



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

January 24, 2018

Mr. Rich Bologna  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
P. O. Box 4, Route 168  
Shippingport, PA 15077

**SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – INTEGRATED  
INSPECTION REPORT 05000334/2017004 AND 05000412/2017004 AND  
INDEPENDENT SPENT FUEL STORAGE INSTALLATION REPORT  
07201043/2017001**

Dear Mr. Bologna:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Beaver Valley Power Station, Units 1 and 2. On January 11, 2018, 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.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, 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 Beaver Valley Power Station. In addition, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 Beaver Valley Power Station.

R. Bologna

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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 the NRC's Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Silas Kennedy, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

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

Enclosure:  
Inspection Report 05000334/2017004  
and 05000412/2017004 w/Attachment:  
Supplementary Information

cc w/encl:  
Distribution via ListServ

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – INTEGRATED INSPECTION REPORT 05000334/2017004 AND 05000412/2017004 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION REPORT 07201043/2017001 DATED JANUARY 24, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

Docket Nos.: 50-334 and 50-412

License Nos.: DPR-66 and NPF-73

Report No.: 05000334/2017004 and 05000412/2017004 and 07201043/2017001

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station (BVPS), Units 1 and 2

Location: Shippingport, PA 15077

Dates: October 1, 2017 through December 31, 2017

Inspectors: J. Krafty, Senior Resident Inspector  
S. Haney, Senior Resident Inspector (Acting)  
S. Horvitz, Resident Inspector  
J. DeBoer, Emergency Preparedness Inspector  
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K. Warner, Health Physicist

Approved By: Silas Kennedy, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Report 05000334/2017004; 05000412/2017004 and 07201043/2017001;  
10/01/2017 – 12/31/2017; Beaver Valley Power Station (BVPS) Units 1 and 2; Other Activities

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified one non-cited violation (NCV) of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated November 15, 2016. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (NRC) requirements are dispositioned, in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Cornerstone: Occupational Radiation Safety

- Green. A self-revealing, very low safety significance NCV of Technical Specification (TS) 5.7.1 for failure to control a high radiation area (HRA) was identified. On November 8, 2017, during independent spent fuel storage installation (ISFSI) dry cask loading campaign activities, the failure of multiple barriers resulted in a worker gaining access to an HRA while signed onto an incorrect radiation work permit (RWP) and a subsequent dose rate alarm. Specifically, a worker signed on to an incorrect RWP during a break, and did not recognize that the surveyed work area dose rates were higher than the RWP setpoints. Additionally, radiation protection personnel controlling access to the HRA failed to ensure that the worker was on the correct RWP per plant procedure requirements for a subsequent entry into an HRA. This resulted in the worker entering an HRA under the incorrect RWP and receiving a dose rate alarm of 1,070 millirem per hour. Upon receiving a dose rate alarm, the worker backed away from the area and reported the issue to radiation protection personnel. FENOC's immediate corrective actions included putting the work in a safe condition, performing follow-up surveys, and verifying remaining personnel trip tickets to ensure all individuals were on the correct RWP. FENOC entered the issue into their corrective action program (CAP) as condition report (CR) 2017-11206.

The failure to control access to an HRA is a performance deficiency that was within FENOC's ability to foresee and correct and should have been prevented. The performance deficiency is more than minor because it is associated with the Program and Process attribute (Procedures) of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine reactor operation. Specifically, the failure of multiple barriers resulted in a worker gaining access to an HRA while signed on to an incorrect RWP and receiving a dose rate alarm. IMC 0612, Appendix E, Section 6, "Health Physics, General Screening Criteria," states that a performance deficiency involving more than one barrier or the loss of a significant barrier would be classified as a more-than-minor performance deficiency. Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low significance (Green) because: (1) it was not an as low as reasonably achievable (ALARA) finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. The finding was a human performance cross-cutting aspect associated with avoiding complacency because FENOC failed to ensure individuals recognize and plan for the possibility of mistakes and ensure individuals implement the appropriate error reduction tools, even when expecting a successful outcome [H.12] (Section 40A5).

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On November 7, 2017, the reactor automatically tripped due to an automatic turbine trip. Foreign material in the iso-phase bus ducts caused an electrical fault and a main generator protection trip. Following inspection and cleaning, operators returned the unit to 100 percent power on November 12, 2017. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 operated at or near 100 percent power for the entire inspection period.

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors reviewed FENOC's readiness for the onset of seasonal low temperatures. The review focused on the emergency diesel generators (EDGs) and the intake structure. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure FENOC personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including FENOC's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### Partial System Walkdowns (71111.04 – 3 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2, outside recirculation spray system (RSS) following '2B' RSS pump test on October 19, 2017
- Unit 2, 'B' train quench spray pump (QSS) following 'B' train comprehensive pump test on October 24, 2017
- Common, diesel-driven fire pump and the general distribution center fire pump with the motor-driven fire pump out of service (OOS) on December 20, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders, CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether FENOC staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 3 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that FENOC controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 2, cable tunnel (fire area 2-CT-1) on October 12, 2017
- Unit 2, fan room (fire area CB-5) on October 12, 2017
- Unit 1, process instrument room (fire area CR-4) on October 23, 2017

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed Unit 1 licensed operator simulator training on October 16, 2017, which included a feed pump trip with a turbine trip failure after a manual reactor trip followed by a steam generator tube rupture and a failure of the 'B' charging pump to start. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the



clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed the Unit 2 turbine throttle and governor valve test on November 18, 2017. The inspectors observed shift turnover briefings, pre-job briefings, and reactivity control briefings to verify that the briefings met the criteria specified in FENOC's Procedure NOP-OP-1002, "Conduct of Operations," Revision 12. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)

a. Inspection Scope

The inspectors reviewed the unit 1 compressed air system on November 9, 2017, to assess the effectiveness of maintenance activities on structure, system, and component performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that FENOC was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the structure, system, or component was properly scoped into the maintenance rule in accordance with Title 10 of the *Code of Federal Regulations* (CFR) 50.65 and verified that the (a)(2) performance criteria established by FENOC staff was reasonable. As applicable, for structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components to (a)(2). Additionally, the inspectors ensured that FENOC staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 3 samples)a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that FENOC performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that FENOC personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When FENOC performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 2, planned maintenance on the 'B' system station service transformer (SSST), the 'B' QSS pump, and the emergency response facility 1H-1G tie breaker on October 24, 2017
- Unit 1, yellow risk for racking 'B' river water pump breaker onto the 4160 volts alternating current DF bus on November 16, 2017
- Unit 2, planned maintenance on the 'C' auxiliary feedwater pump on December 27, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Unit 2, residual heat release valve piping drain valve, 2SDS\*AOV139A, stroke time outside of acceptable range on October 11, 2017
- Unit 2, containment airborne particulate monitor, 2RMR-RQI303, calibrated with out of tolerance measurement and test equipment on November 1, 2017
- Unit 1, EDG 1-1 local circuit annunciator following EDG shutdown on November 2, 2017
- Unit 1 and 2, control room envelope test results exceeded acceptance criteria on November 22, 2017

The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to FENOC's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 4 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 1 and 2, diesel driven fire pump maintenance on October 11, 2017
- Unit 2, EDG 2-1 building outside air damper, 2HVD-MOD22A, inspection and lubrication on October 12, 2017
- Unit 2, 'B' SSST relay calibration and testing on October 19, 2017
- Unit 1, EDG 1-1 relay K10 replacement on November 29, 2017

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's unit 1 activities for the forced outage (1FOAC6), which was conducted from November 7, 2017 to November 12, 2017, following the reactor automatically tripping due to a turbine trip. The inspectors reviewed FENOC's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. The unit remained in Mode 3 (Hot Standby) throughout the forced outage.

During the outage, the inspectors observed portions of the shutdown and cooldown process and monitored controls associated with the following outage activities:

- Configuration management and compliance with the applicable TSs when taking equipment OOS
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Monitoring of decay heat removal operations
- Activities that could affect reactivity
- Identification and resolution of problems related to forced outage activities
- Observed startup/grid synchronization activities on November 12, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied TSs, the UFSAR, and FENOC procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied.

Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- 3BVT 1.44.1, control room emergency supply fan pressurization test on October 11, 2017
- 1MSP-6.06-I and 1MSP-6.07-I, reactor coolant flow loop 1 and 2 channel II tests on October 18, 2017
- 2MSP-6.04-I and 2RCS-F424, reactor coolant flow loop 2 channel I test on November 1, 2017
- 1OST-49.2, shutdown margin calculation (plant shutdown) (updated for cycle 25) on November 7, 2017
- 2OST-26.1, turbine throttle and governor valve test on November 18, 2017
- 1MSP-39.08-E, battery 1-3 inspection and interconnection resistance check on December 5, 2017

b. Findings

No findings were identified.

### **Cornerstone: Emergency Preparedness**

#### 1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04 – 1 sample)

##### a. Inspection Scope

FENOC implemented various changes to the Beaver Valley EALs, Emergency Plan, and Implementing Procedures. FENOC had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR 50, Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by FENOC as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the Emergency Plan. This review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

##### b. Findings

No findings were identified.

## **2. RADIATION SAFETY**

### **Cornerstone: Occupational and Public Radiation Safety**

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

##### a. Inspection Scope

The inspectors reviewed FENOC's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, Regulatory Guide (RG) 8.38, and the procedures required by TSs as criteria for determining compliance.

##### Inspection Planning

The inspectors reviewed the performance indicators (PIs) for the occupational exposure cornerstone, radiation protection program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

##### Contamination and Radioactive Material Control (1 sample)

The inspectors observed the monitoring of potentially contaminated material leaving the radiological controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were properly inventoried and were tested for loose surface contamination.

The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

The inspectors assessed FENOC's performance with respect to maintaining occupational individual and collective radiation exposures ALARA. The inspectors used the requirements contained in 10 CFR 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted a review of Beaver Valley's collective dose history and trends; ongoing and planned radiological work activities; previous post-outage ALARA reviews; radiological source term history and trends; and ALARA dose estimating and tracking procedures.

Implementation of ALARA and Radiological Work Control (1 sample)

The inspectors reviewed radiological work controls and ALARA practices during the observation of in-plant work activities. The inspectors verified use of shielding, contamination controls, airborne controls, RWP controls, and other work controls were consistent with ALARA plans. The inspectors ensured that work-in-progress reviews were performed in a timely manner and adjustments made to the ALARA estimates when appropriate. The inspectors reviewed the results achieved against the intended ALARA estimates to confirm adequate implementation and oversight of radiological work controls. The inspectors also verified that the ALARA staff was involved with emergent work activities and were revising both dose estimates and ALARA controls in the associated RWPs/ALARA Plans, as appropriate.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 2 samples)

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, RGs 8.9 and 8.34, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed radiation protection program audits, National Voluntary Laboratory Accreditation Program dosimetry testing reports and procedures associated with dosimetry operations.

### Internal Dosimetry (1 sample)

The inspectors reviewed internal dosimetry procedures, whole body counter measurement sensitivity and use, adequacy of the program for whole body count monitoring of plant radionuclides or other bioassay technique, adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection, and internal dose assessments for any actual internal exposure.

### Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the CAP.

#### b. Findings

No findings were identified.

## **4. OTHER ACTIVITIES**

### 4OA1 Performance Indicator Verification (71151)

#### .1 Occupational Exposure Control Effectiveness (1 sample)

##### a. Inspection Scope

The inspectors reviewed licensee submittals for the occupational radiological occurrences PI for the first quarter 2016 through the third quarter 2017. The inspectors used PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Revision 7, to determine the accuracy of the PI data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized PI occurrences. The inspectors conducted walkdowns of various Locked High and Very High Radiation Area entrances to determine the adequacy of the controls in place for these areas.

##### b. Findings

No findings were identified.

#### .2 Radiological Effluent TS/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (1 sample)

##### a. Inspection Scope

The inspectors reviewed licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the first quarter 2016 through the third quarter 2017. The inspectors used PI definitions and guidance contained in the NEI 99-02, Revision 7, to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

b. Findings

No findings were identified.

.3 Reactor Coolant System (RCS) Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed FENOC's submittal for the RCS specific activity and RCS leak rate PIs for both Unit 1 and Unit 2 for the period of October 1, 2016, to September 30, 2017. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the PI. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152 – 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify FENOC entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, FENOC performed an evaluation in accordance with 10 CFR 21.

b. Findings

No findings were identified.



## .2 Annual Sample: Radiation Monitoring Instrumentation

### a. Inspection Scope

This was a follow-up problem identification & resolution inspection from the 2016003 quarterly inspection report. The inspectors performed an in-depth review of FENOC's causal analysis and corrective actions associated with CR 2016-01155, Radiation Monitoring System availability and CRs 2016-09741, CR 2016-09767, and CR 2016-01155. Specifically, the inspectors reviewed FENOC's response to the identified marginal effectiveness of the Radiation Monitoring System high impact team (HIT) and lack of management sponsorship. The inspectors assessed FENOC's problem identification threshold, cause analysis, and the prioritization and timeliness of corrective actions to determine whether FENOC was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of FENOC's CAP. In addition, the inspectors interviewed personnel from system engineering, nuclear oversight, performance improvement and reviewed CRs and procedures to assess the effectiveness of the implemented corrective actions. The inspectors also reviewed the meeting minutes of the Radiation Monitor Make It Happen (MIH) team and radiation monitors OOS spreadsheets.

### b. Findings and Observations

No findings were identified.

The inspectors concluded that the Radiation Monitor MIH team was effective in identifying equipment issues and prioritizing equipment repair. The team has a charter, senior management support, and metrics to assess progress. The Director of Engineering has been assigned as the MIH team sponsor. The team has identified monitors that are redundant and can be retired. Engineering change requests/evaluations are currently in progress to retire four additional monitors.

The current total number of monitors OOS is 12. This is an improvement over the last inspection especially considering that the team now has identified that two monitors are degraded but functional, four monitors are identified for retirement, three monitors are identified for upgrade, and three monitors are identified in need of repair. In the previous inspection, there were greater than 20 monitors OOS per month, and the HIT team had not categorized the OOS condition of those monitors. The average OOS monitors per month for the past year has been 12. As the redundant monitors are retired the average OOS monitors will decrease and will free up resources to be more effectively used for other priorities. The upgrades include replacement of hardware and software systems. This project now has funding approval and when implemented, will further reduce the number of OOS monitors. The three monitors in need of repair are in the maintenance queue with the appropriate or conservative priority to ensure the repairs are timely.

In the previous inspection, it was noted there was a lack of participation at the HIT team meetings. The MIH team meets twice monthly and the meetings are attended by the principal team members or alternates regularly. The MIH team meets monthly with senior management to provide status updates and present areas needing management input and/or resolution. Due dates are set appropriately and are reviewed regularly to meet expectations. The team also submits CRs when needed to address parts and schedule issues. All apparent cause corrective actions have been completed.

### .3 Annual Sample: Control Room Emergency Ventilation System (CREVS) Corrective Actions

#### a. Inspection Scope

The inspectors performed an in-depth review of FENOC's causal analysis and corrective actions associated with CR 2016-03836, "NCV for Failure to Properly Evaluate CREVS Test Results." The inspectors also reviewed the corrective actions that resulted from the 2016 Control Room Air In-Leakage Test, 3BVT 1.44.05, and the results of the November 2017 test. The purpose was to determine if corrective actions were appropriate and effective in addressing the cause of the NCV and in restoring normal mode ventilation intake rates and recirculation and pressurization mode in-leakage rates to design basis limits as specified in the UFSAR.

#### b. Findings and Observations

No findings were identified.

The causal evaluation for CR-2016-03836, "NCV for Failure to Properly Evaluate CREVS Test Results" determined that the apparent cause was intra/interdepartmental communication breakdowns, which lead to an inadequate investigation and evaluation of the untested mode uncertainties of CREVS in December 2015. The evaluation also concluded that a contributing factor was that the individuals involved in the test lacked experience with the system and the test. The corrective actions included adding updated limits from the engineering evaluation into the acceptance criteria, requiring that the four required tests be completed before evaluating the results, and requiring a pre-job brief with operations, engineering, and site leadership to ensure interdepartmental communication. The inspectors determined that the corrective actions implemented should be adequate to address the apparent cause.

Corrective actions following the 2016 CREVS test included installing backdraft dampers on the discharge of the Unit 1 recirculation fans, inspecting and cleaning the Unit 1 control room intake and exhaust isolation dampers, and adjusting balance dampers to maintain a positive pressure in the control room envelope. The 2017 test results showed improvement from the 2016 test results in the normal mode (687 standard cubic feet per minute [scfm] versus 1077 scfm unfiltered flow), recirculation mode (207 scfm versus 366 scfm in-leakage), and Unit 1 pressurization mode (85 scfm versus 89 scfm). Test results were slightly worse for the Unit 2 pressurization mode (93 scfm versus 86 scfm in-leakage). Although the majority of the 2017 test results showed improvement, only the recirculation mode met the design basis limit of 300 scfm in-leakage. Although the inspectors concluded that the corrective actions were only partially effective, test results were entered into the appropriate computer models, which showed that the 5 rem total effective dose equivalent limit to the control room personnel would not be exceeded. FENOC performed a prompt operability determination and concluded that CREVS was operable but nonconforming. The inspectors reviewed the prompt operability determination and determined that FENOC's conclusion was appropriate. Since the test acceptance criteria was increased through recalculation of the consequences to the control room operators, a full test will need to be conducted in three years in accordance with the guidance in RG 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors."

#### .4 Annual Sample: Review of River Water Supply Piping Degradation and Through-Wall Leaks

##### a. Inspection Scope

The inspectors reviewed the corrective actions taken in response to a FENOC staff observed trend of degradation and through-wall leaks in the river water supply piping to the recirculating spray heat exchangers at Unit 1. During normal operation, the river water system provides a continuous supply of cooling water to cool at least one primary plant component cooling water heat exchanger, one charging pump lube oil cooler, one control room air conditioning condenser or one control room river water cooling coil, and is backup to the filter water system for motor bearing cooling water and pump bearing lubrication water to the river water and raw water pumps. In the event of a design basis accident, the river water system supplies cooling water to a minimum of two RSS heat exchangers, one charging pump lube oil cooler, one control room river water cooling coil, and one EDG cooling system heat exchanger.

The inspectors assessed FENOC staff's evaluations and implemented or planned corrective actions to evaluate whether FENOC staff appropriately identified, characterized, and corrected problems associated with River Water supply piping leaks. The inspectors compared the actions taken to the FENOC CAP and the requirements in 10 CFR 50, Appendix B, with a focus on applicable repair standards for corrective actions. The inspectors reviewed associated documents, had discussions with FENOC personnel and walked down piping to assess the adequacy of FENOCs evaluations and corrective actions.

##### b. Findings and Observations

No findings were identified.

The corrective actions taken in response to degradation and through-wall leaks in the river water supply piping were timely and complete commensurate with the importance of the system. The inspectors determined FENOC followed the provisions in American Society of Mechanical Engineers (ASME) Nuclear Code Case N-513-3 "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," as endorsed by the NRC in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," when dispositioning the operability of the affected pipe and establishing the scope of the examination required to determine the extent of condition. FENOC staff documented the leak problems in the CAP in a timely manner. The inspectors concluded FENOC staff considered the cause, generic implications, common cause, and previous occurrences for micro-biological induced corrosion in the system.

The prioritization and resolution was commensurate with the safety significance of the system and resulted in a trend identified with long term actions proposed to moderate the negative effects of subsequent through wall leaks. The inspectors reviewed a causal determination that did not result in a conclusive cause of the unexpected corrosion but did result in a corrective action addressing likely causes. The inspectors determined that FENOC staff identified corrective actions that were appropriately focused to correct the problem. The corrective actions, including pipe segment replacement, pipe window repair, and pipe patching were appropriate. For example the inspectors found the application of a welded patch on a section of the river water system BV-WR-20, between WR-101 and WR-19, complied with ASME Code Case N-789.

The completion of the corrective actions were implemented in a timely manner. The inspectors determined operating experience was adequately evaluated for applicability, and applicable lessons learned are communicated to appropriate organizations and implemented.

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

##### .1 Plant Events

###### a. Inspection Scope

Following the Unit 1 reactor trip on November 7, 2017 (Event Notice 53056), the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that FENOC made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72 and 50.73. The inspectors reviewed FENOC's follow-up actions related to the events to assure that FENOC implemented appropriate corrective actions commensurate with their safety significance.

###### b. Findings

No findings were identified.

##### .2 (Closed) Licensee Event Report (LER) 05000334/2017-002-00: Beaver Valley Power Station Unit 1 Inadequate EDG Tornado Missile Protection Identified Due to Non-conforming Design Conditions

On July 19, 2017, FENOC declared both Unit 1 EDGs inoperable due to inadequate tornado missile protection for the engine exhaust piping. Compensatory measures were implemented within the time allowed by the applicable limiting condition for operation and both EDGs were declared operable but nonconforming in accordance with the guidance in Enforcement Guidance Memorandum 15-002, Revision 1. The enforcement aspects of this issue were discussed in inspection report 05000334/2017003 and 05000412/2017003. The inspectors verified that FENOC implemented additional 60 day compensatory measures as required by Enforcement Guidance Memorandum 15-002. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

#### 4OA5 Other Activities

##### Operation of an ISFSI at Operating Plants (60855, 60855.1)

###### a. Inspection Scope

On October 23-26, 2017, the inspectors observed and evaluated BVPS's loading of the fourth dry shielded canister (DSC) associated with their 2017 six cask ISFSI dry cask loading campaign.

The inspectors also reviewed the licensee's planned activities related to long-term operation and monitoring of the ISFSI. The inspectors verified compliance with the Certificate of Compliance (CoC), TS, regulations, and station procedures.

The inspectors observed DSC processing operations including: welding, non-destructive weld examinations, helium leak testing, draining, vacuum drying, pressure testing, helium backfill, decontamination, and surveying. The inspectors observed the heavy lift of the transfer cask (TC)/DSC out of the spent fuel pool into the decontamination building and the subsequent down-ending onto the self-propelled mobile transporter. The inspectors observed the alignment and insertion of the TC/DSC into the horizontal storage module (HSM). During performance of these activities, the inspectors verified that procedure use, communication, and coordination of ISFSI activities met established BVPS standards and requirements. The inspectors attended licensee briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors. The inspectors reviewed loading and monitoring procedures and evaluated FENOC's adherence to these procedures.

The inspectors reviewed BVPS's program associated with fuel characterization and selection for storage. The inspectors reviewed the fourth cask fuel selection package to verify that the licensee was loading fuel in accordance with the CoC, TS, and procedures. The inspectors confirmed that the licensee did not plan to load any damaged fuel assemblies during this campaign. The inspectors reviewed the special nuclear material physical inventory verification for the canisters on the pad.

The inspectors observed radiation protection technicians as they performed surveys and provided job coverage for the cask loading workers. The inspectors reviewed survey data maps and radiological records from the previous DSC loadings to confirm that radiation survey levels measured were within limits specified by the TS and consistent with values specified in the UFSAR. The inspectors also reviewed the ALARA goal for the cask loading to determine the adequacy of FENOC's radiological controls, to ensure that radiation worker doses were ALARA, and that project dose goals could be achieved. The inspectors reviewed survey data maps and radiological records from the DSC loading to confirm that radiation survey levels measured were within limits specified by the TS and consistent with values specified in the UFSAR.

The inspectors performed a walk-down of the heavy haul path and toured the ISFSI pad to assess the material condition of the path, pad and the HSMs. The inspectors also verified that either transient combustibles were not being stored on the ISFSI pad and the vicinity of the HSMs or that proper permits were in place. The inspectors checked the daily logs and verified the licensee was appropriately performing daily HSM temperature surveillances in accordance with TS requirements. The annual environmental reports were reviewed to verify that areas around the ISFSI site boundary were within limits specified in 10 CFR 20 and 10 CFR 72.104.

The inspectors reviewed selected 10 CFR 50.59 and 72.48 screenings to verify that the licensee had appropriately considered the conditions under which they may make changes without prior NRC approval. The inspectors also reviewed corrective action reports and the associated follow-up actions that were generated to ensure that issues were entered into the CAP, prioritized, and evaluated commensurate with their safety significance.

b. Findings

Introduction. The inspectors reviewed a self-revealing Green NCV of TS 5.7.1 for failure to control an HRA. On November 8, 2017, during ISFSI dry cask loading campaign activities, the failure of multiple barriers resulted in a worker gaining access to an HRA while signed onto an incorrect RWP and a subsequent dose rate alarm.

Description. On November 8, 2017, during ISFSI dry cask loading campaign activities, a worker entered an HRA while signed on to an incorrect RWP. As a result, the worker received a dose rate alarm while installing an axial restraining pin in HSM-10 on the ISFSI pad. The worker was briefed that morning to perform work under RWP 117-1041, Task 11 which allowed entry into HRAs. The setpoints on this RWP were 150 millirem for the dose alarm and 1080 millirem per hour for the dose rate alarm. During a break, the worker signed off of RWP 117-1041, Task 11 and onto RWP 117-1042, Task 1. RWP 117-1042, Task 1 does not allow entry into HRAs and had setpoints of 25 millirem for the dose alarm and 75 millirem per hour for the dose rate alarm. After a lunch break, the worker failed to sign back onto the correct RWP and obtain a computerized trip ticket validated by radiation protection personnel. Further, the worker did not recognize that the work area dose rates were higher than his/her RWP set points when the radiation protection technician communicated the surveyed dose rate to the work crew prior to resuming work after the lunch break.

FENOC chose to invoke an exception to posting requirements as allowed by 10 CFR 20.1903 using NOP-OP-4102, "Radiological Postings, Labeling, and Markings." The exception allows for areas or rooms containing radioactive materials to not be posted if the period of time is less than 8 hours if the materials are constantly attended during these periods by an individual who takes precautions necessary to prevent the exposure of individuals to radiation or radioactive materials in excess of the established limits and the area or room is subject to the licensee's control. Radiation protection technicians were controlling the HRA in lieu of posting and locking the area. Radiation protection technicians were required by NOP-OP-4101, "Access Controls for Radiologically Controlled Areas," to verify that for each subsequent entry into an HRA with the same work crew and on the same work shift that each worker is on the appropriate RWP and task and that each worker's HRA trip ticket is initialed by radiation protection. These requirements are described in the Authorization section of the Radiological Access Request and Briefing Form in the procedure. The radiation protection technicians failed to ensure that the worker was on the correct RWP. This and the failure of the worker to sign onto the correct RWP and obtain a trip ticket validated by radiation protection personnel as required by RWP 117-1041-11 resulted in the worker entering an HRA under the incorrect RWP and receiving a subsequent dose rate alarm of 1070 millirem per hour. Upon receiving a dose rate alarm, the worker backed away from the area and reported the issue to radiation protection personnel.

FENOC's immediate corrective actions included putting the work in a safe condition, performance of follow-up surveys, and verification of remaining personnel trip tickets to ensure all individuals were on the correct RWP. FENOC entered the issue into their CAP as CR 2017-11206.

Analysis. The failure to control access to an HRA in accordance with NOP-OP-4102, "Radiological Postings, Labeling, and Markings," and NOP-OP-4101, "Access Controls for Radiologically Controlled Areas," is a performance deficiency that was within FENOC's ability to foresee and correct and should have been prevented.

The performance deficiency is more than minor because it is associated with the Program and Process attribute (Procedures) of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure of multiple barriers resulted in a worker gaining access to an HRA while signed on to an incorrect RWP and receiving a dose rate alarm. IMC 0612, Appendix E, Section 6, "Health Physics, General Screening Criteria," states that a performance deficiency involving more than one barrier or the loss of a significant barrier would be classified as a more-than-minor performance deficiency. Using IMC 0609, Appendix C, Occupational Radiation Safety Significance Determination Process, the finding was determined to be of very low significance (Green) because: (1) it was not an ALARA finding; (2) there was no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised.

The finding has a human performance cross-cutting aspect associated with avoiding complacency because FENOC failed to ensure individuals recognize and plan for the possibility of mistakes and ensure individuals implement the appropriate error reduction tools, even when expecting a successful outcome [H.12].

Enforcement. TS 5.7.1 requires, in part, that each HRA shall be barricaded and conspicuously posted as an HRA and entrance thereto shall be controlled by requiring issuance of a RWP. An exception to posting requirements in NOP-OP-4102, "Radiological Postings, Labeling, and Markings" allows for an HRA to not be posted if the period of time is less than 8 hours if the radioactive materials are constantly attended during these periods by an individual who takes precautions necessary to prevent the exposure of individuals to radiation or radioactive materials in excess of the established limits and the area or room is subject to the licensee's control.

Contrary to the above, on November 8, 2017, during ISFSI dry cask loading campaign activities, FENOC did not take necessary precautions, which could have resulted in the exposure of an individual to radiation or radioactive materials in excess of the established limits. A worker accessed a HRA while signed on to an incorrect RWP and received a subsequent dose rate alarm of 1070 millirem per hour. Radiation protection personnel controlling access to the HRA also failed to ensure that the worker was on the correct RWP per plant procedure requirements for a subsequent entry into a HRA. FENOC's immediate corrective actions included putting the work in a safe condition, performing follow-up surveys, and verifying remaining personnel trip tickets to ensure all individuals were on the correct RWP. Since this violation is of very low safety significance (Green) and was entered into FENOC's CAP as CR-2017-11206, it is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000334; 412/2017004-01, Inadequate Control of Entry into High Radiation Areas)**

#### 40A6 Meetings, Including Exit

On January 11, 2018, the inspectors presented the inspection results to Mr. Richard Bologna, Site Vice President and other members of the BVPS staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

## **ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION  
KEY POINTS OF CONTACT**FENOC Personnel

R. Bologna, Site Vice President  
J. Grabnar, General Plant Manager  
C. Battistone, Oversight Performance Inspector  
T. Blatter, Supervisor Electrical and Instrument and Control Engineering  
A. Brunner, Plant Engineering  
A. Burger, Radiation Protection Supervisor  
B. Checketts, Plant Operator  
E. Crosby, Radiation Protection Manager  
A. Crotty, Plant Engineering Manager  
B. Davis, Loading Campaign Pool-to-Pad Manager  
J. Fontaine, Radiation Protection ALARA Supervisor  
K. Gillespie, Unit 1 Radiation Monitors System Engineer  
H. Gilliam, System Engineer  
C. Glass, Fleet Fuels  
D. Grainger, Cask Load Lead  
J. Halvorsen, Quality Assurance Manager  
A. Hewitt, Electrical Maintenance Superintendent  
E. Hohman, Loading Campaign Pool-to-Pad Manager  
M. Jansto, System Engineer  
D. Jones, IST Engineer  
A. Justice, Instrument and Controls Supervisor  
C. Kaszer, Site Dry Cask Campaign Coordinator  
J. Kaszer, Site Dry Cask Campaign Coordinator  
S. Keener, Unit Supervisor  
K. Kimmerle, Radiation Protection Supervisor  
B. Kremer, Regulatory Compliance Manager  
R. Kurkienicz Work Management, Manager  
E. Loehlen, Maintenance Manager  
P. Logoyda, Radiation Protection Superintendent  
K. McIntyre, Fleet Projects  
S. Mercer, System Engineer  
J. Miller, Fire Marshal  
D. Minkus, Unit 2 Radiation Monitors System Engineer  
K. Mitchell, Plant Engineering  
W. Ott, Quality Control Oversight  
L. Proudfoot, Shift Manager  
B. Ronosky, System Engineer  
S. Sawtschenko, Emergency Preparedness Manager  
K. Sloan, Shift Manager  
T. Steed, Director of Performance Improvement  
E. Thomas, Regulatory Compliance Supervisor  
K. Tiefenthal, Shift Manager  
H. Tremblay, River Water System Engineer  
J. Tweddell, Electrical Maintenance Supervisor  
M. Unfried, Engineering Analysis Engineer  
D. Van Dame, Radiation Protection Supervisor  
J. Vinblad, Cask Load Lead  
D. Wacker, Regulatory Compliance  
T. Winfield, Relay Supervisor  
R. Wolfe, Dry Cask Loading Campaign Project Manager



**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Opened/Closed

05000334;412/2017004-01      NCV      Inadequate Control of Entry into High Radiation Areas (Section 4OA5)

Closed

05000334/2017-002-00      LER      Beaver Valley Power Station Unit 1 Inadequate Emergency Diesel Generator (EDG) Tornado Missile Protection Identified Due to Non-conforming Design Conditions (Section 4OA3.2)

**LIST OF DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**Procedures

1/2OM-53C.4A.75.1, Acts of Nature - Severe Weather, Revision 21  
 1OM-45.3.C.2, Power Supply and Control Switch List Heat Tracing System, Revision 21  
 1OST-45.11A, Cold Weather Protection Verification - Performed in September and October, Revision 3  
 2OM-45D.3.C, Power Supply and Control Switch List, Revision 12  
 2OST-45.11A, Cold Weather Protection Verification - Performed in September and October, Revision 6

**Section 1R04: Equipment Alignment**Procedures

1/2-ADM-1900, Fire Protection Program, Revision 40  
 1OM-13.3.C, Power Supply and Control Switch List, Revision 7  
 1OM-13.3.B.2, Valve List - 1RS, Revision 7  
 2OST-13.2, Quench Spray Pump [2QSS\*P21B] Test, Revision 36

Condition Reports

CR-2017-10732      CR-2017-11930      CR-2017-12087      CR-2017-12124

Drawings

RM-0413-002, Valve Oper No Diagram-Containment Depressurization System, Revision 13  
 RM-0413-002, Valve Oper No Diagram Quench Spray System, Revision 21  
 RM-0433-006, New Warehouse Fire Prot System, Revision 7

**Section 1R05: Fire Protection**Procedures

1/2-ADM-1906, Control of Transient Combustible and Flammable Materials, Revision 13

Condition Reports

CR-2017-10385

Miscellaneous

1PFP-SRVB-713-PROCESS, Process Instrument Room Pre-Fire Plan, Fire Area 1-CR-4,  
Revision 4  
2PFP-CBLT-712, Cable Tunnel, Fire Area 2-CT-1, Revision 5  
2PFP-CNTB-735, Fan Room, Fire Area CB-5, Revision 1  
601085383  
601132312

**Section 1R11: Licensed Operator Regualification Program**

Procedures

NOP-OP-1002, Conduct of Operations, Revision 12  
2OST-26.1, Turbine Throttle, Governor, Reheat Stop and Intercept Valve Test, Revision 37

Condition Reports

CR-2017-10473

Miscellaneous

1LOCT-E-3.001, Licensed Operator Training/Licensed Regualification Training, Revision 1

**Section 1R12: Maintenance Effectiveness**

Condition Reports

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| CR-2015-02230 | CR-2015-02383 | CR-2015-07228 | CR-2015-13651 |
| CR-2016-11691 | CR-2016-12981 | CR-2017-04061 | CR-2017-05600 |
| CR-2017-06462 | CR-2017-06541 | CR-2017-07350 | CR-2017-07364 |
| CR-2017-08616 | CR-2017-08879 | CR-2017-10581 |               |

Miscellaneous

Maintenance Rule (a)(1) Evaluation for CR 2017-06462  
Maintenance Rule System Basis Document for Unit 1 System 34, Revision 9  
Unit System 34 Monthly Monitoring Spreadsheet, October 2017

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

BVBP-OPS-0009, PRA Risk Profile Development, Revision 5  
NOP-OP-1007, Risk Management, Revision 24

Drawings

Miscellaneous

Beaver Valley Unit 1 Weekly Maintenance Risk Summary, for the week of November 13, 2017,  
Revision 2  
Beaver Valley Unit 2 Weekly Maintenance Risk Summary for the Week of December 25, 2017,  
Revision 0  
Beaver Valley Unit 2 Weekly Maintenance Risk Summary for the Week of October 23, 2017,  
Revision 2  
Daily Status Report for October 24, 2017  
Risk Management Plan for 4kV Breaker Racking

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

1OM-36.4.AFC, Local – Circuit, Revision 1  
 2MSP-43.19-I, Containment Airborne Radiation Monitor 2RMR-RQI303 Calibration, Revision 15  
 3BVT 1.44.05, Control Room Air In-Leakage Test, Revision 6  
 3BVT 1.44.2, Unit 2 Train A Control Room Emergency Air Cleanup and Pressurization System  
 Flow and Filter Efficiency Test, Revision 12

Condition Reports

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| CR-2017-10278 | CR-2017-10791 | CR-2017-10857 | CR-2017-10858 |
| CR-2017-10938 | CR-2017-10956 | CR-2017-11065 | CR-2017-11103 |

Miscellaneous

EER 601134810  
 EER 601136655  
 PAF-17-01959, Containment Airborne Radiation Monitor 2RMR-RQI303 Calibration

**Section 1R19: Post-Maintenance Testing**Procedures

1/2-ADM-1900, Fire Protection Program, Revision 40  
 1/2-PMP-M-75-004, Ventilation System Damper Maintenance, Revision 1  
 1/2OST-33.12, Fire Protection System Loop Flow Test, Revision 13  
 1/2RCP-1A-PC, Calibration of Auxiliary Relays, Revision 13  
 1/2RCP-1B-PC, Calibration of Westinghouse/ABB Multi-Contact Auxiliary Relays, Type MG-6,  
 Revision 6  
 1/2RCP-25-PC, Calibration of Westinghouse/ABB Sudden Pressure Relays, Type SPR,  
 Revision 2  
 1/2RCP-30A-PC, Calibration of Timing Relays, Revision 21  
 1/2RCP-96A-PC, Calibration of Beckwith Electric M-2001D Load Tap Changer (LTC)  
 Voltage Regulating Relay, Revision 2  
 1OST-33.8, Diesel Engine Driven Fire Pump Operation Test, Revision 26  
 1OST-36.1, Diesel Generator No. 1 Monthly Test, Revision 67  
 NOP-LP-2601, Procedure/Work Instruction Use and Adherence, Revision 6

Condition Reports

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| CR-2017-07675 | CR-2017-09750 | CR-2017-09786 | CR-2017-09872 |
| CR-2017-09873 | CR-2017-09875 | CR-2017-09989 | CR-2017-10386 |
| CR-2017-10583 | CR-2017-11518 | CR-2017-11598 | CR-2017-11767 |

Work Orders

|           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 200574722 | 200598483 | 200598491 | 200598507 | 200622362 | 200642653 |
| 200646879 | 200649420 | 200653781 | 200663226 | 200665538 | 200726001 |
| 200735959 |           |           |           |           |           |

Miscellaneous

TER-9851, Short Stroking Dampers 2HVD-MOD22A,B, Revision 0

**Section 1R20: Refueling and Other Outage Activities**Procedures

1OM-35.4.AAA, Generator Protection Gen-Trip, Revision 1  
 1OM-50.4.D2, Reactor Startup from Mode 3 to Mode 2, Revision 1  
 1OM-52.4.R.2.S, Secondary Plant Startup, Revision 18

Condition Reports

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| CR-2017-11131 | CR-2017-11132 | CR-2017-11133 | CR-2017-11134 |
| CR-2017-11135 | CR-2017-11208 | CR-2017-11215 | CR-2017-11238 |
| CR-2017-11593 |               |               |               |

Drawings

8700-RE-0021G, Three Line Current Diagram - Generator and Main Transformer No. 1,  
 Revision 21

**Section 1R22: Surveillance Testing**Procedures

1MSP-6.06-I, F-RC415 Reactor Coolant Flow Loop 1 Channel II Test, Revision 13  
 1MSP-6.07-I, F-RC425 Reactor Coolant Flow Loop Channel II Test, Revision 14  
 1MSP-39.08-E, Battery No. 1-3 Inspection and Interconnection Resistance Check, Revision 9  
 1MSP-39.08-E, Battery No. 1-3 Inspection and Interconnection Resistance Check, Revision 10  
 3BVT 1.44.1, Control Room Emergency Supply Fan Pressurization Test, Revision 21  
 2OST-26.1, Turbine Throttle, Governor, Reheat Stop and Intercept Valve Test, Revision 37

Condition Reports

|               |               |               |
|---------------|---------------|---------------|
| CR-2015-02673 | CR-2017-12006 | CR-2017-12307 |
|---------------|---------------|---------------|

Work Orders

|           |           |           |
|-----------|-----------|-----------|
| 200552454 | 200611841 | 200652780 |
|-----------|-----------|-----------|

Miscellaneous

8700-E-203, D.C. System Management - BAT-3/BAT-CHG-3, Revision 0

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**Emergency Plan

Beaver Valley Emergency Preparedness Plan, Appendix C, "Emergency Implementing Procedure Listing", Revision 18  
 Beaver Valley Emergency Preparedness Plan, Appendix E, "Corporate Policy Statement", Revision 17  
 Beaver Valley Emergency Preparedness Plan, Appendix F, "Warning Sirens", Revision 19  
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 Beaver Valley Emergency Preparedness Plan, Section 7, "Emergency Facilities and Equipment", Revision 29  
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**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**

Procedures

1/2-ADM-1624, Routine Survey Program, Revision 10  
NOP-OP-4101, Access Controls for Radiologically Controlled Areas, Revision 12  
NOP-OP-4102, Radiological Postings, Labeling and Markings, Revision 12  
NOP-OP-4107, Radiation Work Permit, Revision 16  
NOP-OP-4502, Control of Radioactive Material, Revision 4  
NOP-OP-4601, Contamination Control Program, Revision 7  
NOP-OP-4701, Radiological Survey Documentation, Revision 1

Condition Reports

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**Section 2RS2: Occupational ALARA Planning and Controls**

Procedures

NOP-OP-4005, ALARA Program, Revision 6

**Section 2RS4: Occupational Dose Assessment**

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**Section 4OA1: Performance Indicator Verification**

Procedures

1/2-ADM-0710, RCS Integrated Leakage Program, Revision 4  
1-CHM-SAM-3.26, RCS-Demineralizer Inlet and Outlet Header, Revision 13  
1OST-6.2, Reactor Coolant System Water Inventory Balance, Revision 27  
1OST-6.2A, Computer Generated Reactor Coolant System Water Inventory Balance,  
Revision 27  
2OST-6.2, Reactor Coolant System Water Inventory Balance, Revision 25  
2OST-6.2A, Computer Generated Reactor Coolant System Water Inventory Balance,  
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NOBP-LP-4012, NRC Performance Indicators, Revision 6

Miscellaneous

Reactor Coolant System Identified Leakage Spreadsheet, October 2016 through  
September 2017  
Unit 1 Reactor Coolant System Leakage, October 2016 through September 2017  
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**Section 4OA2: Problem Identification and Resolution**

Procedures

3BVT 1.44.05, Control Room Air In-Leakage Test, Revision 6  
3BVT 1.44.2, Unit 2 Train A Control Room Emergency Air Cleanup and Pressurization System  
Flow and Filter Efficiency Test, Revision 12

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Cling Water, Revision 13

DWG 8700-RM-0430-005, Piping and Instrumentation Diagram River Water System,  
Revision 27

Miscellaneous

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NOBP-LP-2008, FENOC Corrective Actions Review Board, Revision 2

NOBP-LP-2011, FENOC Causal Analysis, Revision 20

NOP-LP-2001, FENOC Corrective Action Program, Revision 39

**Section 40A5: Other Activities**Procedures

10M-70.4.M, Operation of the Dry Cask Storage Temperature Recorders, Revision 0

1PMP-DC-70.4.F, Dry Shielded Canister Processing, Revision 2

1PMP-DC-70.4.G, Dry Shielded Canister Insertion into HSM-H, Revision 1

BVPM-IFSI-0001 HSM Thermal Monitoring Program

BVPS Unit 1, 1PMP-DC-70.4E, Transfer Cask Handling for Fuel Loading

MSLT-DSC-AREVA Helium Mass Spectrometer Leak Test Procedure Dry Fuel Storage  
Container, Revision Areva TN-01

NOBP-LP-2601, Human Performance Program, Revision 12

NOBP-OP-4009, Radworker Expectations, Revision 06

NOP-NF-3002, Special Nuclear Material Physical Inventory, Revision 3

NOP-OP-4101, Access Controls for Radiologically Controlled Areas, Revision 12

NOP-OP-4701-01, Radiological Survey Form, Revision 00

SPM 9.5, NUHOMS 37PTH DSC Closure Procedure, Revision 1

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50.59 & 72.48 Screening Forms

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Licensing Documents

Certificate of Compliance (CoC) NRC Docket No. 72-1004, Amendment 13, Revision 1

Updated Final Safety Analysis Report for the Standardized NUHOMS Horizontal Modular  
Storage System for Irradiated Nuclear Fuel, Revision 14

Miscellaneous

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Beaver Valley U1 Dry Cask Storage Project 2nd Loading Campaign Oversight Plan

BVPS ISFSI 10 CFR 72.212 Evaluation Report, Revision 2

DMC-1738, Beaver Valley Unit 1 Fuel Assembly Certification and Canister Loading Maps for the  
2017 Dry Cask Loading Campaign, Revision 1

DMC-1739, Beaver Valley Unit 1 Individual Assembly Decay Heat for the 2017 Dry Cask  
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Radiation Work Permit 117-1039, Revision 0

Radiation Work Permit 117-1041, Revision 0

Radiation Work Permit, 117-1042, Revision 0

S22.2-XX-F104NF, NMP Fuel Selection Packages for 2017 ISFSI Campaign, Revision 0

Verification SNM Physical Inventory of Dry Storage Campaign 2015 Unit 1

Verification SNM Physical Inventory of Dry Storage Canister BV-37PTH-S-3-05

Verification SNM Physical Inventory of Dry Storage Canister BV-37PTH-S-3-08

**LIST OF ACRONYMS**

|       |   |
|-------|---|
| ALARA | as low as is reasonably achievable          |
| ASME  | American Society of Mechanical Engineers    |
| BVPS  | Beaver Valley Power Station                 |
| CAP   | corrective action program                   |
| CFR   | <i>Code of Federal Regulations</i>          |
| CoC   | certificate of compliance                   |
| CR    | condition report                            |
| CREVS | control room emergency ventilation system   |
| DSC   | dry shielded canister                       |
| EAL   | Emergency Action Level                      |
| EDG   | emergency diesel generator                  |
| FENOC | FirstEnergy Nuclear Operating Company       |
| HIT   | high impact team                            |
| HRA   | high radiation area                         |
| HSM   | horizontal storage module                   |
| IMC   | Inspection Manual chapter                   |
| ISFSI | Independent Spent Fuel Storage Installation |
| LER   | licensee event report                       |
| MIH   | make it happen team                         |
| NCV   | non-cited violation                         |
| NEI   | Nuclear Energy Institute                    |
| NRC   | Nuclear Regulatory Commission               |
| ODCM  | offsite dose calculation manual             |
| OOS   | out-of-service                              |
| PI    | performance indicator                       |
| QSS   | quench spray system                         |
| RCS   | reactor coolant system                      |
| RG    | Regulatory Guide                            |
| RSS   | recirculation spray system                  |
| RWP   | radiation work permit                       |
| scfm  | standard cubic feet per minute              |
| SSST  | system station service transformer          |
| TC    | transfer cask                               |
| TS    | technical specifications                    |
| UFSAR | Updated Final Safety Analysis Report        |