



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

March 8, 2013

Mr. Paul A. Harden  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
P. O. Box 4, Route 168  
Shippingport, PA 15077-0004

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 & 2 – NRC EVALUATION OF  
CHANGES, TESTS, OR EXPERIMENTS AND PERMANENT PLANT  
MODIFICATIONS TEAM INSPECTION REPORT 05000334/2013007 AND  
05000412/2013007

Dear Mr. Harden:

On February 15, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Beaver Valley Power Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on February 15, 2013, with yourself and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team reviewed selected procedures, calculations and records, observed activities, and interviewed station personnel.

Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Paul G. Krohn, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos. 50-334, 50-412  
License Nos. DPR-66, NPF-73

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Site Vice President  
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Distribution: See Next Page

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P. Harden

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Enclosure:

Inspection Report 05000334/2013007 and 05000412/2013007  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-334, 50-412

License Nos.: DPR-66, NPF-73

Report No.: 05000334/2013007 and 05000412/2013007

Licensee: First Energy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA

Inspection Period: January 28 through February 15, 2013

Inspectors: K. Mangan, Senior Reactor Inspector, Division of Reactor Safety (DRS),  
Team Leader  
D. Kern, Senior Reactor Inspector, DRS  
J. Ayala, Reactor Inspector, Division of Reactor Projects

Approved By: Paul G. Krohn, Chief  
Engineering Branch 2  
Division of Reactor Safety

## **SUMMARY OF FINDINGS**

IR 05000334/2013007 and 05000412/2013007; 1/28/13 – 2/15/13; Beaver Valley Power Station, Units 1 and 2; Permanent Plant Modifications Engineering Team Inspection.

This report covers a 2 week on-site inspection period of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by three region based engineering inspectors. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IP 71111.17)

#### .1 Evaluations of Changes, Tests, or Experiments (35 samples)

##### a. Inspection Scope

The team reviewed 10 safety evaluations to determine whether the changes to the facility or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), had been reviewed and documented in accordance Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59 requirements. In addition, the team evaluated whether First Energy Nuclear Operating Company (FENOC) had been required to obtain U.S. Nuclear Regulatory Commission (NRC) approval prior to implementing the changes. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, Technical Specifications (TS), and plant drawings to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," Revision 1, as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed a sample of twenty-five 10 CFR 50.59 screenings for which FENOC had concluded that a safety evaluation was not required. These reviews were performed to assess whether FENOC's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, and procedure changes.

The team reviewed the safety evaluations and screenings that FENOC had performed and approved during the time period covered by this inspection not previously reviewed by NRC inspectors. All safety evaluations since the last modifications inspection were reviewed, and the screenings and applicability determinations selected were based on the safety significance, risk significance, and complexity of the change to the facility.

In addition, the team compared FENOC's administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to determine whether the procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations and screenings are listed in the Attachment.

##### b. Findings

No findings were identified.

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.2 Permanent Plant Modifications (10 samples)

.2.1 Unit 1 Replacement of Emergency Diesel Generator Speed Sensing Relays

a. Inspection Scope

The team reviewed modification 10-0440-002 which replaced the Unit 1 emergency diesel generator (EDG) speed sensing relays. The Unit 1 EDG original equipment manufacturer identified to FENOC that the speed sensing panels installed in the Unit 1 EDG start circuits were obsolete and recommended installation of replacement units utilizing different internal components including the speed sensing switch and power supply. The speed switch is a relaying device that senses the engine speed via a magnetic pickup at the engine flywheel and each of the Unit 1 EDGs contained two speed sensing panels. The modification was performed to upgrade these components.

The team reviewed the modification to verify the design basis, licensing basis, and performance capability of the speed sensing relays and supported safety-related components had not been degraded by the modification. The team verified that the design specifications of the new speed sensing panels were at least equivalent to the original model. The team interviewed plant engineers and reviewed calculations, evaluations, purchase specifications, vendor product data sheets, and the post maintenance test (PMT) results to evaluate if FENOC had properly implemented the speed sensing relays replacement modification. The team also reviewed corrective action condition reports (CR) to determine whether the new speed sensing panels performed reliably since installation and whether any new performance issues had resulted from the modification. The team also walked down the EDG to assess its material condition and standby configuration. Finally, the team verified that FENOC updated applicable electrical loading calculations, operating and maintenance procedures, vendor manuals, and spare parts inventories. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.2 Unit 1 River Water Motor Operator Valve Replacement

a. Inspection Scope

The team reviewed modification 11-0296-004 which replaced the Unit 1 river water (RW) safety-related recirculation spray heat exchanger header isolation motor-operated valve (MOV) (1RW-103C). The recirculation spray heat exchanger header isolation valves are 24 inch, 150 lb rated, motor-operated butterfly valves which are normally closed. After receiving a containment isolation phase 'B' signal the valve opens to provide a flow path for cooling water to the recirculation spray heat exchangers. The modification was performed to address valve leak-by issues that occurred when system maintenance had been performed. The valve was changed from a flanged rubber seated

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(soft-seated) butterfly valve to a lug style triple-offset hard seated butterfly valve. A new higher starting torque motor for the valve actuator was also installed as part of the modification.

The team reviewed the modification to determine if the design basis, licensing basis, and performance capability of the RW recirculation spray heat exchanger header isolation valve and supported safety-related components had been degraded by the modification. Specifically, the team verified the design specifications of the new MOV were at least equivalent to the original model. The team reviewed the completed work order instructions and documentation to verify that the modification was installed as designed, and reviewed the associated PMT results to ensure that FENOC specified appropriate tests and acceptance criteria, and that the test results confirmed satisfactory performance. Additionally, the team interviewed plant engineers and reviewed corrective action CRs to determine if there were reliability or performance issues that may have resulted from the modification. The team also reviewed affected drawings and operating procedures to ensure that they were properly updated, and walked down the river water system including the location of the valve and motor operator to assess the material condition and configuration of the valve. Finally, the team verified that FENOC adequately updated applicable electrical loading calculations and procedures incorporated the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.3 Unit 1 Vital Bus Alternate Source Regulating Transformer Replacement

a. Inspection Scope

The team reviewed modification 08-0032-002 which was performed to replace the Unit 1 Vital Bus II and IV Alternate Source Regulating Transformer (BV-TRF-1P15). The function of the transformer is to maintain a regulated alternating current (AC) supply to vital busses II and IV when the associated vital bus inverter is either manually bypassed for maintenance or automatically transferred by the inverter's static switch due to a fault on the inverter. The transformers have been in service since initial Unit 1 plant startup. FENOC determined that the regulators should be replaced because they were approaching the end of their design life. Additionally, the manufacturer no longer had a 10 CFR Part 50, Appendix B, qualified program so Class 1E parts were not available.

The team reviewed the modification to evaluate if the design basis, licensing basis, and performance capability of the alternate source regulating transformer and supported safety-related components had been degraded by the modification. The team verified that the design specifications of the new transformer were at least equivalent to the original model. The team interviewed plant engineers and reviewed calculations, evaluations, drawings, and the PMT results to determine if FENOC properly implemented the transformer replacement. The team also reviewed CRs to determine if the new

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transformer performed reliably since installation and whether any performance issues had resulted from the modification. Additionally, the team walked down the Unit 1 switchgear room to assess the material condition and standby configuration. Finally, the team verified that FENOC adequately updated applicable electrical loading calculations, operating and maintenance procedures, and vendor manuals to address the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.4 Unit 1 Install Strainer in River Water Supply Line to Auxiliary Feedwater Pumps

a. Inspection Scope

The team reviewed modification 10-0551 that installed a Y-type strainer in the RW supply line to the auxiliary feed water (AFW) pump. The modification was performed to prevent blockage of the AFW pump, including the AFW pump lube oil cooling system components, when the RW is used to supply AFW. The AFW system, which provides water to the steam generators to cool the plant to cold shutdown, normal water supply is clean water from the primary plant demineralized water storage tank. However, the RW system is the credited ultimate heat sink water supply to the AFW pump. FENOC performed the modification to address an NRC inspection finding for the potential blockage of the AFW pump lube oil cooling system orifices by debris when the AFW pump is supplied by RW (NCV 05000334/2008008). The modification included the installation of a Y-type strainer, with blowdown valve, in the RW supply line to the AFW pumps, and seismically qualified supports.

The team reviewed the modification to determine if the design bases, licensing bases, or performance capability of the AFW cooling water supplies had been degraded by the modification. The team evaluated whether the design specifications of the strainer were sufficient to preclude blockage of downstream AFW components. The team interviewed design engineers and plant operators and reviewed evaluations, installation documents, design drawings, vendor documents, and test reports to assess the adequacy of the newly installed equipment. In addition, the team reviewed station procedures and training records to verify operators had appropriate written instructions, training, and knowledge to successfully align and maintain the alternate RW supply to AFW when needed. Finally, the team walked down the RW supply to the AFW pumps to assess the material condition and standby configuration. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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## .2.5 Unit 2 Alternate Reactor Coolant Pump Seal Injection System Isolation Points

### a. Inspection Scope

The team reviewed modification 10-1613 which installed components (three valves and a piping tee connection) to be used as clearance isolation points for future non-outage work to install a backup water supply for reactor coolant pump (RCP) seal injection line. The future connection would cross-tie the safety injection and charging and volume control (CVCS) systems. Reactor coolant pump seal injection is normally supplied by the charging pumps via the CVCS system. FENOC's subsequent modification to the plant to install the backup water supply for RCP seal injection will reduce the likelihood of a RCP seal failure.

The team reviewed the modification to determine if the design bases, licensing bases, or performance capability of the safety injection and CVCS systems had been degraded by the modification. The team interviewed engineering staff and reviewed evaluations, non-destructive evaluation (NDE) results, PMT results, and associated maintenance work orders to confirm that with the modification was properly implemented and supported continued operability of the affected systems. The team also reviewed system drawings and performed a walk down of portions of the safety injection and CVCS systems to ensure the modification was correctly installed and system configuration was in accordance with design instructions. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

### b. Findings

No findings were identified.

## .2.6 Unit 2 Installation of RCP Shutdown Seal/Floating Ring Seal Removal

### a. Inspection Scope

The team reviewed modification 11-0706 that replaced the RCP number 1 seal inserts with a modified design referred to as a shutdown seal (SDS). The current RCP floating seal design is susceptible to a RCP seal loss-of-coolant accident following a prolonged station blackout. The new RCP SDS is thermally activated to limit RCP seal leak-off to 1 gallon per minute. When installed on all three RCPs, the SDS will support modification of coping strategies for a station blackout and reduce the possibility of a RCP seal loss-of-coolant accident. The modification included replacement of the number one seal runner retainer sleeve and adapter with a SDS sleeve and adapter. The 2CHS-FLT23 RCP seal water return filter media was also modified to a smaller size to ensure SDS debris would be retained in the unlikely event that the SDS would inadvertently actuate when the RCP shaft was rotating. The modification has been completed on the 'B' and 'C' RCPs, and installation on the 'A' RCP is scheduled for a future plant outage.

The team reviewed the modification to determine if the design bases, licensing bases, or performance capability reactor coolant system, the RCPs, and the RCP seals had been

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degraded by the modification. The NRC staff had previously reviewed and approved the associated SDS design model presented in WCAP-17100-P-A, "Probabilistic Risk Assessment Model for the Westinghouse Shut Down Seal," Revision 1, and the team evaluated if the installation was in accordance with this document. The team also interviewed design engineers and reviewed technical evaluations, calculations, the UFSAR, design drawings, vendor manuals and studies, maintenance work orders, and PMT to independently verify the modification was properly implemented and was consistent with WCAP-17541-P, "Implementation Guide for the Westinghouse RCP SHIELD Passive Thermal Shutdown Seal," Revision 0. Finally, the team reviewed station procedures, drawings, and the control room simulator to determine if they were properly updated to reflect the SDS modification on the 'B' and 'C' RCPs. The 10 CFR 50.59 safety evaluation associated with this modification was also reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.7 Unit 2 Replace Motor-Operated Valve Actuator Motor and Change Actuator Setup

a. Inspection Scope

The team reviewed modification 10-0061-012 that installed a new motor on the actuator for MOV (RSS-MOV156C). The modification was performed in order to assure that adequate thrust was available to the valve in order to comply with the Joint Owners Group Motor Operator Valve Program. FENOC was performing the upgrades to meet commitments made in their response to Generic Letter 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves." The design change installed a larger motor and replaced the supply breaker and thermal overloads used to protect the motor. Additionally, the valve spring pack and thrust/torque setpoint limits were changed.

The team reviewed the modification to determine if the design basis, licensing basis, or performance capability of the valve and electrical system had been degraded by the modifications. The team interviewed design engineers, and reviewed design drawings and calculations to determine if the motor and electric circuit met the design and licensing requirements. Additionally, the team reviewed PMT results and associated maintenance work orders to determine if the changes were appropriately implemented. The team also performed a walk down of the valve to determine if the modification was installed in accordance with the design, and to assess the overall material conditions of the systems following the modification work. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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## .2.8 Unit 2 Motor-Driven Auxiliary Feedwater Pump Mechanical Seal Upgrade

### a. Inspection Scope

The team reviewed modification 10-0163-002 that modified and overhauled the 'B' motor-driven AFW pump rotating assembly, and replace the packing on the AFW pump with a mechanical seal. The pump was modified to allow the installation of the mechanical seal. The installation of the seal was performed to increase the reliability and availability of the AFW pump and to eliminate the housekeeping issues associated with leak-off that is required for the previously installed packing design. Finally, the rotating assembly was overhauled by the pump vendor in order to restore pump performance.

The team reviewed the modification to determine if the design basis, licensing basis, or performance capability of the AFW pump had been degraded by the modifications. The team interviewed design engineers and reviewed the seal design to determine if the changes met design and licensing requirements. Additionally, the team reviewed post-modification testing PMT results and associated maintenance work orders to determine if the changes were appropriately implemented. The team also performed a walk down of the AFW pump and reviewed the vendor inspection report to determine if the modification was in accordance with the design, and to assess the overall material condition of the pump following the modification work. Finally, the team reviewed affected surveillance test procedures to verify they had been appropriately updated to reflect the post-modification design and operation. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in Section 1R17.1 of this report. Documents reviewed are listed in the Attachment.

### b. Findings

No findings were identified.

## .2.9 Unit 2 Install 4" Valve, Piping and use a Freeze Seal on 2-SWS-004-191-3 Piping

### a. Inspection Scope

The team reviewed modification 12-0746-02/04 that was performed to replace degraded service water piping and install an isolation valve (2SWS-1232) in the Unit 2 service water system. The modification to the piping was performed to correct a previously identified through-wall leak on the service water piping and to install a valve to allow for future isolation of this pipe section without the need for a freeze seal. The modification consisted of installing a freeze seal, removing a section of 4 inch diameter pipe and elbow, and the installation of new pipe, elbow, and valve.

The team reviewed the modification to determine if the design basis, licensing basis, or performance capability of the service water system had been degraded by the modifications. The team interviewed design engineers, reviewed design drawings, and reviewed specifications for the new components to determine if the changes met the design and licensing requirements. Additionally, the team reviewed PMT results and associated maintenance work orders to verify that the changes were appropriately

Enclosure

implemented. Finally, the team reviewed affected operating procedures and drawings to verify they had been appropriately updated to reflect the post-modification design and operation. The 10 CFR 50.59 screens and safety evaluation determination associated with this modification were also reviewed as described in Section 1R17.1 of this report. Documents reviewed are listed in the Attachment

b. Findings

No findings were identified.

.2.10 Unit 2 Install Additional Water Seal above Existing Water Stop between Control Building and Cable Tunnel

a. Inspection Scope

The team reviewed modification 12-0427 that was developed to restore the design water stop between two safety-related and seismic class 1 structures; the Unit 2 Control Building and Cable Tunnel. The water stop on top of the shake space between the two structures had degraded resulting in rain water/melting snow leaking into the structures and potentially affecting installed equipment. The modification required excavation above the degraded seal, the installation of a pre-manufactured seal on top of the existing water stop, and application of caulk material along the new water seal seams. Station personnel attempted to perform the modification but during excavation station personnel found that an underground concrete cable conduit blocked access to the water stop. The modification package was revised such that a thin layer of sealant was applied on exposed building seams. The removed dirt above the water stop was backfilled and the asphalt covering was reestablished.

The team reviewed the modification to determine if the design bases, licensing bases, or performance capability of the Unit 2 Control Building and Cable Tunnel structures, the water stop, and the safety-related equipment within the affected structures had been degraded by partial implementation of the modification. The team interviewed design engineers and reviewed calculations, the UFSAR, maintenance work orders, CRs, and associated evaluations of equipment operability to determine if the modification met these requirements. The team also walked down portions of the Unit 2 control building and cable tunnel and the above-surface area in the vicinity of the water stop to assess current conditions of the water stop, equipment in the structure, and the potential for water intrusion in the area. Finally, the team reviewed the corrective action program and interviewed design engineers to determine whether appropriate corrective actions were established to restore the water stop design function before safety-related equipment would be adversely affected. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA2 Identification and Resolution of Problems (IP 71152)

###### a. Inspection Scope

The team reviewed a sample of CRs associated with 10 CFR 50.59 and plant modification issues to determine whether FENOC was appropriately identifying, characterizing, and correcting problems associated with these areas, and whether the planned or completed corrective actions were appropriate. In addition, the team reviewed CRs written on issues identified during the inspection to verify FENOC adequately described the problem and incorporated the issue into their corrective action system. The CRs reviewed are listed in the attachment.

###### b. Findings

No findings were identified.

##### 4OA6 Meetings, including Exit

The team presented the inspection results to Mr. Harden, Site Vice President and other members of FENOC's staff at an exit meeting on February 15, 2013. The team returned the proprietary information reviewed during the inspection and verified that this report does not contain proprietary information.

**ATTACHMENT**  
**SUPPLEMENTAL INFORMATION**  
**KEY POINTS OF CONTACT**

Licensee Personnel

P. Harden	Site Vice President
S. Hovanec	Manager, Plant Engineering
C. Mancuso	Manager, Design Engineering
B. Lubert	Supervisor, Design Engineering
G. Cacciani	Engineering Assessment Board Chairman
T. Dimetrovich	Regulatory Compliance Engineer
G. Ebeck	Supervisor, Civil/Structural Design Engineering
D. Price	Supervisor, Mechanical Design Engineering
M. Ressler	Supervisor, Design Engineering Analysis
D. Schwer	Operations Support Superintendant
B. Sepelak	Regulatory Compliance Supervisor
D. Wacker	Regulatory Compliance

**LIST OF DOCUMENTS REVIEWED**

10 CFR 50.59 Evaluations

SE 10-04396, Unit 1 (DLW) HZP Steamline Break for the 9.4% Up-rating and Replacement Steam Generators, Revision 0

SE 10-04767, Revise BVPS-2 UFSAR Section 9.1.2.2 - Spent Fuel Pool Storage, Revision 0

SE 11-00626, BVPS2 Assessment of Containment Response for DBAs for Containment Atmospheric Conversion Project, Revision 1

SE 11-03183, Examination of Underground CCP Piping from Unit 2 Auxiliary Building to Spent Fuel Pool Heat Exchangers, Revision 0

SE 11-03466, Beaver Valley Unit 1 Spent Fuel Pool Criticality Analysis Revised Code Bias Uncertainty, Revision 0

SE 11-05225, BVPS2 Pressurizer Surge Line Leak Before Break/Structural Weld Overlay Analysis, Revision 0

SE 12-02677, BV-2 RWST Silica Cleanup, Revision 0

SE 12-03459, BV-2 Yard Excavation Between Pipe Trench and Electrical Manhole BV-2EMH2B, Revision 0

SE 12-03475, BVPS2 Reactor Coolant Pump Shutdown Seal, Revision 0

SE 12-04555, BV-2 Safeguards Pipe Tunnel Open Concrete Access Plugs, Revision 0

10 CFR 50.59 Screened-out Evaluations

10-00931, Joint Owners Group MOV Program Implementation - 2R15, Revision 0

10-01864, Install Mechanical Seals on 2FWE-P23A,B, Revision 0

10-02492, Supplemental Leak Collection Flow Requirements for the Unit 1 Charging Pump (CH-P-1A, CH-P-1B, CH-P-1C) Cubicles (DBA Alignment), Revision 0

10-03178, Calculation of Setpoints for Steam Generator Leak Rate Monitors, Revision 0



- 10-03387, Revision to UFSAR Section - 9.5.6, BVPS-2 Diesel Generator Air Start System Requirements, Revision 0
- 10-03455, Revision to Unit 1 and Unit 2 License Requirement 3.1.8 Borated Water Sources-Operating Conditions B and C, Revision 0
- 10-03652, Revision to Completion Time for BVPS1 License Requirement 3.7.2 (Flood Protection), Condition C and BVPS2 License Requirement 3.7.2 (Flood Protection), Condition C and Associated Bases, Revision 0
- 10-03925, LDCN 10-130; Unit 1 Cycle 21 COLR Changes Due to Core Design, Revision 0
- 10-04557, Retirement of the TOTE Data Analysis Mainframe Software Which is Replaced by BEACON, "Burnup Tracking and Isotopics Function" as Appropriate, Revision 0
- 10-05235, BV1 RCS Precision Flow Calorimetric Uncertainty, Revision 0
- 11-00059, BVPS2 Defeating Containment Air Lock Door Interlocks, Revision 0
- 11-00531, Seismic Evaluation of ABB COM Overcurrent Relays Revised Seismic Qualification Level, Revision 0
- 11-00576, BVPS2 Alternate RCP Seal Injection System for EDG MSPI Margin Improvement, Revision 0
- 11-00713, Alignment of Excore Instrumentation for Startup After Reload, Revision 0
- 11-02043, BVPS1 Eliminate BV-MOV-1QS-103A and the 8" Bypass line QS-46-153A-Q3, Revision 0
- 11-02148, BVPS1 Install Strainer on River Water Supply Line to Auxiliary Feed Water Pumps (FW-P-2, FW-P-3A and FW-P-3B), Revision 0
- 11-03352, Replace Unit 2 MCC 480V Breakers, Revision 0
- 12-00387, UFSAR and COLR Changes Due to the Unit 1 Cycle 22 Core Design, Revision 0
- 12-01098, BVPS2 Battery Technical Specification Bases Change, Revision 0
- 12-01926, Operation of the Reactor Plant River Water System with Normal Return Flow Path to Unit 1/2 Blowdown Isolated, Revision 0

#### Modification Packages

- ECP 08-0032-002, Replacement of BV1 Vital Bus Alternate Source Regulating Transformers, Revision 0\*
- ECP 10-0061-012, Replace Actuator Motor and Change Actuator Setup for BV-2RSS-MOV156C, Revision 0
- ECP 10-0163-002, Motor Driven Auxiliary Feedwater Pump (BV-2FWE-P23B) Mechanical Seal Upgrade, Revision 0
- ECP 10-0440-000, BV1 EDG Speed Switch Replacement, Revision 0\*
- ECP 10-0551, Install Strainer in RW Supply Line to AFW Pumps (1FW-P-3A and 1FW-P-3B) Downstream of 1-RW-207, Revision Revision 0
- ECP 10-0613, Alternate RCP Seal Injection System Isolation Points for EDG MSPI Margin Improvement (Safety Injection System Isolation "Tie-In" Installation), Revision Revision 0
- ECP 11-0296-004, MOV-1RW-103C, BV1 River Water Motor Operated Valve Replacement, Revision 9\*
- ECP 11-04083, River Water Motor Operated Valve Replacements (1R21), Revision 0\*
- ECP 11-0706, Installation of RCP Shutdown Seal / Floating Ring Seal Removal, Revision 0
- ECP 12-0427, Install Additional Water Seal above Existing Water Stop Between Control Building and Cable Tunnel, Revision 0\*
- ECP 12-0746-02/04, Install a New 4" Valve (2SWS-1232) and use a Freeze Seal on 2-SWS-004-191-3 Piping for Isolation, Revision 0\*

ECP-06-0042-01, Replace the Unit 2 Emergency Diesel Generator Tachometer Signal Generator, Revision 0

(\*modification that is also a 10 CFR 50.59 screen-out evaluation sample not previously listed)

Calculations, Analysis, and Evaluations

10080-US(B)-239, Assessment of Beaver Valley Unit 2 Containment Response for Design Basis Accidents for Containment Atmospheric Conversion Project, Revision 2

8700-DMC-1392, BVPS1 AFW Model Development, Revision 0

8700-DMC-2500, Supplemental Leak Collection Flow Requirements for the Unit 1 Charging Pump (CH-P-1A, CH-P-1B, CH-P-1C) Cubicles (DBA Alignment), Revision 2

8700-DMC-3664, Beaver Valley Unit 1 Spent Fuel Pool Criticality Analysis Revised Code Bias Uncertainty, Revision 0

8700-DQC-0238, Seismic Evaluation of ABB COM Overcurrent Relays Revised Seismic Qualification Level, Revision 0

8700-US(P)-269, Beaver Valley Unit 1 (DLW) HZP Steamline Break for the 9.4% Up-rating and Steam Generator Replacement, Revision 2

PRA-BV3-11-001-R00, BVPS-1 and BVPS-2 Equipment Hatch Missile Shield Removal Risk Analysis, Revision 0

Condition Reports

2007-24307	2012-01319	2013-01555*	2013-02224*
2008-47469	2012-03059	2013-01627*	2013-02326*
2010-76437	2012-07114	2013-01641*	2013-02331*
2010-77096	2012-07256	2013-01786*	2013-02339*
2010-83496	2012-16815-2	2013-01915*	2013-02377*
2010-84146	2013-01151*	2013-02151*	
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(\* denotes NRC identified during this inspection)

Drawings

06.060-0162, Model 85 Y-Strainer 150# RF, Revision A

10080-RC-24J, Sht. 1, Alternate Intake Structure Electrical Manholes, Revision 7

10080-RC-24K, Sht. 2, Alternate Intake Structure Electrical Manholes, Revision 7

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10080-RE-32A, Sht. 1, Arrangements Ductline Plan & Details, Revision 12

10080-RE-32C, Sht. 1, Manholes & Ductline Details, Revision 12

10080-RE-32E, Sht. 3, Arrangements Ductline Plan & Details, Revision 15

10080-RM-0407-003, RCP Seal Water/Excess Letdown, Revision 18

10080-RM-0411-002, Safety Injection Accumulators/Nitrogen, Revision 19

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8700-RC-18A, BVPS1 Key Plan Nuclear Station Area Foundation, Revision 11

8700-RC-8S, Sht. 1, BVPS1 Control Room Extension, Revision 10

8700-RC-8W, BVPS1 Electrical Cable Tunnel-Plan & Sects Control Room Extension, Revision 7

8700-RM-0424-001, Feedwater System, Revision 17

8700-RM-0424-002, Feedwater System, Revision 15

8700-RM-0430-003, Piping & Instrumentation Diagram River Water System, Revision 25  
8700-RM-0430-003, River Water System, Revision 25  
CBD-08-0032-24, Cable Block Diagram BV1 Vital Bus Alternate Source Regulator Busses 2 & 4, Revision 1  
SK-1950F14G, Cast Steel Bolted Bonnet Globe Valve, Revision G  
SK-E08-0032-2-1, BV1 Partial View of Switchgear Room, Revision 0

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1DBD-24B, Design Basis Document for AFW, Revision 12  
1DBD-30, Design Basis Document for RW, ARW, and RAW Water Systems, Revision 18  
Beaver Valley Power Station Improved Standard Technical Specifications, Amendment 289/176  
Beaver Valley Power Station Unit 1, Technical Specification License Amendment Request No. 287, dated 3/28/01  
Beaver Valley Power Station, Unit 1 Updated Final Safety Analysis Report, Revision 27  
Beaver Valley Power Station, Unit 2 Updated Final Safety Analysis Report, Revision 19  
Beaver Valley Unit 1, Licensing Requirements Manual, Revision 78  
Beaver Valley Power Station Unit 1, Technical Specification Amendment No. 246 dated 1/24/02  
BVPS Units 1 and 2 License Amendment 247 and 126, Reduction in Minimum Decay Time Required Prior to Fuel Movement, dated 1/29/02  
BVPS2 Inservice Testing Program for Pumps and Valves, Revision 9  
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BVPS2 UFSAR Change Notice 11-020  
BVPS2 UFSAR Change Notice 11-030  
BVPS2 UFSAR Change Notice 11-065  
BVPS2 UFSAR Change Notice 11-245  
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Miscellaneous

Eval-01-066, Westinghouse Generic - Implementation of Robust Fuel Assembly-2 Design Change, Revision 4  
Eval-09-08, Westinghouse Generic - 17x17 Standardized Debris Filter Bottom Nozzle with Flow Hole Elimination, Revision 0  
Eval-10-12, Westinghouse Generic - 17x17 Robust Protective Grid (RPG), Revision 1  
FENOC-12-135, Transmittal of Shutdown Seal Seismic Testing Results - 2R16 SHIELD Project, dated 11/07/12  
NEI 96-7, Guidelines for 10 CFR 50.59 Evaluations, Rev. 1  
NF-DL-10-02, Transmittal of SLB/M/Es for Beaver Valley Unit 2 Using Increased Stuck Rod Coefficients, dated 12/15/12  
NRC Memorandum, Relationship between the General Design Criteria and Technical Specifications, dated 1/24/94  
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Waterford 3 License Amendment 182, Regarding Approval of Leak-Before-Break of the Pressurizer Surge Line, dated 2/28/11  
WCAP-15264, Westinghouse Revised Thermal Design Procedure Instrument Uncertainty Methodology – Beaver Valley Power Station Unit 1, Revision 4  
WCAP-16612-P, BVPS2 Pressurizer Safety/Relief, Spray, and Surge Nozzles Structural Weld Overlay Qualification, Revision 0

WCAP-17394-P, Leak-Before-Break Analysis Update for the BVPS2 Pressurizer Surge Line, Revision 0

WCAP-17541-P, Implementation Guide for the Westinghouse RCP SHIELD Passive Thermal Shutdown Seal, Revision 0

Wind Speed Plots, dated 10/27/12 – 11/02/12

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1/2OM-53C.4A.75.1, Acts of Nature - Tornado or High Wind Condition, Revision 15

1/2OST-30.21B, Group 2 Flood Door Seal System Operability Check, Revision 7

1/2-PIP-G02, Min. Seismic Clearance for Mechanical and Electrical Components, Revision 6

100115753, Sulzer as Found Report & Repair Plan, Dated 12/21/12

1BVT 1.6.1, Reactor Coolant System Flow Measurement, Revision 23

1OM-24.4.AAG, Prim Plant Demin Water Storage Tank Level Low-Low WT 104-A1, Revision 1

1OM-30.4.AB, Operation of the Reactor Water System with Normal Return Flow Path to Unit 1/2 Blowdown Isolated, Revision 10

1OM-56C.4.F-12, Establishing Portable Emergency Ventilation, Revision 10

1OM-56C.4.F-2, Transferring AFW Pump Suction to RW Supply, Revision 14

2BVT-1.60.6, ASME and Non-ASME Check Valve Reverse Flow Test, Revision 16

2OM-13.4N, RWST Silica Removal, Revision 0

2OM-53A.1.ECA-0.0(ISS1C), Loss of All AC Power, Revision 12

2OM-53A.1.ES0.2(ISS1C), Natural Circulation Cooldown, Revision 11

2OM-53A.1.ES0.3(ISS1C), Natural Circulation Cooldown With Steam Void in Vessel (With RVLIS), Revision 7

2OM-53A.1.ES0.4(ISS1C), Natural Circulation Cooldown With Steam Void in Vessel (Without RVLIS), Revision 10

2OM-53B.4.ECA-0.0(ISS1C), Loss of All AC Power Background, Revision 12

2OM-53B.4.ES0.2(ISS1C), Natural Circulation Cooldown Background, Revision 11

2OM-53B.4.ES0.3(ISS1C), Natural Circulation Cooldown With Steam Void in Vessel (With RVLIS) Background, Revision 7

2OM-53B.4.ES0.4(ISS1C), Natural Circulation Cooldown With Steam Void in Vessel (Without RVLIS) Background, Revision 10

2OM-53C.4.2.6.8, Abnormal RCP Operation, Revision 8

2OST-36.1, Emergency Diesel Generator [2EGS\*EG2] Monthly Test, Revision 60

CM-2-3.43, Primary Plant Demineralized Water Storage Tank, Revision 6

ES-M-013, Environmental Conditions for Equipment Qualification Requirements, Revision 7

NOBP-LP-4003A, FENOC 10 CFR 50.59 User Guidelines, Revision 7

NOP-CC-2003, Engineering Changes, Revision 17

NOP-CC-2003-18, Reload Safety Evaluation – Unit 1 Cycle 22, Revision 0

NOP-CC-2004-09, Design Interface Reviews and Evaluations, Revision 10

NOP-CC-2007, Part/Component Equivalent Replacement Packages, Revision 3

NOP-LP-4003, Evaluation of Changes, Tests and Experiments, Revision 7

NOP-LP-4008, Licensing Document Change Process, Revision 3

NOP-OP-1009, Operability Determinations and Functionality Assessments, Revision 3

NOP-WM-5003, Rigging, Lifting and Load Handling, Revision 3

RM-0413-002, BVPS Unit 2 Quench Spray System, Revision 20

RM-0420-001, BVPS Unit 2 Fuel Pool Cooling and Purification, Revision 11

RM-0430-002, BVPS Unit 2 Service Water Primary Cooling, Revision 41

Work Orders

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200293703	200438475	200477130	200514242
200297889	200440861	200477132	200535480
200308124	200447301	200477133	
200403236	200461291	200481474	

**LIST OF ACRONYMS**

ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feed Water
CFR	Code of Federal Regulations
COLR	Core Operating Limits Report
CR	Condition Reports
CVCS	Charging and Volume Control Systems
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
FENOC	First Energy Nuclear Operating Company
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
LAR	License Amendment Request
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PARS	Publicly Available Records
PMT	Post Modification Test
RCP	Reactor Coolant Pump
RW	River Water
SDS	Shutdown seal
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report