



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
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August 5, 2024

Barry Blair
Site Vice President
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Beaver Valley Power Station
P.O. Box 4 - Route 168
Shippingport, PA 15077-0004

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 – INTEGRATED
INSPECTION REPORT 05000334/2024002 AND 05000412/2024002

Dear Barry Blair:

On June 30, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Beaver Valley Power Station, Units 1 and 2. On July 17, 2024, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

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

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Matt R. Young, Chief
Projects Branch 2
Division of Operating Reactor Safety

Docket Nos. 05000334 and 05000412
License Nos. DPR-66 and NPF-73

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 – INTEGRATED
 INSPECTION REPORT 05000334/2024002 AND 05000412/2024002 DATED
 AUGUST 5, 2024

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

Docket Numbers: 05000334 and 05000412

License Numbers: DPR-66 and NPF-73

Report Numbers: 05000334/2024002 and 05000412/2024002

Enterprise Identifier: I-2024-002-0035

Licensee: Vistra Operations Company, LLC

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA

Inspection Dates: April 1, 2024 to June 30, 2024

Inspectors: N. Day, Senior Resident Inspector
A. Nugent, Resident Inspector
P. Cataldo, Senior Reactor Inspector
S. Elkhiamy, Senior Project Engineer
T. Fish, Senior Operations Engineer
R. Rolph, Senior Health Physicist
A. Taverna, Health Physicist

Approved By: Matt R. Young, Chief
Projects Branch 2
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 Beaver Valley Power Station, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

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

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000412/2023-001-00	LER 2023-001-00 for Beaver Valley Power Station, Unit No. 2, Indications Identified During Reactor Vessel Head Inspection	71153	Closed

PLANT STATUS

Unit 1 started the inspection period at rated thermal power. On April 13, 2024, the unit tripped due to a reactor coolant pump low flow condition which occurred as a result of a failure of the 1A system station service transformer breaker. Following repairs, as well as a scheduled refueling outage, Unit 1 returned to 100 percent power on May 24, 2024. On May 27, 2024, the unit was down powered to 28 percent to repair a heater drain tank normal level control valve. Following repairs, Unit 1 returned to 100 percent power on May 29, 2024. On June 4, 2024, the unit was down powered to 28 percent to repair the 'A' main feedwater regulating valve. Following repairs, Unit 1 returned to 100 percent power on June 5, 2024. Unit 1 remained at rated thermal power for the remainder of the inspection period.

Unit 2 operated at or near rated thermal power for the entire 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) (3 Samples)

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

- (1) Unit 1, spent fuel pool cooling, April 24, 2024
- (2) Unit 1, quench spray train 'B', June 18, 2024
- (3) Unit 2, emergency diesel generator 2-1, June 27, 2024

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, centrifugal charging pump cubicles, June 11, 2024
- (2) Unit 2, component cooling water pumps, June 11, 2024

- (3) Alternate intake structure, June 13, 2024
- (4) Intake structure, June 13, 2024

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the on-site fire brigade training and performance during an announced fire drill on June 20, 2024.

71111.06 - Flood Protection Measures

Flooding Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated internal flooding mitigation protections in the Unit 2, service water 'B' valve pit room, with an updated flood calculation due to a service water piping through wall leak on June 7, 2024.

71111.07A - Heat Exchanger/Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Unit 2, 2CCP-E21, 'B' component cooling water heat exchanger, inspection per GL 89-13, on April 3, 2024. Associated heat exchanger inspection report and condition report (CR) CR-2024-02363 reviewed

71111.08P - Inservice Inspection Activities (PWR)

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 during the Unit 1 refueling outage (1R29) from April 22 to May 3, 2024.

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

The inspectors verified that the following nondestructive examination and welding activities were performed appropriately:

- (1)
 - Manual ultrasonic testing with intergranular stress corrosion cracking parameters, of the 2-inch reactor coolant system 'C' loop hotleg drain Class 1 socket weld, RC-61-1502-Q1 (Nondestructive Examination (NDE) Report UT-BV1R29-007)
 - Manual magnetic particle testing of 'A' steam generator Class 2 inlet nozzle-to-vessel weld RC-E-1A-N-9 (NDE Report MT-BV1R29-002)
 - Repair and Replacement activity associated with installation of a vent valve downstream of 1RS-160, Unit 1 low head safety injection discharge piping, Order 200857091 (NDE Reports BOP-PT-24-008, 009, 010, 011 and 012)

- Visual examination of the containment liner and associated moisture barrier (NDE Report BOP-VT-24-019)
- Visual examination of the exterior containment building concrete (Order 200878873 and 1BVT 1.47.1, "Containment Structural Integrity Test, Revision 17)
- Underwater remote visual examination (VT-3) of control rod guide tube card wear measurements, Guide Cards P10 and M12 (Westinghouse Report DLW-RV010-CJ-000002, Revision 0-A)
- Underwater remote ultrasonic inspection (UT) of thermal shield support block bolts (TSSBB), 135L and 135R, and evaluation of missing TSSBB 195L, broken TSSBB 195R, and subsequent retrieval (Westinghouse Report DLW-RV010-TM-CG-000003, Revision 0, CR-2024-03851, and Westinghouse Final Report WDI-PJF-350434-FSR-001)
- Underwater remote borescope of core barrel-TSSBB clearances

PWR Inservice Inspection Activities Sample - Vessel Upper Head Penetration Inspection Activities (IP Section 03.02) (1 Sample)

The inspectors verified that the licensee conducted the following vessel upper head penetration inspections and addressed any identified defects appropriately:

- (1)
 - Visual examination based on American Society of Mechanical Engineers Code Case N-729-6, of penetrations 7, 37, 43, 47 and 56 (Westinghouse Report WDI-PJF-350486-TSR-001); Boric acid evaluations associated with Penetrations 7 (CR-2024-03556) and 47 (CR-2024-03324), and leaking core exit thermocouple nozzle assembly N-11 mechanical joint (CR-2024-03324)

PWR Inservice Inspection Activities Sample - Boric Acid Corrosion Control Inspection Activities (IP Section 03.03) (1 Sample)

The inspectors verified the licensee is managing the boric acid corrosion control program through a review of the following evaluations:

- (1)
 - Boric acid evaluation for 1-CH-1 (CR-2024-03254)
 - Boric acid evaluation for 1-RH-7 (CR-2024-03266)
 - Boric acid evaluation for 1RH-E-1B main flange (CR-2024-03393)

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 examination failure rates for the requalification annual operating exams administered February to April 2024, and the biennial written examinations completed April 2024.

71111.11Q - Licensed Operator Regualification 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 main control room during reactor vessel drain down for head removal on April 17, 2024.

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

- (1) The inspectors observed and evaluated operator response to a simulated steam generator tube rupture during licensed operator training performance in the Unit 1 simulator on June 18, 2024.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (2 Samples)

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

- (1) Unit 1, main feedwater system, June 29, 2024
- (2) Unit 2, main feedwater system, June 29, 2024

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 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 1, shutdown Yellow risk due to decay heat removal, April 18, 2024
- (2) Unit 1, shutdown Yellow risk due to spent fuel pool cooling, April 30, 2024
- (3) Unit 2, containment entry for unidentified leakage search and mitigation, May 29, 2024

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 1, component cooling water heat exchanger 'C' due to suspected tube leak described in CR 2024-02397, April 1, 2024
- (2) Unit 1, river water header 'B' due to foreign material in ball valve per Design Equivalent Change Package (ECP) 23-1151-002, Revision 4, and CR 24-02701, April 3, 2024

- (3) Unit 1, neutron source range monitor N-32 for CR 2024-03252 being inoperable and invoking mode change to Mode 6 per limiting condition of operation (LCO) 3.0.4.a, April 18, 2024
- (4) Unit 1, 'B' low head safety injection pump full flow test performed per 1OST-11.14A , April 24, 2024
- (5) Unit 2, evaluation of reactor coolant system leakage pressure boundary, found and isolated on May 30, 2024. Inspection focus was to determine if the leak was unidentified or pressure boundary leakage.
- (6) Unit 1, double oil analysis for the 1A system station service transformer load tap changer on May 15, 2024. Testing indicated a potentially degraded condition in both low voltage side load tap changers, CR-2024-04403.

71111.20 - Refueling and Other Outage Activities

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

- (1) The inspectors evaluated Unit 1 RFO29 activities from April 13 to May 21, 2024.

71111.24 - Testing and Maintenance of Equipment Important to Risk

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

Post-Maintenance Testing (PMT) (IP Section 03.01) (8 Samples)

- (1) Unit 1, performance of 1OST-36.7 on April 11, 2024, following replacement of ACB-41A on due to failure, April 10, 2024
- (2) Unit 1, Protective relay testing of system station service transformer 1A per work order (WO) 200941852, May 2, 2024
- (3) Unit 1, 'A' incore monitoring system per WO 200933334, April 5 2024
- (4) Unit 1, emergency diesel generator speed indication repairs performed in WO 200942923, April 23 2024
- (5) Unit 1, performance of reactor containment polar crane preventative maintenance per WOs 200883604, 200882490, and 200882494, April 15, 2024
- (6) Unit 1, type B leak test on recirculation spray heat exchanger metal expansion joints following river water piping repairs, performed on May 15, 2024, per 1OST-47.183 (Limited Use Change PAF-24-00742)
- (7) Unit 1, emergency diesel generator 1-1 following 1OST-36.3 procedure step revisions for failed 1OST-36.3 surveillance attempt on May 14, 2024, per WO 200878882, May 15, 2024
- (8) Unit 1, feedwater regulating valve testing FCV-1FW-479 post positioner replacement, valve actuator, and boosters per WO 200946106, May 21, 2024

Surveillance Testing (IP Section 03.01) (1 Sample)

- (1) Unit 1, emergency diesel generator 1-1 automatic test per 1OST-36.3, May 14, 2024

Inservice Testing (IST) (IP Section 03.01) (1 Sample)

- (1) Unit 1, 'A' motor driven feedwater pump full flow test per 1OST-24.8A, May 7, 2024

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

- (1) Unit 1, primary containment penetration valves TV-1CC-110E2 and TV-1CC-110E3, April 26, 2024

71114.06 - Drill Evaluation

Required Emergency Preparedness Drill (1 Sample)

- (1) Emergency response Green Team drill, April 2, 2024

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) The inspectors observed workers exiting the radiologically controlled area (RCA) at Unit 1 during a refueling outage.
- (2) The inspectors observed the controls established for workers and equipment exiting the RCA at the Unit 2 control point during a Unit 1 refueling outage.

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) The inspectors observed the controls established during resin transfer in Unit 1.
- (2) The inspectors observed the controls established on the residual heat removal platform and the entrance to under the reactor vessel.
- (3) The inspectors observed the controls established for the cubicles posted as high radiation area on 718' of the containment.
- (4) The inspectors observed the controls established for under the reactor head on 692' of the containment.

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 (HRAs) and very high radiation areas (VHRAs):

- (1) VHRA leading to under the reactor vessel
- (2) Unit 2 Chemical and Volume Control Tank Room
- (3) Radiological waste High Rad Drum Storage Area

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.

71124.05 - Radiation Monitoring Instrumentation

Walkdowns and Observations (IP Section 03.01) (8 Samples)

The inspectors evaluated the following radiation detection instrumentation during plant walkdowns:

- (1) Unit 1, auxiliary building portable air monitor (AMS-4)
- (2) Unit 1, auxiliary building area radiation monitors
- (3) Unit 2, auxiliary building area radiation monitors
- (4) Unit 1, 735' auxiliary building installed effluent radiation monitors
- (5) Unit 2, auxiliary building installed effluent radiation monitors
- (6) Unit 2, auxiliary building installed process monitors on 735'
- (7) Unit 2, radiation protection control point portable friskers
- (8) Units 1 and 2, radiation protection control points Argos whole body contamination monitors

Calibration and Testing Program (IP Section 03.02) (13 Samples)

The inspectors evaluated the calibration and testing of the following radiation detection instruments:

- (1) HPI REM500 SN #512
- (2) HPI REM500 SN #537
- (3) Eberline RO-2 SN #4174
- (4) Eberline RO-2 SN #030U
- (5) Eberline RO-20 SN #6157
- (6) Eberline RO-20 SN #6134
- (7) Eberline RO-2A SN #3588
- (8) Eberline RO-2A SN #0915
- (9) Eberline RM-14 SN #4431
- (10) Eberline RM-25 SN #813
- (11) Fluke 451B SN #159
- (12) Fluke 451B SN #624
- (13) Ludlum Model 177 SN #350867

Effluent Monitoring Calibration and Testing Program Sample (IP Section 03.03) (2 Samples)

The inspectors evaluated the calibration and maintenance of the following radioactive effluent monitoring and measurement instrumentation:

- (1) Unit 1, ventilation vent effluent monitor, 1RM-VS-109
- (2) Unit 2, supplemental leak collection radiation system (SLCRS), 2HVS-RQ-109

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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

- (1) Unit 1, April 1, 2023 through March 31, 2024
- (2) Unit 2, April 1, 2023 through March 31, 2024

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

- (1) Unit 1, April 1, 2023 through March 31, 2024
- (2) Unit 2, April 1, 2023 through March 31, 2024

MS07: High Pressure Injection Systems (IP Section 02.06) (2 Samples)

- (1) Unit 1, April 1, 2023 through March 31, 2024
- (2) Unit 2, April 1, 2023 through March 31, 2024

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

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

- (1) Licensee Event Report (LER) 05000412/2023-001-00, Indications Identified During Reactor Vessel Head Inspection (ADAMS Accession No. ML23167A468). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER therefore no performance deficiency was identified. The inspectors did not identify a violation of NRC requirements. This LER is closed.

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On July 17, 2024, the inspectors presented the integrated inspection results to Barry Blair, Site Vice President, and other members of the licensee staff.
- On April 25, 2024, the inspectors presented the radiological hazard and exposure control inspection results to Barry Blair, Site Vice President, and other members of the licensee staff.
- On May 8, 2024, the inspectors presented the inservice inspection outage activities inspection results to Bob Kristophel, General Plant Manager, and other members of the licensee staff.
- On June 4, 2024, the inspectors presented the radiation instrumentation inspection results to Bob Kristophel, General Plant Manager, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08P	Corrective Action Documents Resulting from Inspection	CR-2024-03611		
		CR-2024-03724		
		CR-2024-03932		
71153	Corrective Action Documents	CR-2023-03357		
		CR-2023-03587		
	Engineering Changes	ECP-23-1078-001	Reactor Vessel Head Repair to RVLIS Penetration	Revision 2
	Miscellaneous	2-TYP-4-RV-06	Beaver Valley Power Station, Unit No. 2, Authorization and Safety Evaluation for Alternative Request (ML23249A184)	09/18/2023
	Work Orders	200913374	2R23 Reactor Vessel Head Vent Penetration Repair	