



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

May 4, 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: CLINTON POWER STATION – INTEGRATED INSPECTION REPORT
05000461/2023001

Dear David Rhoades:

On March 31, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Clinton Power Station. On April 6, 2023, the NRC inspectors discussed the results of this inspection with Tom Chalmers, 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 Clinton Power 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 Clinton Power 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 Ruiz, Robert
on 05/04/23

Robert Ruiz, Chief
Reactor Projects Branch 1
Division of Operating Reactor Safety

Docket No. 05000461
License No. NPF-62

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

Letter to David Rhoades from Robert Ruiz dated May 4, 2023.

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05000461/2023001

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

Docket Number: 05000461

License Number: NPF-62

Report Number: 05000461/2023001

Enterprise Identifier: I-2023-001-0053

Licensee: Constellation Nuclear

Facility: Clinton Power Station

Location: Clinton, IL

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

Inspectors: A. Athar, Senior Resident Inspector
A. Muneeruddin, Resident Inspector
J. Murphy, Illinois Emergency Management Agency

Approved By: Robert Ruiz, Chief
Reactor Projects Branch 1
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 Clinton Power 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 Manage Risk During Emergency Reserve Auxiliary Transformer Maintenance			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2023001-01 Open/Closed	[H.12] - Avoid Complacency	71111.13
An NRC-identified finding of very low safety significance (Green) and an associated non-cited violation of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," was identified for the failure of the licensee to manage the increase in risk during maintenance of the emergency reserve auxiliary transformer (ERAT). Specifically, the licensee failed to display protected equipment postings as required per station procedure OP-AA-108-117, "Protected Equipment Program."			

Additional Tracking Items

None.

PLANT STATUS

On January 1, 2023, Unit 1 performed a planned down power to approximately 75 percent to perform a control rod sequence exchange. The unit also experienced negative Megavolt ampere reactivities (MVARs) on the grid during this time, which also required the lowering of power. The unit was returned to full-rated thermal power on January 3, 2023. On January 31, 2023, the unit experienced a main generator/turbine trip that initiated a reactor scram due to a fault on the 345kV line and subsequent trips of both generator output breakers. The unit began power ascension on February 3, 2023, and was returned to full-rated thermal power on February 8, 2023. All other times, the unit was at or near full-rated thermal power.

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

- (1) Division 2 emergency diesel generator (EDG) on March 14, 2023
- (2) Division 3 diesel on March 20, 2023
- (3) High-pressure coolant system (HPCS) on March 15, 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 a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) EDG rooms on February 14, 2023
- (2) Reactor core isolation cooling (RCIC) and low-pressure core spray rooms on February 16, 2023

- (3) Technical support center, HPCS, and residual heat removal (RHR) 'C' rooms on February 21 and 22, 2023
- (4) Containment building on March 24, 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)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during reactor startup on February 3, 2023.

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

- (1) The inspectors observed and evaluated licensed operator requalification simulator training on March 23, 2023.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

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

- (1) Review of periodic 10 CFR 50.65(a)(3) evaluation on February 10, 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) Work Order (WO) 5312674-01, "Emergency Reserve Auxiliary Transformer Switch Repair"
- (2) RHR loop 'B' valve operability on March 2, 2023
- (3) Emergency reserve auxiliary transformer (ERAT) system outage window (SOW) on March 21, 2023
- (4) RHR 'A' room cooler SOW on March 13, 2023

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (2 Samples)

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

- (1) RHR 'B' heat exchanger room temperature controller
- (2) Division 1 diesel invalid overspeed trip test

71111.18 - Plant Modifications

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

The inspectors evaluated the following temporary or permanent modifications and completed a review of the majority of the current licensing basis documents associated with the 50.59 screening:

- (1) (Partial)
50.59 Screening of RCIC being removed as an Engineered Safety Feature on March 29, 2023

71111.20 - Refueling and Other Outage Activities

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

- (1) The inspectors evaluated forced outage activities from January 31 to February 5, 2023.

71111.24 - Testing and Maintenance of Equipment Important to Risk

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

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

- (1) WO 5312674-01, "Ductor Testing of 'B' Phase ERAT Circuit Switcher Interrupter After Replacement of B018 Interrupter"
- (2) CPS [Clinton Power Station] 9080.02, "Diesel Generator 1B Operability Procedure After Replacement of Motor Operated Potentiometers" (WO 5323367-07)
- (3) ERAT MSC PMT on March 22, 2023

Surveillance Testing (IP Section 03.01) (3 Samples)

- (1) Diesel generator (DG) 1A monthly operability on February 15, 2023
- (2) DG 1B semi-annual quick start test on March 1, 2023
- (3) DG 1C integrated testing on March 7, 2023

71114.06 - Drill Evaluation

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

The inspectors evaluated:

- (1) Simulator training observation on March 16, 2023

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) (1 Sample)

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

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

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

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

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

71153 - Follow Up of Events and Notices of Enforcement Discretion

Personnel Performance (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated forced outage performance on January 31, 2023.

INSPECTION RESULTS

Failure to Manage Risk During Emergency Reserve Auxiliary Transformer Maintenance			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2023001-01 Open/Closed	[H.12] - Avoid Complacency	71111.13
<p>An NRC-identified finding of very low safety significance (Green) and an associated non-cited violation of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 50.65(a)(4), “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” was identified for the failure of the licensee to manage the increase in risk during maintenance of the emergency reserve auxiliary transformer (ERAT). Specifically, the licensee failed to display protected equipment postings as required per station procedure OP-AA-108-117, “Protected Equipment Program.”</p> <p><u>Description:</u></p> <p>On March 21, 2023, the licensee removed the ERAT from service to perform planned breaker maintenance. The evaluated risk for this activity was an elevated Green condition. The loss of additional electrical alternating current (AC) or direct current (DC) power sources could result in a high-risk condition, loss of core cooling, or limiting Technical Specification action statements.</p> <p>That morning, inspectors reviewed the station’s daily risk assessment and performed a walkdown of the posted protected equipment to ensure the risk management actions were properly implemented. The inspectors noted that the division 1 and division 2 emergency</p>			

diesel generators (EDGs) were not posted protected, contrary to the requirements of station procedure OP-AA-108-117, "Protected Equipment Program."

When structures, systems, and components (SSCs) are planned to become unavailable, Step 4.2.1 of station procedure OP-AA-108-117, "Protected Equipment Program," revision 7 requires protection of redundant equipment if plant configuration is such that redundant equipment unavailability or manipulation would cause an overall online or outage risk assessment change to red risk or entry into shutdown Technical Specification limiting condition for operation (LCO) of 12 hours or less. In this case, the unavailability of the division 1 or division 2 EDG would cause entry into condition D of Technical Specification 3.8.1, which is a 12-hour LCO.

Once the inspectors informed operations personnel that the division 1 and division 2 EDGs were not posted protected, the licensee performed an extent-of-condition review for all of the protected equipment listed in the control room operator logs, and found that none of the division 1 or division 2 equipment that should have been protected for the ERAT system outage window was protected. This equipment includes division 1 and division 2 EDGs, as previously mentioned; division 1 and division 2 AC switchgear rooms; division 1 and division 2 battery rooms; division 1 and division 2 standby service water trains; division 1 and division 2 Nuclear System Protection System trains; and main control room hand switches associated with all these systems. While these systems were listed as protected equipment in control room operator logs, they were not listed in equipment operator turnover sheets, which are used to ensure that protected equipment postings are walked down each shift to ensure they are intact.

Station procedure OP-AA-108-117, "Protected Equipment Program," revision 7, states that, "Protected equipment actions taken in accordance with this procedure support the Configuration Risk Management Program and are classified as risk management actions for the purpose of compliance with 10 CFR 50.65 (a)(4)." As such, failure to display protected equipment postings in accordance with station procedure OP-AA-108-117, "Protected Equipment Program," represents the licensee's failure to implement risk management actions, as required by 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Corrective Actions: Once the inspectors informed operations personnel that the division 1 and division 2 EDGs were not posted protected, the licensee took immediate action to post "Protected Equipment" signs and barriers on the division 1 and division 2 EDG rooms. Station personnel also performed an extent-of-condition review for all of the protected equipment listed in the control room operator logs and found that none of the division 1 or division 2 equipment that should have been protected for the ERAT system outage window was protected, so the licensee posted "Protected Equipment" signs and barriers for the division 1 and division 2 AC switchgear rooms; division 1 and division 2 battery rooms; division 1 and division 2 standby service water trains; division 1 and division 2 NSPS trains; and main control room hand switches associated with all of these systems. The licensee has entered this issue into the corrective action program.

Corrective Action References: Action Request 4563907

Performance Assessment:

Performance Deficiency: The licensee failed to manage the increase in risk that resulted from maintenance activities on the ERAT, as required by 10 CFR 50.65(a)(4). Specifically, the

licensee failed to display protected equipment postings as required per station procedure OP-AA-108-117, "Protected Equipment Program." This performance deficiency was within the licensee's ability to foresee and prevent.

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's failure to display protected equipment postings on several division 1 and division 2 systems could result in inappropriate work in the areas and the loss of redundant systems for offsite AC power.

Furthermore, the inspectors used Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues," dated January 1, 2021, to inform answers to the more-than-minor screening questions and found this condition consistent with more-than-minor example 8.f because there was a lack of awareness throughout the operations organization regarding which equipment was protected. Daily equipment operator turnover sheets did not include any of the division 1 or division 2 protected equipment. Additionally, an equipment operator accessed the division 2 EDG room to perform work (i.e., place a locking device on a valve). This equipment operator did not notify the shift manager of his entry into a room containing protected equipment.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix K, "Maintenance Risk Assessment and Risk Management SDP." The inspectors assessed the significance of the finding using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management SDP." Because the performance deficiency was related to inadequate risk management actions (RMAs), the inspectors were directed to IMC 0609, Appendix K, Flowchart 2, "Assessment of RMAs." The inspectors determined the finding screened to very low safety significance (Green) because the incremental core damage probability for the maintenance was less than 1E-6.

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. The inspectors found that complacency was a key factor in causing this performance deficiency, as the shift manager assumed that the protected equipment would be posted properly, rather than verifying the postings himself. Furthermore, the use of a peer check may have identified the error in the equipment operator turnover sheets.

Enforcement:

Violation: 10 CFR Part 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," requires, in part, that licensees manage the increase in risk that may result from maintenance activities.

Contrary to the above, from March 21, 2023 to March 22, 2023, the licensee failed to manage the increase in risk during the ERAT maintenance. Specifically, the licensee failed to display protected equipment postings as required per station procedure OP-AA-108-117, "Protected Equipment Program."

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 6, 2023, the inspectors presented the integrated inspection results to Tom Chalmers, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Procedures	CPS 3309.01	High Pressure Core Spray (HPCS)	18d
		CPS 3309.01V001	High Pressure Core Spray Valve Lineup	11b
		CPS 3506.01	Diesel Generator and Support Systems (DG)	41
		CPS 3506.01P006	Placing Division 3 Diesel Generator 1C in Standby	0f
		CPS 3506.01V001	Diesel Generator and Support Systems Valve Lineup	13A
		OP-AA-108-103	Locked Equipment Program	3
		OP-CL-108-103-1001	Locked Valve Lineup (Outside of Drywell)	4
71111.05	Fire Plans	CPS 1893.04M003	Prefire Plan Legend	1
		CPS 1893.04M210	Fire Zone C-2; 737' Containment	6b
		CPS 1893.04M220	Fire Zone C-2; 755' Containment	5
		CPS 1893.04M230	Fire Zone C-2; 778' Containment (East)	5
		CPS 1893.04M231	Fire Zone C-2; 778' Containment (West)	5
		CPS 1893.04M240	Fire Zone C-2; 803' Containment	5
		CPS 1893.04M250	Fire Zone C-2; 828' Containment	6a
		CPS 1893.04M510	737' Diesel Generator: Div 3 Diesel Generator & Day Tank Room Prefire Plan	6c
		CPS 1893.04M511	737' Diesel Generator: Div 1 Diesel Generator & Day Tank Room Prefire Plan	6c
		CPS 1893.04M512	737' Diesel Generator: Div 2 Diesel Generator & Day Tank Room Prefire Plan	7b
		CPS	Nuclear Training Department (NTD) Building Prefire Plan	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
		1893.04M916			
	Procedures	ER-CL-600-1069	Clinton Unit 1, Site List of High-Risk Fire Areas	0	
71111.12	Corrective Action Documents	AR 4538554	New Moore Controller from Stores Failed Bench Test	11/22/2022	
		AR 4556334	Defective Moore 535 Received from Stores	02/22/2023	
		AR 4556359	2nd Defective Moore 535 Received from Stores	02/22/2023	
		AR 4556713	4 Moore 535 Controllers Failed Within the Last 4 Months	02/23/2023	
		AR 4557930	Trend in Moore Controller Issues	02/28/2023	
	Miscellaneous			10 CFR 50.65(a)(3) Periodic Assessment of Maintenance Rule Program	October 15, 2019 through October 15, 2021
		Purchase Order 51636000		Controller, Digital, Model 535 Single Loop Process, Base Unit	001
		Receipt# 249484		Quality Receipt Inspection Package; Receipt# 249484; Catalog ID# 1383969-1	08/10/2020
	Procedures	CC-AA-309-1012		10 CFR Part 21 Technical Evaluations	5
		PES-S-002		Nuclear Engineering Standards	10
PI-AA-125			Corrective Action Program (CAP) Procedure	8	
SM-AA-102			Warehouse Operations	33	
71111.13	Corrective Action Documents Resulting from Inspection	AR 4563907	NRC ID: Divisional DGs not Posted Protected During ERAT SOW	03/21/2023	
		AR 4563907	NRC ID: Divisional DGs not Posted Protected During ERAT SOW	03/21/2023	
	Procedures	ER-AA-600-1042		On-Line Risk Management	13
		OP-AA-108-117		Protected Equipment Program	7
		WC-AA-101-1006		On-Line Risk Management and Assessment	4
	Work Orders	WO 5312674		Replace 'B' Phase ERAT Circuit Switcher B018 Interrupter, 0AP95E	0
	71111.15	Corrective Action Documents	AR 4543385	1TITVY005 RHR B HX Room Temperature Controller Screen Blank	12/17/2022
AR 4543385			Evaluate 3211.01C001/C002 Statement for Correctness: "RHR Pump Room and Heat Exchanger Room Cooling Fans Will Fail to Automatically Start on High Temperature When Fuse FU-1 Is Removed. The Fans Will Still Automatically Start When the	01/13/2023	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			RHR Pump starts." Document Results. Create Additional Actions as Needed.	
		AR 4555969	1TITVY005 RHR B HX Room Temperature Controller Screen Blank	02/21/2023
		AR 4555969	1TITVY005 RHR B HX Room Temperature Controller Screen Blank	02/21/2023
		AR 4562704	Div 1 DG 9080.30 Overspeed Trip Test Indications	03/17/2023
71111.18	Procedures	LS-MW-107-1001	USAR Clinton CHG PKG 2007-004	01/15/2007
71111.24	Work Orders	WO 5312674	Replace 'B' Phase ERAT Circuit Switcher B018 Interrupter, 0AP95E	0
		WO 5323367-07	OP 1DG01KB Perform 9080.02	0