UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE RD, STE 102
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

March 13, 2025

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

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – NRC INSPECTION REPORT 05000277/2024011 AND 05000278/2024011

Dear David Rhoades:

On February 27, 2025, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Peach Bottom Atomic Power Station, Units 2 and 3, and discussed the results of this inspection with Ryan Stiltner, Plant Manager, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

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,

Glenn T. Dentel

Digitally signed by Glenn T. Dentel
Date: 2025.03.13 07:02:23 -04'00'

Glenn T. Dentel, Chief
Engineering Branch 2
Division of Operating Reactor Safety

Docket Nos. 05000277 and 05000278
License Nos. DPR-44 and DPR-56

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – NRC INSPECTION REPORT 05000277/2024011 AND 05000278/2024011 DATED MARCH, 13 2025

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DOCUMENT NAME: https://usnrc.sharepoint.com/teams/EngineeringBranch2/Shared Documents/_Fire Protection/Fire Protection Inspections/Peach Bottom - Uncoordinated Circuits/PB 2024011 DC Uncoordinated circuits.docx
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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000277 and 05000278
License Numbers:	DPR-44 and DPR-56
Report Numbers:	05000277/2024011 and 05000278/2024011
Enterprise Identifier:	I-2024-011-0030
Licensee:	Constellation Energy Generation, LLC
Facility:	Peach Bottom Atomic Power Station, Units 2 and 3
Location:	Delta, PA 17314
Inspection Dates:	December 11, 2023 to February 27, 2025
Inspectors:	M. Patel, Senior Operations Engineer J. Tifft, Senior Reactor Inspector
Approved By:	Glenn T. Dentel, Chief Engineering Branch 2 Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a NRC inspection at Peach Bottom Atomic Power Station, Units 2 and 3, 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

No findings or violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000277,05000278/2024011-01	Uncoordinated Control Cable DC Circuits	71152A	Open

INSPECTION SCOPES

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

OTHER ACTIVITIES – BASELINE

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) Uncoordinated Power and Control Direct Current (DC) Circuits

71153 - Follow Up of Events and Notices of Enforcement Discretion

Reporting (IP Section 03.05) (1 Sample)

The inspectors evaluated the following licensee's event reporting determinations to ensure it complied with reporting requirements.

(1) Licensee Event Report (LER) 05000277/2024-002-00, Peach Bottom Atomic Power Station (PBAPS) Units 2 and 3 Uncoordinated DC Circuits Cause Unanalyzed Condition (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24099A001)

This LER was submitted and subsequently retracted by licensee correspondence titled Cancellation of LER 2024-002-00, Uncoordinated DC Circuits Cause Unanalyzed Condition, dated February 18, 2025 (ML25049A236). This LER is Closed.

INSPECTION RESULTS

Unresolved Item (Open)	Uncoordinated Control Cable DC Circuits URI 05000277,05000278/2024011-01	71152A
Description: The inspectors identified an unresolved item (URI) for a potential performance deficiency related to uncoordinated control cables. Constellation has identified 327 uncoordinated control cables which are inadequately protected based on the fuse characteristics and the minimum fault current for each circuit (i.e., fuse amperages were too high for the associated cables' conductor gauge size and will not deenergize the cable during certain postulated fires). This degraded condition could create the potential for a fire in one		

area to damage cables located in a different fire area, which in turn can impact the equipment credited for fire safe shutdown and invalidate credited safe shutdown methods.

Constellation is in the process of evaluating this population of uncoordinated control cables for impacts on the fire safe shutdown methods credited in Peach Bottom's fire protection program. These potential safe shutdown impacts are potential performance deficiencies and potential violations of 10 *Code of Federal Regulations* (CFR) Part 50, Appendix R, Section III.G.2. Constellation has completed these evaluations for the uncoordinated feeder cables. No performance deficiencies were identified by the inspectors for the uncoordinated feeder cables.

Constellation has completed cable testing that shows that, for the specific test configurations, a postulated hot short within the circuits of concern could not generate the heat required to result in damage to adjacent cables. Constellation has shown that these specific test configurations are applicable to the feeder cables of concern. Constellation is in the process of evaluating these cable testing results for the population of uncoordinated control cables. They are performing an applicability analysis of the control cables for configurations that can be bounded by the testing results. They plan to subsequently evaluate any remaining control cables that cannot be bounded by the assumptions and conclusions of the testing for potential 10 CFR Part 50, Appendix R, Section III.G.2 non-compliances.

Planned Closure Actions: To determine whether or not any performance deficiencies exist, NRC will review the cable testing reports and the resulting specific plant analyses for control cables as they become available. This will include feasibility studies for the testing as it relates to control cables configurations and subsequent 10 CFR Part 50, Appendix R, Section III.G.2 compliance evaluations.

Licensee Actions: Constellation has performed compensatory measures for the uncoordinated feeder cables including updating their fire response procedure to deenergize circuits. Additionally, they have performed modifications on some of the uncoordinated feeder circuits and have scheduled modifications for the remaining feeder circuits.

Constellation performed a briefing for operators on the uncoordinated circuit issue to promote an elevated awareness of the importance of operator rounds in minimizing fire risk. They have not included any specific compensatory actions for control cables as they have not yet determined any existing non-compliances.

Corrective Action References: IR 04442380, IR 4445172, IR 04724221

Observation: Uncoordinated Power and Control Cable DC Circuits	71152A

In September 2021, Constellation initiated an evaluation at Peach Bottom to determine applicability of operating experience regarding potentially uncoordinated DC circuits. Their initial evaluation, completed in August 2022, identified coordination issues with multiple DC feeder circuits and control circuits. Specifically, there were multiple inadequately protected cables based on the fuse characteristics and the minimum fault current for each circuit (i.e., fuse amperages were too high for the associated cables' conductor gauge size and will not deenergize the cable during certain postulated fires). This degraded condition could create the potential for a fire in one area to damage cables located in a different fire area, which in

turn can impact the equipment credited for fire safe shutdown and invalidate credited safe shutdown methods.

Constellation initiated an external contract for a second evaluation to narrow down the feeder cables that were affected. The evaluation for control cables was treated separately and planned in series with the feeder cable evaluation. Constellation received the results of this evaluation in May 2023. Constellation challenged the validity of the assumptions used in the evaluation although they did not dispute that there are cables with this vulnerability. While they were working to determine the exact number of cables affected, they did not establish compensatory measures for the condition until questioned by the inspectors in December of 2023 during the initial inspection for this issue. As a result of questions by the inspectors, Peach Bottom established clearer timelines to address both the feeder cables and control cables. (See IR 04724221).

In January 2024, Constellation approved the results of the feeder cable evaluation. Nineteen feeder cables were determined to be inadequately protected. These cables were the subject of a phase two evaluation to determine which of these vulnerabilities were non-compliant with 10 CFR Part 50, Appendix R, Section III.G.2 requirements. Initially, eight circuits were reported to be non-compliant, in accordance with reporting requirements in 10 CFR 50.73(a)(2)(ii)(B). In February 2024, a more detailed evaluation was performed that narrowed this population down to two and the reporting was revised. An additional 17 cables were determined to affect safe shutdown equipment but with a safe shutdown path remaining available.

Constellation implemented compensatory measures for the non-compliances and developed plans for modification of all inadequately protected feeder circuits. The first of these modifications was implemented during the Unit 2 outage on October 31, 2024.

Subsequently, Constellation has completed cable testing that shows that, for the specific test configurations, a postulated hot short within the circuits of concern could not generate the heat required to result in damage to adjacent cables. Constellation has evaluated these results and shown that these specific test configurations are applicable to the feeder cables reported as non-compliant. They have revised the feeder cable analysis based on this to show that the two previously identified non-compliances are actually compliant with 10 CFR Part 50, Appendix R, Section III.G.2. All uncoordinated feeder cable modifications are still scheduled to occur. Inspectors, with support from technical experts from the Office of Nuclear Regulatory Research, have reviewed the testing results and determined that there were no performance deficiencies associated with the feeder cables.

Based on this analysis, Constellation has retracted the associated LER (LER 2024-002-00, Uncoordinated DC Circuits Cause Unanalyzed Condition). The inspectors reviewed this LER and associated retraction.

Constellation is in the process of evaluating these cable testing results for the population of uncoordinated control cables. They are performing an applicability analysis of the control cables for configurations that can be bounded by the testing results. They plan to subsequently evaluate any remaining control cables that cannot be bounded by the assumptions and conclusions of the testing for potential 10 CFR Part 50, Appendix R, Section III.G.2 non-compliances. NRC has opened a URI to track the control cable resolution.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On February 27, 2025, the inspectors presented the NRC inspection results to Ryan Stiltner, Plant Manager, and other members of the licensee staff.
- On December 13, 2023, the inspectors presented the Initial Problem Identification and Resolution Sample Debrief inspection results to Amy Huber, Principal Regulatory Engineer, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152A	Corrective Action Documents	04442380 04443996 04445172 04539878 04749008 04756572 04757711 04759867		
	Corrective Action Documents Resulting from Inspection	04724221		
	Engineering Changes	640778	Compliance Analysis for DC Hot Short Power Cables	Revision 1
		640810	Alternate Compensatory Measure for IR 4749008 Cable 2DD2509A Non-Compliant for Appendix R (Fire Area 6S/6N)	Revision 0
		640956	Alternate Compensatory Measure for IR 4756572 - Fire Areas 32, 33, 38, and 39 Non-Compliant for Appendix R	Revision 0
		641630	DC Hot Short Power Cable Protection Modification	Revision 0
		642063	Appendix R Common Enclosure Feasibility Evaluation	Revision 0
	Engineering Evaluations	641028	Compliance Actions for Cable 3DD2504A for DC Hot Short Project	Revision 0
	Miscellaneous	EPRI Report	Thermal Analysis of Cable Faults: Damage Potential to Adjacent Target Cables	September 2024
		K-116163-REP-0001	DC Hot Short Test Report	Revision 1
		K-116163-REP-0002	DC Hot Short Test Report – Phase 2	Revision 1
	Procedures	ON-114	Actual Fire Reported in the Power Block, Diesel Generator Building, Emergency Pump, Inner Screen or Emergency Cooling Tower Structures	Revision 26
	Work Orders	05585743-01 05585743-03	Replace Fuses for DC Hot Shorts	10/31/2024