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

February 2, 2023

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 – INTEGRATED INSPECTION REPORT 05000277/2022004 AND 05000278/2022004

Dear David Rhoades:

On December 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Peach Bottom Atomic Power Station, Units 2 and 3. On January 20, 2023, the NRC inspectors discussed the results of this inspection with Ron DiSabatino, Plant Manager, 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 I; the Director, Office of Enforcement; and the NRC Resident Inspector at Peach Bottom Atomic Power Station, Units 2 and 3.

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,

Jonathan E. Greives

Digitally signed by Jonathan E. Greives
Date: 2023.02.02 11:21:44 -05'00'

Jonathan E. Greives, Chief
Projects Branch 4
Division of Operating Reactor Safety

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

Enclosure:
As stated

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SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – INTEGRATED INSPECTION REPORT 05000277/2022004 AND 05000278/2022004 DATED FEBRUARY 2, 2023

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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:	05000277/2022004 and 05000278/2022004
Enterprise Identifier:	I-2022-004-0039
Licensee:	Constellation Energy Generation, LLC
Facility:	Peach Bottom Atomic Power Station, Units 2 and 3
Location:	Delta, PA 17314
Inspection Dates:	October 1, 2022 to December 31, 2022
Inspectors:	S. Rutenkroger, Senior Resident Inspector C. Dukehart, Resident Inspector L. Casey, Senior Allegations Coordinator N. Eckhoff, Health Physicist B. Edwards, Health Physicist C. Hobbs, Reactor Inspector K. Mangan, Senior Reactor Inspector N. Mentzer, Resident Inspector A. Turilin, Reactor Inspector A. Ziedonis, Senior Resident Inspector
Approved By:	Jonathan E. Greives, Chief Projects Branch 4 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 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

Failure to Implement an Effective Maintenance Strategy for Unit 2 and Unit 3 Residual Heat Removal System Agastat Relays			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2022004-01 Open/Closed	None (NPP)	71152A
The inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1.a, "Procedures," and Regulatory Guide (RG) 1.33, for Constellation's failure to establish an effective maintenance strategy for Agastat control relays in the safety-related residual heat removal (RHR) system at both Peach Bottom Unit 2 and Peach Bottom Unit 3. RG 1.33, Appendix A, November 1972, Section I, requires in part, that preventive maintenance schedules should be developed to specify inspection of replacement parts that have a specified lifetime. The vendor specified lifetime is 25,000 operations or 10 years from the date of manufacture, whichever occurs first, which was exceeded for a Unit 2 RHR control relay that failed in October 2017 and was over 37 years old.			

Additional Tracking Items

None.

PLANT STATUS

Unit 2 began the inspection period in end-of-cycle coastdown. On October 16 and 17, 2022, the unit was down powered and then shutdown for a planned refueling outage (RFO). After completing the refueling, the unit was restarted on October 29, 2022, synchronized to the grid on October 30, 2022, and returned to rated thermal power (RTP) on October 31, 2022. On November 2, 2022, the unit was down powered to 55 percent for a control rod pattern adjustment and returned to RTP the following day. The unit remained at or near RTP for the remainder of the inspection period.

Unit 3 began the inspection period at RTP. On November 18, 2022, the unit was down powered to 58 percent for a control rod sequence exchange, scram time testing, main turbine valve exercising and testing, and waterbox cleaning. The unit was returned to RTP the following day and remained at or near RTP for the remainder 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

71111.01 - Adverse Weather Protection

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

(1) Unit common, the inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from impending severe weather during winter weather advisory on December 15, 2022

External Flooding Sample (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding on November 17, 2022

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) Unit 3, standby liquid control on November 9, 2022
(2) Unit 2, 'A' and 'C' high-pressure service water (HPSW) on December 5, 2022
(3) Unit 3, spent fuel pool cooling system on December 21, 2022

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

(1) Unit common, standby gas treatment system on November 23, 2022

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) Unit 2, reactor building drywell area, elevation 135', PF-24 on October 25, 2022
(2) Unit common, cable spreading and computer rooms, PF-78H, on November 7, 2022
(3) Unit 3, reactor building general area, elevation 165', PF-13J, on December 27, 2022
(4) Unit 3, reactor building high-pressure coolant injection (HPCI) room, PF-62, on December 28, 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) Unit 2, reactor building HPCI room on November 21, 2022
(2) Unit common, 'E-2' emergency diesel generator (EDG) room on December 22, 2022

71111.07T - Heat Exchanger/Sink Performance

Heat Exchanger (Service Water Cooled) (IP Section 03.02) (2 Samples)

The inspectors evaluated heat exchanger performance on the following:

(1) RHR heat exchanger 3AE024 cooled by HPSW
(2) EDG heat exchangers (air, lube oil, and jacket water) cooled by emergency service water (ESW)

Ultimate Heat Sink (IP Section 03.04) (1 Sample)

The inspectors evaluated the ultimate heat sink performance on the following:

(1) Unit 2 service water, ESW, and HPSW system operation. IP 71111.07T, Sections 02.02.d.4, d.5, d.6 and d.7 were evaluated

71111.08G - Inservice Inspection Activities (BWR)

BWR Inservice Inspection Activities Sample - Nondestructive Examination and Welding Activities (IP Section 03.01) (1 Sample)

(1) The inspectors verified that the reactor coolant system boundary, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation and that repairs and replacements were appropriately fabricated, examined, and accepted by reviewing the following activities from October 18, 2022 to October 25, 2022:

03.01.a - Nondestructive Examination and Welding Activities

- Record review of manual ultrasonic testing of the reactor water clean-up system pipe to elbow weld, 12-4-5 (NDE Report P2R24-UT-016)
- Record review of manual phased array ultrasonic testing of the core spray safe end to N5B nozzle dissimilar metal weld 14-B-27 (GE Report 172976)
- Direct observation of manual testing of the core spray N-5B nozzle pipe to safe end weld 14-B-41 (NDE Report P2R24-UT-005)
- Record review of manual ultrasonic testing of the control rod drive N-9 nozzle to cap dissimilar metal weld 3-I-19R (NDE Report P2R24-UT-010)
- Record review of encoded phased array ultrasonic testing of the 2-inch level instrumentation nozzle N16A (GE Report 129135)
- Direct observation of general visual examinations of the moisture barrier (NDE Reports P2-VT-016 and P2-VT-032)
- Welding activities associated with the permanent installation of the 6-inch torus drain modification and 2-inch instrument piping located, under work order (WO) 05209091. This included record review of radiography testing of 16 shop welds (W2 through W10 and W13 through W18) and liquid penetrant and magnetic particle testing of field weld W33
- Record review of visual test results of torus internal wetted surfaces (WO 05042561)

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 the planned Unit 2 shutdown for refueling on October 16 and 17, 2022, and the subsequent startup on October 29, 2022

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

(1) The inspectors observed and evaluated licensed operator requalification training in the simulator on November 14, 2022

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (2 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) Unit 2, HPSW unavailable for intake bay cleaning on October 20, 2022
(2) Unit 2, RFO activities, including '2B' 125 Vdc station battery and 'E-42' 4 kV bus testing and maintenance, on October 25, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (3 Samples)

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

(1) Unit 2, refueling water storage tank manual drain valve was difficult to operate on October 18, 2022
(2) Unit common, 'E-124' transformer circuit breaker 2-54-1505 failed to close after the 'E-12' bus was reenergized on October 23, 2022
(3) Unit 2, 'A' core spray loop minimum flow valve did not indicate full open on November 17, 2022

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

(1) Unit 2, modification accepting damaged threads as-is without repair on main steam isolation valve (MSIV) '86C' on November 10, 2022
(2) Unit 2, 'B' and 'D' HPSW pump pressure reduction modification on December 15, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (5 Samples)

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

(1) Unit 2, reactor core isolation cooling (RCIC) low steam pressure flow rate testing following maintenance on October 26, 2022
(2) Unit 2, reactor protection system (RPS) motor-generated set voltage regulator and relay replacements on October 27, 2022
(3) Unit 2, exercising of control rods following maintenance during P2R24 RFO on October 29, 2022

(4) Unit 2, 'B' RHR pump discharge check valve packing replacement on December 13, 2022
(5) Unit 2, 'B' and 'D' HPSW pump modification acceptance testing following pressure reduction modification on December 19, 2022

71111.20 - Refueling and Other Outage Activities

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

(1) The inspectors evaluated Unit 2 RFO P2R24 activities from October 16 to October 30, 2022

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) (3 Samples)

(1) Unit 2, 'E-12' 4 kV bus loss of offsite power and loss of coolant accident functional test on October 24, 2022
(2) Unit 2, alternate rod insertion and recirculation pump trip logic system functional test including scram air header venting and recirculation adjustable speed drive circuit breaker trips, on October 27, 2022
(3) Unit common, 'E-3' EDG fast start and full load test on November 15, 2022

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

(1) Unit 2, 'A' loop MSIV local leak rate test on October 19, 2022

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated how the licensee identifies the magnitude and extent of radiation levels and the concentrations and quantities of radioactive materials and how the licensee assesses radiological hazards

Instructions to Workers (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated how the licensee instructs workers on plant-related radiological hazards and the radiation protection requirements intended to protect workers from those hazards

Contamination and Radioactive Material Control (IP Section 03.03) (2 Samples)

The inspectors observed/evaluated the following licensee processes for monitoring and controlling contamination and radioactive material:

(1) Workers exiting the radiological controlled area during a RFO
(2) Workers exiting the Unit 2 drywell

Radiological Hazards Control and Work Coverage (IP Section 03.04) (4 Samples)

The inspectors evaluated the licensee's control of radiological hazards for the following radiological work:

(1) Unit 2, feed water pipe machining inside drywell
(2) Torus dive for filter inspection and desludging
(3) Unit 2, 'B' reactor water cleanup pump replacement
(4) Unit 2, cavity drain down and decontamination

High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (3 Samples)

The inspectors evaluated licensee controls of the following High Radiation Areas and Very High Radiation Areas:

(1) Unit 2 drywell
(2) Locked High Radiation Area key lock box and log book
(3) Unit 2 torus entrance hatch

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 03.06) (1 Sample)

(1) The inspectors evaluated radiation worker and radiation protection technician performance as it pertains to radiation protection requirements

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified Constellation’s performance indicator submittals listed below for the period October 1, 2021, through September 30, 2022:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

(1) Unit 2 SSFFs
(2) Unit 3 SSFFs

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

(1) Unit 2 Emergency AC Power Systems
(2) Unit 3 Emergency AC Power Systems

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

(1) November 5, 2021, through October 24, 2022

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample (IP Section 02.16) (1 Sample)

(1) November 5, 2021, through October 24, 2022

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program (CAP) related to the following issues:

(1) Unit 2 safety relief valve (SRV)-71K nitrogen supply hoses fretting
(2) Unit 2 and Unit 3 Agastat relays for the RHR system, issue report (IR) 4059704 from October 5, 2017

71152S - Semiannual Trend Problem Identification and Resolution

Semiannual Trend Review (Section 03.02) (1 Sample)

(1) The inspectors reviewed the licensee's CAP for potential adverse trends in the third and fourth quarters of 2022 that might be indicative of a more significant safety issue

INSPECTION RESULTS

Failure to Implement an Effective Maintenance Strategy for Unit 2 and Unit 3 RHR System Agastat Relays			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2022004-01 Open/Closed	None (NPP)	71152A
The inspectors identified a Green finding and associated NCV of TS 5.4.1.a, "Procedures," and RG 1.33, for Constellation's failure to establish an effective maintenance strategy for Agastat control relays in the safety-related RHR system at both Peach Bottom Unit 2 and Peach Bottom Unit 3. RG 1.33, Appendix A, November 1972, Section I, requires in part, that preventive maintenance schedules should be developed to specify inspection of replacement parts that have a specified lifetime. The vendor specified lifetime is 25,000 operations or 10 years from the date of manufacture, whichever occurs first, which was exceeded for a Unit 2 RHR control relay that failed in October 2017 and was over 37 years old.			
Description: On October 5, 2017, TS surveillance procedure ST-O-010-301-2, "A RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test," for Unit 2 was aborted due to failure of the '2A' RHR pump minimum flow valve, MO-2-10-016A, to operate automatically at two different steps in the surveillance procedure. Operator action was taken to manually open MO-2-10-016A following start of the '2A' RHR pump in step 6.4.9 to prevent damage to the pump from overheating. MO-2-10-016A is a normally closed motor operated valve credited with an active safety function to open upon start of the '2A' RHR pump, to protect the pump when operating in low flow or shutoff head conditions, due to a reactor pressure that is higher than the shutoff head of the pump. MO-2-10-016A must be capable of			

opening after a 10 second time delay, when the pump breaker is closed, and high differential pressure exists across the pump. This design feature assures the RHR pump will not operate at a flow rate less than the minimum flow required for adequate pump cooling. TS 3.3.5.1, "Emergency Core Cooling System (ECCS) - Instrumentation," Condition E.2 was entered on October 5, 2017, for inoperable control logic associated with the '2A' RHR pump differential pressure indicating switch, which controls the opening and closing of MO-2-10-016A, with an action statement to restore the channel operable status in 7 days.

The direct cause for the failure of the minimum flow valve to open automatically when required was determined to be the failure of the time delay relay 2-10-K84A. The K84A time delay relay is a normally de-energized 125 VDC Agastat control relay. At the time of failure, the K84A relay was determined to be 37 years old, as indicated by a calibration sticker on the relay. This failure was classified as a Maintenance Rule Function Failure for loss of equipment needed to support the RHR Low Pressure Coolant Injection function of the RHR system, monitored at the single train level. The relay was replaced, TS 3.3.5.1, "ECCS - Instrumentation," Condition E.2 was exited, and the system was returned to service on October 9, 2017.

An extent of condition investigation conducted in IR 4059704 in November 2017 determined that there were 12 time-delay relays of the same model as the K84A relay installed in the RHR system on Unit 2 and Unit 3. The investigation also concluded that the relays were all classified as non-critical components, in which the Performance Centered Maintenance (PCM) template recommended no periodic replacement or preventive maintenance for these relays, and that this was a correct classification. In October 2022, the inspectors determined that 38 Agastat control relays on Unit 2 had no preventive maintenance schedule, or replacement frequency specified. The Unit 3 RHR system also had 38 Agastat control relays with no preventive maintenance schedule, or replacement frequency specified. This maintenance strategy was adopted on April 20, 2017, before the RHR system relay failed in October 2017 and is currently the maintenance strategy that is still in place for normally de-energized Agastat control relays in the RHR system at both Unit 2 and Unit 3.

Constellation procedure ER-AA-200, “Preventive Maintenance Program,” Revision 6, Attachment 5 provides guidance for developing a maintenance strategy for non-critical components. Item 3 lists bullets for determining a reasonable change out frequency based on the expected service life of a component. Item 3.c states in part, to understand the consequence of failure, beyond that based on component classification. Item 3.e states in part, to consider actual operating history of a specific sub-component. Item 3.f states to consider industry experience with the component. Item 11 states in part, that preventive maintenance tasks as recommended by PCM templates, do not supersede preventive maintenance tasks defined by a regulatory required program, such as TSs, and until a regulatory requirement is changed, the regulatory requirement takes precedence.

The vendor specified a qualified life of these relays of 25,000 electrical operations or 10 years from the date of manufacture, whichever occurs first.

The inspectors reviewed internal and external operating experience to determine if similar failed relays examples existed. IR 4228359 documents a case where relay 2-2E-K004 failed during TS Surveillance S12K-1G-TDR-A1C2 for the Peach Bottom Unit 2 automatic depressurization system logic system on March 11, 2019. This failure led to an unplanned entry in TS 3.3.5.1, function 4c until the relay could be replaced. This relay was a TR model Agastat relay that was normally de-energized and in service for 39 years, similar to the 2-10-

K84A relay failure in the Unit 2 RHR system in October of 2017. In their evaluation, Constellation determined that the cause of the failure was "due to age-related degradation ... Engineering evaluation A0038908 defines an expected service life of 40 years." In addition, the failure was "consistent with findings documented in EACE 1422221 [Peach Bottom evaluation in November 2012] ... Age-sensitive parts include the time delay potentiometer, solder joins, and on-board capacitors." Based on this failure, Constellation developed actions to replace 3 similar relays but did not address the relays in the RHR system. These operating experience examples were not fully considered in the development of a maintenance strategy for Agastat control relays in the RHR systems at Peach Bottom.

The Constellation maintenance strategy, as shown in the PCM template, was documented as not required. It did not have a maintenance schedule, nor have a clear development of a basis using the criteria shown in ER-AA-200 for use of industry experience, failure history, and vendor information. There was additional opportunity to re-evaluate the strategy following the failure in 2017. However, no failure analysis was performed on failed time delay relay 2-10-K84A in the RHR system in 2017, therefore, information was not available to support the guidance in ER-AA-200, Attachment 5, Item 3.

Corrective Actions: Constellation issued IR 4531974, to review procedure ER-AA-200-1001, “Equipment Classification,” to determine if enhancements could be made to this corporate procedure to ensure the procedure is in compliance with the Peach Bottom licensing basis. Constellation issued IR 4536189, to perform a review of relevant operating experience, to determine if a change to the current RHR system relay maintenance strategy is needed, and if there are concerns with the service life of other Agastat relays at Peach Bottom.

Corrective Action References: IRs 4059704, 4228359, 4301690, 4531974, 4536189

Performance Assessment:

Performance Deficiency: The inspectors determined that not establishing a preventive maintenance schedule, or effective maintenance strategy for Unit 2 and Unit 3 RHR system Agastat control relays in accordance with TS 5.4.1.a, and as implemented in station procedure ER-AA-200, was a performance deficiency that was reasonably within Constellation's ability to foresee and correct.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, Agastat relay failures in the RHR system have the potential to render a single ECCS instrumentation channel, or single train of the RHR system inoperable per TS, between quarterly surveillance tests. This performance deficiency is similar to Example 13.a in NRC IMC 0612, Appendix E, "Examples of Minor Issues," dated January 1, 2021.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” The inspectors utilized IMC 0609, Appendix A, Exhibit 2, "Mitigating System Screening Questions," and answered "No" to Question 1: "If the finding is a deficiency affecting the design or qualification of a mitigating SSC, does the SSC maintain its operability, or PRA functionality?". The inspectors answered "No" to Question 2: "Does the degraded condition represent a loss of the PRA function of a single train TS system for greater than its TS allowed outage time?". The inspectors answered “Yes” to Question 3: “Does the degraded condition represent a loss of PRA function of one train of a multi-train TS system for greater than its TS allowed outage time?”

Specifically, TSs related to the RHR system had a 7-day allowed outage time (AOT) in 2017, when the failure of the Agastat relay for '2A' RHR pump occurred. The last time operability of the 'A' train of the RHR system was confirmed, was during performance of ST-O-010-301-2, 92 days before the October 5, 2017, surveillance. Therefore, past operability during this 92-day period was unknown and undetermined, which is greater than the TS AOT of 7 days. Therefore, in accordance with IMC 0609, Appendix A, a detailed risk evaluation (DRE) was performed.

The Senior Reactor Analyst (SRA) used the Systems Analysis Programs for Hands-On Evaluation (SAPHIRE), Revision 8.2.6, Peach Bottom Standardized Plant Analysis Risk Model, version 8.80 to perform the DRE. The basic event, RHR-MOV-CC-F016A, MINFLOW Valve 10-16A Fails to Open, was set to TRUE. This was performed to invoke a limited common cause failure potential for the evaluation of the performance deficiency. Other RHR motor operated valve failure probabilities were increased by an order of magnitude to account for increased failure probability though current surveillance tests were satisfactory. The SRA did not include recovery for proper identification and repositioning of the valve(s) by operators. This is considered a bounding analysis for Unit 2 and would represent the potential risk to Unit 3, separately. No failures were identified on Unit 3.

A 92-day exposure time was used to bound the degraded condition and performance deficiency. The increase in core damage frequency (CDF) for the conditional increased failure to open was calculated to be 9E-8/year for the internal risk contribution. The dominant core damage sequence consisted of a postulated loss of 4kV E12 bus, containment failure with loss of all injection, failure to recover the power conversion system, and common failure of the RHR min flow lines. IMC 0609, Appendix A, "SDP For Findings At-Power," does not require a detailed evaluation of external risk contribution for internal event CDF increases below a 1E-7/yr threshold. Additionally, the impact on large early release frequency would not change this risk determination. This issue was determined to be of very low safety significance (Green) for the calculated increase in CDF/yr due to the degraded condition.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: TS 5.4.1.a requires in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in RG 1.33, Appendix A, November 1972. RG 1.33, Appendix A, November 1972, Section I, requires in part, that preventive maintenance schedules should be developed to specify inspection of replacement parts that have a specified lifetime. The vendor specified lifetime is 25,000 operations or 10 years from the date of manufacture, whichever occurs first, which was exceeded in October of 2017 for failed Unit 2 RHR control relay, that was over 37 years old.

Contrary to the above, since April 20, 2017, the date the current maintenance strategy was established, Constellation failed to develop a preventive maintenance schedule, or an effective maintenance strategy for Agastat control relays in the safety-related RHR system, in Unit 2 and Unit 3, that have a specified life per TS 5.4.1.a. This led to an aborted TS surveillance test and entry into a 7-day limiting condition for operation action statement, in October 2017.

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

Observation: Maintenance Strategy for Unit 2 and Unit 3 RHR System Agastat Relays	71152A
The inspectors performed a detailed review of IR 4059704 from October 5, 2017, in which TS surveillance procedure ST-O-010-301-2, "A RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test," for Unit 2 was aborted, due to failure of the '2A' RHR pump minimum flow valve, MO-2-10-016A, to operate automatically at two different steps in the surveillance procedure. The direct cause for the failure of the minimum flow valve to open automatically when required, was determined to be the failure of the Agastat time delay relay 2-10-K84A, that was over 37 years old at the time of failure in 2017. The inspectors interviewed station operators, system engineers, and maintenance engineers concerning the event in 2017, and the current Constellation maintenance strategy that is in effect for Agastat control relays. In addition, a meeting was held with Constellation corporate personnel on Monday, November 7, 2022, to discuss how plant components are classified, using Constellation corporate procedure, ER-AA-200, "Preventive Maintenance Program," and potential enhancements that could be made to this procedure. The inspectors reviewed the PCM strategy for 42 Agastat control relays in the Unit 2 RHR system, and 42 Agastat control relays for Unit 3 RHR system. The inspectors identified a Finding and Violation of regulatory requirements related to the Agastat control relay preventive maintenance strategy for the safety-related RHR system at Units 2 and 3. Details of the Finding and Violation are described in Inspection Results Section, NCV 05000277, 05000278/2022004-01.	

Observation: Unit 2 SRV-71K Nitrogen Supply Hose Fretting	71152A
The inspectors reviewed Constellation staff's corrective actions that were performed following the identification of a leak in the nitrogen supply hoses to the Unit 2 SRV-71K. On May 16, 2021, Constellation staff identified the nitrogen leak was a result of two stainless steel (SS) braided hoses rubbing and fretting which was caused by system induced vibration and a failed tubing support clamp. The issue was entered into the CAP (IR 04424199). On May 18, 2021, Constellation staff replaced the braided hoses and modified the installation orientation such that the hoses will remain separated even if not restrained by the tube support clamp. Following repair and testing, Constellation staff declared SRV-71K operable and it was returned to service. In addition, Constellation staff updated the hose installation procedure (M-C-700-600, Revision 2), the relief valve replacement procedure (M-001-006, Revision 16), and the tubing support specification (NE-00008, Revision 2) to incorporate detailed installation instructions. Lastly, Constellation staff developed a subsequent design change (EC 636137) to the braided hose configuration and implemented the change by installing new hoses on October 23, 2022, during the Unit 2 RFO. The inspectors reviewed the WO for the interim repair that initially replaced the hoses and returned SRV-71K back to service. The inspectors reviewed the CAP Evaluation and resulting corrective actions, including the design and procedure changes. Finally, the inspectors performed a walkdown of SRV-71K and reviewed the WOs for the permanent repair (WO 05217981) and extent of condition (WO 05212374). The inspectors determined the Constellation staff actions had identified the deficiencies that caused the SRV-71K nitrogen leak and corrective actions and extent of condition reviews were adequate.	

Observation: Semi-annual Trend Review by Evaluating Potential Adverse Trends in the Third and Fourth Quarters of 2022	71152S
The inspectors conducted a semi-annual trend review by evaluating sample issues that occurred in the third and fourth quarters of 2022. During the evaluation, the inspectors verified the issues identified were addressed within the scope of the CAP. The inspectors reviewed health reports and related databases for trends and considered prior issues while performing routine walkdowns and attending the plan of the day meetings. The inspectors did not identify any substantive adverse performance trends or repetitive equipment failures during this time that were not already identified by Constellation. The inspectors reviewed potential trends in human performance issues, station communication challenges, fire-related issues, and equipment degradation. Of these, the inspectors noted significant plant impacts from river conditions during the summer period. Unit 2 main condenser fouling caused by river conditions required an abnormal number of downpowers. In addition, numerous safety-related and non-safety-related river-cooled heat exchangers in both units required cleaning during the period, some multiple times. The inspectors reviewed Constellation's monitoring of heat exchanger performance and observed the results of some manual cleanings. The inspectors observed abnormally high amounts of biological debris (shell remains) and silt but did not observe evidence of live clams within the systems. Constellation identified and issued trend issue reports for the heat exchanger fouling and, separately, the Unit 2 main condenser performance. The inspectors determined that the identification of an adverse trend for consideration of long-term corrective actions to improve performance was appropriate. Based on the overall results of the semi-annual trend review, the inspectors determined that Constellation had identified adverse trends at Peach Bottom Atomic Power Station before they could become more significant safety problems. The inspectors continue to monitor the CAP and maintenance effectiveness during routine inspection activities.	

EXIT MEETINGS AND DEBRIEFS

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

- On January 20, 2023, the inspectors presented the integrated inspection results to Ron DiSabatino, Plant Manager, and other members of the licensee staff.
- On November 10, 2022, the inspectors presented the Unit 2 and Unit 3 RHR system Agastat relays inspection results to Sarah Ramos, Senior Manager of Strategic Engineering, and other members of the licensee staff.
- On October 28, 2022, the inspectors presented the exit meeting for IP 71124.01 and IP 71151 inspection results to Ron DiSabatino, Plant Manager, and other members of the licensee staff.
- On October 25, 2022, the inspectors presented the Peach Bottom Unit 2 ISI inspection results to Marcellus Ruff, Manager of Peach Bottom Programs Engineering, and other members of the licensee staff.
- On October 12, 2022, the inspectors presented the Triennial Heat Sink inspection results to David A. Henry, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Operability Evaluations	SE-4	Flood - Bases	Revision 34
	Procedures	LS-AA-4	Preparedness for Extreme External Events	Revision 0
		OP-AA-108-111-1001	Severe Weather and Natural Disaster Guidelines	Revision 24
		OP-PB-108-111-1001	Preparation for Severe Weather	Revision 19
		SE-4	Flood - Procedure	Revision 43
		SY-AA-101-146	Severe Weather Preparation and Response	Revision 3
71111.04	Corrective Action Documents	Condition Reports IR 04087639 IR 04409221 IR 04475047		
		IR 04404162 IR 04443607		
	Miscellaneous	M-363	P & I Diagram Fuel Pool Cooling & Clean-Up	Revision 44
	Procedures	M-315	P & I Diagram Emergency Service Water and HPSW Sys's	Revision 94
		M-397	Standby Gas Treatment Control Diagram	Revision 61
		SO 19.8.A-3	Fuel Pool Cooling System Routine Inspection	Revision 13
		SO 9A.8.A	Standby Gas Treatment System Routine Running Inspection	Revision 6
		SO 9A.8.B	Standby Gas Treatment System Routine Shutdown Inspection	Revision 3
		ST-O-011-350-5	SBLC Explosive Valve Charge Continuity Check and Valve Position Verification	Revision 2
		ST-O-032-350-2	HPSW Valve Alignment Verification	Revision 4
71111.05	Miscellaneous	ECR 632254	PF-0007 REV 4AY- Cable Spread Room	Revision 0
	Procedures	PD-12	Typical Penetration Seal Detail Protective Topping for Foam Seals (SF-60)	Revision 0
		PD-5	Typical Penetration Seal Detail External Pipe or Conduit Seal (SF-20)	Revision 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		PF-0007	Combustible Loading Analysis	Revision 5C
		PF-13J, 'Unit 3 RX Building: General Area – Elevation 165'-0",' Revision 3	Procedures Unit 3 RX Building, General Area - Elevation 165'-0"	Revision 3
		PF-24	Unit 2 Reactor Building, Drywell Area - Elevation 135'-0"	Revision 6
		PF-62	Unit 3 RX Building; HPCI Room – Elevation 88'-0"	Revision 7
		PF-78H	Turbine Building Common, Cable Spreading and Computer Rooms – Elevation 150'-0"	Revision 9
	Work Orders	C0259205	DEHC PENE TBC-15-302-2-6015/6015A ECR 14-00421	Revision 0
71111.06	Corrective Action Documents	IR 04415793	E2 Roof/roll-up door area leaks during rainfall	
	Miscellaneous	ECCS Flooding Analysis		
	Procedures	M-518	Plumbing, Drainage Reactor Building Unit No. 2 Plan at El 091ft-06in	Revision 12
71111.07T	Engineering Evaluations	PM-0589	RHR Heat Exchanger Performance Evaluation	Revision 7
	Miscellaneous		Peach Bottom Atomic Power Station, Unit 2 and 3 Response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment"	Date 01/29/1990
		ER-PB-450-1006-F-0	Structures Monitoring Inspection Checklist - Pump Structure Rooms 800, 801, 802, 803, 804, 805-807	Performed 6/17/2022
	Work Orders	04268137-14	Eddy Current Inspection Report - 'A' RHR Heat Exchanger (3AE024)	Performed 04/20/2021
		04869085 01		performed 10/23/20
		04988982 01		performed 10/29/21
		RT-0-033-600-2	Flow Test of ESW to ECCS Coolers and Diesel Generator Coolers	Performed 8/27/22
		RT-X-010-661-3	RHR Heat Exchanger Performance Calculation Test	Performed 12/01/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08G	Corrective Action Documents	04530721		
71111.13	Corrective Action Documents	IR 4530982		
	Procedures	SO32.7.A-2	Placing Unit 2 HPSW Loops In-Service Using Unit 3 HPSW Pumps	Revision 16
71111.15	Corrective Action Documents	4530585		
		4531583		
		IR 04537592		
	Procedures	ST-O-014-301-2	Core Spray Loop 'A' Pump, Valve, Flow and Cooler Functional and Inservice Test	Revision 45
		ST-O-054-751-2	E-12 4kV Undervoltage Relays and LOCA Loop Functional Test	Revision 27
	Work Orders	WO 05084304		
71111.18	Corrective Action Documents	CRs IR 04531434		
	Miscellaneous	EC637808	AO-2-01A-086C Bonnet Stud Hole Threads Damaged	Revision 0
		ASME B1.1-2003	Unified Inch Screw Threads	Reaffirmed 2008
		EC 627497, EC 627499		
		EPRI TR-104213s	Bolted Joint Maintenance & Applications Guide	December 1995
		NMP Design report certification	NCR LIM MSIV BOLTHOLE AS-IS, 'The Final NCR Disposition is Use-As-Is' MSIV Drawing	
		SR 534	Technical Justification for the Acceptance of the Damaged Bonnet Studs of 2MSS*AOV6A, 6B, 6C, 6D, 7A, 7B, 7C, & 7D	Revision 1
	Work Orders	04269685		
		04892413 04892415		
71111.19	Corrective Action Documents	IR 04532568, IR 04532960		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous	EC 627497		
	Procedures	GP-11.E	RPS SCRAM and ARI Reset	Revision 26
		GP-8.C	Groups I, II, and II Inboard Half Isolation	Revision 22
		SO60F.6.A-2	Transferring Reactor Protection System Power Supplies	Revision 19
		ST-O-003-561-2	Control Rod Exercise – All Rod	Revision 20
		ST-O-010-306-2	B RHR Loop Pump, Valve, Flow and Unit Cooler Functional and Inservice Test	Revision 57
		ST-O-013-210-2	RCIC Low Steam Pressure Flow Rate Test Using Auxiliary Steam	Revision 5
	Work Orders	04892413 04892415		
		05285285		
		05312953		
71111.20	Operability Evaluations	M-004-400		Revision 51
	Procedures	GP-2-2	Normal Plant Start-Up	Revision 27
		GP-3-2	Normal Plant Shutdown	Revision 27
		GP-6	Refueling Operation	Revision 41
71111.22	Corrective Action Documents	IR 4532631		
	Miscellaneous	TCC 22-0034	ST-I-03B-105-2	Revision 16A
	Procedures	ST-I-03B-105-2	ARI/RPT Logic System Functional Test with Scram Air Header Venting and Recirc Breaker Trips	Revision 16
		ST-O-052-413-2	E-3 Diesel Generator Fast Start and Full Load Test	Revision 26
		ST-O-054-751-2	'E-12' 4kV Bus Undervoltage Relays and LOCA Loop Functional Test	Revision 27
		ST/LLRT 20.01A.02	MSIV LLRT Test	Revision 20
	Work Orders	5106406		
		WO 05106306		
71152A	Corrective Action Documents	04424884		
		4059704	MO-2-10-16A Not Opening on RHR Pump Start	10/05/2017
		4219191	E434 LC Failed to Energize During a 4kV Bus Fast Transfer	02/11/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4301690	Relay PCM Template Change	12/05/2019
		4393997	Found Relay 3-10A-K70A out of tolerance high	01/05/2021
	Corrective Action Documents Resulting from Inspection	4531974	NRC ID: Component Classification IAW ER-AA-200-1001	10/25/2022
		4536189	Agastat Relay PM Strategy Challenged	11/10/2022
	Miscellaneous	Catalog 5-1773450-5	TE Connectivity, "Agastat E7000 Series, Nuclear Qualified Time Delay Relays"	Revised 3-13
		Constellation Maintenance Template	Relays - Control / Timing	Revision 1
		Constellation Maintenance Template	Relays - Control / Timing	Revision 2
		ICES 424948	Exelon Maintenance Rule - Failure Classification Form, Peach Bottom Unit 2	11/17/2017
	Procedures	ER-AA-200	Preventive Maintenance Program	Revision 6
		ER-AA-200-1001	Equipment Classification	Revision 6
		PI-AA-125-1003	Corrective Action Program Evaluation Manual	Rev. 7
		ST-I-010-100-2	RHR Loop A Logic System Functional Test	05/01/2018
		ST-I-010-100-2	RHR Loop A Logic System Functional Test	12/02/2015
		ST-O-010-301-2	"A" RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test	10/05/2017
		ST-O-010-301-2	"A" RHR Loop Pump, Valve, Flow and Unit Cooler Functional and Inservice Test	05/17/2022
	Work Orders	WO 05153522	SV-2-16-071K (RV-2-16-071K): Replace Hoses	05/18/2021
71152S	Corrective Action Documents	Issue Report s (IRs) 4511479 4515678 4516673 4516882 4516882 4516918		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4516918 4517287 4517287 4517290 4517290 4517290 4517998 4518779 4518811 4519330 4519951 4520173 4520180 4520301 4520301 4520301 4520488 4520991 4521141 4521519 4522738 4522745 4524364 4524476 4524658 4525857 4526146 4526147 4526154		