



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

June 22, 2023

Q. Shane Lies
Senior VP and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT – BIENNIAL PROBLEM
IDENTIFICATION AND RESOLUTION INSPECTION REPORT
05000315/2023012 AND 05000316/2023012

Dear Q. Shane Lies:

On May 22, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Donald C. Cook Nuclear Plant and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the station's problem identification and resolution program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for problem identification and resolution programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally, the team reviewed the station's programs to establish and maintain a safety-conscious work environment and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation 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 Donald C. Cook Nuclear Plant.

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 Donald C. Cook Nuclear Plant.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by Feliz-Adorno, Nestor
on 06/22/23

Néstor J. Feliz Adorno, Chief
Engineering and Reactor Projects Branch
Division of Operating Reactor Safety

Docket Nos. 05000315 and 05000316
License Nos. DPR-58 and DPR-74

Enclosure:
As stated

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Letter to Q. Shane Lies from Néstor Félix Adorno dated June 22, 2023.

SUBJECT: DONALD C. COOK NUCLEAR PLANT – BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000315/2023012 AND 05000316/2023012

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000315 and 05000316

License Numbers: DPR-58 and DPR-74

Report Numbers: 05000315/2023012 and 05000316/2023012

Enterprise Identifier: I-2023-012-0008

Licensee: Indiana Michigan Power Company

Facility: Donald C. Cook Nuclear Plant

Location: Bridgman, MI

Inspection Dates: May 01, 2023 to May 22, 2023

Inspectors: M. Gangewere, Reactor Inspector
K. Kolaczyk, Reactor Operations Engineer
E. Magnuson, Reactor Inspector
E. Sanchez Santiago, Senior Project Engineer

Approved By: Néstor J. Félix Adorno, Chief
Engineering and Reactor Projects Branch
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a biennial problem identification and resolution inspection at Donald C. Cook Nuclear Plant, 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.

List of Findings and Violations

Failure to Establish Acceptance Criteria for Technical Specification Surveillance Requirement for Source Range Neutron Flux Monitoring Channel Check			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000315,05000316/2023012-01 Open/Closed	[P.2] - Evaluation	71152B
The inspectors identified a finding of very low safety significance (Green) and an associated non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to include appropriate quantitative or qualitative acceptance criteria in procedure 2-OHL-4030-SOM-042 to demonstrate compliance with Technical Specification (TS) Surveillance Requirements (SR) 3.3.1.1 and 3.3.8.1. Specifically, the licensee failed to include acceptance criteria for determining the TS SR channel checks of source range neutron flux monitoring channels had been satisfactorily accomplished.			

Additional Tracking Items

None.

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 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.

OTHER ACTIVITIES – BASELINE

71152B - Problem Identification and Resolution

Biennial Team Inspection (IP Section 03.04) (1 Sample)

- (1) The inspectors performed a biennial assessment of the effectiveness of the licensee's Problem Identification and Resolution program, use of operating experience, self-assessments and audits, and safety-conscious work environment.
 - **Problem Identification and Resolution Effectiveness:** The inspectors assessed the effectiveness of the licensee's Problem Identification and Resolution program in identifying, prioritizing, evaluating, and correcting problems. The inspectors also conducted a 5-year review of the Nuclear Instrumentation System and evaluated the corrective actions for the following non-cited violations, minor violations, and findings: NCV 2021011-01, "Incorrect Valve Design and Bearing Material Assumed for Safety Related Butterfly Valves 1-WMO-733/737 and 2-WMO-734/738," NCV 2022001-01, "Fire Zone Separation Not Maintained," and FIN 2022003-002, "Failure to Ensure Correct Operation of the Meteorological Tower."
 - **Operating Experience:** The inspectors assessed the effectiveness of the licensee's processes for use of operating experience.
 - **Self-Assessments and Audits:** The inspectors assessed the effectiveness of the licensee's identification and correction of problems identified through audits and self-assessments.
 - **Safety-Conscious Work Environment:** The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety-conscious work environment.

INSPECTION RESULTS

Assessment	71152B
<p>Based on the samples reviewed, the team concluded that the licensee's implementation of the Corrective Action Program was generally effective and supported nuclear safety.</p> <p><u>Effectiveness of Problem Identification:</u></p> <p>Based on the samples reviewed, the team concluded that the licensee continued to identify issues at a low threshold and appropriately entered these issues into the Corrective Action Program. The team determined that the licensee usually entered problems into the Corrective Action Program completely and accurately. The inspectors determined that the station has identified negative trends such as contractor oversight and engineering rigor. Though the site was generally effective at identifying negative trends that could potentially impact nuclear safety, the team identified multiple areas where trends were not formally documented, such as nuclear instrumentation failures, single point vulnerability issues, and impacts of steam leaks on the plant, including operations. In addition, the licensee used the Corrective Action Program to document instances in which previous corrective actions were ineffective or were inappropriately closed.</p> <p>The team also noted that some deficiencies were identified by external organizations, including the NRC, that had not been previously identified by licensee staff and were subsequently entered into the Corrective Action Program. In addition, the licensee also utilized Corrective Action Program support processes to identify problems, including the self-assessment and audit process, and the Operating Experience Program. For example, the licensee performed department self-assessments and quality assurance audits to identify issues in station processes. Similarly, the licensee screened issues from both NRC and industry operating experience and entered them into the Corrective Action Program when they were applicable to the station.</p> <p>The team performed a 5-year review of the nuclear instrumentation system. As part of this review, the team interviewed the system engineer, reviewed the plant health report, and reviewed selected corrective actions and condition evaluation documents. The team identified a non-cited violation for the failure to establish acceptance criteria for source range nuclear instrumentation surveillances. This violation is documented in this report.</p> <p><u>Effectiveness of Prioritization and Evaluation of Issues:</u></p> <p>Based on the samples reviewed, the team determined that licensee performance was generally effective at prioritizing and evaluating issues commensurate with the safety significance of the identified problem. The Initial Screening Committee and the Management Screening Committee meetings were generally thorough and intrusive in reviewing issues and prioritizing actions. In addition, the team observed a healthy dialogue between the members of these committees and the members challenged each other when dispositioning issues. However, the team identified multiple examples of issues that were classified as NCAP that should have been classified as CAP or CARC. This observation is documented in more detail in the Results section of this report.</p> <p>In general, once a degraded or non-conforming condition was identified, the Corrective Action Program directed an equipment operability or functionality review to be performed. As a result, most of the samples reviewed were evaluated in a timely manner. However, the team</p>	

noted multiple examples where an extent of condition review did not completely consider the impact of the identified condition on other similar equipment in the plant. This observation is documented in more detail in the Results section of this report.

Effectiveness of Corrective Actions:

Based on the samples reviewed, the team determined that the licensee was generally effective in corrective action implementation. In general, corrective actions for deficiencies that were safety significant were implemented in a timely manner. Problems identified using a root cause or other cause methodologies were resolved in accordance with Corrective Action Program requirements. The team determined that the licensee generally assigned corrective actions that were effective and timely for NRC identified issues and licensee event reports (LERs). However, the team identified an example where the licensee identified an error in a calculation used for determining gas accumulation acceptance criteria and did not establish short term corrective actions in accordance with procedures 12-EHP-5043-EDC-001, "Evaluation of Degraded/Nonconforming Conditions," and PMP-7030-CAP-002, "Condition Report Conduct and Closure." The details associated with this issue are documented in a minor performance deficiency in this report.

Assessment	71152B
<p>The team determined that the licensee's utilization of operating experience was generally effective. The licensee screened industry and NRC operating experience information for applicability to the station. When applicable, actions were developed and implemented to prevent similar issues from occurring. Operating experience lessons learned were communicated and incorporated into plant operations. The team did not identify any concerns in this area.</p>	

Assessment	71152B
<p>The team determined that the licensee's self-assessments and audits were generally effective. The licensee conducted department self-assessments and nuclear oversight audits periodically throughout the organization. These assessments and audits were generally effective in identifying issues and opportunities for improvement at an appropriate threshold. The self-assessments and audits reviewed by the team identified issues that were not previously known, including issues within the Corrective Action Program itself. The licensee's Nuclear Oversight (NOS) also identified deficiencies in the licensee's processes, which were addressed through the Corrective Action Program. The team did not identify any concern in this area.</p>	

Assessment	71152B
<p>The team reviewed the results from the 2023 Employee Concerns Annual Assessment and multiple 2021 and 2022 departmental safety culture surveys. The team also conducted one-on-one interviews with 21 licensee staff concerning the effectiveness of the Corrective Action Program, the ability to raise issues, and the freedom from potential retaliation for raising issues. The team did not identify any impediment to the establishment of a safety-conscious work environment.</p> <p>In general, the licensee's staff was aware of and familiar with the Corrective Action Program and other processes to raise nuclear safety concerns, such as the Employee Concerns Program. Licensee staff indicated they could raise nuclear safety concerns without fear of retaliation. The team did not identify examples of retaliation for raising nuclear safety</p>	

concerns. The licensee staff interviewed believed that operational issues and issues with high safety significance were being appropriately addressed in a timely manner.

Failure to Establish Acceptance Criteria for Technical Specification Surveillance Requirement for Source Range Neutron Flux Monitoring Channel Check

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000315,05000316/2023012-01 Open/Closed	[P.2] - Evaluation	71152B

The inspectors identified a finding of very low safety significance (Green) and an associated non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to include appropriate quantitative or qualitative acceptance criteria in procedure 2-OHL-4030-SOM-042 to demonstrate compliance with Technical Specification (TS) Surveillance Requirements (SR) 3.3.1.1 and 3.3.8.1. Specifically, the licensee failed to include acceptance criteria for determining the TS SR channel checks of source range neutron flux monitoring channels had been satisfactorily accomplished.

Description:

Donald C. Cook Nuclear Plant had a total of two source range neutron flux monitoring channels per Unit. TS 3.3.1, "Reactor Trip System Instrumentation," required two source range neutron flux monitoring channels to be operable in mode 2 below the P-6 (intermediate range neutron flux) interlock, and modes 3, 4, 5 with rod control system capable of rod withdrawal or one or more rods not fully inserted. Technical Specification SR 3.3.1.1 required a channel check to be performed. Similarly, TS 3.3.8, "Boron Dilution Monitoring Instrumentation (BDMI)," required two source range neutron flux monitoring channels to be operable in modes 3, 4, and 5. TS SR 3.3.8.1 required a channel check to be performed.

The inspectors reviewed multiple action reports (ARs) for the Unit 2 source range neutron flux monitoring channels. Specifically, the inspectors reviewed AR 2021-4555, AR 2021-5609, AR 2022-7668, and noted deviations between the two source range channels were inconsistently evaluated. For example:

- AR-2021-4555 documented 2-N-31 trended at a lower magnitude than 2-N-32. This issue was classified as Non-Corrective Action Program (NCAP) item. The actions taken included declaring 2-N-31 operable and completing an NCAP evaluation.
- AR-2021-5609 documented 2-N-31 read a decade lower than 2-N-32. This issue was classified as a Condition Adverse to Quality (CAQ). The actions taken included declaring 2-N-32 inoperable and completing a maintenance rule evaluation.
- AR 2022-7668 documented 2-N-31 read lower than 2-N-32. This issue was classified as NCAP. The actions taken included declaring 2-N-31 inoperable and completing a Failure Investigation Process. An assignment for an NCAP evaluation was performed to define a proper channel check between N-31 and N-32 and a lessons learned communication to licensed operators was initiated. However, no actions from either assignment were taken.

The inspectors also reviewed General Tracker 2021-6735. It stated, "unlike most other indications available in the control room, there is no standard by which a source range is measured against." As a result, the licensee provided training to operators on nuclear instrumentation source range theory to assist in operability determination. The training was

completed in January of 2022.

Technical Specification Bases Revision 60 for SR 3.3.1.1 and 3.3.8.1 stated, "Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A Channel Check will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each channel calibration." The bases further stated, "Agreement criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit."

The licensee established procedure 2-OHL-4030-SOM-042, Revision 56, "Unit 2 Tours – U2 CR M3&4 Shift Chks," to implement TS SR 3.3.1.1 and 3.3.8.1 channel checks. The inspectors noted that the procedure did not include quantitative or qualitative acceptance criteria for the channel checks of source range detectors 2-N-31 and 2-N-32. In contrast, the procedure included acceptance criteria for the intermediate range excore and power range excore detectors, including a minimum, maximum and/or maximum difference between channels values. Licensee procedure PMP-4030-EXE-001, Revision 28, "Conduct of Surveillance Testing," defined acceptance criteria as "parameters against which the collected data is to be compared to determine if: 1. Test completion is satisfactory. 2. Equipment OPERABILITY conditions are satisfied. 3. Technical Specifications are satisfied. 4. Design Basis criteria are adhered too."

The absence of source range detector acceptance criteria resulted in inconsistent operability determinations and follow up actions due to operator judgement variations from crew to crew. The failure to include acceptance criteria to ensure TS SR 3.3.1.1 and 3.3.8.1 channel checks were completed satisfactorily was determined to also be applicable to the Unit 1 procedure 1-OHL-4030-SOM-029, Revision 59, "Unit 1 Tours – U1 CR M3&4 Shift Chks," for the source range detectors.

Corrective Actions: The licensee entered this issue into their Corrective Action Program and planned to establish acceptance criteria in the affected TS SR procedures.

Corrective Action References: AR 2023-3814, "Undefined Acceptance Criteria for Source Range Channel Check"

Performance Assessment:

Performance Deficiency: The licensee's failure to include quantitative or qualitative acceptance criteria for TS SR channel check implementing procedures of the source range neutron flux monitoring channels was contrary to 10 CFR 50 Appendix B, Criterion V, and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to establish acceptance criteria for the source range detectors TS SR channel checks did not ensure the detectors would continue to be able to perform their safety function.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined the finding was of very low safety significance (Green) because they answered "No" to the Reactor Protection System (RPS) question in exhibit 2, "Mitigating Systems Screening Questions."

Cross-Cutting Aspect: P.2 - Evaluation: The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee did not thoroughly evaluate and resolve the absence of source range detector acceptance criteria when they identified there was a need to provide source range nuclear instrumentation calibration training to all operators to assist in operability determinations since there was no acceptance criteria for these instruments.

Enforcement:

Violation: Title 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings" requires, in part, that instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, as of May 15, 2023, the licensee failed to include appropriate quantitative or qualitative acceptance criteria in procedures for determining that important activities have been satisfactorily accomplished. Specifically, the licensee failed to include acceptance criteria to determine the channel checks required by TS SR 3.3.1.1 and 3.3.8.1 were satisfactorily accomplished in procedures 2-OHL-4030-SOM-042 Revision 56, and 1-OHL-4030-SOM-029 Revision 59.

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

Minor Performance Deficiency

71152B

Minor Performance Deficiency: During their review of open corrective actions the inspectors reviewed condition report AR-2018-7809, "Error in AEP-15-46." This AR documented that during a revision to the waterhammer analysis in report AEP-15-45, "Emergency Core Cooling System, Residual Heat Removal System and Containment Spray System Gas Accumulation Evaluation for D.C. Cook Units 1 and 2," it was identified that the vendor incorrectly modeled the discharge piping. This resulted in incorrect acceptance criteria for the waterhammer analysis for the gas accumulation program. The acceptance criteria at the time was 1.3 ft³. The vendor preliminary results expected the final acceptance criteria would be between 0.75 ft³ and 0.9 ft³.

Subsequently, the inspectors reviewed multiple ARs for voids identified in 2021 and 2022. These ARs stated that the acceptance criteria was 1.3 ft³. The inspectors questioned whether the correct acceptance criteria was being used in the interim until the final corrective actions were taken to address the calculational error. Based on their review the inspectors identified the licensee continued to use 1.3 ft³ as the acceptance criteria with no documented justification to address the non-conforming condition. Procedure 12-EHP-5043-EDC-001, "Evaluation of Degraded /Nonconforming Conditions," Revision 31, Section 3.6.3 stated, "Determine Interim Actions for TS [Technical Specification] SSCs [structures, systems and components] and Non-TS SSCs Performing TS Support Functions." Procedure PMP-7030-CAP-002, "Condition Report Conduct and Closure," Revision 43, Section 3.5.3

stated, "Prior to approval, consider what impact the new due date could or would have on the list below: c. Interim Corrective Actions that may be required or are in place." Contrary to these self-imposed standards, the licensee did not determine interim actions for the identified non-confirming condition and in addition extended the due date for correcting the calculation multiple times without consideration of any interim corrective actions for the identified condition. The inspectors determined this was a performance deficiency and the licensee documented this issue in AR 2023-3844.

Screening: The inspectors determined the performance deficiency was minor. The inspectors determined the performance deficiency was of minor significance because in accordance with gas accumulation inspection procedures 1-EHP-4030-108-001A, "Train 'A' Monitoring and Trending of Gas Accumulation in ECCS," Revision 4, 1-EHP-4030-108-001B, "Train 'B' Monitoring and Trending of Gas Accumulation in ECCS," Revision 3, and 1-EHP-4030-108-004, "Outage Monitoring and Trending of Gas Accumulation in ECCS," Revision 16, the licensee would have maintained the identified voids below 20 percent of the acceptance criteria. This value is below the recommended interim acceptance criteria documented in AR 2018-7809.

Observation: Multiple instances of misclassification of condition reports	71152B
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The team reviewed corrective action documents and observed station review committee meetings, as well as management review committee meetings. The inspectors questioned the classification of the following condition reports as NCAP:

- AR 2022-8824, "Missed verification steps on 2-IMO-220" - This AR stated the station sent a safety-related valve stem and nut to an offsite vendor. A licensee procedure required measurement of the components after machining and prior to installation. This action was not performed and documented as a potential nonconformance.
- AR 2023-3504, "1-PP-26N Oil analysis indicates a possible oil mix" - This AR documented that an oil analysis indicated a mix of the correct oil, and an unknown oil was used in the safety-related Unit 1 North safety injection pump.
- AR 2023-3493, "CGID Evaluation Error Corrected" - This AR documented an error in a commercial grade dedication evaluation.

The justification for all of these ARs to be classified as NCAP was that there was no operability impact. The inspectors noted that procedure PMP-7030-MOP-001, "Corrective Action Program Management Oversight Process," defined a condition adverse to quality (CAQ) as a failure, malfunction, deficiency, deviation, effect or nonconformance associated with the performance of an activity affecting the safety-related function of a structure, system or component. This procedure also defined a condition adverse to regulatory compliance (CARC) as "A condition in which the licensee is not in conformance with NRC regulations; a failure to comply with a docketed commitment made to the NRC; a noncompliance with the licensee's Quality Assurance Program that does not consequently affect the safety-related function of a structure, system or component." It also stated that "Conditions Adverse to Regulatory Compliance are addressed within the licensee Corrective Action Program." The inspectors noted using operability as the justification for classifying identified conditions was not in accordance with their established definitions. The importance of correctly classifying identified conditions is to ensure issues are fully identified, appropriate corrective actions assigned, trending of issues, among other actions specific to each classification option. The

licensee reviewed the classification of the items questioned by the team and reclassified them. The inspectors did not identify any safety concerns associated with this observation.

Observation: Evaluation of Extent of Condition

71152B

Prior to the inspection, the licensee identified multiple examples of concluding their review of identified issues without performing a thorough review. The identified examples resulted in repeat failures and issues. During the inspection, the team identified multiple examples of the licensee not fully characterizing extent of condition, including:

- The licensee identified worn u-bolts on a ½” sampling line connected to the RCS Loop #1 hot leg during a routine walkdown of the Unit 1 containment. This discovery was documented in AR 2022-3764, AR 2022-3781, and AR 2022-3786. The station initially assigned a discrepant condition evaluation action (DCE) to fully evaluate the degraded condition of the sample line and u-bolts. Initial evaluation determined the cause of the loose u-bolts and fretting damage to the pipe to be vibration of the system. The DCE was cancelled when replacement of the u-bolts and affected piping was added into the outage work scope. The licensee did not perform an extent of condition on other similar sampling lines to determine if other lines had the same vibration induced degradation.
- In 2020, pressurizer spray valve positioner 2-NRV-164-PU failed due to a previously unidentified single point vulnerability (SPV), causing the associated pressurizer spray valve, 2-NRV-164, to fail fully open. The resulting increase in pressurizer level led to a complicated scram with associated automatic safety injection. The licensee identified that the failed position, and others of the same type, were inappropriately removed from the SPV program in 2018. The station did not perform a review of their SPV program changes to determine if additional components had been inappropriately removed at that time. Subsequently, in 2021, the 2-XJ-113-5 bellow from the moisture separator reheater failed during operation, which led to operators inserting a reactor scram. The licensee’s causal evaluation (AR 2021-5596) determined that the failed bellows should have been classified as a single point vulnerable component. One of the initial corrective actions assigned as part of the root cause evaluation was to perform a review of all single point vulnerability related changes and evaluations over the previous 10 years. This assignment was removed by the corrective action review board and replaced with an ongoing generic review of risk significant engineering changes. In both cases, when latent single point vulnerabilities caused plant transients, the station did not evaluate their single point vulnerability program for further issues.

The inspectors did not identify any safety concerns associated with this observation.

EXIT MEETINGS AND DEBRIEFS

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

- On May 22, 2023, the inspectors presented the biennial problem identification and resolution inspection results to Q. Shane Lies and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Calibration Records	AR 2022-9291	Unit 2 Reactor Trip	11/10/2022
	Corrective Action Documents	AR 2022-2860	ACE for Missed LHRA Posting During Sluice Activities	04/07/2022
		AR 2010-11114	Exposed Insulation Found During U2C19 Recirc Sump Walkdown	10/19/2010
		AR 2015-15397	CDBI Identified Violations	11/30/2015
		AR 2018-6573	Roof Leak	06/24/2018
		AR 2019-11423	2-NRI-32 is Not Responding Correctly and is Inoperable	11/14/2019
		AR 2020-0312-9	MRE: N-44 Failed to 102% in U2 Caused a Unexpected CR Alarm	01/15/2020
		AR 2020-1423	MRule (a)(1) Process for Unit 2 Nuclear Instrumentation	02/12/2020
		AR 2020-3739	2-NRI-32 is Slowly Failing Low	05/03/2020
		AR 2020-6997	Unit 2 Source Range Instrumentation	09/07/2020
		AR 2020-8407	Filters do Not Literally Meet Implied LRA Requirements	10/09/2022
		AR 2020-8661	Update the SPV List and FMEA's for Charging & Spray Valves	10/15/2020
		AR 2021-0040	Perform Common Cause Evaluation of Pressurizer PORV Leakage	01/04/2021
		AR 2021-0040	Perform Common Cause Evaluation of Pressurizer PORV Leakage	01/02/2021
		AR 2021-10263	Clearance Request Submitted by Maintenance Planners	12/16/2021
		AR 2021-10275	1-CCW-256 Removed from U1C31 Scope - Perform Risk Eval	12/16/2021
		AR 2021-2838	Vulnerabilities Introduced During Design Modifications.	04/05/2021
		AR 2021-3483	2-NRI-32 Not Reading Properly	04/24/2021
		AR 2021-4555	2-NRI-31 and 2-NRI-32 Not Trending at the Same Magnitude.	05/17/2021
		AR 2021-5609	U2 Source Range Detector 2-NRI-21 is Inoperable	06/23/2021
AR 2021-5690	Unreliable Performance of Unit 2 Source Range Detectors	06/24/2021		
AR 2021-5745	2-N-32 is Failing Low.	06/27/2021		
AR 2021-6327	CR's Not Written for Evaluations on Failed Safety Related Parts	07/21/2021		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AR 2021-7098	1-WMO-737 Triple Offset Instead of Double Offset	08/17/2021
		AR 2021-7594	1-WMO-733 As-Left Un-Seating Torque Above VDS Criteria	09/07/2021
		AR 2021-8277	NRC POV Violation Internal Valve Maintenance	10/04/2021
		AR 2021-8808	Discrepancy Identified in SFP Inventory Detailed Description	10/26/2021
		AR 2022-0168	EACE for Unit 1 Aux Cable Vault CO2 Actuation	01/06/2022
		AR 2022-0168	Unit 1 Aux Cable Vault CO2 Actuated	01/06/2022
		AR 2022-0195	1-HV-ACE-S1-FD Failed to Close.	01/06/2022
		AR 2022-0198	Inadequate Guidance Regarding TRM Actions	01/07/2022
		AR 2022-0936	EDG 2R Lifter Damaged	02/01/2022
		AR 2022-10001	Evaluate Unit 2 Pressurizer Heaters and Spray Bypass Valve	12/11/2022
		AR 2022-1042	Freezing Frazzle Ice Conditions	12/23/2022
		AR 2022-1272	RVLIS Uncertainty Potentially Non-Conservative	02/15/2022
		AR 2022-2860	Demin Room Not Posted as LHRA During Resin Sluice as LHRA During Resin Sluice	04/07/2022
		AR 2022-3764	1-RC-101-L1 Line Support Wearing Out	04/29/2022
		AR 2022-3786	Second Worn U-bolt Downstream of 1-RC-101-L1	04/29/2022
		AR 2022-3870	CRDM Cables Dangling out of Window into the Reactor Cavity	05/02/2022
		AR 2022-4033	Weld Failed Dye Penetrant Exam	05/07/2022
		AR 2022-41	Corrosion in Fire Protection Piping	03/27/2013
		AR 2022-4255	Gas Void at 1-CS-353	05/14/2022
		AR 2022-4994	U2 T/C #43 (Core Location F05) Erratic Readings	06/08/2022
		AR 2022-5785	Removal of CST and Connected Piping from ISI Program	07/13/2022
		AR 2022-6282	Failure to Implement/Maintain Procedures for the MET Tower	08/04/2022
		AR 2022-6828	Unit 1 Reactor Trip - RCP 13 Trip	08/28/2022
		AR 2022-6921	SCD-PE-EVALUATION-100001022 Came to Incorrect Conclusion	08/30/2022
		AR 2022-7538	Track A(1) Process for RCS-09 IAW 12-EHP-5035-MRP-001	09/27/2022
		AR 2022-7668	2-N-31 Failed Low	10/01/2022
		AR 2022-7740	Critical Parameters Found out of Tolerance	10/02/2022
		AR 2022-7824	Unacceptable Conditions Identified During QC Inspection.	10/04/2022
		AR 2022-7827	Tube Cleaning Brushes Found in 2-HE-15E	10/04/2022
		AR 2022-7862	CR Not Initiated Same Shift as Condition	10/05/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AR 2022-7876	Lifting and Rigging Knowledge Gap	10/05/2022
		AR 2022-7877	Radiation Worker Practices	10/05/2022
		AR 2022-7924	Shield Wall Plate Bolt Pulling from Wall	10/06/2022
		AR 2022-7925	DRT217 VA Door Found Unsecure	10/06/2022
		AR 2022-7943	Lost Pen with Lanyard in Unit 2 Upper Ice Condenser	10/07/2022
		AR 2022-7967	FME Earplug End Broken Off in Ice Condenser - Retrieved	10/07/2022
		AR 2022-7975	BHI Radiation Worker Practices	10/07/2022
		AR 2022-8029	Lube Oil Found without CCM Permit	10/09/2022
		AR 2022-8033	Dropped Object in Upper Ice Condenser	10/09/2022
		AR 2022-8046	Instrument Tubing Pulled Out at 2-HE-47-CDN	10/09/2022
		AR 2022-8088	HEPA Not Issued IAW Procedure	10/10/2022
		AR 2022-8107	Dropped Object During Containment Flange Removal.	10/10/2022
		AR 2022-8158	Tube Cleaning Brush Lost in Drain to TRS	10/12/2022
		AR 2022-8160	Working Within 6' of Leading Edge w/o Fall Protection	10/12/2022
		AR 2022-8164	Maintenance Permit Procedure Performance Errors	10/12/2022
		AR 2022-8206	Master Lee Lifting and Rigging	10/13/2022
		AR 2022-8215	Unit 2 MSR TK-97 Support Baseplate Anchor Bolt Broken Off	10/13/2022
		AR 2022-8267	2-ICR-6 Accumulator Tank Sample TR B CIV Failed LLRT	10/15/2022
		AR 2022-8278	Peer Inspector without QC-Q-0001	10/15/2022
		AR 2022-8300	Work Group Not Complying with PMP-2270-CCM-001	10/16/2022
		AR 2022-8380	Certified Instruments Issued for More Than 10 Days.	10/18/2022
		AR 2022-8390	Temporary Power Cords Not Routed IAW PMP-2281-SWP-001	10/18/2022
		AR 2022-8473	Ice Machine Hose Leaks	10/20/2022
		AR 2022-8509	Unacceptable Weld	10/20/2022
		AR 2022-8545	Partial Discharge Activity Observed on RCP23's Cables.	10/21/2022
		AR 2022-8728	Action Not Reported During Shift	10/26/2022
		AR 2022-8772	Field Work Performed Prior to Design Approval	10/25/2022
		AR 2022-8805	Combustibles Left Unattended in Welding Work Area	10/28/2022
		AR 2022-8824	Missed Verification Steps on 2-IMO-220	10/29/2022
		AR 2022-9180	2-DRV-407 Leaks By	11/07/2022
		AR 2022-9190	Unit 2 N-32 Reading 5 Cps when De-Energized.	11/08/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AR 2022-9291	Unit 2 Reactor Trip	11/10/2022
		AR 2022-9308	Unit 2 Plant Heatup Issues	11/11/2022
		AR 2022-93921	ODE Has Been Requested for U1 TDAFWP Room Temperature	11/15/2022
		AR 2022-9698	Unit 1 RCS In-Leakage Trend	11/29/2022
		AR 2023-0504	RCE for Unit 2 Reactor Trip Failed CARB	01/18/2023
		AR 2023-0812	1-WFI-743 Needs to be Replaced	01/26/2023
		AR 2023-0854	2-CF-128 Check Valve is Leaking By	01/27/2023
		AR 2023-1862	2-WMO-703 Failed to Auto Open During Pump Start.	03/04/2023
		AR 2023-2457	Unit 1 Has Entered Tier 1 Actions for RCS Leakage	03/14/2023
		AR 2023-3294	EC-58174 for 2-MRV-213-F Issues	04/26/2023
		GT 2019-4420	Unusually Low Reading on Source Range Nuc. Instrumentation	04/26/2019
		GT 2020-3839	Knowledge Gap Identified in Calibrating Source Range NI's	05/06/2020
		GT 2021-0078-2,3,4,5,6	ESYE General Tracker - 2021	01/04/2021
		GT 2021-1619	Quick Hit Self Assessment on NFPA 805 Fire Protection Program	02/18/2021
		GT 2021-2361	Update Isometric Drawing for 1-SV-78-AB1	03/16/2021
		GT 2021-4250	NRC Information Notice 2021-01 DBAI PORV Inspections	05/11/2021
		GT 2021-4925	Rx Trip Caused by Spurious Neutron Flux Signal	05/27/2021
		GT 2021-5546	Westinghouse Nuclear Instrumentation Bypass Panel	06/21/2021
		GT 2021-7069	NRC Information Notice IN 2021-03, OE Re: Derecho Event	08/16/2021
		GT 2021-7529	Source Range High Flux Reactor Trip Bypassed When Required	09/02/2021
		GT 2021-9551	Industry Level 1 Clearance Events	11/23/2021
		GT 2022-0636	QH for Repeat Maintenance	01/24/2022
		GT 2022-10273	NSRB November 2022 Meeting Action Items	12/21/2022
		GT 2022-1166	Manual Reactor Trip Due to an Electro-Hydraulic Oil Leak	02/10/2022
		GT 2022-1694	STRIDE STI-22-01 RVLIS Surveillance Frequency Extension	03/02/2022
		GT 2022-4161	Enertech Valve Design Basis Verification Qualification	05/11/2022
		GT 2022-5363	Automatic Reactor Trip Following Loss of All Four RCPs	06/23/2022
		GT 2022-5789	12-PP-145E East Diesel Fire Pump Inboard Pump Packing	07/13/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Temps	
		GT 2022-7741	Source Range NI Surveillance Tracking	10/02/2022
		GT 2022-9150	NRC Regulatory Issue Summary 2022-02, Operational Leakage	11/07/2022
	Engineering Changes	0058180	Revise Drawing 1-CA-539-L1-3 per As-Built Info\GT 2021-2361	0
		EC-0000057965	Implementation of the Inservice Inspection Program Boundaries Bases Document	0
		EC-0000058174	Unit 2 Control Air Filter Installation for 2-MRV-213/223/233/243	0
	Miscellaneous	ARM-21-04-02	Equipment Trending Challenges	04/08/2021
		I&C LRTP	I&C Long Range Training Plan Specialty/Task Refresher	2022
		ISA-S7.3-1975(R 1981)	Quality Standard for Instrument Air	0
		NI Q1 2023	Nuclear Instrumentation System Walkdown Report	03/28/2023
		NI Q2 2022	Nuclear Instrumentation System Walkdown Report	04/11/2022
		NI Q3 2022	Nuclear Instrumentation System Walkdown Report	07/11/2022
		NI Q4 2022	Nuclear Instrumentation System Walkdown Report	12/08/2022
		Performance Monitoring Plan	Nuclear Instrumentation System	02/14/2019
		PRF230019	Enertech Valve Design Basis Verification Qualification	0
		Q4-2020	Unit 2 Nuclear Instrumentation System Health Report	03/14/2020
		Q4-2021	Unit 2 Nuclear Instrumentation System Health Report	03/21/2022
		Q4-2021	Unit 1 Nuclear Instrumentation System Health Report	03/21/2022
		U2 NI-01 (a)(1)	Action Plan Revision	11/10/2021
	Procedures	1-EHP-6040-164-001	Unit 1 Control Air Sampling Test	9
		1-IHP-4030-113-129	Nuclear Instrumentation Source Range Channel Operational Test and Calibration	12
		1-IHP-4030-113-129	Nuclear Instrumentation Source Range Channel Operational Test and Calibration	13
		12-EHP-5036-EQR-002	System Engineering	20

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		12-IHP-5040-EMP-004	Plant Winterization and De-Winterization	26
		2-EHP-6040-264-001	Unit 2 Control Air Sampling Test	9
		2-IHP-4030-213-229	Nuclear Instrumentation Source Range Channel Operational Test and Calibration	19
		DTG-VSR-001	Design Vertical Slice Review Process	0
		DTG-VSR-001	Design Vertical Slice Review Process	1
		EHI-5054-ICT	Non-EQ Instrumentation Circuits Test Review Program	2
		EHI-5054-SWD-001	System Walkdowns	17
		MHI-5024	Repeat Maintenance and Trending Process	23
		PMI-5055	Winterization-Summarization	8
		PMI-7030	Corrective Action Program	47
		PMP-2291-PMT-001	Work Management Post Maintenance Testing Matrices	53
		PMP-4030-EXE-001	Conduct Of Surveillance Testing	28
		PMP-5055-001-001	Winterization-Summarization	40
		PMP-7030-CAP-001	Action Initiation	43
		PMP-7030-CAP-002	Condition Report Conduct and Closure	43
		PMP-7030-MOP-001	Corrective Action Program Management Oversight Process	37
		PMP-7030-MOP-001	Corrective Action Program Management Oversight Process	37
		PMP-7030-OPR-001	Operability Determination	39
		PMP-7030-TND-001	Trend Analysis	13
		PMP-7032-FIP-001	Failure Investigation Process	16

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	Self-Assessments	GT 2018-0522	Instrument Air Quality Quick-Hit Self-Assessment (QHSA)	
		GT 2019-1551	Quick Hit Self Assessment per PMP-7034-SAP-001 on Fluid Leak Management	02/18/2019
		GT 2021-9788-1	Assessment of Important Equipment Failures System Engineering Department	12/08/2021
		GT 2021-9791	Cable Aging and Monitoring QHSA	12/02/2021
		GT- 2015-13155	Create Action Plan to Improve Filtration for Analog Positioners	10/09/2015
		GT-2021-7403	Quick Hit Self Assessment per PMP-7034-SAP-001 Winterization Program	08/30/2021
		NOS-21-08	Engineering, Design Control, In-Service Inspections/In-Service Tests	09/15/2021
	Work Orders	55342726	Replace Aged Channel I Triaxial Cables	02/23/2018
		55543105-01	Non-EQ Instrumentation Circuits Cables Test Review	02/08/2023
		55545156	WR for 2-NRI-32 Cable Inspection/Repair	10/04/2022
		55562843	1-WMO-737 Valve Replacement per ACE AR 2021-1897	04/20/2022
		55563578	Anomalies Identified by AMS During CHAR Testing	07/06/2021
		5556461801	MTI, 2-IHP-4030-213-229, COT and Calibration CH1, N-31.	10/02/2022
		5556461901	MTI-2-IHP-4030-213-229: COT and Calibration CH2 N-32	10/01/2022
		C10022138001	2022-3764, 1-RC-101-L1, Repair Tubing Section between NSX-I01 & NRV-101	05/04/2022
C10046877	2-CF-128 Check Valve is Leaking By	02/28/2023		