



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
475 ALLENDALE RD, STE 102
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

August 20, 2024

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

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 – COMPREHENSIVE
ENGINEERING TEAM INSPECTION - INSPECTION REPORT
05000334/2024010 AND 05000412/2024010

Dear Barry Blair:

On August 1, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Beaver Valley Power Station, Units 1 and 2 and 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,

Mel Gray, Chief
Engineering Branch 1
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 – COMPREHENSIVE
 ENGINEERING TEAM INSPECTION - INSPECTION REPORT
 05000334/2024010 AND 05000412/2024010 DATED AUGUST 20, 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: 05000334/2024010 and 05000412/2024010

Enterprise Identifier: I-2024-010-0025

Licensee: Vistra Operations Company, LLC

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA

Inspection Dates: July 15, 2024 to August 1, 2024

Inspectors: J. Brand, Senior Reactor Inspector
P. Cataldo, Senior Reactor Inspector
J. Lilliendahl, Senior Emergency Response Coordinator
K. Mangan, Senior Reactor Inspector
D. McHugh, Reactor Inspector
J. Schoppy, Senior Reactor Inspector
A. Turilin, Reactor Inspector

Approved By: Mel Gray, Chief
Engineering Branch 1
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a comprehensive engineering team 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

None.

INSPECTION SCOPES

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

REACTOR SAFETY

71111.21M - Comprehensive Engineering Team Inspection

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59 screening and/or evaluations, and operating experience:

Structures, Systems, and Components (SSCs) (IP section 03.01) (10 Samples)

For each component or operator action sample listed below, the team reviewed licensing and design basis documents and a sampling of applicable operator actions, periodic testing results, corrective action program documents, internal and external operating experience, preventive and corrective maintenance work orders, modifications, and aging management programs. Additionally, the team performed walkdowns of the component or procedure and conducted interviews with licensee personnel.

The team used the attributes contained in IP 71111.21M, Appendix A, *Component Review Attributes*, such as those listed below as guidance. Specifically, the team evaluated these attributes as per 71111.21M, Appendix B, *Component Design Review Considerations* and 71111.21M, Appendix C, *Component Walkdown Considerations*.

- (1) Risk significant operator action - Unit 1 weather-related Loss-of-Offsite Power
 - Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.
 - Component controls will be functional and provide desired control during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Instrumentation and alarms are available to operators for making necessary decisions.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.

- Potential degradation is monitored or prevented.
 - Equipment is adequately protected from environmental hazards.
- (2) Unit 1 Power-Operated Relief Valve, 1-PCV-1RC-456
- Air and nitrogen will be available and unimpeded during accident/event conditions.
 - Air, nitrogen, and electric, including those used for control functions, will be available and adequate during accident/event conditions.
 - Component controls will be functional and provide desired control during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Heat will be adequately removed from major components.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.
 - Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
 - Tests and/or analyses validate component operation under accident/event conditions.
 - Potential degradation is monitored or prevented.
 - Equipment qualification is suitable for the environment expected under all conditions.
 - Equipment is adequately protected from environmental hazards.
 - Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
 - Performance capability of selected components have not been degraded through modifications.
- (3) Unit 1 Recirculation Spray Heat Exchanger "1D," River Water Inlet Isolation Valve, MOV-1RW-104D
- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
 - Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.
 - Component controls will be functional and provide desired control during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Instrumentation and alarms are available to operators for making necessary decisions.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.

- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
- Tests and/or analyses validate component operation under accident/event conditions.
- Potential degradation is monitored or prevented.
- Equipment qualification is suitable for the environment expected under all conditions.
- Equipment is adequately protected from environmental hazards.
- Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
- Performance capability of selected components have not been degraded through modifications.

(4) Unit 1 Quench Spray Pump, 1QS-P1A

- Process medium (water) will be available and unimpeded during accident/event conditions.
- Energy sources (electricity), including those used for control functions, will be available and adequate during accident/event conditions.
- Component controls will be functional and provide desired control during accident/event conditions.
- Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
- Instrumentation and alarms are available to operators for making necessary decisions.
- Heat will be adequately removed from major components.
- Components' installed configuration will support its design basis function under accident/event conditions.
- Component operation and alignments are consistent with design and licensing basis assumptions.
- Design bases and design assumptions have been appropriately translated into design calculations and procedures.
- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
- Tests and/or analyses validate component operation under accident/event conditions.
- Potential degradation is monitored or prevented.
- Equipment is adequately protected from environmental hazards.
- Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
- Performance capability of selected components have not been degraded through modifications.

(5) Unit 1 Safety-Related 125 VDC Battery, No. 1-2 (Bus 1-2)

- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
- Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.

- Component controls will be functional and provide desired control during accident/event conditions.
- Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
- Components' installed configuration will support its design basis function under accident/event conditions.
- Component operation and alignments are consistent with design and licensing basis assumptions.
- Design bases and design assumptions have been appropriately translated into design calculations and procedures.
- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
- Tests and/or analyses validate component operation under accident/event conditions.
- Potential degradation is monitored or prevented.
- Equipment qualification is suitable for the environment expected under all conditions.
- Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.

(6) Unit 2 Emergency Diesel Generator, 2-2

- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
- Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.
- Component controls will be functional and provide desired control during accident/event conditions.
- Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
- Instrumentation and alarms are available to operators for making necessary decisions.
- Heat will be adequately removed from major components.
- Installed configuration will support its design basis function under accident/event conditions.
- Component operation and alignments are consistent with design and licensing basis assumptions.
- Design bases and design assumptions have been appropriately translated into design calculations and procedures.
- Performance capability of selected components have not been degraded through modifications.
- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
- Tests and/or analyses validate component operation under accident/event conditions.
- Potential degradation is monitored or prevented.

- Equipment qualification is suitable for the environment expected under all conditions.
 - Equipment is adequately protected from environmental hazards.
- (7) Unit 2 Low Head Safety Injection Pump, 2SIS-P21A
- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
 - Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.
 - Component controls will be functional and provide desired control during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Instrumentation and alarms are available to operators for making necessary decisions.
 - Heat will be adequately removed from major components.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.
 - Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
 - Tests and/or analyses validate component operation under accident/event conditions.
 - Potential degradation is monitored or prevented.
 - Equipment qualification is suitable for the environment expected under all conditions.
 - Equipment is adequately protected from environmental hazards.
 - Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
 - Performance capability of selected components have not been degraded through modifications.
- (8) Unit 2 Charging Pump, 2CHS-P21A
- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
 - Energy sources (fuel, air, steam, electricity), including those used for control functions, will be available and adequate during accident/event conditions.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.

- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
 - Tests and/or analyses validate component operation under accident/event conditions.
 - Potential degradation is monitored or prevented.
 - Equipment is adequately protected from environmental hazards.
- (9) Unit 2 Turbine-Driven Auxiliary Feedwater Pump, 2FWE-P22
- Water will be available and unimpeded during accident/event conditions.
 - Steam supply will be available and adequate during accident/event conditions.
 - Component controls will be functional and provide desired control during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Heat will be adequately removed from major components.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.
 - Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
 - Tests and/or analyses validate component operation under accident/event conditions.
 - Potential degradation is monitored or prevented.
 - Equipment is adequately protected from environmental hazards.
 - Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
 - Performance capability of selected components have not been degraded through modifications.
- (10) Unit 2 Recirculation Spray Heat Exchanger, 2RSS-E21B
- Process medium (water, air, electrical signal) will be available and unimpeded during accident/event conditions.
 - Operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions.
 - Instrumentation and alarms are available to operators for making necessary decisions.
 - Heat will be adequately removed from major components.
 - Components' installed configuration will support its design basis function under accident/event conditions.
 - Component operation and alignments are consistent with design and licensing basis assumptions.
 - Design bases and design assumptions have been appropriately translated into design calculations and procedures.

- Acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met.
- Tests and/or analyses validate component operation under accident/event conditions.
- Potential degradation is monitored or prevented.
- Equipment qualification is suitable for the environment expected under all conditions.
- Equipment is adequately protected from environmental hazards.
- Component inputs and outputs are suitable for application and will be acceptable under accident/event conditions.
- Performance capability of selected components have not been degraded through modifications.

Modifications (IP section 03.02) (5 Samples)

- (1) Unit 1 EC-20-0012-002: Overload Heater Replacement for MCC-1-41-1M
- (2) Unit 1 EC-21-0022-001: Upgrade MCC-1-1-Q Cutler Hammer Components
- (3) Unit 1 EC-24-1071: WR-89 Slip-on Flange Installation for Repair
- (4) Unit 2 EC-22-1072-001: Thermal Shield Support Block Bolt Bore Internal Thread Staking
- (5) Unit 2 EC-22-1046-001: Through-wall Defect Removal, Line BV-WR-20-151-Q3

10 CFR 50.59 Evaluations/Screening (IP section 03.03) (10 Samples)

- (1) 18-00478: Implementation of License Amendment /Setting Changes for BV1 Degraded Voltage and Loss of Voltage Protection
- (2) 22-0086-001/2/3: Piping Material Change Downstream of Unit 1 AFWP Restricting Orifices
- (3) 22-0073-001/002: U1 Diesel Tank Level Setpoint Change
- (4) 22-1073-001: Tubing Downstream of 1RC-272 Support Relocation
- (5) 22-1076-001: Installation of Permanent Shielding at 1SW-24
- (6) 22-0049-001/002/003: Pressure Switch Setpoint Changes for U1 FWIV HYV-1FW-100A/B/C
- (7) 20-0117-001: Replace U2 SWS Emergency Diesel Generator Heat Exchanger Inlet Valves
- (8) 21-0077-001: Protect Fire Protection Lines from Future Wear
- (9) Unit 2, PAF-17-00193/Screen 17-00374/16-00913: Associated with CR-2023-05501
- (10) 50.59 associated with Compensatory Measure to Maintain Operability for U2 RWST 2QSS-TK21, from CR-2023-06404

Operating Experience Samples (IP section 03.04) (3 Samples)

- (1) NRC IN 2020-04: Operating Experience Regarding Failure of Fire Protection Main Yard Piping
- (2) NRC IN 2021-03: Operating Experience Related to DAEC Derecho Event on August 10, 2020
- (3) NRC IN 2023-01: Risk Insights for High Energy Arcing Faults Operating Experience and Analyses

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On August 1, 2024, the inspectors presented the comprehensive engineering team inspection results to Barry Blair, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
71111.21M	Calculations	10080-E-048	Emergency Diesel Generator Loading with Station Blackout	Revision 16	
		10080-N-862	Auxiliary Feedwater Pump Performance	Revision 0	
		211-N-423	Determine the Available NPSH for Low Head Safety Injection (LHSI) Pumps at Design Flow	Revision 0	
		8700-DMC-3523	Quench Spray System Performance	Revision 2	
		8700-E-202	DC System Management Battery 1-2 - Battery Charger 1-2	Revision 3	
		BV-10080-N-824	Recirculation Spray Heat Exchanger Inputs for MAAP Containment Analysis	Revision 1	
		DMC-1516	Determination of the Valve Total Required Thrust, Actuator Capability and Margin Assessment for AOVs PCV-1RC-455C, D & 456	Revision 2, Addendum 1	
	Corrective Action Documents	CR-	2011-05786		
			2013-00419		
			2017-07594		
			2018-07705		
			2020-04803		
			2020-06052		
		2020-08083			
		2020-09580			
		2021-08267			
		2021-09187			
		2022-00253			
		2022-00542			
		2022-01653			
		2022-05250			
		2022-05564			
		2022-07907			
		2022-08878			
		2023-00246			
		2023-01707			
		2023-02575			
		2023-03005			

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			2023-03077 2023-03128 2023-03906 2023-04171 2023-04462 2023-05492 2023-05501 2023-05660 2023-06861 2023-09188 2024-00897 2024-00966 2024-02299 2024-02955 2024-02967 2024-02972 2024-02973 2024-03488 2024-03785 2024-04511	
	Corrective Action Documents Resulting from Inspection	CR-2024-	05832 05844 05850 05884 05887 05902 05904 05917 05918 05921 05934 05935 05936 05996	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			06010 06012 06040 06041 06054 06074 06164 06166 06168 06170 06192 06196 06197 06201	
	Drawings	RE-0001V	125DC One Line Diagram, Sheet 1	Revision 37
	Engineering Evaluations	12-04	10 CFR Part 21 Masoneilan Evaluation	12/04/2012
		EER-601419582	U1/U2 RWST Boron/Instrument Mission Time	Revision 0
		EER-601448014	Evaluate Out-of-Tolerance PCV-1RC-456	05/02/2024
	Miscellaneous	1OST-13	Quench Spray Pump [QS-P-1A] Test	07/07/2022
		1OST-13.1	Quench Spray Pump [1QS-P1A] Test	07/29/2024
		1OST-47.03G	Containment Isolation and ASME Sections XI Test	07/29/2024
		2502.190-230-001	Operation and Maintenance Manual for Emergency Diesel Generators	08/07/2019
		2OST-11.01	LHSI Pump Full Flow Test	12/26/2023
		2OST-36.2	Emergency Diesel Generator [2EGS*EG2-2] Monthly Test	06/26/2024
		2OST-36.2	Emergency Diesel Generator [2EGS*EG2-2] Monthly Test	07/24/2024
		2OST-36.23	EDG Simultaneous Start Test	10/30/2021
		2OST-36.2A	Emergency Diesel Generator [2EGS*EG2-2] 9-Hour Test	05/13/2023
		NUREG-1929	Safety Evaluation Report Related to the License Renewal of Beaver Valley Power Station	October 2009
		RAD/50.59 Screen 23-01338	RWST Level Sensing Lines Cold Weather Protection Verification	Revision 0
	NDE Reports	Eddy Current Report 55140680	U2 RSS-E21B, 1R22	10/25/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	BVBP-OPS-0029	Control of Critical Actions	Revision 12
		NOP-OP-1013-02	Time Critical Operator Actions for Actuating CREVs	Revision 0
		NOP-OP-1013-02	Time Critical Operator Actions for Terminating Uncontrolled Charging flow to the RCS	Revision 0
	Work Orders	200557370		
		200761059		
		200943046		
		200837181		
		200476965		
		200800869		
		200848185		
		200849618		
		200849729		
		200849744		
		200850565		
		200853218		
200744228				
200795833				
200797763				
200832743				
200650530				