



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

May 3, 2022

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

**SUBJECT: BYRON STATION – INTEGRATED INSPECTION REPORT 05000454/2022001
AND 05000455/2022001**

Dear Mr. Rhoades:

On March 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Byron Station. On April 7, 2022, the NRC inspectors discussed the results of this inspection with Mr. J. Kowalski, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

Two findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the 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 Byron 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 Byron 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,



Signed by Peterson, Hironori
on 05/03/22

Hironori Peterson, Chief
Branch 3
Division of Reactor Projects

Docket Nos. 05000454 and 05000455
License Nos. NPF-37 and NPF-66

Enclosure:
As stated

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Letter to David Rhoades from Hironori Peterson dated May 3, 2022.

SUBJECT: BYRON STATION – INTEGRATED INSPECTION REPORT 05000454/2022001
AND 05000455/2022001

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

Docket Numbers: 05000454 and 05000455

License Numbers: NPF-37 and NPF-66

Report Numbers: 05000454/2022001 and 05000455/2022001

Enterprise Identifier: I-2022-001-0058

Licensee: Constellation Energy Generation, LLC

Facility: Byron Station

Location: Byron, IL

Inspection Dates: January 01, 2022 to March 31, 2022

Inspectors: S. Bell, Health Physicist
D. Betancourt-Roldan, Senior Resident Inspector
N. Shah, Senior Project Engineer
C. Thompson, Illinois Emergency Management Agency
J. Vera, Acting Senior Resident Inspector
J. Weigandt, Resident Inspector

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

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting an integrated inspection at Byron 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 Adhere to Plant Barrier Control Program Leads to a Failure to Enter Technical Specification Limiting Condition of Operation 3.8.1.F for Two Diesel Generators Inoperable			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000455/2022001-01 Open/Closed	[H.8] - Procedure Adherence	71111.15
The inspectors identified a finding of very low safety significance with an associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” when licensee personnel failed to adhere to the Plant Barrier Control Program. Specifically, the licensee failed to declare Unit 2 Emergency Diesel Generators (EDGs) inoperable and enter Technical Specification (TS) Limiting Condition of Operation (LCO) 3.8.1.F when maintenance personnel opened a credited hazard barrier.			

Failure to Follow Surveillance Procedure Leads to Actuation of Carbon Dioxide Suppression System in Opposite Unit			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000454/2022001-02 Open/Closed	[H.2] - Field Presence	71111.22
A finding of very low safety significance (Green) and associated NCV of TS 5.4.1.c, “Procedures,” was self-revealed on December 16, 2021, when the licensee failed to implement procedure MA-BY-EM-1-FP002-006, “Fire Protection Zones 3.2B-2, 2Z2 Suppression Zones 2S-44 Detection Zones 2D-51 (Zone 3.2B-2),52,” Revision 1. Specifically, while performing a surveillance on the Unit 2 lower cable spreading room (LCSR) CO2 fire suppression system the maintenance crew failed to follow procedure and actuated the Unit 1 LCSR CO2 suppression system.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000454,05000455/2021004-01	Applicability of Technical Specifications when opening EDG roll up doors	71111.15	Closed

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 the unit remained at or near full power for the entire inspection period.

Unit 2 began the inspection period operating at full power. With the exception of minor reductions in power to support scheduled testing activities the unit remained at or near full power for most of the entire inspection period. At the end of the inspection period the unit was at 87 percent power and was in coast down for an upcoming refueling outage.

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," conducted routine reviews using IP 71152, "Problem Identification and Resolution," 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) (4 Samples)

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

- (1) Unit 1 'A' Residual Heat Removal (RH) for 'B' RH work window on January 12, 2022
- (2) 2B Component Cooling (CC) water prior to testing 2B, as documented in Work Order (WO) 5201522 on January 27, 2022
- (3) Auxiliary Building Ventilation (VA) following Inaccessible Plenum Inspections on February 4, 2022
- (4) Direct Current (DC) and instrument inverter alignment following 212 RTS on March 16, 2022

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (3 Samples)

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

- (1) South outdoor areas and Essential Service Water (SX) Cooling Tower on February 4, 2022
- (2) Fire Zone (FZ) 11.5-0, North and South Boric Acid Tank Room on March 8, 2022
- (3) North outdoor areas on March 15, 2022

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (2 Samples)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Turbine Building basement on February 18, 2022
- (2) Unit 1 Auxiliary Feedwater (AF) areas on February 23, 2022

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

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

- (1) The inspectors observed and evaluated the performance of a complex casualty graded scenario by a crew of licensed plant operators in the facility's simulator on March 2, 2022.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (2 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Unit 1 EDGs on February 1, 2022
- (2) a(3) Assessment on February 18, 2022

Quality Control (IP Section 03.02) (1 Partial)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

- (1) (Partial)
Unit 1B Containment Spray System work window on January 20, 2022

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) Evaluation of the emergent work associated with Unit 1 secondary repairs, as documented in Issue Reports (IRs) 4470112, 4470127, and 4470158 (Work Order (WO) 5219491) on January 6, 2022
- (2) Evaluation of the planned work associated with 2B RH Work Window, as documented in WOs 5035414, 5036233, and 5042626 on February 15, 2022
- (3) Evaluation of the planned and emergent work associated with the 2A CC Pump, as documented in WO5166103-1 on March 2, 2022
- (4) Evaluation of the planned work associated with new fuel receipt, as documented in WO 5166103-1 on March 10, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 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 Unit 2 AF Pumps following identification of incomplete post-maintenance testing, as documented in IR 4474490
- (2) Evaluation of the operability of the 0C Control Room Chiller following identification of a degraded air intake ionization chamber, as documented in IR 4470508
- (3) Evaluation of the operability of the 1S18880, Unit 1 Accumulator N2 Supply Outside Containment Isolation Valve following identification of questions on its position indication, as documented in IR 4480465
- (4) Evaluation of the operability of the 1C steam generator power operated relief valve following identification receipt of unexpected alarms, as documented in IRs 4471047 and 4474434
- (5) Evaluation of the operability of the 2B AF pump following identification failure of fire seal, as documented in IR 4482988

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:

- (1) Engineering Change 634411: Revise documents to permanently isolate the essential service water (SX) pump oil coolers on February 14, 2022

71111.19 - Post-Maintenance Testing

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

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

- (1) Functional and operational testing of the 1CS01PB following maintenance outage window, as document in WO 05200036-02 on January 20, 2022
- (2) Functional and operational testing of the 2B RH Pump following several work activities, as documented in WOs 5035414, 5036233, 5037850, and 5042626 on February 16, 2022
- (3) Functional and operational testing of the 0SX163C 0A SX Cooling Tower Riser Isolation Motor Operated Valve following post-maintenance inspections and diagnostic test, as documented in WOs 5135939-3 and 5009251-4 on March 10, 2021
- (4) Functional and operational testing of the Unit 1B SX Pump following a work window, as documented in WOs 5140534 and 5140535 on March 23, 2022

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Partial)

- (1) (Partial)
The inspectors evaluated fuel receipt, outage scope, and outage risk for upcoming Refueling Outage B2R23.

71111.22 - Surveillance Testing

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

Surveillance Tests (other) (IP Section 03.01) (4 Samples)

- (1) 1BOSR 5.5.8.SI.5-2A; 1B Safety Injection (SI) Test, as documented in WO 5205758
- (2) 1BOSR 5.5.8.CV.5-2A; 1B Charging Pump Test, as documented in WO 5217092
- (3) 0BOSR 7.9.6-2 and 5.5.8.SX.5-2C; (0B SX Makeup Pump monthly and comprehensive tests), as documented in WOs 5230238 and 5217094
- (4) Inadvertent actuation of the carbon dioxide (CO₂) system on Unit 1 during work, as documented in IR 4467164

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) 1BOSR 5.5.8.SX.5-2C; 1B SX Comprehensive Test, as documented in WO 5217089

RADIATION SAFETY

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walkdowns and Observations (IP Section 03.01) (3 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

- (1) Liquid effluent discharge system, including the effluent release tanks, radwaste release tank monitor (0RE-PR001), and the station blowdown monitor (0RE-PR010)
- (2) Liquid effluent secondary system components in the Turbine Building, including the turbine building fire and oil sump monitor (0RE-PR005) and the condensate polisher sump monitor (0RE-PR-041)
- (3) Auxiliary Building ventilation system, including effluent monitors Unit 1 auxiliary building vent effluent monitor (1RE-PR028) and the Unit 2 auxiliary building vent effluent monitor (2RE-PR028)

Sampling and Analysis (IP Section 03.02) (5 Samples)

Inspectors evaluated the following effluent samples, sampling processes and compensatory samples:

- (1) The inspectors observed the effluent sampling of the 0WX26T liquid effluent tank on January 11, 2022
- (2) The inspectors evaluated the operability of the radwaste release tank monitor (0RE-PR001) and the requirements for compensatory samples
- (3) The inspectors evaluated the sampling and analysis of the gaseous effluent contained within the waste gas decay tank system
- (4) The inspectors evaluated the sampling and analysis of the gaseous effluents released from the Unit 1 and Unit 2 auxiliary building vents
- (5) The inspectors evaluated the sampling and analysis of the liquid effluents released via station liquid effluent tanks

Dose Calculations (IP Section 03.03) (2 Samples)

The inspectors evaluated the following dose calculations:

- (1) Gaseous effluent releases for December 2021
- (2) Liquid effluent releases for December 2021

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, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

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

- (1) Unit 1 (January 1, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

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

- (1) Unit 1 (January 1, 2021 through December 31, 2021)
- (2) Unit 2 (January 1, 2021 through December 31, 2021)

71152A - Annual Follow-Up Problem Identification and Resolution

Annual Follow-Up of Selected Issues (Section 03.03) (1 Sample)

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

- (1) Silting issues in the SX flow lines on February 11, 2022

INSPECTION RESULTS

Failure to Adhere to Plant Barrier Control Program Leads to a Failure to Enter Technical Specification Limiting Condition of Operation 3.8.1.F for Two Diesel Generators Inoperable			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000455/2022001-01 Open/Closed	[H.8] - Procedure Adherence	71111.15
<p>The inspectors identified a finding of very low safety significance with an associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” when licensee personnel failed to adhere to the Plant Barrier Control Program. Specifically, the licensee failed to declare Unit 2 Emergency Diesel Generators (EDGs) inoperable and enter Technical Specification (TS) Limiting Condition of Operation (LCO) 3.8.1.F when maintenance personnel opened a credited hazard barrier.</p> <p><u>Description:</u></p> <p>On December 10, 2021, while performing a review of Unit 2 “A” EDG work activities (check valve and starting air compressor motor replacement WO# 5196347), the inspectors noted that the 0DSSD167, 2A EDG roll-up door had been opened without following guidance to enter Limiting Condition of Operation Action Requirement (LCOAR) for both trains of EDGs. The door was opened to facilitate movement of a lifting device and the air compressor motors during motor replacement. Records indicated the door was opened for 8 minutes on the evening of December 9th and 11 minutes on the 10th. According to BAP 1100-3A3, “Pre-Evaluated Plant Barrier Matrix,” the High Energy Line Break (HELB) barrier compensatory actions stated, in part, the following:</p> <p>“H14 Door Open 1. Enter LCOAR 1/2BOL 8.1 for both trains of DG.”</p> <p>Inspectors questioned licensee staff about not entering the 2-hour LCO per the BAP</p>			

1100-3A3 and local signage. Licensee personnel stated to the resident inspectors that they did not want to impose additional time pressure on the workers, and that they had an evaluation to support not entering the LCO. The licensee conducted the activities using the prepared Plant Barrier Impairment (PBI) Permit, CC-AA-201-F-01 (PBI # 21-267) and associated evaluation CC-AA-201-F-02, Plant Barrier Impairment Permit Evaluation. The evaluation stated, in part:

“An open roll-up door may affect the operability of BOTH trains of EDG because of HELB considerations on the wall separating the two trains of DG. BAP 1100-3A3 directs entry into LCOAR 1/2BOL 8.1 for both trains of DG. In lieu of the LCOAR entry, the activity must be planned and conducted to limit the risk to the EDGs. Measures to limit risk include the following:

1. The door is not degraded and is capable of being closed during this activity.
2. The plant should not have steam leaks that are considered imminent HELB threats.
3. The activity should be planned to ensure the large component and the transport device will fit through the door.
4. Personnel shall be ready for transfer of the equipment immediately following opening of the door.
5. In addition, both the door and the equipment shall be in continuous attendance to permit the door to be closed expeditiously if adverse plant conditions develop.
6. The door will be closed and secured (as required) immediately following the equipment move.

These actions will ensure that the risk to the EDGs will be minimal such that LCOAR entry is not required during this activity.”

Further inspection prompted questions related to the compensatory actions and EDG operability. The PBI Permit showed “Yes” per “BAP 1100-3A3” was marked for compensatory action required and listed 4 items in the “Compensatory Action” section. The governing procedure, CC-AA-201, Plant Barrier Control Program, includes a step (6.1.2.1.A) to list the pre-evaluated compensatory measures (see H14 above). The H14 verbiage would have directed entry into TS LCO 3.8.1.F. However, the H14 verbiage was not listed on the PBI Permit. Instead, the “Compensatory Action” section listed items from the evaluation outlined above.

The inspectors reviewed Byron’s Final Safety Analysis Report and saw that it states that the EDGs are credited equipment for mitigating a postulated design basis event, including steam system piping failure (Ref. Tables 15.0-7 and 15.1-2) and HELB events. Inspectors determined that the EDG roll-up doors are credited as HELB barriers and are located near large high energy (main steam and main feedwater) piping. As such, personnel compensatory actions would not be reliable if a HELB event occurred.

Similarly, the inspectors identified that RIS 2001-09, Control of Hazard Barriers provides an AFW example in the main body and Example 3 that clarify TS applicability with respect to HELB barriers. The RIS states: “For example, an auxiliary feedwater (AFW) pump that is credited with mitigating a HELB event would be rendered inoperable if a barrier that is credited with protecting the AFW pump from the effects of the postulated HELB event is removed to allow maintenance to be performed in the AFW pump room.” It also states: “It may be possible to take compensatory measures to maintain pump operability and avoid entering the TS action statement for shutting down the reactor (e.g., installing a temporary

barrier that provides equivalent protection).” As the RIS example demonstrates, without appropriate compensatory actions to mitigate the risk of a HELB event, the conditions for entry to the LCO for EDGs would apply.

The licensee’s position was that as the roll-up doors are being used for their intended purpose of ingress/egress for maintenance purposes the momentary opening of the door would not require entering the LCO. In addition, they are referencing industry position documented on APC 15-31, “NEI Regulatory Issues Task Force Position Paper Managing Risk and Operability While Opening Doors on Seismically Qualified Cabinets,” as providing basis for their position. The inspectors pointed out to the licensee that the roll-up door does not meet the definition for normal ingress/egress in the plant barrier impairment program. In particular, Step 2.12 of CC-AA-201 states the following:

2.12. Door Designed for Personnel Ingress/Egress: A hinged door separating two areas, both of which are accessible during all operating modes. This definition excludes roll-up doors, HVAC duct access hatches, condenser hatches.

As the roll-up doors are not designated as normal ingress/egress the procedure requires for the removal of the barrier be evaluated.

The inspectors reached out with the information above to the NRR Technical Specifications Branch to establish whether the momentary opening of the door would not require entering the LCO. Based on the discussion it was determined that the roll-up door protects both EDGs, and both would be affected when the roll-up door is open. Therefore, during the time the roll-up door is open, the licensee should enter LCO 3.8.1 Condition F for both EDGs inoperable.

Corrective Actions: The licensee has entered the inspectors concern into their corrective action program under AR# 4470117, NRC ID: Question related to EDG roll-up door usage, 01/05/2022.

Corrective Action References: AR 4470117

Performance Assessment:

Performance Deficiency: The licensee’s failure to properly follow their Plant Barrier Control Program when opening a credited HELB barrier was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Configuration Control 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 licensee opened a credited HELB barrier without properly following the Plant Barrier Control Program, resulting in an unplanned inoperability of the Unit 2 EDGs.

Significance: The inspectors assessed the significance of the finding using Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” The team determined that this finding was of very low safety significance (Green) because it was not a deficiency affecting the design or qualification of a mitigating SSC, did not represent a loss of the Probabilistic Risk Assessment (PRA) function of a single train TS system for greater than its TS allowed outage time, did not represent a loss of the PRA function of one train of a

multi-train TS system for greater than its TS allowed outage time, did not represent a loss of the PRA function of two separate TS systems for greater than 24 hours, did not represent a loss of a PRA system and/or function for greater than 24 hours, and did not represent a loss of the PRA function of one or more non-TS trains of equipment designated as risk significant in accordance with the licensee’s maintenance rule program for greater than 3 days.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, the licensee failed to follow their PBI steps that would have directed entry into the TS LCO. BAP 1100-3A3 directs entry into LCOAR 1/2BOL 8.1 for both trains of DG. Instead, licensee personnel incorrectly used compensatory steps in lieu of entering the appropriate TS LCO.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, requires, in part, 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. The licensee established CC-AA-201 revision 13, “Plant Barrier Control Program” as the implementing procedure for barrier impairment, an activity affecting quality.

Procedure CC-AA-201, Steps 6.4.2 and 6.4.3 state “REVIEW the PBI PRMIT and ensure the compensatory actions and Operability Impact is acceptable.” and “DETERMINE if any Technical Specification, Technical Requirement Manual or other administrative tracking requirement action statement is required to impair the barrier.”

Contrary to the above, on December 9th and on the 10th, the licensee failed to follow Steps 6.4.2 and 6.4.3 of CC-AA-201. Specifically, Operations Management did not adequately ensure the compensatory actions for HELB would maintain Unit 2 EDGs Operable. Additionally, Operations Management failed to determine Technical Specification Limiting Condition of Operation (LCO) 3.8.1.F as applicable.

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

The disposition of this finding and associated violation closes URI: 05000454, 05000455/2021004-01.

Failure to Follow Surveillance Procedure Leads to Actuation of Carbon Dioxide Suppression System in Opposite Unit

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000454/2022001-02 Open/Closed	[H.2] - Field Presence	71111.22

A finding of very low safety significance (Green) and associated NCV of TS 5.4.1.c, “Procedures,” was self-revealed on December 16, 2021, when the licensee failed to implement procedure MA-BY-EM-1-FP002-006, “Fire Protection Zones 3.2B-2, 2Z2 Suppression Zones 2S-44 Detection Zones 2D-51 (Zone 3.2B-2),52,” Revision 1. Specifically, while performing a surveillance on the Unit 2 lower cable spreading room (LCSR)

CO2 fire suppression system the maintenance crew failed to follow procedure and actuated the Unit 1 LCSR CO2 suppression system.

Description:

The Unit 1 and Unit 2 LCSRs at Byron are protected by a CO2 suppression system. This system is required to be periodically tested in accordance with the Fire Protection Program. This is accomplished by utilizing surveillance procedure MA-BY-EM-1-FP002-006, "Fire Protection Zones 3.2B-2, 2Z2 Suppression Zones 2S-44 Detection Zones 2D-51 (Zone 3.2B-2),52," Revision 1. On December 16, 2021, the Electrical Maintenance Department was tasked with the performance of the prior mentioned surveillance on the Unit 2 LCSR. This work is performed with the Unit 2 LCSR CO2 suppression system out of service to prevent the system from discharging CO2 into the Unit 2 LCSR areas.

Part of the surveillance is to perform an "Abort Switch Test" for the Unit 2 LCSR suppression zone 2S-44. This part of the surveillance actuates the CO2 suppression portion of the system with the associated zone isolated from CO2. The steps to be performed per the procedure were the following:

- 11.1 Remove cover to local pushbutton 2HS-CO048 (439 P-22); and
- 11.2 Push local pushbutton 2HS-CO048 (439 P-22) and Begin timing evacuation.

The crew assigned to perform the Abort Switch Test searched for the pushbutton (2HS-CO048) that is designed to actuate CO2 suppression in the 2S-44 zone for approximately twenty minutes. After failing to find the pushbutton, the technicians requested support from the lead Senior Technician via radio to help locate the component. Following a walkdown Unit 1 and Unit 2 LCSR zones the lead technician notified the crew performing that he found a "CO048" pushbutton on the Unit 1 side of the LCSR and verbally led that crew to the location. The step in the surveillance to actuate the 2HS-CO048 (Step 11.2) requires signatures from both the performer and the verifier identifying that the correct component prior to actuation. Contrary to that action the crew did not verify the Unit designation and proceeded to press the pushbutton on the panel. After a few seconds, the crew heard dampers closing and smelled wintergreen. Recognizing that CO2 suppression was actuated, they immediately evacuated the Unit 1 LCSR. The Control Room made the announcement over the plant paging system that CO2 was being discharged on the Unit 1 side of the Auxiliary Building and instructed all personnel to evacuate the area. Following the discharge of the CO2 system, the site instituted fire rounds on all affected areas until the CO2 system was restored.

Following the event, the licensee performed an investigation and uncovered that the start of the surveillance was delayed due to conflicting station priorities, which placed perceived time pressure on the shop Supervisors. A thorough Pre-Job Brief of the individuals was also not performed even though some of the individuals were not familiar with the task or had not performed it in three or more years.

Corrective Actions: Planned corrective actions for this event include changes to the procedure that would isolate CO2 to the station prior to performing surveillances. This would also include the use of fire watches while the system is isolated.

Corrective Action References: AR 04467164

Performance Assessment:

Performance Deficiency: The licensee's failure to properly follow surveillance MA-BY-EM-1-FP002-006 when performing testing in the Unit 2 LCSR was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, maintenance technicians' failure to follow the procedure led to them incorrectly pressing local push button 1HS-CO048, vice 2HS-CO048. This led to the initiation of the Unit 1 LCSR CO2 suppression system and the evacuation of the affected area.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors screened the finding against the Initiating Event screening questions in Exhibit 1 and determined that it did not impact the frequency of a fire or internal flooding initiating event. Therefore, the finding screened to very low safety significance (Green).

Cross-Cutting Aspect: H.2 - Field Presence: Leaders are commonly seen in the work areas of the plant observing, coaching, and reinforcing standards and expectations. Deviations from standards and expectations are corrected promptly. Senior managers ensure supervisory and management oversight of work activities, including contractors and supplemental personnel. Specifically, licensee supervision failed to ensure that technicians applied adequate peer checks or other human performance tools (e.g., Pre-Job briefs) during the surveillance.

Enforcement:

Violation: Technical Specification 5.4.1.c, "Procedures" requires, in part, that written procedures shall be established, implemented, and maintained covering the following activities: Fire Protection Program implementation.

Section 4.0 of the Byron Fire Protection Report states that the CO2 system will be subjected to periodic tests.

The licensee established MA-BY-EM-1-FP002-006, "Fire Protection Zones 3.2B-2, 2Z2 Suppression Zones 2S-44 Detection Zones 2D-51 (Zone 3.2B-2),52," Revision 1, as the implementing procedure for testing the CO2 system in the LCSR. Section 11 of the procedure, "Abort Switch Testing," contained the following steps:

- 11.1 Remove cover to local pushbutton 2HS-CO048 (439 P-22); and
- 11.2 Push local pushbutton 2HS-CO048 (439 P-22) and Begin timing evacuation.

Contrary to the above, on December 16, 2021, the licensee failed to follow Steps 11.1 and 11.2 while performing the surveillance MA-BY-EM-1-FP002-006 on Unit 2. Specifically, Maintenance personnel failed to verify the Unit designation prior to proceeded to press the pushbutton. This led to 1HS-CO048 being pressed vice 2HS-CO048 and caused the actuation of the CO2 system in the Unit 1 LCSR.

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 7, 2022, the inspectors presented the integrated inspection results to Mr. J. Kowalski, Site Vice President, and other members of the licensee staff.
- On January 14, 2022, the inspectors presented the radiation protection baseline inspection results to Mr. J. Kowalski, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Drawings	6E-2-4002F	Single Line Diagram 120V AC ESF Instrument Inverter Bus 212 and 214 125V DC ESF Distribution Center 212	G
	Procedures	BOP CC-E2B	Component Cooling System Train B Electrical Line Up (Unit 2)	4
		BOP CC-M2B	Train B Component Cooling System Valve Lineup (Train B Safety Loop and Seal Water HX)	6
		BOP FP-M1	Fire Protection System Valve Lineup	49
		BOP RH-E1A	Residual Heat Removal System Train A Electrical Lineup (Unit 1)	3
		BOP RH-M1A	Train "A" Residual Heat Removal System Valve Lineup	9
		BOP VA-E1	Auxiliary Building Ventilation Electrical Lineup (Unit 1)	5
		BOP VA-E2	Auxiliary Building Ventilation Electrical Lineup (Unit 2)	4
		BOP VA-E3	Auxiliary Building Ventilation Electrical Lineup (Unit 0)	6
		BOP VA-M1	Auxiliary Building HVAC System Mechanical Line-Up	5
	Work Orders	5065965	Clean/Inspect Instrument Inverter	03/16/2022
5201522		(NEIL)- 2CC01PA Comprehensive IST Rqmts for CC Pump	01/27/2022	
71111.05	Fire Plans	PFP AB 401-0 FZ 11.5-0 N	Pre-Fire Plan Auxiliary Building 401-0 Elevation General Area North Fz 11.5-0 North	2
		PFP AB 401-0 FZ 11.5-0 S	Pre-Fire Plan Auxiliary Building 401-0 Elevation General Area South FZ 11.5-0 South	2
		PFP SXCT FZ 18.14A-1,2	Pre-Fire Plan Essential Service Water Cooling Tower Electrical Substation 0B/SX Cooling Tower	2
		PFP SXCT FZ 18.14B-1,2	Pre-Fire Plan Essential Service Water Cooling Tower Electrical Substation 0A/SX Cooling Tower	2
	Procedures	0BOSR 10.B.5-1	Quarterly Fire Protection Valve Lineup Surveillance	27
		BOP FP-M1	Fire Protection System Valve Lineup	49
71111.06	Corrective Action Documents	4482988	2B AF Pump Room Fire Sealant Failure	03/07/2022
	Drawings	M-518	Auxiliary Building Process Pipe Sleeve Sealing Schedule	AA
		M-556-14	Diesel Oil Exhaust	K
NP14-11		Self-Supporting High-Density Gel Typical Mechanical	3	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Seals	
		NP14-14	TS-MS-0091 Boot Seal	4
		S-697	Auxiliary Building Floor Framing Plan EL 401'-0" Area 3	CV
	Miscellaneous	BB-PRA-012	Internal Flood Evaluation Summary Notebook, BYR/BRW Unit 1 & 2	9
71111.11Q	Miscellaneous	22-2-1 OBE	Byron Station Licensed Operator Requalification Simulator Scenario Guide	0
71111.12	Corrective Action Documents	04401914	1A DG Jacket Water Cooler SX leak	02/12/2021
		04402538	1B DG Jacket Water Overflow Pipe Has Oil Coming Out of It	02/15/2021
		04409626	Potential Cause for 1B Diesel Generator Degradation	03/17/2021
		04409647	Potential Cause for 1A Diesel Generator Degradation	03/17/2021
		04419373	1A DG Jacket Water Lower Cooler 1DG01KA Leaking SX	04/27/2021
		04419745	1A DG Manually Secured due to Exhaust Leak	04/28/2021
		04429554	Tube Plugging for 1B DG Lower JW Cooler	06/15/2021
		04432379	1A DG Secured due to Low Indicated SX Flow	06/30/2021
	04465820	1A EDG Non-Emergency Trip Circuit Test and Tighten	12/10/2021	
	Corrective Action Documents Resulting from Inspection	4472772	NRC ID: No Fire Extinguisher During Hot Work Fire Watch	01/19/222
	Miscellaneous		Maintenance Rule a(3) Assessment	09/30/2021
			Maintenance Rule a(3) Assessment	1/2020 – 6/2021
	Procedures	ER-AA-320	Maintenance Rule Implementation Per NEI 18-10	0
		ER-AA-320-1007	Maintenance Rule 18-10 - Periodic a(3) Assessment	1
Work Orders	1538757-1	EWP-MM Overhaul Operator / Stem	01/20/2022	
	1538757-8	EM Perform Valve as Left Diagnostic Testing 1CS001B	01/20/2022	
	1807588	MM - 1CS049B Replace Valve	01/19/2022	
	5110561-1	EWP MM - Perform Relief Valve Testing – Autogen	01/20/2022	
	5110562-1	EWP MM - Perform Relief Valve Testing – Autogen	01/20/2022	
71111.13	Corrective Action Documents	4470112	11C Heater High/High 2 Caused 1C LP Htr String to Isolate	01/05/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4470126	1CB025, Low Pressure HTRS Bypass Valve, Not Closing	01/05/2022
		4470127	12C Low Pressure Heater Relief Valve Not Reseating	01/05/2022
		4470158	12B FW Heater Level Indication About 12 Above Expected	01/05/2022
		4479890	Lessons Learned Rollup for 11C FW Heater Response	02/22/2022
		4481336	2A CC Pump Impeller Degradation Identified.	02/28/2022
	Procedures	OP-AA-201-004	Fire Prevention for Hot Work	17
		OP-BY-108-117-1000	Byron Protected Equipment Program	17
	Work Orders	4620415	2CC01PA Has Outboard Seal Leak/Chemical Buildup	03/05/2022
		5035414-01	Change/Sample Motor Bearing Lubricant	02/14/2022
		5036233	Perform Inspection of Motor (2RH01PB-M)	02/15/2022
		5037850	PM Inspection, In-Service Diag Test, PIT	02/15/2022
		5166103-01	RXS New Fuel Receipt and Inspection for U-2 Outage	03/10/2022
		5219491	1C Flash Tank Level Controller Not Working	01/13/2022
		WR 1508224	1CB025, Low Pressure HTRS Bypass Valve, Not Closing	01/07/2022
		WR 1508229	12B FW Heater Level Indication About 12 Above Expected	01/10/2022
71111.15	Corrective Action Documents	04470508	"A" VC Outside Air Intake Detector Trouble	01/07/2022
		04471047	Unexpected Alarm 1C SG PORV Trouble	01/10/2022
		04474434	1C SG PORV UPS Trouble	01/28/2022
		04482988	2B AF Pump Room Fire Sealant Failure	03/07/2022
		447440	Incomplete PMT for MCB Hand Switch Replacement	01/28/2022
		4474490	Incomplete PMT for MCB Hand Switch Replacement	01/28/2022
		4480465	Possible Limit Switch Issue on 1SI8880	02/24/2022
	Corrective Action Documents Resulting from Inspection	4477314	Lessons Learned for DG Roll Up Door PBI's	02/10/2022
		4479992	URI: Applicability of TS when Opening EDG Roll Up Doors	02/22/2022
		4480538	Historical Issue with 0DSSD167	02/24/2022
		4482059	Minor Cracking on the Cell Covers for Batt. 211	03/02/2022
	Drawings	4483464	Request Inspect/Replace L2X Relay - 2B AF Pump	03/08/2022
		6E-2-4030AF01	Schematic Diagram Auxiliary Feedwater Pump 2A 2AF01PA	AA

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		6E-2-4030AF02	Schematic Diagram Auxiliary Feedwater Pump 2B (Diesel Driven) 2AF01PB	Z
	Miscellaneous	1BOSR 6.3.5-11.BY01	Acceptance Criteria Data Sheet	0
	Procedures	1BOSR 0.5-2.SI.3-4	1SI8880, 1SI8964, 1SI8871 and 1SI8888 Position Indication Test	3
		1BOSR 6.3.5-11	1SI8880, 1SI8964, 1SI8871 and 1SI8888 Stroke Test	7
71111.18	Calculations	LTC1003573270010-01 R(1)	SX Pump Lube Oil Cooler Elimination Analysis	08/11/2021
	Engineering Changes	634411	Revise Documents to Permanently Isolate SX Pump Oil Coolers	0
71111.19	Corrective Action Documents	4483969	PMTs for SXCT Riser Valve MOV Inspections	03/10/2022
	Corrective Action Documents Resulting from Inspection	4474522	Container Used in RCA with No Radioactive Material Sticker	01/28/2022
		4485004	Leak By Greater Than 20GPM On 0SX163C	03/15/2022
		4485067	NRC ID Observation Working at Heights	03/15/2022
		4486869	NRC ID: 1B SX PP Oil Low In Sight Glass After Work Window	03/23/2022
	Work Orders	5009251	PM Inspection, In-service Diag. Test, PIT	03/10/2022
		5027570-3	OPS PMT - 1FI-SX042, 1SX200B, 1SX200D	03/22/2022
		5035414-2	OPS PMT – Verify Proper RH Pump Motor Oil Level	02/16/2022
		5036233	Perform Inspection of Motor (2RH01PB-M)	02/15/2022
		5037850-4	OPS PMT - PIT & Stroke Test	02/16/2022
		5084416-3	OPS PMT – Stroke and PIT	02/15/2022
		5135939	LR-SXCT C Cell Inspection per TRM	03/10/2022
		5140534-2	OP PMT: Verify Proper SX Pump/Motor Oil Level	03/22/2022
5140535-2		OP-Perform PMT	03/22/2022	
5200036	(NEIL)-1CS01PB Comprehensive IST Rqmts for Containment Spray	01/20/2022		
71111.22	Corrective Action Documents	4467164	CO2 Storage Tank Trouble Alarm	12/16/2021
	Procedures	MA-BY-EM-FP002-006	Fire Protection Zones 3.2B-2, 2Z2 Suppression Zones 2S-44 Detection Zones 2D-51 (Zone 3.2B-2), 52	1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Work Orders	04973623-01	LCSR Fire Protection Zones Low Pressure CO2 System Actuation	
		5205758-01	OPS 1BOSR 5.5.8.SI.5-2A 1B SI IST Group A Pump Test	02/11/2022
		5217089-1	LR-OPS: 1BOSR 5.5.8.SX.5-2C 1B SX Comprehensive	03/22/2022
		5217092	(NEIL)- 1CV01PB Group A Ist Requirements For CV Pump	02/15/2022
		5217094-01	OPS 0BOSR 5.5.8.SX.5-2C 0B SX Comprehensive	03/18/2022
		5230238-01	LR-0BOSR 7.9.6-2, SX Makeup Pump 0B Monthly Operability	03/18/2022
71124.06	Corrective Action Documents	AR 04333196	CWBD ODCM Compositor No Flow	04/06/2020
		AR 04343530	Re-establish Continuous Flow for CWBD ODCM Sampling	05/15/2020
		AR 04412979	Effluent Report	03/31/2021
	Engineering Evaluations		Offsite Dose Calculation Manual Revision Documentation	15-17
	Miscellaneous		2019 Annual Radioactive Effluent Release Report	04/23/2020
			2020 Annual Radioactive Effluent Release Report	04/21/2021
			2020 Annual Land Use Census	09/01/2020
		G-20210630-296-B	Unit 1 Containment Effluent Release	06/30/2021
		G-20210818-351-B	Waste Gas Decay Tank B Batch Effluent Release	08/20/2021
		L-20220111-153-B	Liquid Effluent Batch 0WX26T Tank Release	01/11/2022
	Procedures	BCP-400-ECNMT/ROUTINE	Gaseous Effluent Release Form - Routine Containment Release	1
		BCP-400-EWASTE GAS	Gaseous Effluent Release Form Type: Waste Gas Decay Tank	1
		BCP-400-EWX01	Liquid Radwaste Release Form for Release Tank OX-O1T	3
		CY-BY-130-300-300-69	Compositing Continuous Liquid Effluent Samples	15
		CY-BY-170-200-F-400-46	Waste Gas Decay Tank Sample Form	2
		CY-BY-170-301	Offsite Dose Calculation Manual	15, 17
	Radiation Surveys		Unit 1 Auxiliary Building Vent Effluent Monitor 1RE-PR028 Effluent Sample Data (Tritium, Noble Gas,	01/10/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Particulate and Iodine)	
			Unit 2 Auxiliary Building Vent Effluent Monitor 2RE-PR028 Sample Data (Tritium, Noble Gas, Particulate, and Iodine)	01/10/2022
71151	Miscellaneous		Operating Logs from January - December 2021	
	Procedures	LS-AA-2001	Collecting and Reporting of NRC ROP Performance Indicator Data	17
71152A	Corrective Action Documents Resulting from Inspection	4470437	Security Vehicle Left Running in Protected Area	01/06/2022
		4474460	NRC ID: Summary of 4Q21 Integrated Inspection Exit Meeting	01/28/2022
		4474556	NRC ID: Pipe 1ES87AB May Be Rubbing Against a Snubber	01/28/2022
		4475505	ES Line Pipe Support Broken (First One)- Line Vibration	02/02/2022
		4475509	ES Line Pipe Support Broken (Second One)- Line Vibration	02/02/2022
		4481241	NRC 4Q21: Minor Violation - Inadequate Operator Logs	02/28/2022
		4486245	NRC ID - Floor Drain Covered	03/21/2022
		4486246	NRC ID: 0A SX Pump Gear Box Breather Dirty	03/21/2022
		4486246	0A SX Pump Gear Box Breather Dirty	03/21/2022
	4486623	NRC ID: Potential Trend in Timely Completion of HURB Actions	03/22/2022	