Xcel Energy®

Prairie Island Nuclear Generating Plant
1717 Wakonade Drive East
Welch, MN 55089

February 26, 2015

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Docket Numbers 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

Prairie Island Nuclear Generating Plant's Fourth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

References:

1. NRC Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (ADAMS Accession No. ML12054A682).

2. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 0, dated August 29, 2012 (ADAMS Accession No. ML12221A339).

3. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, dated August 2012 (ADAMS Accession No. ML12240A307).

4. NRC Letter to NSPM, Prairie Island Nuclear Generating Plant, Units 1 and 2 "Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC NOS. MF0832 and MF0833)," dated November 14, 2013 (ADAMS Accession No. ML13311A486).

5. NSPM Letter to NRC, "Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated October 29, 2012 (ADAMS Accession No. ML12305A313).

6. NSPM Letter to NRC, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated February 26, 2013 (ADAMS Accession No. ML13060A363).

7. NSPM Letter to NRC, "Prairie Island's First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated August 26, 2013 (ADAMS Accession No. ML13239A093).

8. NSPM Letter to NRC, "Prairie Island Nuclear Generating Plant's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0832 and MF0833)," dated February 26, 2014 (ADAMS Accession No. ML14057A647).

9. NSPM Letter to NRC, "Prairie Island Nuclear Generating Plant's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0832 and MF0833)," dated August 25, 2014 (ADAMS Accession No. ML14237A485).

On March 12, 2012, the Nuclear Regulatory Commission (NRC) staff issued Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," (Reference 1) to all NRC power reactor licensees and holders of construction permits in active or deferred status. Reference 1 was immediately effective and directs Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, to have a reliable indication of the water level in the spent fuel storage pool for Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2. Specific requirements are outlined in Attachment 2 of Reference 1.

Pursuant to Condition C of Section IV, Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (ISG), an overall integrated plan, and status reports at six-month intervals following the submittal

of the overall integrated plan. The ISG (Reference 2) endorses, with exceptions and clarifications, the methodologies described in a guidance document from the Nuclear Energy Institute (NEI), NEI 12-02, "Industry Guidance for Compliance with Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1 (Reference 3). Reference 4 provided the NRC interim staff evaluation of the overall integrated plan (Reference 6) and request for additional information.

Reference 5 provided the PINGP initial 60-day status report regarding reliable spent fuel pool instrumentation. Reference 6 provided the overall integrated plan for PINGP. References 7, 8, and 9 provided the first, second, and third six-month status reports, respectively, for the overall integrated plan, per Condition C.2 of Section IV of Reference 1.

The purpose of this letter is to provide the fourth six-month status report pursuant to Section IV, Condition C.2 of Reference 1, which delineates the progress made in implementing the requirements of the Reference 1 Order. The enclosed report provides an update of milestone accomplishments since the overall integrated plan was submitted, including changes to the compliance method, schedule, or the need and basis for relief, if any.

Please contact Stevie Du Pont, Licensing Engineer, at 651-267-7421, if additional information or clarification is required.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

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

Executed on February 26, 2015.

Kevin Davison
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Director of Nuclear Reactor Regulation (NRR), USNRC
Project Manager, Prairie Island Nuclear Generating Plant, USNRC
Resident Inspector, Prairie Island Nuclear Generating Plant, USNRC

ENCLOSURE

Prairie Island Nuclear Generating Plant Units 1 and 2
Fourth Six-Month Status Report for Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation

1.0 Introduction

The Nuclear Regulatory Commission (NRC) issued Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," on March 12, 2012 (Reference 1). The Order requires licensees to have reliable indication of the water level in associated spent fuel pools capable of supporting identification of the following spent fuel pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. The Order required licensees to submit an overall integrated plan, including a description of how the requirements in Attachment 2 of the Order would be achieved. Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, submitted the overall integrated plan (Reference 2) for the Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2, on February 26, 2013. References 4, 5 and 9 provided the first, second and third six-month status reports for the overall integrated plan, per Condition C.2 of Section IV of Reference 1.

On July 11, 2013, the NRC Staff provided requests for additional information (RAIs) in Reference 6 regarding the Spent Fuel Pool Instrumentation (SFPI) overall integrated plan. Reference 3 provided the NSPM responses to NRC Requests for Additional Information (RAIs) regarding the overall integrated plan for PINGP.

On November 14, 2013, the NRC issued an Interim Staff Evaluation (ISE) for PINGP's SFPI overall integrated plan (Reference 7). The ISE documents the NRC Staff's review and provides feedback on NSPM's overall integrated plan. The ISE also includes RAIs, response to which the NRC Staff needs to complete their review. The RAIs issued by the NRC in the ISE supersede the RAIs reported in the Reference 6.

This Enclosure provides the PINGP Units 1 and 2 fourth six-month status report. This status report includes an update of milestone accomplishments since the previous six-month status report was submitted, including any changes to the compliance method, schedule, or the need and basis for relief, if any.

2.0 Milestone Accomplishments

The original milestone schedule, with target dates, was provided in Section 1.2 of Reference 2. No milestones were scheduled for completion subsequent to the previous six-month status report and prior to January 31, 2015. Therefore, NSPM has no milestone accomplishments to discuss.

3.0 Milestone Schedule Status

The following table provides an update of the milestone schedule to support the overall integrated plan. This includes a brief milestone status and a revised target date if the date has changed. The dates are planning dates subject to change as design and implementation details are developed. No target completion dates for milestones have completed or changed for this six-month status report. However, as noted in Section 6 of the third six-month status report (Reference 9), NSPM will provide the responses to the ISE RAIs via the online reference portal (ePortal) by March 31, 2015 instead of in this six-month status report.

Table 1 – Overall Integrated Plan Milestone Schedule

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	October 2012	Complete	
Submit Overall Integrated Plan	February 2013	Complete	
Select Instrument Vendor (Target date 1st Quarter 2013)	1st Quarter 2013	Complete	
Submit First Six-month Status Update	August 2013	Complete	
Commence Engineering Design	3rd Quarter 2013	Complete (Design Started)	
Submit Second Six-Month Status Update	February 2014	Complete	
Submit Third Six-Month Status Update	August 2014	Complete	
Submit Fourth Six-Month Status Update (includes responses to Requests for Additional Information (RAIs))	February 2015	Complete with this submittal	
Commence Installation	2nd Quarter 2015	Not Started	

Table 1 – Overall Integrated Plan Milestone Schedule (Continued)			
Milestone	**Target Completion Date**	**Activity Status**	**Revised Target Completion Date**
Submit Fifth Six-Month Status Update (includes responses to remaining RAIs)	August 2015	Not Started	
Reliable Spent Fuel Pool Instrumentation Operational	End of 2R29	Not Started	
Submit Report that Full Compliance is Achieved	1st Quarter 2016	Not Started	

4.0 Proposed Changes to Compliance Method

There are no changes proposed to the compliance method described in the overall integrated plan (Reference 2).

5.0 Need and Basis for Relief from the Requirements of the Order

NSPM expects to comply with the Order implementation date and requirements and no relief is required at this time.

6.0 Open Items from Overall Integrated Plan and Interim Staff Evaluation

NSPM has not identified any open items in the overall integrated plan for PINGP. The overall integrated plan contained future actions to ensure compliance with the Order. The future actions were identified internally and are being tracked through NSPM's corrective action program (CAP).

On November 14, 2013, the NRC issued the ISE for PINGP's SFPI overall integrated plan (Reference 7). The ISE identified RAIs that were necessary for the NRC to determine the acceptability of NSPM's plans for implementing the requirements of Order EA-12-051. In Reference 5, NSPM stated that the responses to the NRC's ISE RAIs will be provided in the fourth six-month status report scheduled for February 2015.

Subsequently, the NRC notified each licensee participating in the audit not to formally submit their RAI responses on the docket but instead, put their responses and any other supporting information on their online reference portal (ePortal) by the date identified in their ISE to support the NRC Staff's review process (Reference 8). In accordance with this guidance from the NRC, NSPM will provide the responses to the ISE RAIs via the

online reference portal (ePortal) by March 31, 2015 instead of in this six-month status report. Incorporation of the RAI responses into these status reports was discussed in Reference 3.

Table 2 - Interim Staff Evaluation Request for Additional Information		
RAI Number	**Description**	**Status**
1	Please provide the results of the calculation used to determine the water elevation necessary for the pump's required NPSH to confirm that Level1 has been adequately identified.	Completed Response provided in upload to online reference portal (ePortal)
2	Please provide the results of the evaluation to be performed to determine the projected dose rate impact and the appropriate Level 2 value as a result of other hardware stored in the SFP.	Completed Response provided in upload to online reference portal (ePortal)
3	Please describe the impact of the installation of the pneumatic sealed gates on the reliability of the SFP level instrumentation for each SFP, and what compensatory measures would be taken to ensure reliable level indication in each SFP when the gate is installed.	Started
4	Please provide a clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the proposed routing of the cables that will extend from the sensors toward the location of the read-out/display device.	Started

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
5	Please provide additional information describing how the final arrangement of the SFP instrumentation and routing of the cabling between the level instruments, the electronics and the displays, meets the Order requirement to arrange the SFP level instrument channels in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the SFP.	Started

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
6	Please provide the following: a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Describe the methodology that will be used to estimate the total loading, inclusive of design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces. b) A description of the manner in which the level sensor (and stilling well, if appropriate) will be attached to the refueling floor and/or other support structures for each planned point of attachment of the probe assembly. Indicate in a schematic the portions of the level sensor that will serve as points of attachment for mechanical/mounting or electrical connections. c) A description of the manner by which the mechanical connections will attach the level instrument to permanent SFP structures so as to support the level sensor assembly. d) A description of how other material stored in the SFP will not create adverse interaction with the fixed instrument location(s).	Completed Response provided in upload to online reference portal (ePortal)
7	For RAI 6(a) above, please provide the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.	Completed Response provided in upload to online reference portal (ePortal)

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
8	For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that was used to qualify the structural integrity of the affected structures/equipment.	Completed Response provided in upload to online reference portal (ePortal)
9	Please provide the following: a) A description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under BDB ambient temperature, humidity, shock, vibration, and radiation conditions. b) A description of the testing and/or analyses that will be conducted to provide assurance that the equipment will perform reliably under the worst case credible design basis loading at the location where the equipment will be mounted. Include a discussion of this seismic reliability demonstration as it applies to a) the level sensor mounted in the SFP area, and b) any control boxes, electronics, or read-out and re-transmitting devices that will be employed to convey the level information from the level sensor to the plant operators or emergency responders. c) A description of the specific method or combination of methods that will be used to confirm the reliability of the permanently installed equipment such that following a seismic event the instrument will maintain its required accuracy.	Completed Response provided in upload to online reference portal (ePortal)

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
10	For RAI #9 above, please provide the results for the selected methods, tests and analyses used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.	Completed Response provided in upload to online reference portal (ePortal)
11	Please provide the following: a) A description of how the two channels of the proposed level measurement system meet this requirement so that the potential for a common cause event to adversely affect both channels is minimized to the extent practicable. b) Further Information on how each level measurement system, consisting of level sensor electronics, cabling, and readout devices will be designed and installed to address independence through the application and selection of independent power sources, the use of physical and spatial separation, independence of signals sent to the location(s) of the readout devices, and the independence of the displays.	Completed Response provided in upload to online reference portal (ePortal)
12	Please provide the following: a) A description of the electrical ac power sources and capabilities for the primary and backup channels. b) Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.	Completed Response provided in upload to online reference portal (ePortal)

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
13	Please provide the following: a) An estimate of the expected instrument channel accuracy performance under both (a) normal SFP level conditions (approximately Level1 or higher) and (b) at the BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post- shock conditions) that would be present if the SFP level were at the Level 2 and Level 3 datum points. b) A description of the methodology that will be used for determining the maximum allowed deviation from the instrument channel design accuracy that will be employed under normal operating conditions as an acceptance criterion for a calibration procedure to flag to operators and to technicians that the channel requires adjustment to within the normal condition design accuracy.	Started

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
14	Please provide the following: a) A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ. b) A description of how such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently-installed SFP level instrumentation. c) A description of how functional checks will be performed, and the frequency at which they will be conducted. Describe how calibration tests will be performed, and the frequency at which they will be conducted. Provide a discussion as to how these surveillances will be incorporated into the plant surveillance program. d) A description of what preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.	Started

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
15	Please provide the following: a) The specific location for the primary and backup instrument channel display. b) For any SFP level instrumentation displays located outside the main control room, please describe the evaluation used to validate that the display location can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the display as credited in the evaluation, as well as the actual time (e.g., based on walk-throughs) that it will take for personnel to access the display. Additionally, please include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the display or monitor the display periodically.	Completed Response provided in upload to online reference portal (ePortal)
16	Please provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection procedures that will be developed for use of the spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical .objectives to be achieved within each procedure.	Started

Table 2 - Interim Staff Evaluation Request for Additional Information (Continued)		
RAI Number	**Description**	**Status**
17	Please provide the following: a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Please include a description of the plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment. b) Information describing compensatory actions when both channels are out-of-order, and the implementation procedures. c) Additional information describing expedited and compensatory actions in the maintenance procedure to address when one of the instrument channels cannot be restored to functional status within 90 days.	Started

Note: Completed RAI responses above are provided in upload to online reference portal (ePortal), *Xcel Energy Fukushima Response, Prairie Island – SFPI.*

7.0 Potential Draft Safety Evaluation Impacts

There are no potential impacts to the draft Safety Evaluation identified at this time.

8.0 References

1. NRC Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (ADAMS Accession No. ML12054A682).

2. NSPM Letter to NRC, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order

Number EA-12-051)," dated February 26, 2013 (ADAMS Accession No. ML13060A363).

3. NSPM Letter to NRC, "Responses to Requests for Additional Information Regarding Prairie Island Nuclear Generating Plant's Overall Integrated Plan Submitted in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0832 and MF0833)," dated August 6, 2013 (ADAMS Accession No. ML13219A859).

4. NSPM Letter to NRC, "Prairie Island's First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated August 26, 2013 (ADAMS Accession No. ML13239A093).

5. NSPM Letter to NRC, "Prairie Island Nuclear Generating Plant's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0832 and MF0833)," dated February 26, 2014 (ADAMS Accession No. ML14057A647).

6. NRC Email to NSPM, "Prairie Island Units 1 and 2 - Draft RAI RE: OIP for Reliable SFP Instrumentation (TAC Nos. MF0832 and MF0833)," dated July 11, 2013 (ADAMS Accession No. ML13205A355).

7. NRC Letter to NSPM, "Prairie Island Nuclear Generating Plant, Units 1 and 2 Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0832 AND MF0833)," dated November 14, 2013 (ADAMS Accession No. ML13311A486).

8. NRC Letter, "Nuclear Regulatory Commission Audits of Licensees Responses to Reliable Spent Fuel Pool Instrumentation Order EA-12-051," dated March 26, 2014 (ADAMS Accession No. ML14083A620).

9. NSPM Letter to NRC, "Prairie Island Nuclear Generating Plant's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0832 and MF0833)," dated August 25, 2014 (ADAMS Accession No. ML14237A485).