



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

May 8, 2023

David Rhoades
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer (CNO)
Constellation Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION – INTEGRATED INSPECTION REPORT
05000456/2023001 AND 05000457/2023001

Dear David Rhoades:

On March 31, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Braidwood Station. On April 14, 2023, the NRC inspectors discussed the results of this inspection with G. Gugle, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

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 Braidwood Station.

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 Braidwood Station.

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,

A handwritten signature in cursive script that reads "April M. Nguyen".

Nguyen, April signing on behalf
of Peterson, Hironori
on 05/08/23

Hironori Peterson, Chief
Reactor Projects Branch 3
Division of Operating Reactor Safety

Docket Nos. 05000456 and 05000457
License Nos. NPF-72 and NPF-77

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

Letter to David Rhoades from Hironori Peterson dated May 08, 2023

SUBJECT: BRAIDWOOD STATION – INTEGRATED INSPECTION REPORT
05000456/2023001 AND 05000457/2023001

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 05000456 and 05000457

License Numbers: NPF-72 and NPF-77

Report Numbers: 05000456/2023001 and 05000457/2023001

Enterprise Identifier: I-2023-001-0052

Licensee: Constellation Energy Generation, LLC

Facility: Braidwood Station

Location: Braceville, IL

Inspection Dates: January 01, 2023 to March 31, 2023

Inspectors: R. Bowen, Illinois Emergency Management Agency
A. Demeter, Resident Inspector, Byron Station
D. Kimble, Senior Resident Inspector
P. Smagacz, Resident Inspector

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

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Braidwood Station, 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 Follow 1A Emergency Diesel Generator Maintenance Work Instructions			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000456/2023001-01 Open/Closed	[H.5] - Work Management	71111.12
<p>A self-revealed finding of very low safety significance (i.e., Green) and an associated non-cited violation (NCV) of 10 Code of Federal Regulations Part 50, Appendix B, Criterion V, <i>Instructions, Procedures, and Drawings</i>, was identified for the licensee's failure to follow the prescribed and established maintenance work instructions and procedures for a scheduled 2-year maintenance and inspection of the 1A Emergency Diesel Generator (EDG). Specifically, work instructions provided by the licensee under safety-related Work Order (WO) 4967061, <i>Perform 2-Year Inspection of the 1A Emergency Diesel Generator</i>, during the period from November 29, 2021, through December 6, 2021, specified that the main lubricating oil strainers be opened, inspected, and cleaned as part of the EDG's 2-year maintenance activities. However, without providing any technical justification or utilizing the station's approved process for making a change to the procedure steps, licensee technical personnel overseeing the work marked these instruction steps as "not applicable" and completed the procedure without performing the requisite inspection and cleaning of the strainers. This condition was subsequently revealed in late November of 2022 when unusually low 1A EDG lubricating oil pressures were noted with the engine running.</p>			

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period operating at full power. With the exception of minor reductions in power to support scheduled testing activities and load changes requested by the transmission system dispatcher, the unit remained operating at or near full power for the entire inspection period.

Unit 2 began the inspection period operating at full power. On March 24, 2023, the unit reached the end of the fuel cycle and power coast down operations commenced in preparation for its planned A2R23 Refuel Outage. The unit continued to reduce power in accordance with the licensee's approved reactivity management plan, and was operating at approximately 97.4 percent power at the end of the inspection period.

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 activities described in IMC 2515, Appendix D, "Plant Status," observed risk significant activities, and completed on-site portions of IPs. 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

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

The inspectors reviewed and evaluated selected system configurations during partial physical alignment verifications of the following systems/trains:

- (1) The 1A Auxiliary Feedwater (AF) Train, associated with a degraded condition identified by the NRC on the Service Water (SX) supply to the 1A AF Pump, as documented in Issue Report (IR) 4546554 during the weeks ending January 7 through January 21, 2023
- (2) The 2A AF Train during 2B AF Train maintenance during the week ending March 11, 2023
- (3) The 2A Emergency Diesel Generator (EDG) during 2B EDG maintenance during the week ending March 18, 2023

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting physical inspections and performing reviews to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Fire Zone 11.2-0; Auxiliary Building 346' Elevation, Unit 2 General Area (South) during the week ending January 21, 2023.
- (2) Fire Zone 8.3-2; Turbine Building 401' Elevation, Unit 2 grade level (Southeast) during the week ending February 4, 2023.
- (3) Fire Zone 11.3-0 South; Auxiliary Building 364' Elevation, General Area (South) during the week ending March 4, 2023.
- (4) Fire Zone 9.1-2; Diesel Generator 401' Elevation, Unit 2B EDG Room during the week ending March 18, 2023.

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

The inspectors evaluated the performance and training of the on-site fire brigade during observation of the following drill activities:

- (1) Observation of announced and unannounced fire drills with multiple crews on February 21, 2023.

71111.07A - Heat Exchanger/Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors conducted a review that evaluated readiness and performance of the following safety-related heat exchanger:

- (1) The Unit 2 Component Cooling (CC) Heat Exchanger, as documented in Work Order (WO) 4943128 during the weeks ending March 4 through March 18, 2023.

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 the following licensed operator activities in the control room:

- (1) Various activities involving on-watch operations crews. These activities included, but were not limited to:
 - Selected observations involving the operation of Unit 1 without a functional plant process computer (PPC), during the week ending January 21, 2023.
 - Observation of 1A EDG testing and 4160 Vac electrical bus manipulations, during the week ending February 25, 2023.

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

The inspectors observed and evaluated the following licensed operator training activity:

- (1) A complex casualty evaluated scenario involving a crew of licensed operators was observed in the facility's simulator on February 16, 2023.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure that selected structures, systems, and components (SSCs) remain capable of performing their intended functions. The following SSCs and/or maintenance activities were reviewed:

- (1) A maintenance effectiveness review for EDG lube oil systems, with specific emphasis on the adequacy of lube oil filter and lube oil strainer maintenance activities during the weeks ending January 7 through March 31, 2023. A finding of very low safety significance (Green) and an associated non-cited violation associated with the inspectors' review are documented in the Inspection Results section of this report.
- (2) A maintenance effectiveness review for SX supply to the AF pumps, with specific emphasis on the adequacy of maintenance activities associated with low flow/stagnant water lines during the weeks ending January 7 through March 31, 2023.
- (3) A maintenance effectiveness review associated with pressurizer power-operated relief valve (PORV) planned/preventative maintenance and leakage during the weeks ending February 11 through March 31, 2023.

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Review and evaluation of the risk associated with power restoration to the Unit 1 PPC following a small electrical fire that destroyed the normal power supply, as documented in WO 5329160 during the week ending January 21, 2023.
- (2) Review and evaluation of the risk associated with removal of the 2D Main Condenser Waterbox from service with the unit operating at full power to support troubleshooting and repair of a main condenser tube leak, as documented in WO 5337065 during the week ending February 25, 2023.
- (3) Review and evaluation of the risk and activities associated with the 2B EDG planned overhaul and maintenance window, as documented in WO 5105822 during the week ending March 18, 2023.
- (4) Review and evaluation of the risk and activities associated with the 1A SX Cubicle Cooler freeze seal and maintenance window, as documented in WO 5225725 during the week ending March 25, 2023.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Evaluation of the operability of the 1A EDG with respect to its mission time following identification of lube oil supply pressure issues, as documented in IR 4539225 during the weeks ending January 14 through January 28, 2023.
- (2) Evaluation of the operability of the 2B Diesel-Driven AF Pump following the identification of clear control power fuses and a failed alarm relay in the pump's control power circuit, as documented in IR 4551248 during the week ending February 4, 2023.
- (3) Evaluation of the operability of the 2B EDG following discovery of low peak firing pressure in the 3L cylinder, as documented in IR 4549907 during the weeks ending January 28 through February 11, 2023.
- (4) Evaluation of the operability of SX supply to the 1A AF Pump following NRC identification of a pinhole leak in line 1SX25AA-6, as documented in IR 4546554 during the weeks ending January 7 through February 18, 2023.
- (5) Evaluation of the operability of the SX return line from the 1A EDG following identification of a pinhole leak in line 1SX27DA-10, as documented in IR 4550393 during the weeks ending February 4 through February 18, 2023.
- (6) Evaluation of the operability of the 0C Auxiliary Building Non-Accessible Ventilation Train following questions regarding charcoal filter penetration test results, as documented in IR 4565467 during the week ending March 31, 2023.

71111.18 - Plant Modifications

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

The inspectors reviewed and evaluated the following temporary change to the configuration of the facility:

- (1) Review of temporary plant modification per Engineering Change (EC) 638311: *Evaluation for Temporarily Bypassing Computer Inverter 1CS08J to Facilitate Repairs* during the weeks ending January 29 through March 31, 2023.

71111.24 - Testing and Maintenance of Equipment Important to Risk

The inspectors reviewed and evaluated the following post-maintenance and surveillance testing activities to verify system operability and/or functionality:

Post-Maintenance Testing (PMT) (IP Section 03.01) (3 Samples)

- (1) Functional and operational testing of the 1B Residual Heat Removal Pump following a normally scheduled periodic replacement of the pump's supply breaker, as documented in WO 5303140 during the week ending January 21, 2023.

- (2) Functional and operational testing of the 2B EDG lockout relays following a periodic 2-year maintenance window, as documented in WO 5180938 during the week ending March 18, 2023.
- (3) Functional and operational testing of the 2B EDG following a periodic 2-year maintenance window, as documented in WO 5105822 during the week ending March 25, 2023.

Surveillance Testing (IP Section 03.01) (2 Samples)

- (1) 2BwOSR 3.8.1.2-1: *Unit Two 2A Diesel Generator Operability Surveillance*, as documented in WO 5330596 during the week ending February 4, 2023.
- (2) 1BwOSR 3.3.2.3: *Unit One Undervoltage Simulated Start of 1A Auxiliary Feedwater Pump Surveillance*, as documented in WO 5315860 during the weeks ending March 4 through March 11, 2023.

Inservice Testing (IST) (IP Section 03.01) (1 Sample)

- (1) 0BwOSR 5.5.8.CC-1; *A IST Requirements for Component Cooling Pump OCC01P and Discharge Check Valves*, as documented in WO 53212190 during the week ending January 28, 2023.

Reactor Coolant System Leakage Detection Testing (IP Section 03.01) (1 Sample)

- (1) Review and evaluation of Unit 2 reactor coolant system unidentified leakage following a small increase in the normal periodic calculated leakage, as documented in IR 4556108 during the week ending February 25, 2023.

Diverse and Flexible Coping Strategies (FLEX) Testing (IP Section 03.02) (1 Partial)

- (1) (Partial)
On-site full flow performance testing of the 0FX02PB (0B High Head FLEX Pump) by station personnel following rebuild of the positive displacement pump by an offsite vendor, as documented in IR 4548150 during the weeks ending January 14 through March 31, 2023.

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

The inspectors evaluated site's emergency plan by observing the following emergency response organization (ERO) activities:

- (1) A site-wide emergency preparedness drill that resulted in a simulated Site-Area Emergency event classification on March 15, 2023.

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated site's emergency plan by observing the following ERO activities:

- (1) A site-wide emergency preparedness drill that resulted in a simulated Site-Area Emergency event classification on March 29, 2023.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors reviewed and verified selected portions of the licensee's performance indicator submittals listed below:

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

- (1) Unit 1 (January 1, 2022 through December 31, 2022)
- (2) Unit 2 (January 1, 2022 through December 31, 2022)

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

- (1) Unit 1 (January 1, 2022 through December 31, 2022)
- (2) Unit 2 (January 1, 2022 through December 31, 2022)

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

- (1) Unit 1 (January 1, 2022 through December 31, 2022)
- (2) Unit 2 (January 1, 2022 through December 31, 2022)

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (1 Partial)

The inspectors conducted an in-depth review of the licensee's implementation of the corrective action program (CAP) related to the following issue:

- (1) (Partial)
Review and assessment of the station's corrective actions stemming from the startup of Braidwood Unit 1 from Refueling Outage A1R23 with the 1A Main Steam Isolation Valve (MSIV) closed, as documented in IR 4531005 during the weeks ending January 7, 2023 through March 31, 2023.

71153 - Follow-up of Events and Notices of Enforcement Discretion

Personnel Performance (IP Section 03.03) (1 Sample)

The inspectors reviewed and evaluated the performance of licensee personnel associated with the following unplanned event:

- (1) Review of operator and overall station response to a small electrical fire on January 18, 2023, in cabinet 1CX08J, which supplies power to the Unit 1 PPC, as documented in IR 4548945 during the week ending January 21, 2023.

INSPECTION RESULTS

Failure to Follow 1A Emergency Diesel Generator Maintenance Work Instructions			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000456/2023001-01 Open/Closed	[H.5] - Work Management	71111.12
<p>A self-revealed finding of very low safety significance (i.e., Green) and an associated non-cited violation (NCV) of 10 Code of Federal Regulations Part 50, Appendix B, Criterion V, <i>Instructions, Procedures, and Drawings</i>, was identified for the licensee's failure to follow the prescribed and established maintenance work instructions and procedures for a scheduled 2-year maintenance and inspection of the 1A Emergency Diesel Generator (EDG). Specifically, work instructions provided by the licensee under safety-related Work Order (WO) 4967061, <i>Perform 2-Year Inspection of the 1A Emergency Diesel Generator</i>, during the period from November 29, 2021, through December 6, 2021, specified that the main lubricating oil strainers be opened, inspected, and cleaned as part of the EDG's 2-year maintenance activities. However, without providing any technical justification or utilizing the station's approved process for making a change to the procedure steps, licensee technical personnel overseeing the work marked these instruction steps as "not applicable" and completed the procedure without performing the requisite inspection and cleaning of the strainers. This condition was subsequently revealed in late November of 2022 when unusually low 1A EDG lubricating oil pressures were noted with the engine running.</p>			
<p><u>Description:</u></p> <p>On November 27, 2022, during a normally scheduled 1A EDG monthly surveillance, plant operators noted that indicated engine lubricating oil pressure and indicated turbocharger lubricating oil pressure were lower than the expected values. The normally expected range for engine lubricating oil pressure is 45 to 60 psig, while the normally expected range for the turbocharger lubricating oil pressure is 33 to 40 psig. Instead of obtaining indicated oil pressures within these ranges, operators noted that the indicated engine lubricating oil pressure was reading approximately 39 psig, and had declined after the first hour that the 1A EDG was running in a loaded condition. Similarly, the indicated turbocharger lubricating oil pressure was noted to be 31 psig, and had been declining from the beginning of the 1A EDG loaded run. While outside of their respective expected bands, the licensee concluded that neither indicated lubricating oil pressure represented an unacceptable condition that would impact the EDG's availability or operability, and that the 1A EDG lubricating (lube) oil system was satisfactorily performing its specified function. A maintenance action was created to adjust the system's oil pressure regulators to restore indicated oil pressures to their nominal bands.</p> <p>The licensee ran the 1A EDG again on November 29, 2022, to support the adjustment of the oil system's pressure regulating valves. Both the 1DG5041A, <i>1A EDG Turbocharger Lube Oil Pressure Regulating Valve</i>, and 1DG5032A, <i>1A EDG Lube Oil Header Relief Valve</i>, were adjusted. With the 1A EDG running and the 1DG5041A valve adjusted to its maximum setting, the licensee noted only minor increases in lube oil and turbocharger lube oil pressures.</p> <p>In a continuation of their troubleshooting efforts, the licensee removed the 1A EDG from service on December 1, 2022, to facilitate more detailed inspection of components within the</p>			

lube oil system. An inspection of Lube Oil Strainers 1DG02MA and 1DG03MA revealed significant blockage, with Lube Oil Strainer 1DG03MA almost completely plugged. No metal was present in either strainer. Oil sludge and fiber material were recovered from each strainer. A subsequent inspection of Main Lube Oil Filter 1DG01MA showed indication that the filter elements had started to plug and some had begun to degrade and shed fiber filter medium. The licensee replaced the filter elements in Main Lube Oil Filter 1DG01MA and cleaned and restored Lube Oil Strainers 1DG02MA and 1DG03MA to their original condition. During the subsequent post-maintenance testing run of the 1A EDG, the licensee was able to adjust both the engine lube oil pressure and the turbocharger lube oil pressure into their respective normal operating bands.

The licensee performed a corrective action program (CAP) evaluation regarding the circumstances surrounding this issue. As part of that evaluation, it was discovered that the procedure section requiring the cleaning of Lube Oil Strainers 1DG02MA and 1DG03MA had not been performed as required during the last 2-year 1A EDG maintenance window in November/December 2021. Instead, that portion of the procedure (Section 4.10.12 of safety-related maintenance procedure BwMP 3100-022, *Diesel Generator 2-Year Inspection*) was marked as “not applicable” by the licensee’s technical staff supporting the 1A EDG maintenance work. No justification for this deviation from the required steps of the procedure was provided. A similar procedure section for inspecting/replacing the filter elements in Main Lube Oil Filter 1DG01MA was allowed to be marked as “not applicable” based on the filter elements being within the manufacturer’s 6-year replacement periodicity and measured differential oil pressure across the filter being within established specifications.

Corrective Actions: In addition to the licensee replacing the filter elements in Main Lube Oil Filter 1DG01MA and cleaning and restoring Lube Oil Strainers 1DG02MA and 1DG03MA to their original condition on the 1A EDG, reviews of the history of lube oil strainer cleaning and main lube oil filter element replacements were performed for the remaining 3 EDGs at Braidwood Station. Both the 1B and 2A EDGs had their lube oil strainers and lube oil filter elements replaced during their respective maintenance windows in 2022. Based on this maintenance history review, the licensee inspected and cleaned the lube oil strainers on the 2B EDG on December 12, 2022. Those lube oil strainers were found to be as expected - dirty, but not abnormally fouled. Based on the 2B EDG oil pressures and trends being normal, the 2B EDG lube oil filter elements were replaced during the subsequent regularly scheduled 2B EDG maintenance window in March 2023.

Corrective Action References:

- 4539225; *Low Lube Oil and Turbo Oil Pressure During 1A EDG Run*; 11/27/2022
- 4539982; *1A EDG Low Lube Oil and Turbo Oil Pressure After Adjustment*; 11/30/2022
- 4540521; *1DG01MA, 1DG02MA, and 1DG03MA As Found Conditions*; 12/02/2022

Performance Assessment:

Performance Deficiency: Safety-related WO 4967061, *Perform 2-Year Inspection of the 1A Emergency Diesel Generator*, was implemented by the licensee during the period from November 29, 2021, through December 6, 2021, to accomplish a periodic and planned maintenance window on the 1A EDG. This WO directed the performance of safety-related maintenance procedure, BwMP 3100-022, *Diesel Generator 2-Year Inspection*, and Section 4.10.12 of the procedure specified that Lube Oil Strainers 1DG02MA and 1DG03MA be inspected and cleaned per the steps provided. The inspectors concluded that the licensee’s failure to have performed Section 4.10.12 of BwMP 3100-022 as written, and to have restored Lube Oil Strainers 1DG02MA and 1DG03MA to their original condition, allowed

for the continued buildup of material within the strainers and the eventual issue with low 1A EDG lube oil pressures that was identified in November 2022. Further, the inspectors concluded that this failure constituted a performance deficiency that was within the licensee's ability to have foreseen and that should have been prevented.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance 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 inspectors determined that the licensee's failure to have cleaned Lube Oil Strainers 1DG02MA and 1DG03MA and restored them to their original condition as required by Section 4.10.12 of BwMP 3100-022 contributed to the subsequent plugging of those strainers, and as such, had an adverse impact on 1A EDG reliability. The inspectors also compared the finding with the examples listed in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix E, "Example of Minor Issues." Example 4.k was found to be similar in that the performance deficiency adversely affected Mitigating Systems Cornerstone of Reactor Safety objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Because the finding involved a deficiency that did not impact 1A EDG operability or PRA [Probabilistic Risk Analysis] functionality, the inspectors determined the finding to be of very low safety significance (i.e., Green). Specifically, the low indicated oil pressures experienced by the 1A EDG due to the plugging of Lube Oil Strainers 1DG02MA and 1DG03MA, were not significant enough to have had an adverse impact on 1A EDG PRA mission time or operation. As part of their inspection sample, the inspectors pulled several months of historical 1A EDG oil pressure data from the plant computer in an effort to identify any discernible rate of change that would call into question the 1A EDG's capability to have met its mission time. No such trend was found.

Cross-Cutting Aspect: H.5 - Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities. Specifically, this finding involved a significant error in work execution where a section of a safety-related maintenance procedure was intentionally not performed with no technical justification for the deviation.

Enforcement:

Violation: Appendix B to 10 CFR Part 50, 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. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to this requirement, during the licensee's most recent 1A EDG maintenance work window from November 29, 2021, through December 6, 2021, Section 4.10.12 of BwMP 3100-022, *Diesel Generator 2-Year Inspection*, requiring the inspection and cleaning of

safety-related 1A EDG Lube Oil Strainers 1DG02MA and 1DG03MA was improperly marked as “not applicable” by the licensee and not performed.

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

EXIT MEETINGS AND DEBRIEFS

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

- On April 14, 2023, the inspectors presented the integrated inspection results to G. Gugle, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Corrective Action Documents	4546554	SX Leak in Pipe Upstream of 1AF017A	01/04/2023
	Procedures	BwOP AF-E1	Electrical Lineup - Unit 1 Operating	15
		BwOP AF-E2	Electrical Lineup - Unit 2 Operating	11
		BwOP AF-M1	Operating Mechanical Lineup Unit 1	20
		BwOP AF-M2	Operating Mechanical Lineup, Auxiliary Feedwater, Unit 2	18
		BwOP DG-M3	Operating Mechanical Lineup Unit 2 2A D/G	15
71111.05	Corrective Action Documents	4561001	Fire Marshall Identified 1st Fire Drill Observations	03/10/2023
	Fire Plans	Pre-Fire Plan No. 101	Fire Zone 11.2-0; Auxiliary Building 346' Elevation, Auxiliary Building General Area - South	4
		Pre-Fire Plan No. 113	Fire Zone 11.3-0 South; AB 364' Unit 1 Auxiliary Building General Are (South)	2
		Pre-Fire Plan No. 66	Fire Zone 8.3-2; Turbine Building 401' Elevation, Unit 2 Turbine Grade Level (SE)	5
		Pre-Fire Plan No. 89	Fire Zone 9.1-2; DG 401' Diesel Generator Room 2B & Day Tank Room	2
	Miscellaneous	Fire Drill Scenario 20.18.09.24	Unit 1 Flammable Liquids Cabinet Fire	09/24/2018
		Fire Drill Scenario 20.22.03.18	2EH01PB Motor Fire	03/18/2022
	Procedures	BwAP 1100-16	Fire/Hazardous Materials Spill and/or Injury Response	39
		BwAP 1100-3	Fire Chief (Designated Field Supervisor) Implementing Procedure	4
		BwAP 1100-4	Fire Brigade Implementing Procedure	5
		BwAP 1110-1	Fire Protection Program System Requirements	48
		BWAP 1110-3	Plant Barrier Impairment Program	40
		BwAR 0-37-A4	Unit One Area Fire	18
		BwOP FP-100	Fire Response Guidelines	25
		BwOP PBI-1	Plant Barrier Impairment Program Pre-Evaluated Barrier Matrix	5
		CC-AA-201	Plant Barrier Control Program	14

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		ER-AA-600-1069	High Risk Fire Area Identification	4
		ER-BR-600-1069	Site List of High Risk Fire Areas - Braidwood Unit 1 and Unit 2	0
		OP-AA-201-003	Fire Drill Performance	21
		OP-AA-201-004	Fire Prevention for Hot Work	19
		OP-AA-201-005	Fire Brigade Qualification	11
		OP-AA-201-008	Pre-Fire Plan Manual	6
		OP-AA-201-009	Control of Transient Combustible Material	28
		OP-AA-201-012-1001	Operations On-Line Fire Risk Management	5
		OP-BR-201-012-1001	Braidwood On-Line Fire Risk Management	4
71111.07A	Work Orders	4943128	LR-2CC01A Eddy Current Testing and Inspection	03/01/2023
71111.11Q	Miscellaneous	BR2C23-06.0	Braidwood 2 Cycle Coastdown Reactivity Plan	03/20/2023
	Procedures	OP-AA-101-111-1001	Operations Standards and Expectations	32
		OP-AA-101-113	Operator Fundamentals	16
		OP-AA-101-113-1006	4.0 Crew Critique Guidelines	12
		OP-AA-103-102	Watch-Standing Practices	21
		OP-AA-103-102-1001	Strategies for Successful Transient Mitigation	3
		OP-AA-103-103	Operation of Plant Equipment	2
		OP-AA-104-101	Communications	5
		OP-AA-111-101	Operating Narrative Logs and Records	19
		OP-AA-300	Reactivity Management	14
		TQ-AA-10	Systemic Approach to Training Process Description	7
		TQ-AA-150	Operator Training Programs	23
		TQ-AA-155	Conduct of Simulator Training and Evaluation	13
		TQ-AA-201	Examination Security and Administration	19
		TQ-AA-306	Simulator Management	11
		TQ-BR-201-0113	Braidwood Training Department Simulator Examination Security Actions	27

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.12	Corrective Action Documents	4539225	Low Lube Oil and Turbo Oil Pressure During 1A EDG Run	11/27/2022
		4539982	1A EDG Low Lube Oil and Turbo Oil Pressure After Adjustment	11/30/2022
		4540521	1DG01MA, 1DG02MA, and 1DGo3MA as Found Conditions	12/02/2022
		4550413	Trend in SX System Leaks	01/25/2023
	Procedures	BwMP 3100-022	Diesel Generator 2-Year Inspection	40
		BwMP 3100-082	Diesel Generator 6-Year Inspection	34
		ER-AA-310-1002	Maintenance Rule Functions - Safety Significant Classification	3
		ER-AA-320	Maintenance Rule Implementation per NEI 18-10	0
		ER-AA-320-1001	Maintenance Rule 18-10 - Scoping	0
		ER-AA-320-1003	Maintenance Rule 18-10 - Failure Definitions	0
		ER-AA-320-1004	Maintenance Rule 18-10 - Performance Monitoring and Dispositioning Between (a)(1) and (a)(2)	1
	Work Orders	4967061	Perform 2-Year Inspection of the 1A Emergency Diesel Generator	11/29/2021
71111.13	Corrective Action Documents	4549385	Plant Process Computer Links Still Not Connected	01/19/2023
		4549386	Unit 1 Plant Process Computer Network Switch Unresponsive after Power Restoration	01/19/2023
		4549391	Unit 1 Plant Process Computer Network Switch Unresponsive after Power Restoration	01/19/2023
		4549730	4.0 Critique - 1CX08J Fire Response	01/22/2023
	Miscellaneous		Adverse Condition Monitoring and Contingency Plan; 2CS08J Monitoring	0
	Procedures	ER-AA-330-009	ASME Section XI Repair/Replacement Program	18
		ER-AA-335-015-2013	VT-2 Visual Examination in Accordance with ASME 2013	1
		ER-AA-600	Risk Management	7
		ER-AA-600-1042	On-Line Risk Management	13
		MA-AA-716-004	Conduct of Troubleshooting	20
		MA-AA-736-610	Application of Freeze Seal to All Piping	13
		OP-AA-107	Integrated Risk Management	6
		OP-AA-108-117	Protected Equipment Program	7

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Work Orders	WC-AA-101-1006	On-Line Risk Management and Assessment	4
		5105822-01	2DG01KB - Perform 6-Year Inspection of Diesel Generator	03/13/2023
		5225725-02	1SX16AA-3" - Install and Remove Freeze Seal MR-90	03/21/2023
		5329160-04	1CX08J Install MR90 for Repairs - TCCP No. 638311	01/18/2023
		5337065-07	2D Waterbox - Stage Ventilation and Open Upper Manways	02/23/2023
71111.15	Corrective Action Documents	39622686	Engine Analysis 2A EDG Cylinder 6L Low Peak Firing Pressure	01/11/2017
		4541858	U1 PZR Porv Tailpiece Temperature Trend	12/09/2022
		4549610	UT Readings Below Tminon 1SX25AA-6"	01/20/2023
		4549908	Engine Analysis 2B EDG Cylinder 3L Low Peak Firing Pressure	01/23/2023
		4550393	Leak on Underside of Piping Just Downstream of 1SX057A	01/25/2023
		4550631	UT Readings Below Tmin on 1SX25AA-6"	01/26/2023
		4551248	2B AF Pump Control Power Fuse Cleared - 2PL05J-FU-6	01/30/2023
		4551315	Scope Expansion Inspections on 1SX27DB-10"	01/30/2023
		4551316	Scope Expansion Inspections on 2SX27DA-10"	01/30/2023
		4551318	Scope Expansion Inspections on 1SX26AB-10"	01/30/2023
		4551319	Scope Expansion Inspections on 1SX26AA-10"	01/30/2023
		4553594	Unexpected Annunciator 1-12-C6 Pzr Porv Dsch Temp High	02/09/2023
		4555819	Review of UT Data from 2SX27DA-10"	02/20/2023
		4565454	Charcoal Sample Results 0VA05FH	03/28/2023
		4565467	0VA05FH Charcoal Penetration Exceeds Admin Limit	03/28/2023
	Corrective Action Documents Resulting from Inspection	4546554	SX Leak in Pipe Upstream of 1AF017A	01/04/2023
	Drawings	20E-2-4030AF02	Schematic Diagram Auxiliary Building Feedwater Pump 2B (Diesel Driven) 2AF01PB	W
	Engineering Changes	638242	Operability Evaluation 23-001: Pinhole Leak on Pipe 1SX25AA-6"	0 and 1
		638248	Piping Stress Report for Subsystems 1AF03, 1AFF20, 1AFF31, 1WFF44, and 1AFF03	0
		638358	Operability Evaluation 23-002: Pinhole Leak on Pipe	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous		1SX27DA-10" Downstream of 1SX057A	
		638371	Piping Stress Analysis for Subsystem 1SX13	0
			Adverse Condition Monitoring and Contingency Plan; SX Piping Leaking Upstream 1SX017A (1SX25AA)	1
			Adverse Condition Monitoring and Contingency Plan; 1SX27DA-10" Piping Through Wall Leak	0
	Procedures	BwISR 5.5.11.e-1c	Auxiliary Building Non-Accessible Filter Plenum System Total Bypass Leakage Test - Plenum 'C'	11
		CC-AA-309-101	Engineering Technical Evaluations	16
		ER-AA-600-1012	Risk Management Documentation	14
		OP-AA-106-101-1006	Operational Decision-Making Process	24
		OP-AA-108-111	Adverse Condition Monitoring and Contingency Planning	17
		OP-AA-108-115	Operability Determinations (CM-1)	26
	Work Orders	4924112	LR-Perform 2 Year Inspection of the Diesel Generator	12/21/2020
		5148459	Diesel Generator Preoutage Engine Analysis (2MO Prior to Out)	01/19/2023
71111.18	Drawings	20E-1-4138	Internal-External Wiring Diagram DEH Controller Cabinet 1PA22J	S
		20E-1-4191A	External Wiring Diagram 20KVA Inverter, 1CX08J	K
	Engineering Changes	638311	MR90 - Evaluation for Temporarily Bypassing Computer Inverter 1CX08J to Facilitate Repairs	0
71111.24	Corrective Action Documents	4548150	0FX02PB, Acceptance Criteria Not Met During Testing	01/12/2023
		4556108	2BwOSR 3.4.13.1 Deviation Action Level I Exceeded	02/21/2023
		4558760	1PA13J Defective Light Socket	03/02/2023
		4561676	2BwOSR 3.4.13.1 Deviation Action Level I Exceeded	03/13/2023
	Procedures	0BwOS FX-12	FLEX Pump Full Flow Test Surveillance	1
		1BwOSR 3.3.2.3	Undervoltage Simulated Start of 1A Auxiliary Feedwater Pump	7
		1BwOSR 5.5.8.CC-1	A IST Requirements for Component Cooling Pump 0CC01P and Discharge Check Valves	9
		1BwOSR 5.5.8.RH-5B	Group A IST Requirements for Residual Heat Removal Pump 1RH01PB	23

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		2BwOS DG-2B	2B Diesel Generator Overspeed Trip Test	5
		2BwOSR 3.4.13.1	Unit Two Reactor Coolant System Water Inventory Balance Surveillance	47
		2BwOSR 3.8.1.14-2	Unit 2 2B Diesel Generator 24 Hour Endurance Run	14
		2BwOSR 3.8.1.2-1	Unit Two 2A Diesel Generator Operability Surveillance	54
		2BwOSR 3.8.11.2-2	Unit Two 2B Diesel Generator Operability Surveillance	53
		BwOP DG-11T1	Diesel Generator Start/Stop Log	8
		BwOP DG-11T2	Diesel Generator Operating Log	32
		OP-BR-FX-1003	High Head FLEX Pump Operating Guideline	1
	Work Orders	5105822-18	Ops PMT - 2B EDG Slave Relay Start	03/17/2023
		5105822-19	Ops PMT - Verify 2B EDG 100% Load Capability	03/17/2023
		5163389	2B Diesel Generator Overspeed Trip Test	03/17/2023
		5180938	2FSV-DG5209B Replace DG Pneumatic Solenoid Valve	03/18/2023
		5303140	IST-1RH01PB ASME Group A Test & CC-1SI8958B	01/19/2023
		5309859	2B Diesel Generator Operability Semi-Annual Surveillance	03/17/2023
		5312190	IST - For 1/2CC9463A/B & 0CC9464 - ASME Surveillance Requirements for 0CC01P	01/24/2023
		5330596	LR-IST-2A D/G Operability Monthly	02/01/2023
		535340647	LR-IST-2B D/G Operability Monthly	03/17/2023
71114.06	Corrective Action Documents	4668305	Braidwood 2023 PI Drill Series - MCR/SIM Learnings	04/07/2023
		4668309	Braidwood 2023 PI Drill Series - TSC Learnings	04/07/2023
		4668310	Braidwood 2023 PI Drill Series - OSC Learnings	04/07/2023
	Miscellaneous		EP Performance Indicator Drill Manual/Guide for 2023	2023
	Procedures	EP-AA-1000	Standardized Radiological Emergency Plan	33
		EP-AA-1001	Radiological Emergency Plan Annex for Braidwood Station	35
71151	Miscellaneous		NRC Performance Indicator Data; Initiating Events - Unit/Reactor Shutdown Occurrences	01/01/2022 - 12/31/2022
			NRC Performance Indicator Data; Initiating Events - Unplanned Power Changes per 7000 Critical Hours	01/01/2022 - 12/31/2022
	Procedures	LS-AA-2001	Collecting and Reporting of NRC Performance Indicator	17

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Data	
		LS-AA-2010	Monthly Data Elements for NRC/WANO Unit/Reactor Shutdown Occurrences	6
		LS-AA-2030	Monthly Data Elements for NRC Unplanned Power Changes per Critical Hours	6
71152A	Corrective Action Documents	4530477	OSP-A 1A MSIV Failed to Open	10/19/2022
		4531005	1A Steam Generator PORV Lift	10/20/2022
	Miscellaneous		Station Outage Control Center Logs	10/19-20/2022
			Unit 1 Main Control Room Logs	10/19-20/2022
	Procedures	1BwGP 100-1T26	Flowchart Exception Sheet	1
		1BwGP 100-2	Plant Startup	48 - 49
		1BwGP 100-2T1	1BwGP 100-2 Flowchart	15 - 16
		1BwGP 100-2T2	MODE 3 to 2 Checklist	29 - 31
		BwAP 1300-6	Special Procedures, Tests, or Experiments	16
		BwAP 340-1	Use of Procedures for Operating Department	33
		BwOP MS-9	Opening the Main Steam Isolation Valves	10
		HU-AA-104-101	Procedure Use and Adherence	7
		NO-AA-10	Quality Assurance Topical Report (QATR)	98
		OP-AA-108-110	Evaluation of Special Tests or Evolution Evolutions	4
		PI-AA-120	Issue Identification and Screening Process	13
		PI-AA-125	Corrective Action Program (CAP) Procedure	8
		PI-AA-125-1001	Root Cause Analysis Manual	6
		PI-AA-125-1003	Corrective Action Program Evaluation Manual	7
		PI-AA-125-1004	Effectiveness Review Manual	2
71153	Corrective Action Documents	4548945	Fire, 1CX08J, Unit 1 Miscellaneous Electrical Equipment Room, 1VE01C Fan Trip	01/18/2023