



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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May 1, 2019

Mr. Scott Sharp
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
INTEGRATED INSPECTION REPORT 05000282/2019001 AND
05000306/2019001

Dear Mr. Sharp:

On March 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Prairie Island Nuclear Generating Plant, Units 1, 2. On April 18, 2019, the NRC inspectors discussed the results of this inspection with Mr. S. Hafen, Acting Plant Manager and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements.

If you contest the violations or significance or severity of the violations documented in this inspection report, 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 copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC resident inspector at Prairie Island.

If you disagree with a cross-cutting aspect assignment 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC resident inspector at Prairie Island.

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/

Hironori Peterson, Chief
Branch 3
Division of Reactor Projects

Docket Nos.: 05000282; 05000306
License Nos.: DPR-42; DPR-60

Enclosure:
IR 05000282/2019001; 05000306/2019001

cc: Distribution via LISTSERV®

Letter to Scott Sharp from Hironori Peterson dated May 1, 2019

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2—NRC
 INTEGRATED INSPECTION REPORT 05000282/2019001 AND
 05000306/2019001

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 05000282 and 05000306

License Numbers: DPR-42 and DPR-60

Report Numbers: 05000282/2019001 and 05000306/2019001

Enterprise Identifier: I-2019-001-0049

Licensee: Northern States Power Company - Minnesota

Facility: Prairie Island Nuclear Generating Plant, Units 1 and 2

Location: Welch, MN

Inspection Dates: January 01, 2019 to March 31, 2019

Inspectors: S. Bell, Health Physicist
N. Feliz-Adorno, Senior Reactor Inspector
L. Haeg, Senior Resident Inspector
M. Jones, Senior Reactor Inspector
K. Pusateri, Resident Inspector

Approved By: Hironori Peterson, Chief
Branch 3
Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting a quarterly inspection at Prairie Island Nuclear Generating Plant, Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC’s assessment are summarized in the table below.

List of Findings and Violations

Failure to Establish Adequate Procedures for Verifying the Auxiliary Feedwater Room Coolers Thermal Performance			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000282,05000306/2019001-01 Open/Closed	[H.4] - Teamwork	71111.07T
The inspectors identified a finding of very low safety significance (Green) and an associated Non-Cited Violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure to establish procedures appropriate to the circumstance for verifying the auxiliary feedwater (AFW) room coolers thermal performance. Specifically, the licensee upgraded the classification of these coolers to safety-related and credited existing procedures to verify their thermal performance. However, these procedures were not developed or modified to achieve this purpose.			

Failure to Implement Preventive Maintenance Procedure Results in #12 Diesel-Driven Cooling Water Pump Engine Jacket Water Leak			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000282,05000306/2019001-02 Open/Closed	[H.14] - Conservative Bias	71152
A Green finding and associated NCV of Technical Specification 5.4, “Procedures,” was self-revealed on December 10, 2018, when the licensee failed to properly implement procedure FP-PE-PM-01, “Preventive Maintenance Program,” to develop a preventive maintenance strategy to prevent failure of a safety-related 12 DDCLP engine jacket water/lubricating oil heat exchanger anode plug from occurring.			

Additional Tracking Items

None.

PLANT STATUS

Prairie Island Units 1 and 2 operated at full power for the entirety of the inspection period, with the exception of brief down powers to support surveillance testing.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

External Flooding Sample (IP Section 03.04) (1 Sample)

The inspectors evaluated readiness to cope with external flooding for the following areas:

- Intake ad plant screenhouse
- Cooling tower pump house

Impending Severe Weather Sample (IP Section 03.03) (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for extreme cold weather forecast on January 19, 2019 and the week of January 28, 2019.

71111.04 - Equipment Alignment

Partial Walkdown (IP Section 02.01) (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 1 safety injection systems on January 25, 2019
- (2) A train safeguards room coolers with the 122 control room chiller out of service for planned maintenance on February 20, 2019
- (3) #11 component cooling pump during #12 component cooling pump motor testing on March 21, 2019

71111.04S - Equipment Alignment

Complete Walkdown (IP Section 02.02) (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the 121 and 122 control room safeguards chilled water systems between February 21-27, 2019.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Various Fire Area walkdowns during Unit 2 elevated fire risk on January 7, 2019
- (2) Walkdowns of Fire Zones 2, 11, and 43 during Unit 2 elevated fire risk on February 6, 2019
- (3) Fire Zone 8: containment spray pump room Unit 1 on February 11, 2019
- (4) Fire Area 28 a-e: transformers outside turbine building on March 19, 2019

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 02.02a.) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the following areas:

The #12, #22, & #121 cooling water system rooms on March 29, 2019

71111.07T - Heat Sink Performance

Triennial Review (IP Section 02.02) (3 Samples)

The inspectors evaluated heat exchanger/sink performance on the following:

- (1) Ultimate heat sink (Inspection Procedure 71111.07, Sections 02.02.d.4 and 02.02.d.5)
- (2) Diesel driven cooling water pump (DDCLP) jacket water heat exchangers (135-101 & 235-081)
- (3) DDCLP right angle gear oil coolers (117-121 & 217-121)

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

The inspectors observed and evaluated licensed operator performance in the control room while placing excess letdown in service to repair an instrument air leak on January 17, 2019.

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

The inspectors observed and evaluated licensed operator re-qualification training in the simulator on March 12, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (1 Sample)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

#12 residual heat removal system on January 15, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Work Week 1901 risk management actions with the 121 control room chiller out of service for planned maintenance on January 7, 2019
- (2) Work Week 1904 maintenance risk during extreme cold weather on January 29, 2019
- (3) Work Week 1910 maintenance risk during 1R transformer replacement on March 12, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determinations and Functionality Assessments (IP Section 02.01) (5 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) #121 control room chiller air consumption unacceptable on January 13, 2019 (AR 501000021920)
- (2) Past Operability Review of leak on 12 diesel-driven cooling water pump (DDCLP) anode on January 22, 2019
- (3) Fuel oil leak increasing rate on January 20, 2019 (AR 501000022183)
- (4) D5/D6 unplanned Limiting Condition for Operation due to -30°F temperatures on January 31, 2019 (AR 501000023202)
- (5) Unit 2 emergency diesel generator radiator fan motor grease low temperature on February 19, 2019 (AR 501000021920)

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

Engineering Change 601000001300; temporary modification for D6 emergency diesel generator combustion air on February 4, 2019

71111.19 - Post Maintenance Testing

Post Maintenance Test Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Return-to-service testing of D2 emergency diesel generator following planned maintenance on January 22, 2019
- (2) #22 DDLCP testing following major work on February 25, 2019
- (3) #12 safety injection pump testing following offline motor test on March 20, 2019
- (4) #22 safety injection pump testing following valve diagnostic test on March 27, 2019

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Testing (IP Section 03.01) (4 Samples)

- (1) The 12 and 21 auxiliary feed water pump surveillance test design packing leakage on February 8, 2019
- (2) SP 2035B: Reactor Protection Logic Test at Power Train B on February 8, 2019
- (3) SP 1106C: 121 Cooling Water Pump Quarterly Test with Low Pressure Automatic Start on February 21, 2019
- (4) SP 1054: Unit 1 Turbine Stop Valve Testing on March 15, 2019

RADIATION SAFETY

71124.08 - Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Radioactive Material Storage (IP Section 02.01) (1 Sample)

The inspectors evaluated radioactive material storage in the follow areas:

- Barrel Yard

Container check (e.g., swelling, leakage and deformation)

- 10' Sealand Containers
- 20' Sealand Containers
- 55 Gallon Drums
- Mixed Waste Drum
- Radioactive Low Specific Activity (LSA) Boxes

Radioactive Waste System Walkdown (IP Section 02.02) (1 Sample)

The inspectors evaluated the following radioactive waste processing systems during plant walkdowns:

Liquid or solid radioactive waste processing systems

- ATCOR Drumming System
- ADT Evaporator System

Radioactive waste resin and/or sludge discharges processes:

- Liquid Radwaste Processing System

Shipment Preparation (IP Section 02.04) (1 Sample)

The inspectors evaluated training and qualification records for selected individuals due to limited observation of the radioactive material shipment preparation process.

Shipping Records (IP Section 02.05) (1 Sample)

The inspectors evaluated the following non-excepted package shipment records:

- 17-022; Radioactive Waste Shipment
- 18-035; Radioactive Waste Shipment
- 18-045; Radioactive Material Shipment
- 19-002; Radioactive Waste Shipment

Waste Characterization and Classification (IP Section 02.03) (1 Sample)

The inspectors evaluated the radioactive waste characterization and classification for the following waste streams:

- High Activity Filter
- Blast Media
- Ion Exchange Resin

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (2 Samples)

- (1) Unit 1 (January 1, 2018 through December 31, 2018)
- (2) Unit 2 (January 1, 2018 through December 31, 2018)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02)
(2 Samples)

- (1) Unit 1 (January 1, 2018 through December 31, 2018)
- (2) Unit 2 (January 1, 2018 through December 31, 2018)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03)
(2 Samples)

- (1) Unit 1 (January 1, 2018 through December 31, 2018)
- (2) Unit 2 (January 1, 2018 through December 31, 2018)

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

- (1) Unit 1 (January 1, 2018 through December 31, 2018)
- (2) Unit 2 (January 1, 2018 through December 31, 2018)

71152 - Problem Identification and Resolution

Annual Follow-Up of Selected Issues (IP Section 02.03) (1 Sample)

The inspectors reviewed the licensee’s implementation of its corrective action program related to the following issues:

#12 DDCLP active jacket water leak on December 10, 2018 (AR 501000020904)

71153 – Follow-Up of Events and Notices of Enforcement Discretion

Event Follow-Up (IP Section 03.01) (1 Sample)

The inspectors evaluated the licensee's response to extreme cold temperatures and impacts to the D5/D6 Emergency Diesel Generators during the week of January 28, 2019.

INSPECTION RESULTS

Failure to Establish Adequate Procedures for Verifying the Auxiliary Feedwater Room Coolers Thermal Performance			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000282,05000306/2019001-01 Open/Closed	[H.4] - Teamwork	71111.07T
The inspectors identified a finding of very low safety significance (Green) and an associated Non-Cited Violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure to establish procedures appropriate to the circumstance for verifying the auxiliary feedwater (AFW) room coolers thermal performance. Specifically, the licensee upgraded the classification of these coolers to safety-related and credited existing procedures to verify their thermal performance. However, these procedures were not developed or modified to achieve this purpose.			

Description:

On multiple occasions, the licensee identified the AFW pump room temperature profiles following a design basis accident (DBA) or a high energy line break (HELB) were higher than previously predicted. The licensee captured these discoveries in their Corrective Action Program (CAP) and performed multiple operability evaluations which determined the affected system, structures, and components (SSCs) were operable but not conforming. Examples of these discoveries included CAP1237000 initiated on June 11, 2010, and QIM500001266815 initiated on January 18, 2011. As part of the corrective actions, the licensee replaced the non-safety related AFW room coolers in 2017 under modification 6MOD00026419. The licensee also issued revisions 0 and 0A of calculation ENG-ME-847, "HELB Case Specific Inputs & SEA Room Heat Up," and revision 1 of calculation ENG-ME-849, "Design Basis Accident Room Heat Up Model Case Specific Inputs and Results," to credit the coolers heat removal function as a safety function. Lastly, on February 21, 2019, the classification of these coolers was upgraded to safety-related. As a result, revision 25 of procedure H21, "Generic Letter 89-13 Implementing Program," was revised to manage the coolers thermal performance.

Procedure H21 credited periodic test procedures TP 1789A, "AFW Pump Room Cooler Flushing, Flow Balancing, dP Monitoring, & Air Side Inspection, Train A," revision 1, and TP 1789B, "AFW Pump Room Cooler Flushing, Flow Balancing, dP Monitoring, & Air Side Inspection, Train B," revision 5, as a means of managing and verifying the AFW pump room coolers thermal performance. Procedure H21 stated:

Test procedures TP 1789A (Train A) and TP 1789B (Train B) are performed annually. During the procedure, the cooling water flow rate and the cooling water inlet and outlet pressures are recorded for each cooler. This data is sufficient to trend changes in cooling water differential pressure across a cooler. An increase in differential pressure would be an indication that flow blockage is present within the tubes of the coolers.

However, on March 5, 2019, the inspectors noted procedures TP 1789A and TP 1789B were not adequate for verifying the AFW room coolers thermal performance. Specifically, these procedures: (1) did not contain instructions to obtain and evaluate as-found differential pressure (dP) conditions; (2) masked as-found conditions because they performed flushing and flow balancing prior to obtaining dP measurements; and (3) did not incorporate acceptance criteria that were correlated to thermal performance. These deficiencies prevented the licensee from recording, evaluating and trending the accumulation of macrofouling and debris in between testing periods. However, procedure H21 relied on trending the above information as a means of identifying a potential reduction in AFW room cooler thermal performance.

Upon further review, the inspectors noted procedures TP 1789A and TP 1789B were not developed to verify thermal performance. Specifically, their purposes were to perform flushing, flow balancing, dP monitoring, and air side inspection of the AFW pump room coolers. The inspectors confirmed this observation through interviews with licensee personnel. In addition, the inspectors learned during these interviews the licensee did not evaluate the activities prescribed in procedures TP 1789A and TP 1789B to ensure they were adequate to verify AFW room cooler thermal performance prior to crediting them as a means of verifying room cooler thermal performance. Specifically, the design engineering work group did not communicate and coordinate with the program engineering work group when crediting the procedures maintained and implemented by the program engineering work group.

Corrective Action: The immediate corrective action was to perform an operability review, which reasonably determined the AFW room coolers were operable. At the time of this inspection, the licensee was still evaluating its planned corrective actions to restore compliance.

Corrective Action Reference: QIM501000023925

Performance Assessment:

Performance Deficiency: The inspectors determined the failure to establish procedures appropriate to the circumstance for verifying the AFW room coolers thermal performance was contrary to 10 CFR Part 50, Appendix B, Criterion V, "Instructions Procedures, and Drawings," and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the procedures credited for the verification of the AFW room coolers thermal performance would allow unacceptable cooler thermal performance to go undetected, which would have the potential to adversely impact the capability of accident mitigating SSCs supported by these coolers (e.g., AFW system).

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations". The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality of mitigating systems. Specifically, the licensee performed an immediate operability review, which reasonably determined the AFW pump room coolers were operable based, in part, on the demonstrated thermal performance of other heat exchangers exposed to similar hydraulic and thermal conditions, and the AFW pump room coolers relatively short operating history.

Cross-Cutting Aspect: H.4 - Teamwork: Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, the design engineering work group did not communicate and coordinate with the program engineering work group when crediting the procedures maintained and implemented by the program engineering work group.

Enforcement:

Violation: Title 10 CFR 50, Appendix B, Criterion V, "Instructions Procedures, and Drawings," requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. It also requires that instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. The licensee credited procedures TP 1789A, "AFW Pump Room Cooler Flushing, Flow Balancing, dP Monitoring, & Air Side Inspection, Train A," Revision 1, and TP 1789B, "AFW Pump Room Cooler Flushing, Flow Balancing, dP Monitoring, & Air Side Inspection, Train B," Revision 5, to verify the thermal performance of the AFW pump room coolers, an activity affecting quality.

Contrary to the above, since February 21, 2019, activities affecting quality were not prescribed by documented procedures of a type appropriate to the circumstances and did not include appropriate quantitative or qualitative acceptance criteria for determining that important activities had been satisfactorily accomplished. Specifically, on February 21, 2019, the

licensee upgraded the AFW pump room coolers classification to safety-related and credited existing procedures TP 1789A and TP 1789B to verify their thermal performance via differential pressure measurements and flow monitoring. However, these existing procedures failed to verify auxiliary feedwater room cooler thermal performance because the procedures: (1) failed to contain instructions for obtaining and evaluating as-found differential pressure and flow conditions; (2) masked as-found room cooler conditions because flushing and flow balancing were performed prior to obtaining differential pressure measurements; and (3) did not incorporate acceptance criteria that were correlated to thermal performance.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Implement Preventive Maintenance Procedure Results in #12 Diesel-Driven Cooling Water Pump Engine Jacket Water Leak

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000282,05000306/2019001-02 Open/Closed	[H.14] - Conservative Bias	71152

A Green finding and associated NCV of Technical Specification 5.4, "Procedures," was self-revealed on December 10, 2018, when the licensee failed to properly implement procedure FP-PE-PM-01, "Preventive Maintenance Program," to develop a preventive maintenance strategy to prevent failure of a safety-related 12 DDCLP engine jacket water/lubricating oil heat exchanger anode plug from occurring.

Description:

On December 10, 2018, with the 12 DDCLP out-of-service for a planned engine oil replacement, a maintenance technician discovered an approximate 4 drop-per-minute (dpm) active weep hole leak from a sacrificial anode plug on the engine jacket water/lubricating oil heat exchanger. Engineering staff inspected the condition, informed the shift manager, and generated AR 501000020904, "Active Jacket Water Leak on 12 DDCLP." Although the 12 DDCLP was out-of-service at the time of discovery, the station was not in a Technical Specification Limiting Condition for Operation due to the 121 motor-driven cooling water pump aligned to the 'A' cooling water header. However, based on the lack of reasonable assurance that the leak would remain at its current rate under engine running conditions, and considering that the jacket water system did not have a safety-related makeup source, the shift manager declared that the 12 DDCLP was not operable for the anode condition. The station developed plans to drain the jacket water system and replace the leaking and other similar anodes with carbon steel plugs under a design equivalency change. This was determined to be acceptable based on existing chemical additives in the jacket water that negated the use of sacrificial anodes.

Following additional extent-of-condition reviews, and returning the 12 DDCLP to service, the licensee contracted two laboratories to conduct forensic analyses of affected anode plugs since the failure rate was much faster than previously considered when a preventive maintenance (PM) strategy was established following the discovery of severely corroded anodes in August of 2018 (see Non-Cited Violation 2018003-02 within NRC Prairie Island Inspection Report 2018003). After receiving the results of the forensic analyses, the licensee performed a past operability review and determined that the 12 DDCLP remained operable

based on testing of the leaking anode that showed compaction of corrosion products within micro-cracks of the anode that minimized leakage over time. This, in turn, supported reasonable assurance of past operability of the 12 DDCLP for its mission time during the time frame that the anode was installed. The licensee also performed a condition evaluation to review the programmatic decisions associated with the preventive maintenance strategy development following the August of 2018 issues.

The inspectors reviewed the past operability review, forensic analyses, and condition evaluation. The inspectors acknowledged testing results performed by a contracted vendor to support the past operability conclusions; however, they noted that there were some differences between the vendor testing setup and as-installed configuration of the anode in the system. Regardless, based on the licensee's additional evaluation of a bounding "worst-case" leakage of the anode from a past-operability standpoint, the inspectors determined that it was reasonable to conclude that the 12 DDCLP remained operable during the timeframe that the anode was installed.

Additionally, the inspectors revisited and reviewed evaluations and corrective actions from the August of 2018 corrosion issue. The inspectors noted that the contracted metallurgist vendor laboratory for those evaluations provided applicable zinc anode corrosion rate information, and suggested that exposure of the anode weep hole could be reached in as little as 63 days under worst case conditions. The inspectors also noted that during development of the preventive maintenance strategy to address the August of 2018 issue and aforementioned Non-Cited Violation, this information provided by the vendor was not considered to prevent future failures/leaks. Instead, the station determined on November 3, 2018, that formal external monthly inspections of the anode, as well as removal/inspection on a 4-year frequency, was sufficient to prevent failures/leaks.

Corrective Actions: Corrective actions included installation of carbon steel plugs within the 12 and 22 DDCLP engine jacket water/lubricating oil heat exchangers. This, in turn, eliminated the need for a preventive maintenance strategy to address galvanic corrosion to anode plugs within the DDCLP engine jacket water systems.

Corrective Action Reference: AR 501000020904

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to properly implement FP-PE-PM-01, "Preventive Maintenance Program," Revision 21, to establish an appropriate preventive maintenance strategy for the 12 DDCLP, was a performance deficiency. The cause of the issue of concern (leaking 12 DDCLP anode) was reasonably within the licensee's ability to foresee and correct and the issue of concern should have been prevented. Specifically, the licensee did not appropriately consider contracted laboratory vendor information provided to the station in November of 2018 that showed failure frequencies of these anodes as early as 63 days. Instead, a presumed anode leak rate, degradation progression based on internal operating experience, and generically applicable industry guidance (all of which required several assumptions as to their veracity/applicability) were inputs into determining that non-preventive monthly external inspections for leaks and a 4-year internal inspection frequency were appropriate preventive maintenance strategies for the anodes within the 12 DDCLP engine jacket water system.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety

concern. Specifically, if the preventive maintenance program was not properly implemented, failures could occur prior to maintenance being conducted.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations". Specifically, the finding screened as very low safety significance (Green) because the inspectors answered Yes to Question A.1 under Exhibit 2—Mitigating Systems Screening Questions due to the finding being a deficiency affecting the design or qualification of the mitigating SSC for which operability was maintained.

Cross-Cutting Aspect: H.14 - Conservative Bias: Individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, the decision to implement a preventive maintenance strategy that relied on identification and/or an inspection frequency that did not consider vendor-stated failure frequencies was not prudent nor conservative considering the number of unknowns related to the degradation mechanism and how failure would have manifested itself.

Enforcement:

Violation: Violation: Technical Specification 5.4, "Procedures" states, in part, that "Written procedures shall be established and implemented covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978."

NRC Regulatory Guide 1.33, Revision 2, Appendix A, Section 9 addresses "Procedures for Performing Maintenance" and Section 9.b addresses "Preventative maintenance schedules should be developed to specify inspection or replacement of parts that have a specific lifetime."

The licensee established Procedure FP-PE-PM-01, "Preventive Maintenance Program," Revision 21, as the implementing procedure to develop and specify preventive maintenance schedules. As stated, in part, within FP-PE-PM-01, Section 5.0, "Requirements," the "...legitimate reasons for creating and performing a Maintenance Plan: A task that specifically addresses known failure modes," and that "These reasons must be documented in the PM basis, including discussion of how the identified PM strategy will prevent those failures from occurring."

Contrary to the above, on November 3, 2018, the licensee failed to properly implement procedure FP-PE-PM-01. Specifically, the licensee did not appropriately consider corrosion rate information provided by a contracted metallurgy laboratory to develop a preventive maintenance strategy to prevent failure of a safety-related 12 DDCLP engine jacket water/lubricating oil heat exchanger anode plug from occurring.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Observation	71153
The inspectors evaluated the licensee's response to extreme cold temperatures forecast during the week of January 28, 2019. In particular, the inspectors reviewed the station's evaluation of potential impacts to the D5 and D6 Emergency Diesel Generators, FLEX equipment, offsite power/grid reliability, and other plant equipment operating margins. The inspectors focused on the station's risk management actions and determined that the licensee had appropriately	

removed items from their work week schedule that could either increase any likelihood in reliability of operations, or impact essential systems that were important for station response during the extreme cold temperatures. The station identified in a review of station procedures and vendor correspondence that the D5 and D6 Emergency Diesel Generators were not qualified for operation at temperatures below -30°F. The inspectors assessed the licensee's approaches to mitigate this concern, including: contacting their vendors for additional information, developing a temporary modification, and ultimately, submitting a one-time TS change request to the Nuclear Regulatory Commission. Overall, the inspectors determined that the licensee's emergent response to the extreme cold temperature forecast was conducted safely.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On April 18, 2019, the inspector presented the quarterly integrated inspection results to Mr. S. Hafen, Acting Plant Manager and other members of the licensee staff.
- On February 15, 2019, the inspector presented the Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation to Mr. S. Sharp, Site Vice President and other members of the licensee staff.
- On March 7, 2019, the inspector presented the Heat Sink Performance - Triennial Review to Mr. H. Hanson, Plant Manager and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.01—Adverse Weather

- C28-11; CST Winter Operation; Revision 10
- TP 1637; Winter Plant Operation; Revision 54
- AR 50100002276; Cold Weather Preparations; 01/31/2019
- CY-ADMN-003; Strategic Water Chemistry Plan Closed Cooling Water Systems; Revision 2
- RPIP 3669; D5 and D6 Diesel Generator Coolant Samples; Revision 10
- AB-4; Flood; Revision 56
- SP 1293; Inspection of Flood Control Measures; Revision 26

71111.04—Equipment Alignment

- C1B.1; Engineered Safeguards Equipment Support Systems; Revision 53
- C1.1.14-1; Unit 1 Component Cooling System; Revision 35
- C1.1.35-3; Cooling Water System; Revision 41

71111.05AQ—Fire Protection

- Fire Detection Zone 8; Unit 1 Auxiliary Bldg. Floor El. 695' (Diagram); Revision 41
- Fire Detection Zone 2; Fire Area 31 & 32—F5 Appendix A—Auxiliary Feedwater Pump Rooms Floor Elevation 695'; Revision 43
- Fire Detection Zone 11—Fire Area 20 and 81; BUS 15 and 16 Switchgear Rooms Floor Elevation 715'-10; Revision 41
- Fire Area 31 & 32—F5 Appendix A—Auxiliary Feedwater Pump Rooms Floor Elevation 695'; Revision 43

- Fire Detection Zone 43—Fire Area 22 and 80; BUS 111 and 121 Switchgear Rooms—Floor Elevation 715’–10; Revision 41
- Fire Area 28a-e; Transformers—Outside Turbine Building; Revision 45

71111.06—Flood Protection

- 5AWI 8.9.0; Internal Flooding Drainage Control; Revision 21
- H36; Plant Flooding; Revision 11

71111.07T—Heat Sink Performance

- 6MOD00025413; 12 Diesel Driven Cooling Water Pump Replacement; 11/12/2018
- 6MOD00021788; Safeguards Bay Level and Traveling Screen; 07/25/2018
- SP 1424; Unit 1 Five (5) Year Containment Fan Coil Unit Performance Test; Revision 2
- SP 1304; Unit 1 Component Cooling Heat Exchanger Performance Test; Revision 10
- SP 1106A; 12 Diesel Cooling Water Pump Monthly Test; Revision 95
- TP 1789A; AFW Pump Room Cooler Flushing, Flow Balancing, DP Monitoring, & Air Side Inspection, Train A; Revision 1
- TP 1789B; AFW Pump Room Cooler Flushing, Flow Balancing, DP Monitoring, & Air Side Inspection, Train B; Revision 5
- H21; Generic Letter 89-13 Implementing Program; Revision 25
- C35 AOP1; Loss of Pumping Capacity or Supply Header with SI; Revision 15
- C35 AOP2; Loss of Pumping Capacity or Supply Header without SI; Revision 14
- C35 AOP8; Loss of Cooling Water Return Header; Revision 14
- C35; Cooling Water; Revision 88
- C47020; Alarm Response Procedure; Revision 51
- C47520; Alarm Response Procedure; Revision 44
- CY-ADMN-003; Strategic Water Chemistry Plan Closed Cooling Water Systems; Revision 2
- H65.2.9; Closed-Cycle Cooling Water System Aging Management Program; Revision 2
- PM 3002-2-12; 12 DDCLP Minor Diesel Periodic Maintenance; Revision 47
- PM 3002-2-22; 22 DDCLP Diesel Minor Periodic Maintenance; Revision 46
- PM 3108-2; Cooling Water Emergency Intake Structure 5 Year Inspection; Revision 6
- PM 3110-1A; Loop A Cooling Water Header Internal Coating Inspection; Revision 0
- ENG-ME-517; Determination of Potential Water Hammer Scenarios for Generic Letter 96-06; 09/27/2002
- ENG-ME-347; Minimum Required Intake Bay Volume; 01/28/2015
- ENG-ME-573; Tube Plugging Limits for 12 and 22 DDCLP Jacket Water Heat Exchangers; Revision 1A
- ENG-ME-604; Tube Plugging Limits for 12 and 22 DDCLP Right Angle Drive Gear Oil Coolers; Revision 2
- ENG-ME-820; CI Hydraulic Analysis- LOOP, LOCA, and Seismic Response; Revision 1
- AR 501000023635; AFW Room Cooler Testing; 02/27/2019
- AR 501000016704; MIC Inspection: Unacceptable Thin Spot; 09/10/2018
- Final Eddy Current Inspection Report 12 DDCLP Gear Oil Cooler; 04/05/2017
- Final Eddy Current Inspection Report 12 DDCLP Jacket Water Cooler; 04/05/2017
- Final Eddy Current Inspection Report 22 DDCLP Gear Oil Cooler; 03/21/2018
- Final Eddy Current Inspection Report 22 DDCLP Jacket Water Cooler; 03/21/2018
- RPIP 3668; Diesel Cooling Water Pump Coolant Samples; Revision 10
- WO 700036424; SP1110A Train A CL Header Isolation Valve Test; 12/04/2018
- WO 700042314; SP1110B Train B CL Header Isolation Valve Test; 02/02/2019
- WO700020527; SP1193A – Cycle AFWP & CL MOV’s CSD; 10/11/2018

- WO 700036423; SP1159 CL QTR Valve Test; 12/09/2018
- WO 700039179; TP 1789B – AFWP Room Cooler Flushing; 01/25/2019
- WO 700015316; TP 1789A – AFWP Room Cooler Flushing; 01/08/2018
- WO 700036279; TP1789A – AFWP Room Cooler Flushing; 02/18/2019
- WO 700022735; PM 3108-2 CL Emergency Intake Structure; 11/14/2018
- WO 700026893; PM 3512-8 Screen House Underwater Inlet Inspections; 11/14/2018
- WO 700022735; PM 3108-2 CL Emergency Intake Structure; 11/14/2018
- WO 700012648; PM 3109-1-21 21 CL STRNR Inspection; 09/28/2018
- WO 700039272; SP1106A 12 Diesel CL Pump Monthly; 01/19/2019
- WO 700034120; SP1106A 12 Diesel CL Pump Monthly; 10/18/2018
- WO 700031923; SP1110A Train A CL Header Isolation Valve Test; 09/02/2018
- WO 700474522; SP 1380 – IST Test of CL-43-1 During Refueling; 10/28/2016
- WO 700014012; SP 1845 Cycle 3-Way CL Supply to 12 DDCLP; 03/13/2018
- WO 700012092; SP1106A - 12 DD CLP(145-392)MNTH TEST; 08/18/2017
- WO 700033403; SP1106B - 22 Diesel Cooling Water Pump Monthly Test; 05/17/2018
- WO 700036425; 22 Diesel Cooling Water Pump Monthly Test; 08/18/2018
- WO 700037066; SP1106A - 12 DD CLP(145-392)MNTH TEST; 12/14/2018
- WO 700039272; 12 Diesel Cooling Water Pump Monthly Test; 02/06/2019
- WO 700047980; Refill Coolant per PM 3002-2-22, Attachment A; 02/27/2019
- AR 501000023928; Model WO 343505 Reflects Wrong Chemical; 03/06/2019
- AR 501000023925; 2019 NRC UHS AF RM UC DP Testing; 03/06/2019
- AR 501000023939; NRC UHS Observation: Test and Maintenance Procedure; 03/07/2019

71111.11Q—Licensed Operator Requalification

- XH-1-38; Flow Diagram Chemical and Volume Control—Unit 1; 08/12/2010
- 1C12.1; Letdown, Charging, and Seal Water Injection—Unit 1; Revision 29
- SEG #P9118ST-0802; Cycle 18# Simulator Session #2; Revision 1

71111.12—Maintenance Effectiveness

- AR 5010000019392; 12 RHR Train MR Unavailability Above 75%; 10/30/2018
- H24; Maintenance Rule Program; Revision 21

71111.13—Maintenance Risk Assessment and Emergent Work

- PRA-PI-SY-SVCS; Safeguards Ventilation System Pg. 14 of 44; Revision 5.3
- AR 501000021906; Minor Leak on 121 CR Chiller End Bell; 01/31/2019
- AR 501000021779; Rework: Replace 121 Chilled Water Expansion Bellows; 01/27/2019
- AR 501000021847; Incorrect Rev of Dedication Plan Used; 01/09/2019
- AR 501000021786; Bump Hazard; 01/08/2019
- WW1901 Schedule Evaluation (01/06/2019—01/12/2019); 11/19/2018
- FP-OP-RSK-01; Risk Monitoring and Risk Management; Revision 9

71111.15—Operability Evaluations

- AR 501000022550; D5 and D6 Room Temperatures are Challenged; 01/30/2019
- AR 501000007124; D5/D6 Diesel Temperature Limit; 01/10/2018
- AR 5010000021920; 121 CR Chiller Air Consumption Unacceptable; 01/13/2019
- AR 5010000022183; Fuel Oil Leak on 2EG-9-53 Increase Rate; 01/20/2019
- AR 5010000022572; D5/D6 Unplanned LCO Due to -30F Temperatures; 01/18/2019

- AR 501000023202; U2 EDG Radiator Fan Motor Grease; 02/15/2019
- ENG–ME–662; Unit 2EDG Building Maximum Outside Air Temperature Evaluation; Revision 2
- D18; Equipment Lubrication; Revision 100
- H32.2; Lubrication Sampling and Analysis Program; Revision 12

71111.18—Plant Modifications

- AR 501000022541; D6 Diesel Generator Surging When Running; 01/30/2019
- Design Change Package 6010000001300; Temporary Modification for D6 Emergency Diesel Generator Combustion Air; Revision 0

71111.19—Post Maintenance Testing

- SP 1088B; Train B Safety Injection Quarterly Test; Revision 29
- AR 501000024741; Leaking CC Fitting on 22 SI Pump; 03/16/2019
- MSIP 3005; Testing Equipment Deenergized and Personnel Protective Grounding; Revision 18
- SP 1106B; 22 Diesel Cooling Water Pump Monthly Test; Revision 95
- C35; Cooling Water; Revision 88
- AR 501000022264; 87 Relay Incorrect Bench Test Values; 01/22/2019
- AR 501000022282; Trend—NRC Identified Material Condition; 01/23/2019
- AR 501000022283; D2 Vertical Drive Coupling Runout; 01/23/2019
- AR 501000022300; D2 Instrument Flush Partial Complete; 01/23/2019
- AR 501000022162; Bolt Broke While Removing D2 Exhaust Opposite Control Side (OCS); 01/20/2019
- AR 501000022185; D2 Exhaust Ext. Bellows Beyond 10% Margin; 01/21/2019
- AR 501000022204; Coating Indications on the HX Heads; 01/20/2019

71111.22—Surveillance Test

- SP 2032B; Safeguards Logic Test at Power—Train B; Revision 30
- SP 2035B; Reactor Protection Logic Test at Power—Train B; Revision 39
- AR 501000022919; Unexpected 47508–0509 Annunciator; 02/08/2019
- SP 1090B; 12 Containment Spray Pump Quarterly Test (WO 700044392); Revision 30
- NF—39237; Flow Diagram Containment Internal Spray System Units 1 and 2; Revision 00
- AR 501000023652; Unable to Review IW41 for Three WOs; 02/27/2019
- AR 501000023676; 121 CL PMP; 02/26/2019
- SP 1054; Turbine Stop, Governor, Reheat Stop and Reheat Intercept Valve Exercise; Revision 45
- SP 1106C; 121 Cooling Water Pump Quarterly Test; Revision 49
- NF—39216–1; Flow Diagram Cooling Water–Screenhouse Units 1 and 2; 04/11/2007
- SP 2042; RTD Bypass Flowmeter Functional Test; Revision 25

71124.08—Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

- NRC Question Response Form; Out of Service Equipment; 03/24/2017
- Nuclear Oversight Audit Report; 12/01/2017
- Self-assessment for Inspection Procedure 71124.08; Undated
- Barrel Yard Monthly Inventory; 02/06/2019

- Radioactive Material/Waste Transportation Training Documents; Various Documents
- 10 CFR 61 Analysis; PI Hi Filter; 04/05/2002
- 10 CFR 61 Analysis; PED Sponge Media; 06/12/2014
- 10 CFR 61 Analysis; PINGP-16-LLF; 10/22/2016
- 10 CFR 61 Analysis; PINGP-12-LLF; 03/15/2012
- 17-022; Radioactive Waste Shipment; 08/23/2017
- 18-035; Radioactive Waste Shipment; 11/07/2018
- 18-045; Radioactive Material Shipment; 10/25/2018
- 19-002; Radioactive Waste Shipment; 01/14/2019
- FP-RP-RW-02; Radioactive Shipping Procedure; Revision 21
- RPIP 1320; Monitoring of Rad Waste in Interim Storage; Revision 9
- RPIP 1322; Radman for Windows to Generate Scaling Factors; Revision 11
- RPIP 1330; Satellite RCA Process; Revision 13
- D59; Process Control Program; Revision 12
- AR 501000005858; Amount of Resin in Liner #161; 11/30/2017
- AR 501000005956; NOS: Different RW Tare Weights; 12/01/2017
- AR 501000005990; Improper Torqueing for Shipment 17-023; 11/30/2017
- AR 501000006092; NOS: Ossie with Attachment 17 in Radwaste Shipping Packages; 12/05/2017
- AR 501000006157; NOS: Trend in Radwaste Shipping Documentation Quality; 12/06/17
- AR 501000008273; Heated Radioactive Storage Building; 02/12/2018
- AR 501000015991; Puddles of Water Observed on Radioactive Material Storage Boxes; 08/22/2018

71151—Performance Indicator Verification

- AR 501000015410; Corroded Drain Plugs on 12 and 22 DDCWP; 08/09/2018
- AR 501000020904; Active Jacket Water Leak on 12 DDCLP; 12/10/2018
- CD 5.14; Preventive Maintenance Program Standard; Revision 4
- FP-PE-PM-01; Preventive Maintenance Program; Revision 21

71152A—Problem Identification and Resolution

- FP-PA-PI-02; NRC/INPO/WANO Performance Indicator Reporting; Revision 14

71153—Event Follow-Up

- AR 501000022574; Grid Condition Yellow; 01/31/2019
- AR 501000022587; MISO Orange Energy Alert; 01/31/2019
- AR 501000022572; Unplanned LCO Entry Into T.S. 3.8.1 B and E; 01/31/2019
- MRB# 01344228; Unit 2 Emergency Diesel Generator Margin Concern Due to High or Low Outside Air Temperature; Revision 5x 08/31/2015
- Project #21-7450-378; Nuclear Specification For Emergency Diesel Generators D5 and D6; Revision 3