to ensure the credited timeline could be met. As previously stated, the licensee had not implemented the majority of these recommendations at the time of this inspection. Similarly, this evaluation did not verify that necessary equipment and tools were properly staged and in good working condition. In addition, the 2011 evaluation did not provide a review to verify that the execution of the activity would not be impeded by the event, or that the activity would not be impeded by other adverse conditions possible during the event. For example, the earthen levee portion of the levee construction activities was evaluated as achievable within 12 days. However, the 2011 evaluation did not consider that during the last few days of the approach to the peak river level, the plant access road would be flooded. As a result, an alternate site access path through a densely forested hilly area would be necessary for transportation of levee materials into the protected area in order to complete the levee during this time.

NEI 12-07, Section 3.10, *Reasonable Simulation,* states, "reasonable simulation is a walk-through of a procedure or activity to verify the procedure or activity can be executed as specified/written. This simulation would require verification that:

- all resources needed to complete the actions will be available. (Note that staffing assumptions must be consistent with site access assumptions in emergency planning procedures.)
- any credited time dependent activities can be complete in the time required considering the time required for detection, recognition and communication to initiate action for the applicable flood hazard.
- specified equipment/tools are properly staged and in good working condition.
- connection/installation points are accessible.
- the execution of the activity will not be impeded by the event it is intended to mitigate or prevent (for example, access to the site and movement around it can be accomplished during the flood).
- the execution of the activity will not be impeded by other adverse conditions that could reasonably be expected to simultaneously occur (for example, winds, lightning, and extreme air temperatures)."

Following the licensee's 50.54(f) submittal, and in response to inspectors' questions, the licensee developed a timeline which accurately represented actual procurement and levee construction timelines. The timeline provided by the licensee documented that the A.6 actions would take 26.5 days to implement, from the first day on which flood preparations would need to begin, to the time that the design basis flooding event would reach its peak.

Analysis

The inspectors determined that the licensee's failure to adequately validate that external flood protection actions and timelines were achievable was a performance deficiency, because it was the result of the failure to meet the standards of NEI 12-07 that the licensee had committed to; the cause was reasonably within the licensee's ability to foresee and correct; and should have been prevented. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting area of Human Performance, having decision-making components, and involving aspects associated with using conservative assumptions in decision making, verifying the validity of the underlying assumptions, and identifying possible unintended consequences. [H.1(b)]

The inspectors screened the performance deficiency per IMC 0612, "Power Reactor Inspection Reports," Appendix B, dated September 7, 2012, and determined that the issue was more than minor because if left uncorrected, failure to adequately validate levee construction and equipment pre-staging timelines has the potential to lead to a more significant safety concern. Specifically, if the site fails to account for the time and effort necessary to acquire flood mitigation resources prior to the flood, and the time and activities necessary to construct the ring levee, the site may not be able to complete their flood protection measures in time to mitigate floods on the design basis scale. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The inspectors answered "No" to all the questions in Section A, "Mitigating SSCs and Functionality," Section C, "Reactivity Control Systems," and Section D, "Fire Brigade." The inspectors answered "No" to the Section B, "External Event Mitigating Systems," question because the finding did not directly involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors). Therefore, the inspectors determined the finding to be of very low safety significance. (Green)

Enforcement

The inspectors concluded that no violation of NRC requirements occurred. In response to issues raised by the resident staff regarding the execution of the flooding walk-through, the licensee performed a focused walk-through of the A.6 procedure and developed a detailed, resource loaded timeline to accurately reflect the timelines and resources associated with their flood protection actions. Issues identified as a result this focused walk-through and issues identified by the resident inspectors were entered into the licensee's corrective action program (CAP). The licensee entered the failure to adequately perform the flooding walk-through deficiency into the corrective action program as CAP 01378051. **(FIN 05000263/2013008-02; Inadequate TI-187 Procedure Walk-Through)**

4OA6 Management Meetings

.1 Exit Meeting Summary

On May 15, 2013, the inspectors presented the inspection results to Mr. Mark Schimmel and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Schimmel, Site Vice President
J. Grubb, Plant Manager
W. Paulhardt, Operations Manager
N. Haskell, Site Engineering Director
K. Jepson, Assistant Plant Manager
S. Mattson, Maintenance Manager
A. Zelie, Radiation Protection Manager
P. Kissinger, Regulatory Affairs Manager
L. Anderson, Emergency Preparedness Manager
T. Shortell, Training Manager

Nuclear Regulatory Commission
K. O'Brien, Deputy Director, Division of Reactor Projects
K. Riemer, Chief, Reactor Projects Branch 2 (via telecom)

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000263/2013008-01	AV	Failure to Maintain an Adequate Flood Plan Consistent with Design Requirements
05000263/2013008-02	FIN	Inadequate TI-187 Procedure Walk-Through

Closed

05000263/2013008-02	FIN	Inadequate TI-187 Procedure Walk-Through

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Section 4OA5

Procedures

- 3853; Equipment important to EP; Revision 1
- 1385; periodic structural inspection; Revision 10
- A.6; Acts of Nature; Revisions 41, 43, 44, 45, and 46
- 1478; Annual Flood Surveillance; Revision 1-7

CAPs

- CAP 01353461; Procedure question on A.6 execution
- CAP 01353463; Engineering Flooding Walkdowns challenges Ops Shift
- CAP 01353964; NRC Flooding WD Questions not responded <24 hrs as expected
- CAP 01354075; Intake Structure follow up work due to Flooding Walkdowns
- CAP 01354211; Clarification on Flooding Protection in USAR 12.2.1.7.1
- CAP 01355853; Update USAR for External Flooding description discrepancy
- CAP 01356612; Fukushima flood walkdown noted corroded conduit/piping
- CAP 01359435; A.6 Enhancement opportunities
- CAP 01362152; Temp Trailers/Objects obstruct path of A.6 Levee
- CAP 01362189; Evaluate Plant/Site Outage Config for A.6 Flooding Concerns
- CAP 01362913; Error in MNGP Ext Flooding Walkdown Report
- CAP 01365895; Fukushima Walkdown area incorrectly considered LHRA
- CAP 01374634; 2.3 Walkdown-Unknown Flood Protection for FZ-6545
- CAP 01374566; 2.3 Walkdown: Gap Material Between RB and TB
- CAP 01363535; Flooding Pene. Seals need to be verified to withstand Flood
- CAP 01364274; Clarity Needed wrt Flooding Documents and Licensing Basis
- CAP 01370065; Potential Blockage of River Level Indication
- CAP 01363288; River level instrumentation concern above 921’
- CAP 01362635; Errors in walkdown record form #70
- CAP 01355069; FSW piping design press exceeded during DBF conditions
- CAP 01378062; NRC Id’d potential finding & apparent violation of TS 5.4.1.a
- CAP 01378051; NRC Id’d green finding for flooding walk-throughs
- CAP 01318904; A.6 procedure should be revised
- CAP 01368745; A.6 (acts of nature) may contain steps outside design basis
- CAP 01362913; Error in MNGP ext flooding walkdown report
- CAP 01362049; identified enhancements needed for A.6 procedure
- CAP 01362317; Penetrations in flood barrier for A.6
- CAP 01361890; Drawing deficiencies noted from flooding walkdowns

- CAP 01361895; Additional staffing required for flood preps IAW A.6
- CAP 01353929; Inadequate design detail on drawing for flood barriers
- CAP 01353659; OE: OE36614 flood barrier seals could not be verified installed
- CAP 01353461; procedure questions on A.6 execution
- CAP 01355841; Track completion of USAR 12.2.1.7.1 AR
- CAP 01280332; IER 11-1: receiving warehouse possible seismic damage
- CAP 01357883; internal dealine for NRC flooding walkdown report at risk
- CAP 01354525; scope add for walkdown areas not orig identified
- CAP 01276715; IERL1-11-1 support equipment for A.6 proc not assured available
- CAP 01358879; A.6 procedure incorrectly characterizes construction period
- CAP 01358177; Fukushima flood walkdowns uncovered A.6 deficiencies
- CAP 01384725; A.6—some yard drains not on drawings & issues with ext flood
- CAP 01384497; A.6—use of inflatable plugs in yard drains for ext flooding
- CAP 01384300; Flooding mock audit—A.6 and CLB discrepancy
- CAP 01384301; Flooding mock audit—WRF's do not conform with NEI guidance
- CAP 01384296; Flooding mock audit—Activity schedule for A.6
- CAP 01384297; Flooding mock audit—bin wall constructability
- CAP 01384298; Flooding mock audit—walkdown record forms lack detail
- CAP 01384291; Flooding mock audit—Bin wall drawings
- CAP 01384292; Flooding mock audit—engineering bin wall construction
- CAP 01384293; Flooding mock audit—entry conditions for A.6
- CAP 01384288; Flooding mock audit—review levee design change
- CAP 01384290; Flooding mock audit—CLB flood implementation time
- CAP 01384285; Flooding mock audit—detail needed in CAP completion notes
- CAP 01384281; Flooding walkdowns not completed per NEI 12-07 guidance
- CAP 01384236; Flooding mock audit—memorandum of understanding
- CAP 01384229; Flooding mock audit—incomplete corrective actions for IER

Work Orders

- WO 424810-02; recalibrate computer point CWT104, river level transmitter; 3/3/2011
- WO 424810-01; work plan to implement flooding preparations for the 919' flood; 3/25/2011
- WO 437533-01; 1478 Annual Flood surveillance; 2/14/2012
- WO 410859; EDES - MSC, 1478 ANNUAL FLOOD SURVEILLANCE; 4/23/2011

Engineering Change Packages

- EC-19415; MNGP External Flooding Plan Update: Alternative Analysis and Final Design Report; 1/5/2012
- EC-21310; Flooding Walkdown Open Penetration Plugging
- EC-21587; Creation Of Flooding Penetration Equip ID's "PENS"CAP 136

Drawings

- NH-178639; Flood barriers for A.6 acts of nature procedure; Revision 77
- NH-178639-1; Levee alignment and bin wall plan; Revision 0
- NH-178639-2; Details and sections; Revision 0
- NH-178639-3; Sections and quantities; Revision 0

- NH-178639-4; Bin wall section; Revision 0
- NH-178639-5; Bin wall profile; Revision 0
- NH-48841; Flood protection for office & control building steel details; Revision 76
- NH-51677; Flood protection for turbine building tube pulling struct—stl det; Revision 76
- NF-36453; Intake structure sections & details—sheet 1-3; Revision A
- NF-365-453; Intake structure plan at el 934'; Revision 76
- NF-36305; MNGP reactor building floor plan at elev 896'-3"; Revision 0
- NF-36343; Reactor building wall penetrations—west side; Revision 5
- NF-36346; Reactor building wall penetrations—north wall; Revision 2
- NH-36295; reactor building service water discharge; Revision 2
- Reactor building internal flooding sump pump map—elevation 896'
- NF-36294; Reactor building wall penetrations below elevation 935'; Revision 5
- NF-36444; Site plan; Revision 80
- NF-364434; Intake structure perspective; Revision A
- NF-36454; MNGP intake structure plan at el 919'; Revision 77

Other Documents

- Walkdown Record Form 77; A.6 Section 5.0 procedure walk-through; 10/15/2012
- Walkdown Record Form 63; Ring levee; 11/2/2012
- Walkdown Record Form 33; IS-919-A Intake structure main pump room; 9/24/2012
- Walkdown Record Form 20; RB-896-I—Torus room lower level; 9/24/2013
- GAR 1354530; HPCI Room follow up work due to Flooding Walkdowns
- GAR 1354534; Tank Room follow up work due to Flooding Walkdowns
- GAR 1354536; RCIC Room follow up work due to Flooding Walkdowns
- PCR 1360230; A.6 Rev. 44
- GAR 1361376; Fukushima Flooding Walkdown Follow-On Actions
- GAR 01354284; Flooding walkdown **master tracking GAR**
- PCR 1363220; 1478, Rev. 5
- PCR-01318905; A.6 Rev 40; 12/30/2011
- GAR 01319274; Ext flood plan berm const study; 1/4/2012
- DBD-T.5; Design Bases Document: external flooding; Revision 4
- T.5—6.2.1; Effect of maximum probable flood: Specification "flood protection requirements for maximum probable flood;" 1982; verified 9/18/91
- LER 90-019-01; potential loss of fuel oil transfer capability during external flooding due to procedural inadequacy; 4/24/1991
- NRC Safety Evaluation Report for MNGP dated March 18, 1970
- NRC Safety Evaluation for full term license review—MNGP supplement 1 dated December 1980
- MNGP Amendment 16—Answers to AEC questions dated August 29, 1969
- NRC Safety Evaluation Report for MNGP dated January 6, 1981
- Monticello—Flooding rcmd 2.3—A.6 Procedure Section 5.0 walk-through kickoff meeting agenda; 10/23/2012
- Recommendation 2.3 spreadsheet—external flooding walkdown; procedure A.6 section 5.0 walk-through per NEI 12-07 R.0-A Section 3.10 & 5.5.6; 11/16/2012
- A.6 Implementation Timeline, version 1; 11/16/2012

- MNGP Final Response to NRC request for information pursuant to 10CFR 50.54(f) regarding the flooding aspects of Recommendation 2.3 of the near-term task force review of insights from the Fukushima Dai-ichi accident; dated 11/27/2012
- Probable maximum flood response schedule—critical path; Revision D; 1/2/2013
- Probable maximum flood response schedule—all activities; Revision D; 1/2/2013
- Probable maximum flood response schedule—timeline; Revision D; 1/2/2013
- Probable maximum flood response schedule following timeline corrective action implementation—critical path; Revision D; 3/2013
- Probable maximum flood response schedule following timeline corrective action implementation —all activities; Revision D; 3/2013
- Probable maximum flood response schedule following timeline corrective action implementation —timeline; Revision D; 3/2013
- Veit & Company, Inc. Technical execution plan—Xcel MNGP levee construction; 1/24/2013
- List of prestaging actions performed; 3/18/2013

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
AV	Apparent Violation
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
HEP	Human Error Probability
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination of External Events
ISFSI	Independent Spent Fuel Storage Installation
LERF	Large Early Release Frequency
MNGP	Monticello Nuclear Generating Plant
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resources Council
PARS	Publicly Available Records System
PMF	Probable Maximum Flood
PRA	Probabilistic Risk Assessment
RCIC	Reactor Core Isolation Cooling
SDP	Significance Determination Process
SERP	Significance and Enforcement Review Panel
SPAR	Standardized Plant Assessment Risk
SSC	Structure, System, and
TI	Temporary Instruction
TS	Technical Specification
USAR	Updated Safety Analysis Report

cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Monticello Nuclear Generating Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Steven A. Reynolds, Director
Division of Reactor Projects

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Letter to M. Schimmel from S. Reynolds dated June 11, 2013

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT, NRC INSPECTION REPORT 05000263/2013008; PRELIMINARY YELLOW FINDING

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