



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, ILLINOIS 60532-4352

November 1, 2017

Mr. Christopher Church  
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 DESIGN  
BASES ASSURANCE INSPECTION (PROGRAMS): INSPECTION  
REPORT 05000263/2017011

Dear Mr. Church:

On October 6, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial baseline Design Bases Assurance Inspection (Programs) at your Monticello Nuclear Generating Plant. The inspection reviewed the implementation of the Environmental Qualification Program for electrical equipment. The enclosed report documents the results of this inspection, which were discussed on October 6, 2017, with Mr. Kent Scott and other members of your staff.

Based on the results of this inspection, no violations of significance were identified.

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/*

Mark T. Jeffers, Chief  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure:  
IR 05000263/2017011

cc: Distribution via LISTSERV®

Letter to Christopher Church from Mark T. Jeffers dated November 1, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000263/2017011

Licensee: Northern States Power Company

Facility: Monticello Nuclear Generating Plant

Location: Monticello, MN

Dates: September 18, 2017, through October 6, 2017

Inspectors: B. Jose, Senior Reactor Inspector (Lead)  
I. Khan, Reactor Inspector  
I. Hafeez, Reactor Inspector

Observers: N. Khan, NRR Inspector Trainee

Approved by: M. Jeffers, Chief  
Engineering Branch 2  
Division of Reactor Safety

Enclosure

## **SUMMARY**

Inspection Report 05000263/2017011; 09/18/2017—10/06/2017; Monticello Nuclear Generating Plant; Design Bases Assurance Inspection (Programs).

The inspection was a 2-week onsite baseline inspection that focused on the implementation of the Environmental Qualification Program. The inspection was conducted by three regional engineering inspectors. No findings were identified by the inspectors. 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 0609, "Significance Determination Process," dated October 8, 2015. Cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (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," dated July 2016.

### **NRC-Identified and Self-Revealed Findings**

#### **Cornerstone: Mitigating Systems, Barrier Integrity**

No findings were identified.

### **Licensee-Identified Violations**

None

## REPORT DETAILS

### 1. REACTOR SAFETY

#### **Cornerstone: Mitigating Systems and Barrier Integrity**

#### 1R21 Design Bases Assurance Inspection (Programs) (71111.21N)

##### .1 Introduction

This is a baseline inspection of a licensee's program conducted per U.S. Nuclear Regulatory Commission (NRC) Inspection Procedure 71111.21N, Attachment 1. The objective of the Design Bases Assurance Inspection is to gain reasonable assurance that structures, systems, and components can adequately perform their design basis function. This includes reasonable assurance that electrical equipment important-to-safety for which a qualified life has been established can perform its safety functions without experiencing common cause failures before, during, and after applicable design basis events. This inspection will review the licensee's implementation of the electrical equipment Environmental Qualification (EQ) Program, as required by their license, for maintaining the qualified status of equipment during the life of the plant. The inspection is intended to assess the program's effectiveness by sampling a limited number of components. This inspectable area verifies aspects of the Mitigating Systems and Barrier Integrity cornerstones for which there are no indicators to measure performance.

The inspectors assessed the implementation of the EQ Program, established to meet the requirements of Title 10 of the *Code of Federal Regulations*, Part 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants." The scope of this rule included safety-related equipment relied upon to remain functional during and following design basis events, nonsafety-related equipment whose failure under postulated environmental conditions could prevent safety-related equipment from performing design functions, and certain post-accident monitoring equipment. The NRC originally verified plant's EQ Program implementation through a series of onsite inspections from 1984–1989. The EQ Program at that time established measures to ensure components met the EQ rule through the 40-year operating license period.

Specific documents reviewed during the inspection are listed in the Attachment to the report.

##### .2 Inspection Sample Selection Process

The inspectors selected components for review using information provided by the licensee. The Monticello Nuclear Generating Plant, Probabilistic Risk Assessment was reviewed and used for selecting components, generally components that had a high Fussell Vesely Importance factor. Additional selection criteria included discussions with plant staff, reviewing procurement, maintenance, and design records, and walking down plant areas susceptible to high-energy line break. Based on these reviews, the inspectors focused the inspection on EQ Program elements and components repaired, modified, or replaced. Components selected included motor-operated valves, air operated valves, and transmitters (pressure, flow, and level) located both inside and outside of containment.

For each component selected, the inspectors evaluated the equipment qualifications of supporting sub-components including seals, lubricants, connectors, control and power cables, solenoids, transducers, limit switches, and terminal blocks.

This inspection constituted 10 samples (2 components of which were located in primary containment) as defined in Inspection Procedure 71111.21N, Attachment 1, Section 02.01.

### .3 Component Design

#### a. Inspection Scope

The inspectors assessed the licensee's implementation of the EQ Program as required by Title 10 of the *Code of Federal Regulations*, Part 50.49. The inspectors evaluated whether the licensee staff properly maintained the EQ of electrical equipment important to safety through plant life (repair, replacement, modification, and plant life extension), established and maintained required EQ documentation records, and implemented an effective Corrective Action Program (CAP) to identify and correct EQ-related deficiencies and evaluate EQ-related industry operating experience.

This inspection effort included a review of EQ Program-related procedures, component EQ files, EQ test records, equipment maintenance and operating history, maintenance and operating procedures, vendor documents, design documents, and calculations. The inspectors interviewed operators, engineers, maintenance staff, and procurement staff. Additionally, the inspectors performed in-plant walkdowns of accessible components to verify installed equipment was the same as described in the EQ component documentation files, verify components were installed in their tested configuration, determine whether equipment surrounding the EQ component may fail in a manner that could prevent the EQ component from performing its safety function, and verify that components located in areas susceptible to a high-energy break line were properly evaluated for operation in a harsh environment. Components removed from the EQ Program were reviewed to ensure an adequate basis existed to no longer require the components to meet EQ requirements. The inspectors reviewed procurement records and inspected a sample of replacement parts stored in the warehouse to verify EQ parts approved for installation in the plant were properly identified and controlled; and that storage time and environmental conditions did not adversely affect the components' qualified life or service life. Documents reviewed for this inspection are listed in the Attachment. The following 10 EQ components (samples) were reviewed:

- K10B-MTR, 12 Residual Heat Removal (RHR) Auxiliary Air Compressor Motor
- SV-2379, Torus to Reactor Building Vacuum Breaker Air Operated Valve
- AO-2-86A/SV1, 11 Outboard Main Steam Isolation Valve Main Control Valve
- SV-2-71C, SRV C, Air Operator Solenoid Valve
- MO-2076, Reactor Core Isolation Cooling Inboard Steam Isolation Valve (Limitorque Motor Operated Valve)
- Raychem Low and Medium Voltage Splices
- LT-7338B, Torus Wide Range Level Transmitter
- MO-2011, RHR Division 1 to Torus Spray Inboard Motor Operated Valve;
- PS-10-101B, Drywell Pressure Transmitter;
- EP-1728, RHR E to P Converter

b. Findings

No findings were identified.

.4 Operating Experience

a. Inspection Scope

The inspectors reviewed two EQ-related operating experience issues associated with the selected components to ensure that associated generic concerns had been adequately evaluated and addressed by the licensee. The operating experience issues listed below were reviewed as part of this inspection:

- Information Notice 2014-04, "Potential for Teflon Material Degradation in Containment Penetrations, Mechanical Seals and Other Components; "and
- Information Notice 84-57, "Operating Experience Related to Moisture Intrusion in Safety-Related Electrical Equipment at Commercial Power Plants."

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

The inspectors reviewed a sample of the selected component problems identified by the licensee and entered into the CAP. The inspectors reviewed these issues to assess the licensee's threshold for identifying issues and the effectiveness of corrective actions related to design issues. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the CAP. The specific corrective action documents sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings were identified.

4OA6 Management Meeting

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. K. Scott, and other members of the licensee staff on October 6, 2017. The licensee acknowledged the issues presented. The inspectors confirmed that some of the potential report input discussed was considered proprietary and will be handled in accordance with NRC policy.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

K. Scott, Director, Site Operations  
M. Lingenfelter, Site Engineering Director  
A. Ward, Regulatory Assurance Manager  
D. Bosnic, Director, Support Services  
J. Oquist, EQ Engineer  
B. Dixon, Programs Engineering  
R. Loeffler, Design Engineering  
J. Hill, Design Engineering  
P. Nordmier, Programs Engineering  
A. Kouba, Regulatory Assurance

#### U.S. Nuclear Regulatory Commission

P. Zurawski, Senior Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened, Closed and Discussed

None

### **LIST OF ACRONYMS USED**

CAP	Corrective Action Program
EQ	Environmental Qualifications
NRC	U.S. Nuclear Regulatory Commission
RHR	Residual Heat Removal



## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of 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.

### **CORRECTIVE ACTION DOCUMENTS GENERATED DUE TO THE INSPECTION**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date</u></b>
501000003415	Rosemount O Ring Replacement	10/05/2017
501000003384	EQ Reference Number Transposed	10/05/2017
501000003404	Procedure 0424 Bases Clarification	10/05/2017
501000003328	NRC Question on EQ File 13-006	10/04/2017
501000003351	Raychem Installation Instructions	10/04/2017
501000003293	EQ File Reference Update	10/03/2017
501000002980	EQ File 98-051 Clarification	09/22/2017
501000002906	EQ File 13-006 Quarterly Cycles	09/22/2017
501000002884	Monticello Response to IN 2014-04 Enhancement	09/20/2017
501000002802	EQINSP-MOV Actuator Serial Numbers Wrong	09/18/2017

### **CORRECTIVE ACTION DOCUMENTS REVIEWED DURING THE INSPECTION**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date</u></b>
500001527265	Elevated Temperature in SBGT Room	06/21/2012
01363359	SSE EQ PM Frequency not Aligned with Qualified Lives	12/14/2012
01364249	Fire Penetration Degradation in HPCI and Tank Room	12/21/2012
01470658	MO-2008 Exceeds EQ Cycle Limit	03/18/2015
01475626	Discovery of VCI Device Challenges Operability of EQ MOVs	04/21/2015
01510144	Previously Unrecognized Impact of AREVA Transition on EQ	01/27/2016
01424726	NRC INFORMATION NOTICE 2014-04: Potential for Teflon Material Degradation in Containment Penetrations, Mechanical Seals A07174 03/31/2014 and Other Components	03/31/2014

### **DRAWINGS**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Revision</u></b>
NX-7822-22-5b	RCIC Steam Supply Line Isolation MO-2076 Scheme	78
B-208-199	Elementary Diagram 1P57-F015B	K

### **EQ FILES**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Revision</u></b>
98-004	ASCO Solenoid Valves (50.49)	1
13-006	AVCO MSIV Solenoid Valves (50.49)	2
98-051	Reliance Motors (50.49)	2
08-016	Rosemount 1154 Transmitters	2
98-017	G. E. Cable (POR)	2

**EQ FILES**

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
98-020	General Electric Containment Penetration (POR)	2
98-026	Limatorque Motor Operators (50.49)	2
98-036	Raychem Low Voltage Splices (50.49)	1
98-039	Rosemount Pressure Transmitter Series A (DOR)	2
98-043	Rotork Valve Operators (50.49)	2
98-107	Rockbestos Firewall III/SIS Cable (50.59)	2

**MISCELLANEOUS**

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
NEDC-32303P	Qualification Test Report of MSIV Solenoid Valve Cluster Assemblies Hiller 975-30710 (AVC B6930-082)	01/1994
PII-55235	NPKV Nuclear Plant Kit Stub Connection	AA
PII-55244	Heavy Wall, Flame-Retardant Nuclear Cable Sleeves	AD
PII-57879	Nuclear Plant Kit End Sealing Kit	AA
PCR 01496687	Electrical Product List	26

**MODIFICATIONS**

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
26038	EQ MOV Cycling Limit Extension to 4000 Cycles for Limatorque and Rotork NA1 Actuators	1
EC-20636	Door 45 Blocked by SCISSORS Lift	0
EC-27157	HELB Flow Through FZ1330	0

**PROCEDURES**

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
4920-PM	Change out Procedure for ASCO Solenoid Valves	28
MMP-007	MOV Actuator Installation/Removal	10
DI-0910-001-234	Westinghouse Qualification Testing of Rosemont Model 1153 Series A Electronic Transmitters	01/04/1979
MWI-8-M-4.15 4302	Conductor Splicing and Cable Jacket Repair Model 1153 Series B Alkaline Pressure Transmitters for Nuclear Service	14 E
SVI-P57-T2001	Safety-Related Instrument Air MOV Operability Test	7

**WORK DOCUMENTS**

<u>Number</u>	<u>Description or Title</u>	<u>Date</u>
00543465-01	Replace MO-2397 Actuator to Resolve OBN	04/15/2017
00543467-10	Replace MO-2398 Actuator to Resolve OBN	04/20/2017
00460213-02	PM 4920 (Replace Solenoid Valve SV-2379 – EQ)	04/23/2015
00444158-04	PM: AO-2-86A Replace Air Control Assembly	04/21/2017
00533974-05	PM: AO-2-86A 4240-02-PM MSIV General Inspection	04/20/2017
00455535-02	PM 4183 (12 RHR Aux Air Compressor K-10B)	01/29/2013

## **WORK DOCUMENTS**

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<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date</u></b>
00440958-01	I&C – PCT, Performance Outage I&C PM 7267 on PCT-7 Instruments	05/20/2013
00344467-01	Perform Outage I&C PM 7627 on PCT-7 Instruments	02/16/2009
00343746 01	(XX)-CNST, CV-2790, Install Scaffolding	03/10/2010
00343889 01	Elec-A0-2-86D, Perform 4910-PM	05/11/2009
00394445 01	Elec-SV-2791, Bench Test	11/12/2010
00411853 01	IC-FS-2950, Replace Flow Switch	08/26/2010
00498191 01	Replace Solenoid Valve SV-2380 per 4920 PM	09/09/2014
20006149 02	Perform Full PMI-0030 on MOV 1P57-F015B	03/15/2005