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

July 28, 2022

Mr. 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 05000277/2022002 AND 05000278/2022002

Dear David Rhoades:

On June 30, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Peach Bottom Atomic Power Station, Units 2 and 3. On July 8, 2022, 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.

Two findings of very low safety significance (Green) are documented in this report. Both 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 I; the Director, Office of Enforcement; and the NRC Resident Inspector at Peach Bottom Atomic Power Station, Units 2 and 3.

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 I; 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: 2022.07.28 12:36:00 -04'00'

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

cc w/ encl: Distribution via LISTSERV

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – INTEGRATED INSPECTION REPORT 05000277/2022002 AND 05000278/2022002 DATED JULY 28, 2022

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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: | 05000277/2022002 and 05000278/2022002 |
| Enterprise Identifier: | I-2022-002-0039 |
| Licensee: | Constellation Energy Generation, LLC |
| Facility: | Peach Bottom Atomic Power Station, Units 2 and 3 |
| Location: | Delta, PA 17314 |
| Inspection Dates: | April 1, 2022 to June 30, 2022 |
| Inspectors: | P. Boguszewski, Resident Inspector<br>E. Brady, Resident Inspector<br>P. Cataldo, Senior Reactor Inspector<br>B. Edwards, Health Physicist<br>N. Floyd, Senior Reactor Inspector<br>J. Kulp, Senior Reactor Inspector<br>P. Ott, Operations Engineer<br>S. Rutenkroger, Senior Resident Inspector<br>A. Turilin, Reactor Inspector<br>S. Wilson, Senior Health Physicist |
| Approved By: | Jonathan E. Greives, Chief<br>Projects Branch 4<br>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

| 480V Breaker Hoist Seismic Restraint Disengaged Due to Design Vulnerability | | | |
|---|---|---|---|
| Cornerstone | Significance | Cross-Cutting Aspect | Report Section |
| Mitigating Systems | Green<br>NCV 05000277,05000278/2022002-01<br>Open/Closed | [H.12] - Avoid Complacency | 71111.04 |
| The inspectors identified a Green finding and associated non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," because Constellation did not maintain safety-related equipment in a seismically analyzed condition. Specifically, Constellation implemented a design change to the method of restraint to 480 volt (V) breaker hoists that resulted in a seismically unrestrained hoist in close proximity to safety-related components, challenging the seismic qualifications of the equipment. | | | |

| Failure to Correct Condition Adverse to Fire Protection Associated with Fire Safe Shutdown Drywell Temperature Indication | | | |
|---|---|---|---|
| Cornerstone | Significance | Cross-Cutting Aspect | Report Section |
| Mitigating Systems | Green<br>NCV 05000277,05000278/2022002-02<br>Open/Closed | [H.13] - Consistent Process | 71111.19 |
| The inspectors identified a Green finding and associated NCV of Unit 2 License Condition 2.C(4) "Fire Protection," when Constellation did not implement all provisions of the approved fire protection program. Specifically, the drywell temperature indicator on the Unit 2 alternate safe shutdown panel, a component credited for fire safe shutdown (FSSD), was failed and Constellation did not identify the issue in post-maintenance testing (PMT) and did not identify the component as credited for Appendix R when assessing functionality. As a result, a condition adverse to fire protection was not promptly identified and corrected. | | | |

### Additional Tracking Items

| Type | Issue Number | Title | Report Section | Status |
|---|---|---|---|---|
| LER | 05000277/2021-001-00 | LER 2021-001-00 for Peach Bottom, Unit 2, High-Pressure Coolant Injection (HPCI) System Declared Inoperable Due to Instrument Power Inverter Failure | 71153 | Closed |

## PLANT STATUS

Unit 2 began the inspection period at rated thermal power (RTP). On May 13, 2022, operators reduced power to approximately 60 percent for a control rod pattern adjustment, control rod scram time testing, and main turbine valve and bypass valve testing and returned the unit to RTP the following day. On May 16, 2022, operators inadvertently removed power from the 'B' reactor protection system (RPS) following loss of the 'A' RPS due to a grid electrical transient which caused Unit 2 to automatically trip offline and receive a Group 1 primary containment isolation valve isolation. Operators used safety systems for decay heat removal and reactor pressure and level control. Operators restarted the unit on May 18, 2022, and returned the unit to RTP on May 20, 2022. Later the same day, operators reduced power to approximately 67 percent for a control rod pattern adjustment and returned the unit to RTP on May 21, 2022. The unit remained at or near RTP for the remainder of the inspection period.

Unit 3 began the inspection period at RTP. On April 29, 2022, operators reduced power to approximately 66 percent for a control rod pattern adjustment, control rod scram time testing, and main turbine valve testing and returned the unit to RTP the following day. The unit 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

71111.04 - 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 common, 'A' emergency service water (ESW) during 'B' ESW maintenance on May 25, 2022
(2) Unit 3, 'B' residual heat removal (RHR) system during Unit 3 'C' RHR system maintenance on May 26, 2022
(3) Unit 3, ‘B’ loop core spray (CS) during ‘A’ loop CS surveillance testing on May 31, 2022
(4) Unit 2, ‘B’ loop high-pressure service water (HPSW) during ‘C’ HPSW maintenance on June 1, 2022

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

(1) The inspectors evaluated system configurations during a complete walkdown of the unit common emergency diesel generators (EDGs) through June 1, 2022

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (6 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) PF-3, Unit 2, 'B' RHR system on May 31, 2022
(2) PF-132, Unit common, diesel generator building general area on June 22, 2022
(3) PF-78H, Unit common, cable spreading and computer rooms on June 23, 2022
(4) PF-108, Unit common, main control room on June 23, 2022
(5) PF-117, Unit 2, emergency battery and switchgear rooms on June 23, 2022
(6) PF-117, Unit 3, emergency battery and switchgear rooms on June 23, 2022

71111.11A - Licensed Operator Requalification Program and Licensed Operator Performance

Requalification Examination Results (IP Section 03.03) (1 Sample)

(1) The inspectors reviewed and evaluated the licensed operator requalification exam results for the annual operating exam and biennial written exam, which was completed on April 12, 2022

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (2 Samples)

(1) The inspectors observed and evaluated licensed operator performance in the control room during a scram with complications on May 16, 2022
(2) The inspectors observed and evaluated licensed operator performance in the control room during reactor startup after a complicated scram on May 18, 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 May 9, 2022

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 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 2, high-pressure coolant injection (HPCI) system on June 6, 2022
(2) Unit 3, HPCI system on June 7, 2022
(3) Unit 3, HPSW on June 15, 2022

Aging Management (IP Section 03.03) (1 Sample)

The inspectors evaluated the effectiveness of the aging management program for the following SSCs that did not meet their inspection or test acceptance criteria:

(1) Unit common, 'B' ESW pipe leak on May 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) Unit common, '2EA' transformer and '2SU' bus planned maintenance on May 3, 2022
(2) Unit common, ‘A’ ESW during ‘B’ ESW repairs on May 25, 2022
(3) Unit 2, ‘A’ CS planned maintenance on June 13, 2022
(4) Unit common, 'E-4' EDG planned maintenance on June 21, 2022

71111.15 - Operability Determinations and Functionality Assessments

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

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

(1) Unit 3, 'B' RHR spring can support indicated low off scale on April 22, 2022
(2) Unit 3, main turbine stop valve number one position indication erratic on April 25, 2022
(3) Unit 3, HPSW piping external corrosion in the admin pipe tunnel on May 13, 2022
(4) Unit common, 'B' ESW pipe weep on May 20, 2022
(5) Unit 2, HPCI system audible steam leak on May 25, 2022
(6) Unit 3, ‘A’ standby liquid control system with depressurized accumulator on May 29, 2022

71111.17T - Evaluations of Changes, Tests, and Experiments

Sample Selection (IP Section 02.01) (28 Samples)

The inspectors reviewed the following evaluations, screenings, and/or applicability determinations for 10 CFR 50.59 from June 13 to June 17, 2022:

(1) PB-2018-002-E, Unit 2 Digital Feedwater Level and Speed Control Replacement, Revision 0
(2) PB-2019-001-E, Defeat of RBCCW to Drywell Chilled Water Swap, Revision 0
(3) PB-2019-002-E, Contaminated Auxiliary Steam System, Revision 0

(4) PB-2019-003-E, Adoption of the Tornado Missile Risk Evaluator (TMRE) Methodology, Revision 0
(5) PB-2020-002-E, NETCO SNAP-IN Neutron Absorbing Inserts Retention Force, Revision 0
(6) PB-2021-001-E, GNF3 Impact on the Long-Term ATWS Analysis Results and the AST Core Inventory, LOCA, FHA, and CRDA, Revision 0
(7) PB-2021-002-E, 50.59 in Support of Procedure Changes for Tech Eval EC 635496, Revision 1
(8) PB-2019-009-S, Unit 3 Circulating Water Pump High Discharge Pressure Trip Removal, Revision 0
(9) PB-2019-012-S, Engineering Safeguards (ES) Compartment Cooling and Ventilation, Revision 0
(10) PB-2019-013-S, North Switchyard, #1 Transformer Replacement and SU-35 Modification, Revision 0
(11) PB-2019-018-S, High Area Temperature Alarm Setpoint Change, Revision 0
(12) PB-2019-029-S, PCTCC for Mechanical Gag on AO-2(3)-08 2(3)466A & B, Revision 0
(13) PB-2019-030-S, HPCI Sensing Line Vibration Monitoring, Revision 0
(14) PB-2019-032-S, Adoption of the Tornado Missile Risk Evaluator (TMRE) Methodology, Revision 0
(15) PB-2020-002-S, Replacement of MO-3-10-089A/B/C/D for HPSW Pressure Reduction, Revision 3
(16) PB-2020-009-S, Surveillance Test Interval Change of the EDG RHR Load Reject Test, Revision 0
(17) PB-2020-016-S, Defeat of a Main Turbine Trip Signal, Revision 0
(18) PB-2020-022-S, Eliminate 3C RFP Low Suction Pressure Trip (Temp Mod), Revision 0
(19) PB-2020-026-S, Half Nozzle Repair of RPV Nozzle N-16A, Revision 0
(20) PB-2020-029-S, U3 HPCI Vibration M&TE Installed Greater than 90 Days, Revision 0
(21) PB-2021-003-S, RPS Division A Cables Replacement, Revision 0
(22) PB-2021-010-S, Remove 3C RFPT Exhaust Valve Trip (Temp Mod), Revision 0
(23) PB-2021-012-S, Create Cold Shutdown and Refuel Trips-121, T-121, T-131, T-132, Revision 0
(24) PB-2021-014-S, Revise MUR Reactor Heat Balance PEAM-MUR-0100 (GE Task Report T0100), Revision 0
(25) PB-2021-020-S, Repair Hole in Service Water Discharge Pipe, Revision 0
(26) PB-2021-021-S, Representative Temp Inputs to U3 DW BAT for Out of Service Temperature Elements, Revision 0
(27) PB-2021-023-S, Revise Calculation ME-0457 For Drywell Average Bulk Temperature, Revision 0
(28) PB-2022-003-S, Bypass of CV-3-07B-3515 Controller, Revision 0

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) Unit common, 'B' ESW permanent repair of a pipe leak in the admin building pipe tunnel on May 27, 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, HPCI alternative control panel power supply ‘E/S-8344A’ replacement on May 23, 2022
(2) Unit common, 'B' ESW pressure test following pipe repair on May 27, 2022
(3) Unit 2, 'C' HPSW pump following planned maintenance on June 1, 2022
(4) Unit common, 'E-4' EDG fast start and full load test on June 27, 2022
(5) Unit 3, battery charger '3AD003' replacement of obsolete capacitors with new capacitors on June 28, 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) (5 Samples)

(1) Unit common, 'E-3' EDG run on May 6, 2022
(2) Unit common, 'E-2' EDG slow start and full load test on May 10, 2022
(3) Unit 3, main steam relief valve actuator and backup nitrogen supply valve logic test on May 12, 2022
(4) Unit 2, ‘B’ HPSW radiation monitor monthly source check on May 23, 2022
(5) Unit common, ‘E-3’ EDG slow start full load and in-service test surveillance on June 16, 2022

Inservice Testing (IP Section 03.01) (2 Samples)

(1) Unit 3, ‘A’ loop CS pump, valve, flow, and cooler functional and in-service test on May 31, 2022
(2) Unit 3, HPSW pump, valve, and flow functional and in-service test on June 30, 2022

**RADIATION SAFETY**

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Permanent Ventilation Systems (IP Section 03.01) (1 Sample)

The inspectors evaluated the configuration of the following permanently installed ventilation systems:

(1) Control room emergency ventilation system and quarterly testing reports

Temporary Ventilation Systems (IP Section 03.02) (1 Sample)

(1) Evaluated the control and maintenance tracking of the HEPA units and vacuums at the 135' Unit 2 HEPA storage cage and 135 Unit 2 Radioactive Waste storage cage

Use of Respiratory Protection Devices (IP Section 03.03) (1 Sample)

(1) Observed respirator fit testing of three individuals

Self-Contained Breathing Apparatus for Emergency Use (IP Section 03.04) (1 Sample)

(1) Observed self-contained breathing apparatus (SCBA) donning and doffing, as well as monthly SCBA testing

71124.04 - Occupational Dose Assessment

Source Term Characterization (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated licensee performance as it pertains to radioactive source term characterization

External Dosimetry (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated how the licensee processes, stores, and uses external dosimetry

Internal Dosimetry (IP Section 03.03) (2 Samples)

The inspectors evaluated the following internal dose assessments:

(1) Whole body counting program and a positive uptake evaluation
(2) Urine sampling program and storage location

Special Dosimetric Situations (IP Section 03.04) (2 Samples)

The inspectors evaluated the following special dosimetric situations:

(1) Declared pregnant worker program
(2) Unit 2 drywell at power entry ALARA/Micro ALARA plan

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (2 Samples)

(1) Unit 2, April 1, 2021 to March 31, 2022
(2) Unit 3, April 1, 2021 to March 31, 2022

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

(1) Unit 2, April 1, 2021 to March 31, 2022
(2) Unit 3, April 1, 2021 to March 31, 2022

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 (CAP) related to the following issues:

(1) Unit 2, HPCI power inverter failure causing loss of the flow controller on April 29, 2021 (Issue Report (IR) 4420189)

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 first and second quarters of 2022 that might be indicative of a more significant safety issue

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated a Unit 2 scram with a loss of ultimate heat sink and the licensee's response on May 16, 2022.

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event report (LER):

(1) LER 05000277/2021-001-00 for Peach Bottom, Unit 2, HPCI System Declared Inoperable Due to Instrument Power Inverter Failure (ADAMS Accession No. ML21175A057)

The inspectors determined that the cause of the condition described in the LER was not reasonably within the licensee's ability to foresee and correct and therefore was not reasonably preventable. No performance deficiency nor violation of NRC requirements was identified.

**INSPECTION RESULTS**

| 480V Breaker Hoist Seismic Restraint Disengaged Due to Design Vulnerability | | | |
|---|---|---|---|
| Cornerstone | Significance | Cross-Cutting Aspect | Report Section |
| Mitigating Systems | Green<br>NCV 05000277,05000278/2022002-01<br>Open/Closed | [H.12] - Avoid Complacency | 71111.04 |
| The inspectors identified a Green finding and associated non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," because Constellation did not maintain safety-related equipment in a seismically analyzed condition. Specifically, Constellation implemented a design change to the method of restraint to 480 volt (V) breaker hoists that resulted in a seismically unrestrained hoist in close | | | |

proximity to safety-related components, challenging the seismic qualifications of the equipment.

Description: The NRC inspectors identified a design control violation that affects the safety-related 480V alternating current (AC) power distribution system. This system ensures the availability of AC electrical power for systems required to shutdown the reactor and maintain it in a safe condition after an operational transient or design basis event. On March 2, 2022, the NRC inspectors identified a breaker hoist stored next to safety-related 480V load center 'E-234' with the seismic restraint turnbuckle not connected to the hoist. Similar issues were previously identified by the NRC in July and October 2020, documented as NCVs 2020011-003 and 2020004-01, in which breaker hoists were stored next to load centers and not seismically restrained.

After the July and October 2020 issues were identified, Constellation implemented a design change, installing concrete anchor bolts at approved storage locations adjacent to the 480V load centers. In addition, Constellation implemented a change to the method of attachment to the anchor bolts by using a short open-body turnbuckle latching onto a closed-body bolt installed on the hydraulic lift of the hoist. To engage and restrain the turnbuckle, operators raised the lift of the hoist to place the turnbuckle in tension.

After the inspectors identified a hoist with the turnbuckle not engaged, Constellation performed an evaluation and determined that the hydraulic pressure of the lift relaxed over time and disengaged the turnbuckle. Specifically, the hoist was last used and properly restrained during the Unit 2 Fall refueling outage completed in November 2021. Constellation also determined that an incorrect assumption that the hoists were used more frequently was the primary cause for not considering the loss of hydraulic pressure over time when the design change was implemented.

Corrective Actions: Constellation immediately relocated the breaker hoist to a location away from safety-related equipment, documented the issue in the CAP, and permanently relocated the breaker hoist storage locations away from safety-related equipment.

Corrective Action References: IR 04482016

Performance Assessment:

Performance Deficiency: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because Constellation did not maintain safety-related equipment in a seismically analyzed condition. Specifically, Constellation implemented a design change to the method of restraint to 480V breaker hoists that resulted in a seismically unrestrained hoist in close proximity to safety-related components, challenging the seismic qualifications of the equipment.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design 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 inspectors identified a condition in which the site seismic analysis associated with safety-related equipment was not consistent with the installed plant configuration and adversely affected the reliability of safety-related systems.

The initial engineering evaluation associated with the breaker hoists determined that the hoists were susceptible to tipping during expected seismic forces. Based on this analysis,

Constellation determined that a new restraint design was required to be implemented to prevent tipping during expected seismic forces when the hoists were stored adjacent to safety-related equipment. In addition, the inspectors observed that the direction the hoist would fall when tipped would result in contact with the front of the load center which would not be an acceptable outcome from the design process. This issue is similar to example 3.a in IMC 0612, Appendix E, "Examples of Minor Issues," in that, the modification was required to be reworked to resolve the seismic concerns because the design process would not have accepted the hoists being unrestrained adjacent to the load centers nor allowed contact with the controls/switches on the front of the load centers.

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 determined that this finding was a deficiency affecting the design or qualification of mitigating SSCs, where the SSCs maintained their operability or functionality. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

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. Constellation approved a design change and did not recognize and plan for the possibility of an operator error, the latent issue with lowering hydraulic pressure, and the inherent increased risk of locating breaker hoists adjacent to safety-related equipment as opposed to an alternate location away from safety-related equipment.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design changes, including field changes, shall be subject to design control measures commensurate with the original design and be approved by the responsible organization.

Contrary to the above, a design change was not subject to design control measures commensurate with the original design. Specifically, from an indeterminate date prior to, and on, March 2, 2022, a non-seismically restrained breaker hoist was stored adjacent to the 'E-234' 480V load center and was not restrained to prevent tipping. The affected safety-related equipment would be subject to seismic induced forces that had not been considered in the original analysis and would have increased the probability of failure during accident mitigation.

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

| Failure to Correct Condition Adverse to Fire Protection Associated with Fire Safe Shutdown Drywell Temperature Indication | | | |
|---|---|---|---|
| Cornerstone | Significance | Cross-Cutting Aspect | Report Section |
| Mitigating Systems | Green<br>NCV 05000277,05000278/2022002-02<br>Open/Closed | [H.13] - Consistent Process | 71111.19 |
| The inspectors identified a Green finding and associated NCV of Unit 2 License Condition 2.C(4) "Fire Protection," when Constellation did not implement all provisions of the approved fire protection program. Specifically, the drywell temperature indicator on the Unit 2 alternate | | | |

safe shutdown panel, a component credited for fire safe shutdown (FSSD), was failed and Constellation did not identify the issue in post-maintenance testing (PMT) and did not identify the component as credited for Appendix R when assessing functionality. As a result, a condition adverse to fire protection was not promptly identified and corrected.

Description: The PBAPS FSSD analysis ensures the ability to safely shut down both units of the plant and identifies the methods and systems which survive to allow shutdown in response to a fire event. The FSSD requirements are described in Specification NE-00296, "Non-Nuclear Safety Related Fire Protection Specification for Post-Fire Safe Shutdown Program Requirements at Peach Bottom Atomic Power Station." NE-00296 requires process monitoring instrumentation to properly control FSSD system transitions and essential operator actions. The required instrumentation is specified to include that which provides direct reading of the process variables of the reactor and containment (e.g., pressure, temperature, and level of the reactor vessel, containment, and condensate storage tank).

Fire Area 025 consists of the Unit 2 and Unit 3 main control room, the emergency shutdown panel area, the cable spreading room, and the computer room. Calculation PF-0016-025, "Fire Area 025 – Fire Safe Shutdown Analysis," determines the impact of an area-wide exposure fire in Fire Area 25 on the ability to shut down both units of the plant and identifies the components credited to satisfy FSSD requirements, including process variables. Drywell temperature indicator TI-8455 is located on the Unit 2 HPCI Alternative Control Station (ACS) which has HPCI, RHR, and HPSW system instrumentation and controls and reactor process monitoring instrumentation. PF-0016-025 identifies TI-8455 as credited for FSSD for monitoring Unit 2 drywell temperature.

On May 23, 2022, the inspectors observed the replacement of power supply 'E/S-8344A' for the Unit 2 HPCI ACS. The inspectors noted that the work order required PMT that validated the new power supply provided power to the cabinet at the output of the component. The inspectors also noted that procedure MA-AA-716-012, "Post Maintenance Testing," provides lists of activities with preferred and applicable post-maintenance tests. For a power supply replacement for plant instrumentation, MA-AA-716-012 lists a component calibration, channel operation, and channel check as PMTs. The component calibration test has a note which states to verify the expected result at least one point beyond the affected component. Although MA-AA-716-012 does not require performing every listed PMT, the inspectors noted that the work order did not require a channel operation verification or channel check of the affected instrumentation and did not verify supplied voltage at least one point beyond the output of the replaced component E/S-8344A.

Following the power supply replacement and completion of the PMT, the inspectors observed the indicators and gauges on the panel when power was restored. The inspectors identified that TI-8455 Unit 2 drywell temperature changed from downscale (expected with no power) to upscale (not expected and indicating a failed open condition) when power was restored. The inspectors informed Constellation personnel of the adverse condition, and the personnel initiated a condition report that documented the failed temperature indication. Actions were recommended and created to investigate the condition during the next refueling outage.

The inspectors noted that the condition report did not identify FSSD functionality in the operability/functionality screening and no actions were created to evaluate impact to FSSD or consider mitigating measures until the function was restored. Constellation procedure OP-AA-108-115, "Operability Determinations (CM-1)," requires deficient conditions involving non-technical specification components to be assessed for functionality, including functions described in the Fire Protection Plan. A provision of the fire protection plan, as described in

the Updated Final Safety Analysis Report, is that when equipment analyzed for FSSD is not functional, troubleshooting, repair, and return to service shall be performed on a high priority basis.

The inspectors reviewed applicable documentation, confirmed that TI-8455 was listed as a credited FSSD component, and questioned Constellation personnel on the categorization and classification of the adverse condition on May 27, 2022. Constellation validated the FSSD classification, added TI-8455 to the priority work list as Priority B2, and then repaired temperature element TE-8455 and returned TI-8455 to service on June 2, 2022.

Corrective Actions: Constellation repaired TE-8455 and restored TI-8455 to service.

Corrective Action References: IR 04507814

Performance Assessment:

Performance Deficiency: The inspectors identified a Green finding and associated NCV of Unit 2 License Condition 2.C(4) "Fire Protection," because Constellation did not implement all provisions of the approved fire protection program. Specifically, the drywell temperature indicator on the Unit 2 alternate safe shutdown panel, a component credited for FSSD, was failed and Constellation did not identify the issue in PMT and did not identify the component as credited for Appendix R when assessing functionality. As a result, a condition adverse to fire protection was not promptly identified and corrected.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Protection Against External Factors 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 required process variable instrumentation for Unit 2 drywell temperature was not available for a fire in Fire Area 25, e.g., main control room. This issue is similar to example 3.0 in IMC 0612, Appendix E, “Examples of Minor Issues,” in that, the PBAPS FSSD analysis credited component TI-8455 as the alternate shutdown method for indicating Unit 2 drywell temperature in the event of a fire in the main control room and no other actions or equipment were present and available to fulfill this required function.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix F, “Fire Protection and Post - Fire Safe Shutdown SDP.” The inspectors assigned a “High” degradation rating in step 1.3 based on the finding category being post-fire safe shutdown and the most applicable rating example being a plant condition that cannot be assessed or readily inferred from information available. The inspectors then assessed the finding using the qualitative screening criteria questions in step 1.4. The inspectors determined that the impact of the fire finding was limited to equipment which is not required for the credited safe shutdown success path. Specifically, Unit 2 drywell temperature indication was not a required parameter for the operators to successfully implement the applicable FSSD procedures, as written. Therefore, using step 1.4.7 question ‘B’ the inspectors determined the finding to be of very low safety significance (Green).

Cross-Cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. Constellation personnel made a functionality screening decision without reviewing available information

contained in procedures and other supporting documents, and a systematic review would reasonably have resulted in a different outcome.

Enforcement:

Violation: Unit 2 License Condition 2.C(4) "Fire Protection," requires, in part, that Constellation implement all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility. A provision described in the Updated Final Safety Analysis Report, in part, is that conditions adverse to fire protection are promptly identified and corrected. Contrary to this, Constellation did not implement all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report when the Unit 2 alternate safe shutdown panel drywell temperature indicator was failed and Constellation did not promptly identify and correct this condition from May 23, 2022, to June 2, 2022.

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

| Observation: Unit 2 HPCI Power Inverter Failure Causing Loss of the Flow Controller | 71152A |
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On April 29, 2021, PBAPS Unit 2 experienced a failure of the HPCI system power inverter 'INV-2-23-094.' The inverter converts a 125 V direct current (DC) input to 120 VAC output, providing power to the HPCI flow controller and other downstream HPCI instruments. The failure of the inverter caused loss of the flow controller with no flow demand signal output. On a system initiation, the governor valve of the HPCI turbine would have closed, and the HPCI system would have stopped running following the initial start-up ramp. Thus, HPCI was not able to perform its design function of automatic injection into the vessel to mitigate an accident scenario such as a small break loss of coolant accident.

Troubleshooting revealed that INV-2-23-094 did not function when 125 VDC was applied to the input. No obvious signs of failure were identified during the initial visual inspection. INV-2-23-094 was replaced with a spare, and the HPCI system was returned to service the following day. The failed inverter was sent to the vendor for failure analysis and potential refurbishment. The vendor concluded that the inverter contained a transformer design change introduced in 2015, which posed a higher risk of failure during operation. As a result, the vendor issued a notification pursuant to 10 CFR Part 21, “Final Notification of a Deviation with Inverter Assembly (Model NLI-072034-CSI-K-5-A),” (ADAMS Accession No. ML21322A051).

Constellation performed an evaluation which determined that the failure was a result of vendor design changes internal to the power supply. The inspectors reviewed the evaluation, extent of condition reviews and field inspections, corrective actions completed and planned, the LER, the Part 21 notification, and the vendor failure analysis report. The inspectors determined that Constellation’s corrective actions were commensurate with the safety significance and appropriately addressed the deficiency. The inspectors did not identify any findings or violations of more than minor significance.

However, the inspectors identified that the documented basis for the system maintenance rule status to remain (a)(2) and not be placed in (a)(1) was not a valid rationale. The basis stated that the cause was believed to be infantile failure. The inspectors noted that maintenance strategies incorporate measures to reduce infantile failures. Therefore, given such a failure a review and adjustment to maintenance strategies would have been

appropriate along with enhanced monitoring under (a)(1). However, the inspectors noted that after completion of the maintenance rule status determination the vendor determined a design change was responsible and issued a Part 21 notification. Then, Constellation's corrective actions focused on identifying and removing inverters with the deviation from service and not adjusting ongoing maintenance strategies. Therefore, the inspectors did not identify a basis to question the system remaining (a)(2).

Based on the documents reviewed and discussions with Constellation personnel, the inspectors noted that, in general, Constellation identified problems and entered them into the CAP at a low threshold.

| Observation: Semi-annual Trend Review by Evaluating Potential Adverse Trends in the First and Second Quarters of 2022 | 71152S |
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The inspectors conducted a semi-annual trend review by evaluating sample issues that occurred in the first and second 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. No substantive adverse performance trends or repetitive equipment failures were identified during this time.

However, the inspectors noted multiple issues identified by the NRC in which field conditions did not meet station standards. The inspectors identified conditions such as equipment stored improperly or placed in unapproved locations and abnormal room temperatures indicating ventilation damper issues. The inspectors also identified issues during significant in-progress maintenance such as cable pull forces exceeding approved limits during EDG maintenance. The inspectors determined that the conditions reasonably represented the beginning of an adverse performance trend but noted that Constellation initiated a trend review to improve performance.

Based on the overall results of the semi-annual trend review, the inspectors determined that Constellation had identified adverse trends at PBAPS 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 July 8, 2022, the inspectors presented the integrated inspection results to Ron DiSabatino, Plant Manager, and other members of the licensee staff.
- On June 17, 2022, the inspectors presented the 50.59 team inspection debrief inspection results to Adam Frain, Engineering Director and Acting Plant Manager and other members of the licensee staff.
- On April 21, 2022, the inspectors presented the IP 71124.03 and 71124.04 debrief inspection results to Dave Henry, Site Vice President, and other members of the licensee staff.

**DOCUMENTS REVIEWED**

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|---|---|---|---|---|
| 71111.05 | Procedures | PF-108 | Unit Common, Main Control Room, Elevation 165'-0" | Revision 6 |
| | | PF-108 | Unit Common, Main Control Room, Elevation 165'-0" | Revision 6 |
| | | PF-127 | Unit 2 Turbine Building, Emergency Battery Switchgear Rooms, Elevation 135'-0" | Revision 11 |
| | | PF-127 | Unit 3 Turbine Building, Emergency Battery and Switchgear Rooms, Elevation 135'-0" | Revision 11 |
| | | PF-127 | Unit 2 Turbine Building, Emergency Battery, Switchgear Rooms, Elevation 135'-0" | Revision 11 |
| | | PF-127 | Unit 3 Turbine Building, Emergency Battery Switchgear Rooms, Elevation 135'-0" | Revision 11 |
| | | PF-132 | Diesel Generator Building, General Area, Elevation 127'-0" | Revision 9 |
| | | PF-132 | Diesel Generator Building, General Area, Elevation 127'-0" | Revision 9 |
| | | PF-78H | Turbine Building Common, Cable Spreading and Computer Rooms, Elevation 150'-0" | Revision 9 |
| | | PF-78H | Turbine Building Common, Cable Spreading and Computer Rooms, Elevation 150'-0" | Revision 9 |
| 71111.13 | Procedures | OP-AA-108-117 | Protected Equipment Program | Revision 7 |
| | | WC-AA-101-1006 | On-line Risk Management and Assessment | Revision 4 |
| 71111.15 | Corrective Action Documents | 4494939 | | |
| | | 4497232 | | |
| | | 4502487 | | |
| | | Issue Reports (IRs)<br>4502005<br>4502343 | | |
| | | IRs<br>4495507<br>4497309 | | |
| | Engineering Changes | 99-00389 | | |
| | Miscellaneous | P-S-38 | Standby Liquid Control System | Revision 10 |
| 71111.17T | Corrective Action | 4505679 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|---|---|---|---|---|
| | Documents Resulting from Inspection | 4505686 | | |
| | Miscellaneous | ML20015A299 | USNRC Letter from Office of Nuclear Reactor Regulation (H. Nieh) to Nuclear Energy Institute (J. Uhle), TIMELY RESOLUTION OF ISSUES RELATED TO TORNADO-MISSILE PROTECTION – SUPPLEMENTAL INFORMATION | 02/07/2020 |
| 71111.19 | Corrective Action Documents | IR 4503296 | | |
| | Procedures | ST-O-052-414-2 | Unit Common, E-4 Diesel Generator Fast Start and Full Load Test | |
| | | ST-O-052-414-2 | E-4 Diesel Generator Fast Start and Full Load Test | Revision 26 |
| | Work Orders | 4248551 | | |
| | | WO 04257279 | Task 3 | |
| | | WO-04257279 | Task 3 | |
| 71111.22 | Corrective Action Documents | IR 4498825, IR 4465770 | | |
| | Procedures | SO 52.A.8.C | Diesel Generator Running Inoperable | Revision 46 |
| | | ST-I-016-220-3 | Main Steam Relief Valve Actuator and Backup N2 Supply Valve Logic Test | Revision 6 |
| | | ST-I-63H-101-2 | HPSW 'B' Monitor Monthly Source Check | Revision 3 |
| | | ST-O-014-301-3 | CS Loop A Pump, Valve, Flow and Cooler Functional and In-Service Test | Revision 39 |
| | | ST-O-032-301-3 | HPSW Pump, Valve and Flow Functional and Inservice Test | Revision 42 |
| | | ST-O-032-301-3 | HPSW Pump, Valve and Flow Functional and Inservice Test | |
| | | ST-O-052-313-2 | E-3 Diesel Generator Slow Start Full Load and IST Test | Revision 22 |
| | Work Orders | 05038775 | | |
| | | 5248220 | | |
| 71152S | Corrective Action Documents | IR 4471493<br>IR 4473581<br>IR 4478586<br>IR 4480018<br>IR 4480176 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|---|---|---|---|---|
| | | IR 4480181<br>IR 4482016<br>IR 4482033<br>IR 4485243<br>IR 4486379<br>IR 4486635<br>IR 4486767<br>IR 4486818<br>IR 4487024<br>IR 4494939<br>IR 4497232<br>IR 4497443<br>IR 4497937<br>IR 4501690<br>IR 4502005<br>IR 4502993<br>IR 4503292<br>IR 4504471 | | |
| 71153 | Corrective Action Documents | IR 4420189 | | |
| | Miscellaneous | ML21322A051, 2021-26-00 | Paragon Energy Solutions Final Notification of a Deviation with Inverter Assembly (Model NLI-072034-CSI-K-5-A) | |