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

August 9, 2017

Mr. Scott D. Northard
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company, Minnesota
1717 Wakonade Drive East
Welch, MN 55089–9642

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 NRC TEMPORARY INSTRUCTION 2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION AND EMERGENCY PREPAREDNESS INSPECTION REPORT 05000282/2017007; 05000306/2017007

Dear Mr. Northard:

On July 14, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Prairie Island Nuclear Generating Plant, Units 1 and 2. On July 14, 2017, the NRC inspectors discussed the results of this inspection with you and members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA–12–049 and EA–12–051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

The NRC inspectors did not identify any findings or violations during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

***/RA/***

Ann Marie Stone, Team Leader
Technical Support Staff
Division of Reactor Projects

Docket Nos. 50–282; 50–306; 72–010
License Nos. DPR–42; DPR–60; SNM–2506

Enclosure:
IR 05000282/2017007; 05000306/2017007

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Letter to Scott D. Northard from Ann Marie Stone dated August 9, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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|---|---|
| Docket Nos: | 50–282; 50–306; 72–010 |
| License Nos: | DPR–42; DPR–60; SNM–2506 |
| Report No: | 05000282/2017007; 05000306/2017007 |
| Licensee: | Northern States Power Company, Minnesota |
| Facility: | Prairie Island Nuclear Generating Plant, Units 1 and 2 |
| Location: | Welch, MN |
| Dates: | July 10 through July 14, 2017 |
| Inspectors: | S. Sheldon, Project Engineer (Team Lead)<br>L. Haeg, Senior Resident Inspector<br>D. Reeser, Senior Operations Engineer<br>V. Petrella, Reactor Inspector |
| Approved by: | Ann Marie Stone, Team Leader<br>Technical Support Staff<br>Division of Reactor Projects |

Enclosure

## SUMMARY

Inspection Report 05000282/2017007; 05000306/2017007; 7/10/2017 -07/14/2017; Prairie Island Nuclear Generating Plant, Units 1 and 2 Temporary Instruction 2515/191 Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/staffing/Multi-Unit Dose Assessment Plans.

This inspection was performed by three NRC regional inspectors and one resident inspector. No findings of significance or violations of NRC requirements were identified during this inspection. 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 April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," Revision 6.

NRC–Identified and Self-Revealing Findings

None.

## REPORT DETAILS

## 4. OTHER ACTIVITIES

4OA5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2515/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," is to verify the licensee has adequately implemented the mitigation strategies as described in the licensee's "Final Integrated Plan [for] Beyond Design Basis FLEX Mitigating Strategies" (ADAMS Accession No. ML16351A208), and the NRC's safety evaluation (ADAMS Accession No. ML17110A275) and to verify the licensee installed reliable water-level measurement instrumentation in their spent fuel pool. The purpose of this TI was also to verify the licensee had implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including multi-unit dose assessment capability and enhancements to ensure staffing is sufficient and communications can be maintained during such an event.

The inspection also verifies plans for complying with NRC Orders EA–12–049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12054A736) and EA–12–051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12054A679) are in place and are being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter and multi-unit dose assessment information provided per COMSECY–13–0010, Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013, (ADAMS Accession No. ML12339A262).

The inspectors discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walk downs to verify the strategies could be implemented as stated in the licensee's submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team's inspection activities are described in the following sections. This inspection closes TI 2515/191 for the Prairie Island Nuclear Generating Plant, Units 1 and 2.

.1 Mitigation Strategies for Beyond-Design Basis External Events

a. Inspection Scope

The inspectors examined the licensee's established guidelines and implementing procedures for the beyond-design basis mitigation strategies. The inspectors assessed how the licensee coordinated and documented the interface/transition between existing off-normal and emergency operating procedures with the newly developed mitigation strategies. The inspectors selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and completeness of the procedures; familiarity of operators with the

procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The inspectors verified a preventive maintenance program had been established for the Diverse and Flexible Coping Strategies (FLEX) portable equipment and periodic equipment inventories were in place and being conducted. Additionally, the inspectors examined the introductory and planned periodic/refresher training provided to the Operations staff most likely to be tasked with implementation of the FLEX mitigation strategies. The inspectors also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors verified the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittal(s) and the associated safety evaluation and determined the licensee is generally in compliance with NRC Order EA–12–049. The inspectors verified the licensee satisfactorily:

- developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events;
- integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
- protected FLEX equipment from site-specific hazards;
- developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and
- developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program as appropriate.

c. Findings

No findings were identified.

.2 Spent Fuel Pool Instrumentation

a. Inspection Scope

The inspectors examined the licensee’s newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation and that the cabling for the power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors determined the licensee satisfactorily installed and established control of the spent fuel pool (SFP) instrumentation as described in the plant specific submittals and the associated safety evaluation and determined the licensee is generally in compliance with NRC Order EA–12–051. The inspectors verified the licensee satisfactorily:

- installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
- installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
- trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
- developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

a. Findings

No findings were identified.

.3 Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation and plant walk downs, the inspectors verified the licensee has implemented required changes to staffing, communications equipment and facilities to support a multi-unit extended loss of AC power (ELAP) scenario as described in the licensee's staffing assessment and the NRC safety assessment. The inspectors also verified the licensee has implemented multi-unit dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's multi-unit dose assessment submittal. Documents reviewed are listed in the attachment.

b. Assessment

The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 response to a large scale natural emergency event that results in an ELAP to all site units and impedes access to the site. The inspectors verified the following:

- the licensee satisfactorily implemented required staffing change(s) to support a multi-unit ELAP scenario;

- EP communications equipment and facilities are sufficient for dealing with a multi-unit ELAP scenario; and
- the licensee implemented multi-unit dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings were identified.

4OA6 Management Meeting

.1 Exit Meeting Summary

On July 14, 2017, the inspectors presented the inspection results to Mr. S. Northard and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors confirmed none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee

S. Northard, Site Vice President
T. Conboy, Director of Site Operations
W. Paulhardt, Plant Manager
S. Sharp, Director of Performance Improvement
J. Kapitz, Director of Fukushima Response
J. Nemcek, FLEX Program Manager
H. Butterworth, Business Support Manager
J. Kivi, Regulatory Affairs Manager
T. Borgen, Operations Manager
T. Holt, Operations Support Manager
B. Greenhoe, Project Manager
L. Gunderson, Regulatory Affairs Engineer
W. Eppen, Operations
J. Loesch, Operations
D. Hartinger, Operations
R. Sitek, Emergency Preparedness
R. Pearson, Design Engineering
S. Thomas, Engineering

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

None.

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.

Condition Reports Initiated as a Result of the Inspection
- 501000000516; FLEX Insp - SFPLI EC Cable Tray Qualification; 7/12/2017
- 501000000548; FLEX Insp - Enhancements to Deploy; 7/13/2017
- 501000000575; FLEX Insp - Sat Phone Charging at +24 hrs.; 7/13/2017

Condition Reports Reviewed
- 01509612; FLEX 300 KW Generator Shore Power Indicates Fault to Battery; 1/22/2016
- 01519023; Some Satellite Phones Appear to be Nonfunctional; 4/18/2016
- 01520363; FLEX Support Guide for Flooding; 4/28/2016
- 01526828; 2016 EP Exercise - FLEX, EDMGs, and SAMGs; 6/29/2016
- 01527685; Erosion Around Flex Building; 7/10/2016
- 01530265; FLEX Implementation during Shutdown Loss Of Power; 8/2/2016
- 01531517; FLEX Building Washout; 8/12/2016
- 01538430; Fukushima: Satellite Phone for EOF Field Team Communicator; 10/18/2016
- 01546416; FLEX Compressor Not Working; 1/4/2017
- 01554999; FLEX Program/Pm Documentation Discrepancy Found; 4/6/2017
- 01559274; SFPLI Cable Tray Qualification; 5/22/2017
- 01559304; 122 FLEX SGMU Pump Unavailable; 5/19/2017
- 01560675; 122 FLEX DSL Driven Submersible Pump Failure to Start; 6/21/2017
- 01561393; FLEX 300kW Diesel Generator 24hr Load Test FAT Doc Missing; 6/19/2017
- 01561459; 122 FLEX Submersible Failed TP 1871B; 6/21/2017
- 501000000455; Door 508 Will Not Open By Use Of The Push Button Switch; 7/10/2017
- 501000000399; FLEX Strategy to Feed SG Pump with CST; 7/7/2017
- 501000000350; 122 FLEX Submersible Pump Hydraulic Leak; 7/5/2017
- 1509606; FLEX Building Power May Be Undersized – Block Heaters Unplug; 1/22/2016
- 1512975; FLEX Building – Heat Detection Recommendation; 2/19/2016
- 1533726; FLEX Storage Building Overhead West 508; 9/5/2016
- 1544704; FLEX Equipment Fuel Level – Staged Value May Be Non-Conforming; 12/12/2016

Calculations
- 178599.51.2016; Calculation for Sizing Portable FLEX SG and SFP Makeup Pump; Rev 0
- ENG-CS-424; Portable FLEX Equipment Overturning and Sliding Under Design Basis SSE; Rev 0
- M484-0001-001; FLEX Portable SG Makeup Pump; Rev 0
- SC-11634309-01; Superstructure Design Calculations for PI FLEX Building; Rev 2

Miscellaneous Documents
- Prairie Island Nuclear Generating Plant FLEX (Beyond Design Basis) Validation Supplement; 07/10/2016
- FLEX; Diverse And Flexible Coping Strategies (FLEX) Program Document; Rev 3
- IP-WA500/500-DD-ET; Primary SG Make Up Pump Test Report; Rev A

- PCR 602000000163; C20.17 AOP3 Procedure Change; 6/12/2017
- L-PI-13-008; Responses to Generic Technical Issues for Resolution Regarding Licensee Communications Submittals Associated with Near-Term Task Force Recommendation 9.3; 2/20/2013
- DIT EC23558-09; Fukushima – Portable Diesel Generator Connections; 6/18/2015
- M484-0001-001; FLEX Portable SG Makeup Pump; Rev 0

Modifications
- EC23555; Fukushima Response Spent Fuel Pool Instrumentation; Rev 0
- EC23556; Fukushima Satellite Phone Communications; Rev 0

Procedures
- 1C1.6 AOP3; Shutdown Loss of Power; Rev 4
- 1C15; Residual Heat Removal System Unit 1; Rev 48
- 1C28.1 AOP3; Aux Feedwater System Operation When AC Power is Lost; Rev 2
- 1ECA-0.0; Loss of All Safeguards AC Power; Rev 28
- 1FSG-1; Long Term RCS Inventory Control; Rev 1
- 1FSG-3; Alternate Low Pressure Feedwater; Rev 1
- 1FSG-4; ELAP DC Bus Load Shed/Management; Rev 1
- 2C1.6 AOP3; Shutdown Loss of Power; Rev 5
- 2C15; Residual Heat Removal System Unit 2; Rev 49
- 2ECA-0.0; Loss of All Safeguards AC Power; Rev 31
- 2FSG-1; Long Term RCS Inventory Control; Rev 2
- 2FSG-4; ELAP DC Bus Load Shed/Management; Rev 2
- 5AWI 15.6.1; Shutdown Safety Assessment; Rev 38
- AB-2; Tornado/Severe Thunderstorm/High Winds; Rev 42
- AB-4; Flood; Rev 50
- BDB-FLEX; Diverse and Flexible Coping Strategies (FLEX) Program Document; Rev 3
- C20.17 AOP3; Repowering the Telephone PBX with a Portable Generator; Rev 2
- F3-13; Offsite Dose Calculation; Rev 19
- F3-13.1; Rad & Met Data for Dose Projections; Rev 2
- F3-13.3; Manual Dose Calculations; Rev 14
- F3-20; Determination of Radioactive Release Concentrations; Rev 24
- FLEX; Diverse and Flexible Coping Strategies (FLEX) Program Document; Rev 3
- FP-BDB-EQP-01; Equipment Important to BDB Compliance; Rev 5
- FP-BDB-IP-01; SAFER Response Staging Area Procedure; Rev 1
- FP-BDB-CHNG-01; FLEX Strategy Change Process; Rev 2
- FP-EDCM-DP-01; Offsite Dose Assessment Using the Unified RASCAL Interface; Rev 1
- FSG-0; ELAP General Reference; Rev 0
- FSG-5; Initial Assessment and FLEX Equipment Staging; Rev 3
- FSG-11; Alternate SFP Makeup and Cooling; Rev 1
- FSG-20; Cooling Water Management Following a Loss of AC Power; Rev 0
- FSG-38; Refueling FLEX Portable Equipment; Rev 2
- FSG-50; Shutdown Loss of Power with External Flooding; Rev 4
- ICPM 0-073-121; 121 Spent Fuel Pool Wide Range Level Instrumentation Maintenance; Rev 1
- ICPM 0-073-122; 122 Spent Fuel Pool Wide Range Level Instrumentation Maintenance; Rev 1
- PINGP 1102; Unit 1 Shutdown Safety Assessment; Rev 40
- PINGP 1103; Unit 2 Shutdown Safety Assessment; Rev 38
- PINGP 1813 (FSG-5); 480V 300kW Portable Generator Hard Card; Rev 0
- PINGP 1814 (FSG-5); Submersible Pump Hard Card; Rev 1
- PINGP 1815 (FSG-5); SG-SFP Makeup Pump Hard Card; Rev 1

- PINGP 1816 (FSG-5); D8 Dozer – FLEX Debris Removal Hard Card; Rev 0
- PINGP 1817 (FSG-5); Cart Caddy Hard Card; Rev 0
- PINGP 783; Steam Release Activity (F3-13.3 / F3-20); Rev 18
- PINGP 784; Shield Building Stack Activity (F3-13.3 / F3-20); Rev 14
- PINGP 946; Dose Calculation Worksheet (F3-13.3 /F3-20); Rev 6
- SAFER Response Plan for Prairie Island Nuclear Generating Plant; Rev 002
- TP 1000; Annual FLEX Equipment Inventory; Rev 1
- TP 1560; 121 and 122 Diesel Generator OST Transfer to D2 Fuel Oil Day Tank Capability Test; Rev 4
- TP 1636; Summer Plant Operation; Rev 32
- TP 1637; Winter Plant Operation; Rev 53
- TP 1869A; 121 FLEX 300KW Dsl Gen Test and Inspection Quarterly (034-071); Rev 2
- TP 1870A; 121 FLEX Dsl Driven SG-SFP M-U Pmp Test and Inspection (045-1291); Rev 1
- TP 1871A; 121 FLEX Dsl Driven Submersible Pmp Test and Inspection (045-1301); Rev 1

Training Documents
- P9114L-0709; Fukushima FLEX Training (Non Licensed Operator/ Licensed Operator); Rev 0
- P9114L-0809; Fukushima FLEX Training (Non Licensed Operator/ Licensed Operator); Rev 0
- P9114L-0909; Fukushima FLEX Training (Non Licensed Operator/ Licensed Operator); Rev 0
- P9116A-0501; FLEX Tour (Licensed Operator Requal – Cycle 16E); Rev 0
- P9116L-0802; FLEX Refresher (Non Licensed Operator/Licensed Operator); Rev 0
- PI-FLEX-001; Fukushima FLEX Training; Rev 2
- PI-FLEX-002; FLEX D8T Dozer Operations; Rev 0
- PI-FLEX-002N; FLEX for Prairie Island Security; Rev 0
- PI-FLEX-003; FLEX Portable 480V Generator and Msc Equipment; Rev 0
- PI-FLEX-004; Prairie Island FLEX Response; Rev 0
- PI-FLEX-005; Prairie Island FLEX Response for Key Decision Makers; Rev 0
- PI-FLEX-TPD; Prairie Island FLEX Training Program Description; Rev 4
- Requal – Cycle 14H; Rev 0
- Requal – Cycle 14I; Rev 0
- Requal – Cycle 16G; Rev 0
- Requal – Cycle 16H; Rev 0

Work Orders
- 00552490; TP I869A - Quarterly Functional Test Of 121 FLEX 300KW DSL Generator; 5/22/2017
- 00536528; TP 1873B - 122 FLEX Fuel Cube (DC) Testing; 11/30/2016
- 00556517; TP 1869C - Quarterly Functional Test of 123 FLEX 300 KW DSL Generator; 5/22/2017
- 00556148; TP 1869B - Quarterly Functional Test of 122 FLEX 300 KW DSL Generator; 5/22/2017
- 00548889; TP 1870B - 122 FLEX DD SG-SFP M-U Pump Annual Operational;
- 00518789; FLEX Verification; 10/31/2015

## LIST OF ACRONYMS USED

| | |
|---|---|
| AC | Alternating Current |
| ADAMS | Agencywide Document Access and Management System |
| CFR | *Code of Federal Regulations* |
| DC | Direct Current |
| ELAP | Extended Loss of AC Power |
| EP | Emergency Preparedness |
| FLEX | Diverse and Flexible Coping Strategies |
| FSG | FLEX Support Guidelines |
| IMC | Inspection Manual Chapter |
| IR | Inspection Report |
| NRC | U.S. Nuclear Regulatory Commission |
| SFP | Spent Fuel Pool |