



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

November 4, 2013

Mr. Eric Larson  
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 – NRC INTEGRATED INSPECTION  
REPORT 05000334/20130004 AND 05000412/2013004 AND INDEPENDENT  
SPENT FUEL STORAGE INSTALLATION (ISFSI) REPORT 07201043/2013001**

Dear Mr. Larson:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Beaver Valley Power Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on October 25, 2013 with Eric Larson, Site Vice President, 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No NRC-identified or self-revealing findings are documented in this report. However, inspectors documented three licensee-identified violations, which were determined to be of very low safety significance. The NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Beaver Valley Power Station.

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's Public Document Room or from the Publicly Available Records component of the NRC's

Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Gordon K. Hunegs, 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 05000334/2013004 and 05000412/2013004  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Gordon K. Hunegs, 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 05000334/202013004 and 05000412/2013004  
 w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

Distribution w/encl:

W. Dean, RA  
 D. Lew, DRA  
 D. Roberts, DRP  
 M. Scott, DRP  
 R. Lorson, DRS

J. Trapp, DRS  
 G. Hunegs, DRP  
 B. Bickett, DRP  
 A. Dugandzic, DRP  
 G. Stock, DRP  
 D. Spindler, DRP, SRI

E. Carfang, DRP, RI  
 P. Garrett, DRP, Resident AA  
 D. Rich, RI OEDO  
 RidsNrrPMBeaverValley Resource  
 RidsNrrDorlPl1-2 Resource  
 ROPreports Resource

DOCUMENT NAME: G:\DRP\BRANCH6\+++Beaver Valley\BV Inspection Reports & Exit Notes\BV Inspection Reports 2013\BV\_IR2013-004 rev final.docx

ADAMS Accession No: **ML13310A594**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	DSpindler/DS per email	BBickett/BB	GHunegs/GKH		
DATE	11/4/13	11/4/13	11/4/13		

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket Nos.: 50-334, 50-412

License Nos.: DPR-66, NPF-73

Report No.: 05000334/2013004 and 05000412/2013004

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA 15077

Dates: July 1, 2013 to September 30, 2013

Inspectors: D. Spindler, Senior Resident Inspector  
E. Carfang, Resident Inspector  
E. Burket, Emergency Preparedness Inspector  
T. Fish, Senior Operations Engineer  
N. Floyd, Reactor Inspector  
S. Hammann, Senior Health Physicist  
D. Kern, Senior Reactor Inspector  
J. Laughlin, Emergency Preparedness Inspector  
T. Moslak, Health Physicist  
J. Piotter, Senior Structural Engineer  
J. Tomlinson, Operations Engineer

Approved By: Gordon Hunegs, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## TABLE OF CONTENTS

SUMMARY .....	3
1. REACTOR SAFETY .....	4
1R01 Adverse Weather Protection .....	4
1R04 Equipment Alignment .....	4
1R05 Fire Protection .....	5
1R06 Flood Protection Measures .....	6
1R07 Heat Sink Performance .....	6
1R11 Licensed Operator Requalification Program .....	6
1R12 Maintenance Effectiveness .....	9
1R13 Maintenance Risk Assessments and Emergent Work Control .....	9
1R15 Operability Determinations and Functionality Assessments .....	10
1R18 Plant Modifications .....	11
1R19 Post-Maintenance Testing .....	11
1R22 Surveillance Testing .....	12
1EP2 Alert and Notification System Evaluation .....	12
1EP3 Emergency Response Organization Staffing and Augmentation System .....	13
1EP4 Emergency Action and Emergency Plan Changes .....	13
1EP5 Maintaining Emergency Preparedness .....	14
1EP6 Drill Evaluation .....	14
2. RADIATION SAFETY .....	15
RS05 Radiation Monitoring Instrumentation .....	15
2RS6 Radioactive Gaseous and Liquid Effluent Treatment .....	17
4. OTHER ACTIVITIES .....	18
4OA1 Performance Indicator Verification .....	18
4OA2 Problem Identification and Resolution .....	19
4OA3 Follow-Up of Events and Notices of Enforcement Discretion .....	24
4OA5 Other Activities .....	24
4OA6 Meetings, Including Exit .....	25
4OA7 Licensee-Identified Violations .....	25
ATTACHMENT: SUPPLEMENTARY INFORMATION .....	26
SUPPLEMENTARY INFORMATION .....	A-1
KEY POINTS OF CONTACT .....	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED .....	A-2
LIST OF DOCUMENTS REVIEWED .....	A-2
LIST OF ACRONYMS .....	A-13

## SUMMARY

IR 05000334/2013004, 05000412/2013004; 07/01/2013-09/30/2013; Beaver Valley Power Station, Units 1 and 2; Routine Integrated Report.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

No findings were identified.

### **Other Findings**

Three violations of very low safety significance that were identified by FENOC were reviewed by the inspectors. Corrective actions taken by FENOC have been entered into FENOC's corrective action program. The violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent power and operated at full power until September 7, 2013 when the unit entered end-of-cycle coast down operations. On September 28, 2013, operators commenced a shutdown, from an initial power of 94 percent, for a planned refueling and maintenance outage (1R22). The unit reached Mode 5 (cold shutdown) on September 30, 2013.

Unit 2 began the inspection period at 100 percent power and operated at or near full power throughout the inspection period.

### 1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01 – 1 sample)

#### Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

##### a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed FENOC's procedures affecting these areas and the communications protocols between the transmission system operator and FENOC. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether FENOC established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system engineer, reviewing condition reports and open work orders, and walking down portions of the offsite and AC power systems including the 345 kilovolt (kV) and 138 kV switchyards.

##### b. Findings

No findings were identified.

1R04 Equipment Alignment

#### Partial System Walkdowns (71111.04 – 4 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 2-2 emergency diesel generator (EDG) and 2A offsite power transformer electrical alignment during elevated plant risk on August 1, 2013

- 2A outside recirculation spray (RSS) pump with the 2B outside RSS pump out of service for testing on August 6, 2013
- 1-2 EDG during monthly testing of 1-1 EDG on August 14, 2013
- 1B low head safety injection during preventive maintenance on the 1A low head safety injection train on August 20, 2013

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 Updated Final Safety Analysis Report (UFSAR), technical specifications, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their 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's staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 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 out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 2 Turbine Building (Fire Area TB-1) on July 12, 2013
- Unit 2 Turbine Building (Fire Area TB-2) on July 12, 2013
- Unit 2 West Cable Vault (Fire Area CV-1) on July 16, 2013
- Unit 2 Main Steam Valve Room/ Emergency Switchgear Vent Room (Fire Areas MS-1 and CV-4) on July 16, 2013
- Unit 1 Auxiliary Building 768 Level (Fire Area PA-1A) on July 22, 2013

b. Findings

No findings were identified.



1R06 Flood Protection Measures (71111.06 – 1 sample)Annual Review of Cables Located in Underground Bunkers/Manholesa. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes EMH-8A and EMH-8B which contain service water and river water cables, to verify that the cables were not submerged in water, that cables and splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)a. Inspection Scope

The inspectors reviewed the 1A primary plant component cooling heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified FENOC's commitments to NRC Generic Letter 89-13. The inspectors reviewed actual performance tests for the heat exchangers including the results of previous inspections of the 1A primary plant component cooling heat exchanger. The inspectors discussed the results of the most recent inspection with engineering staff. The inspectors verified that FENOC initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 2 samples).1 Quarterly Review of Licensed Operator Requalification Testing and Traininga. Inspection Scope

The inspectors observed licensed operator simulator training on July 18, 2013, which included hostile action, reactor trip, and a loss of offsite power. 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 Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed Unit 1 reactor shutdown and cooldown to Mode 5 on September 30, 2013. The inspectors observed evolution briefings and reactivity control briefings to verify that the briefings met the criteria specified in NOP-OP-1002, "Conduct of Operations," Revision 8. Additionally, the inspectors observed operator performance to verify that procedure use, crew communications, reactivity management and coordination of activities between work groups met established expectations and standards.

b. Findings

No findings were identified.

.3 Licensed Operator Regualification (71111.11B – 1 sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, and Inspection Procedure Attachment 71111.11, "Licensed Operator Regualification Program and Licensed Operator Performance."

Examination Results

Regualification exam results (operating test, only) for year 2013 were reviewed to determine if pass/fail rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process (SDP)."

The review verified the following:

- Individual pass rate on the dynamic simulator scenarios was greater than 80 percent. (Pass rate was 93.3 percent.)
- Individual pass rate on the job performance measures (JPM) of the operating exam was greater than 80 percent. (Pass rate was 100 percent.)
- Individual pass rate on the written examination was greater than 80 percent. (NA: The written exam was previously administered in May and June 2013.)
- More than 80 percent of the individuals passed all portions of the regualification exam. (Pass rate was 93.3 percent.)
- Crew pass rate was greater than 80 percent. (Pass rate was 91.7 percent.)

### Written Examination Quality

The inspectors reviewed a sample of comprehensive written exams that facility staff previously administered to the operators in May and June 2013.

### Operating Test Quality

The inspectors reviewed operating tests (scenarios and JPMS) associated with four different examination weeks.

### Licensee Administration of Operating Tests

The inspectors observed facility training staff administer dynamic simulator exams and JPMS during the week of August 26, 2013. These observations included facility evaluations of crew and individual operator performance during the simulator exams and individual performance of JPMS.

### Exam Security

The inspectors assessed whether facility staff properly safeguarded exam material, and whether test item repetition guidelines were met.

### Remedial Training and Re-examinations

The inspectors reviewed five remedial training packages and the associated re-exams for operators who failed the comprehensive written exams administered in May and June 2013.

### Conformance with License Conditions

License reactivation and license proficiency records were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met. The inspectors also reviewed a sample of records for requalification training attendance, and a sample of medical examinations for compliance with license conditions and NRC regulations.

### Simulator Performance

Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems.

### Problem Identification and Resolution

The inspectors reviewed recent operating history documentation found in inspection reports, licensee event reports, the licensee's corrective action program, and the most recent NRC plant issues matrix. The inspectors focused on events associated with operator errors that may have occurred due to possible training deficiencies.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, or component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program 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 SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by FENOC staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs 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.

- 1-1 motor generator set failure on August 1, 2013
- Unit 1 and Unit 2 radiation monitors out of service on August 29, 2013
- Unit 2 4kV breaker failures on September 12, 2013

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 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 technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Emergent corrective maintenance on residual heat release valve (2SVS-HCV104) due to failure to stroke open on July 8, 2013
- Elevated risk due to planned maintenance on 2-2 EDG room dampers on September 3, 2013
- Elevated risk due to rescheduling of maintenance activities based on independent system operator hot weather and maximum emergency generator alerts on September 11, 2013
- Elevated risk during emergent corrective maintenance on 2-1 EDG due to the digital reference unit failure on September 18, 2013

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Elevated inboard motor bearing temperature on 21A charging pump on July 23, 2013
- Control rod K-10 inadequately tested for control rod movement per 2OST-1.1, "Control Rod Assembly Partial Movement Test," on August 4, 2013
- Pinhole leak found on the atmospheric vent for the 2-1 EDG fuel oil tank on August 7, 2013
- Grounds on 2-5 and 2-6 direct current buses associated with 2-2 EDG alarm panel on August 14, 2013
- Supply breaker trip on 21B refueling water storage tank cooling water outlet valve on August 20, 2013
- 21B and 21C service water pump comprehensive pump testing and redrawn pump curves on September 4, 2013

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification 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 technical specifications and UFSAR to FENOC's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by FENOC. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples).1 Temporary Modificationsa. Inspection Scope

The inspectors reviewed the temporary modification implemented by engineering change package 13-0501, "Temporary Relief valve installation at 2CHS-646 due to excessive seat leakage on thermal relief valve 2CHS-RV8144 on the regenerative heat exchanger," to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

.2 Permanent Modificationsa. Inspection Scope

The inspectors evaluated a modification to the control room air conditioning system implemented by engineering change package 10-0784, "Replace Control Room AC System Temperature Control Valves TCV-1RW-101A & B." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, and observed installation of temperature control valve TCV-1RW-101B. The inspectors reviewed 10 CFR 50.59 documentation, verified correct materials were installed, and reviewed post-modification testing results.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- 1C charging pump restoration after introduction of oil into the pump suction on June 24, 2013
- Repair to 21A charging pump inboard motor bearing on July 5, 2013
- Residual heat release valve (2SVS-HCV104) corrective maintenance on July 9, 2013
- 1A component cooling water pump mechanical seal replacement on July 24, 2013
- Installation and testing of a temporary relief valve for the regenerative heat exchanger downstream of 2CHS-646 on July 29, 2013
- "C" charging pump lube oil temperature controller (2CHS-TC-150C) calibration on August 14, 2013

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, 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:

- 1OST-13.7B, Unit 1 2B Recirculation Spray Pump Flow Test on August 5, 2013
- 2OST-7.6, Unit 2 Centrifugal Charging Pump [2CHS\*P21C] Operating Surveillance Test on August 14, 2013 (in service test)
- 2OST-36.1, Unit 2 Emergency Diesel Generator [2EGS\*EG2-1] Monthly Test on August 21, 2013
- 1OST-24.3, Motor Driven Auxiliary Feed Pump Test [1FW-P-3B] on September 4, 2013

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP2 Alert and Notification System Evaluation (71114.02 - 1 sample)

a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the Beaver Valley Power Station Alert and Notification System (ANS). During this inspection, the

inspectors conducted a review of the ANS testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency (FEMA) approved ANS Design Report to ensure compliance with design report commitments for system maintenance and testing. During the annual full cycle siren test on September 5, 2013, the inspectors observed the interaction between FENOC and offsite response organization staff in the Beaver County Emergency Operations Center. 10 CFR 50.47(b)(5) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Beaver Valley Power Station Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key licensee staff to respond to an emergency event and to verify FENOC's ability to activate their emergency response facilities (ERFs) in a timely manner. The inspectors reviewed the Beaver Valley Power Station Emergency Plan and Implementing Procedures for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, the most recent drive-in drill report, and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. Title 10 CFR 50.47(b)(2) and related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

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

a. Inspection Scope

The Office of Nuclear Security and Incident Response (NSIR) headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) and the Emergency Plan located under ADAMS accession number ML13177A412 as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.



Additionally, the resident inspectors reviewed FENOC's identification (CR-2013-04258) of a Unit 1 containment elevated release radiation monitor, 1RM-VS-110, which was not capable of displaying the value specified in the EAL scheme, as previously thought. The enforcement aspects of this issue are discussed in Section 4OA7.

The specific documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness (71114.05 - 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of FENOC's efforts to maintain the Beaver Valley Power Station emergency preparedness (EP) program. The inspectors reviewed: Letters of Agreement with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practices; licensee maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternate emergency response facility maintenance. The inspectors also verified FENOC's compliance at Beaver Valley with new NRC EP regulations regarding: emergency action levels for hostile action events; protective actions for on-site personnel during events; emergency declaration timeliness; ERO augmentation and alternate facility capability; evacuation time estimate updates; on-shift ERO staffing analysis; and ANS back-up means.

The inspectors further evaluated FENOC's ability to maintain their EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, an actual event report, self-assessments, 10 CFR 50.54(t) review reports, and EP-related condition reports. The inspectors reviewed a sample of EP-related condition reports initiated at Beaver Valley from June 2012 through September 5, 2013. Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a hostile action based FENOC emergency drill on July 18, 2013 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, alternate technical support center, and emergency operations facility to determine whether the event

classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by FENOC staff in order to evaluate FENOC's critique and to verify whether the FENOC staff was properly identifying weaknesses and entering them into the corrective action program.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

**Cornerstones: Occupational and Public Radiation Safety**

RS05 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

a. Inspection Scope

During July 29 - August 1, 2013, the inspector conducted the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation used to ensure a safe work environment, and to detect and quantify radioactive process streams and effluent releases. Implementation of these programs was reviewed against the criteria contained in UFSAR, Off-site Dose Calculation Manual (ODCM), applicable industry standards, and the licensee's procedures.

Walkdown of Process and Effluent Monitoring Systems

The inspector walked down selected portions of Unit 1 and Unit 2 liquid and gaseous effluent monitoring systems and area monitors to assess material condition and the status of system upgrades. The walk-down in Unit 1 included portions of the recirculation spray heat exchanger river water system (RM-1RW-100-A-D), the liquid waste effluent monitor (RM-1LW-104), liquid waste contaminated drains monitor (RM-1LW-116), and gaseous effluent monitors (RM-1VS-109/110/111/112). Monitors walked down in Unit 2 included liquid waste monitor (2SGC-RQ100), component cooling water monitor (2CCP-RQ100) and fuel building gaseous effluent monitors (2RMF-RQ301A/B).

Calibration of Portable Survey Instruments, Area Monitors, Electronic Dosimeters and Effluent Monitors

The inspector reviewed the operating procedures, calibration reports, and current source activities/dose rate characterizations for the in-service Shepherd Model 89-400 calibrators (Nos. 8216/8246) and the iDC-HF Electronic Dosimeter Calibrator, used for calibrating survey instruments and electronic dosimeters, respectively. The inspector reviewed the calibration records for the RadCal Electrometers and associated ion chambers used in calibrating these calibrators.

The inspector reviewed the calibration records for selected survey meters, electronic dosimeters, and contamination monitors including small article monitors (SAM-11), personal contamination monitors (PCM-2 & SPM-906), portable instruments (RM-14, telepole, RO-2A & RO-2), electronic dosimeters (DMC-2000), neutron survey instruments (ASP-1), and airborne monitors (AMS-4).

The inspector observed a technician performing calibrations of portable survey instruments (RO-2A and Telepole), and daily operational checks of various instruments (RO-2, Victoreen Fluke, E-520, and Telepole). The inspector confirmed that procedural requirements were met. The inspector also observed the technician perform pre-use functional checks on the Shepherd 89-400 calibrator, located in the Unit 2 instrument shop.

The inspector observed I&C technicians perform the quarterly flow verification for the Unit 2 Elevated Release Effluent Monitor (BV-2HVS-RQI109A). The inspector reviewed the actions taken (CR-2013-11718) by the technicians upon identifying the flow indication was out of tolerance per MSP 2MSP-43.32A-1.

During walkdowns in various plant areas, the inspector confirmed that available monitoring instruments were calibrated, that daily source checks had been performed, and that the instruments were operational. Instruments checked included hand-held survey instruments, electronic dosimeters, air monitors, and contamination monitors.

The inspector reviewed contamination sampling results (10 CFR 61 radionuclide analyses) used to characterize difficult-to-measure radioisotopes in Unit 1 and Unit 2, to determine if the calibration sources were representative of the radioisotopes found in the plant. Whole body counting system records and contamination monitor set points were reviewed to determine if this data was incorporated in system setup to ensure that difficult-to-measure radioisotopes were accounted for when making measurements.

#### Laboratory Instrumentation:

The inspector reviewed the calibration records and daily source checks for the gamma spectroscopy system (Detectors Nos 1, 2, 3, 5, 6, and 7) and scintillation counter (LSA Packard 3100 TR) to verify that the instruments were calibrated and properly maintained. The inspector confirmed that the check sources used aligned with the plant's isotopic mix.

#### Whole Body Counters:

The inspector reviewed the calibration and operating procedure for the FastScan and AccuScan-II whole body counting systems. The inspector determined that appropriate radioactive sources phantoms were used in making calibrations and that calibration sources were representative of radioisotopes found in the plant.

#### Post-Accident Monitoring Instrumentation:

The inspector reviewed the calibration records for the Unit 1 and Unit 2 high range containment radiation monitors, RM-1RM-219A/B and 2RMR-RQ206/207, respectively. The inspector determined that the electronic and radiation source calibrations were appropriately conducted.

The calibration records for various area monitors, used to assess in-plant radiological conditions, were reviewed including auxiliary building and fuel building area radiation monitors. Included in this review was the Unit 1 Fuel Pool Bridge radiation monitor (RM-1RM-207) and control room area radiation monitors (2RMC-RQ201/202).

Problem Identification and Resolution:

The inspector reviewed selected Condition Reports (CR), a Nuclear Quality Assessment audit, and field observation reports to evaluate the licensee's threshold for identifying, evaluating, and resolving problems in implementing the radiation monitoring instrumentation. Included in this review were CR's related to instrument obsolescence.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 1 sample)a. Inspection Scope

During July 29 - August 1, 2013, the inspector conducted the following activities to ensure the gaseous and liquid effluent monitoring systems are maintained so radiological discharges are properly measured.

The inspector used the requirements contained in the ODCM, applicable Industry standards, and licensee procedures as criteria for determining compliance.

Procedures, Special Reports, and Other Documents

The inspector reviewed condition reports related to effluent controls issued since the previous inspection. The inspector reviewed effluent program implementing procedures, including those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations. The inspector reviewed copies of licensee assessment reports of the effluent monitoring program since the last inspection.

Walkdowns and Observations

The inspector walked down the following components of the gaseous and liquid discharge systems to verify that equipment configuration and flow paths align with the descriptions in the Beaver Valley UFSAR and to assess equipment material condition.

Liquid Discharge Monitors:

- 1RW-100 Component Cooling Heat Exchanger monitor
- 1RW-100 A/B/C/D, Recirculation Spray Heat Exchanger monitor
- 1LW-104, Unit 1 Liquid Waste Effluent monitor
- 1LW-116, Unit 1 Contaminated Drains monitor
- 2SGC-RQ100, Unit 2 Liquid Radwaste Discharge monitor

Gaseous Discharge Monitors:

- 2HVS-1RQ-109 B/C/D, Particulate, Iodine, Noble Gas Low, Medium and Wide range monitors
- 2HVS-RQ101, Ventilation Vent monitor

### Effluent Flow Measuring Instruments

The inspector reviewed the methodology that the licensee uses to determine the effluent stack and vent flow rates to verify that the flow rates are consistent with TSs/ODCM and UFSAR values. Included in this review was observing I&C technicians perform the quarterly flow verification test, per 2MSP-43.32A-1, for the Unit 2 Elevated Release Radiation Monitor (2HVS-RQ1109).

### Ground Water Protection Initiative Implementation

The inspector reviewed the licensee's Ground Water Protection Initiative (GPI) program and ground water monitoring results to determine if the licensee has implemented its program as intended, and to identify any anomalous results. For anomalous results, the inspector assessed that the licensee has identified and addressed deficiencies through its corrective action program.

The inspector reviewed evaluations of leaks or spills, and reviewed the effectiveness of remedial actions. The inspector reviewed onsite contamination events and assessed whether the source of the leak or spill was identified and terminated.

For past spills, leaks, or unexpected liquid discharges, the inspector assessed that sufficient radiological surveys were performed to evaluate the extent of the contamination and the resulting dose.

The inspector reviewed the evaluation of discharges from onsite surface water bodies that contain radioactivity with the potential for ground water leakage. The inspector assessed whether the licensee is properly accounting for discharges from these surface water bodies as part of their effluent release reports.

The inspector assessed recent changes to the groundwater monitoring and control program, including the installation of a groundwater recovery system. This system is designed to extract groundwater and discharge the water to the yard drains, as a controlled and monitored pathway.

### Problem Identification and Resolution

Inspector assessed whether problems associated with the effluent monitoring and control program are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee's corrective action program. In addition, the inspector evaluated the effectiveness of the corrective actions for a selected sample of problems documented by the licensee.

b. Findings

No findings were identified.

## **4. OTHER ACTIVITIES**

### 40A1 Performance Indicator Verification (71151)

#### 1. Mitigating System Performance Index (6 samples)

a. Inspection Scope

The inspectors reviewed FENOC's submittal of the Mitigating Systems Performance Index for the following systems for the period of September 1, 2012 through August 31, 2013:

- Unit 1 Auxiliary Feedwater System
- Unit 2 Auxiliary Feedwater System
- Unit 1 Residual Heat Removal System
- Unit 2 Residual Heat Removal System
- Unit 1 Support Cooling Water System
- Unit 2 Support Cooling Water System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed FENOC's operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

2. Emergency Preparedness Performance Indicators (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP Performance Indicators (PI): (1) Drill and Exercise Performance; (2) ERO Drill Participation; and, (3) ANS Reliability. The last NRC EP inspection at Beaver Valley Power Station was conducted in the second calendar quarter of 2012. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2012 through the second calendar quarter of 2013 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 6, was used as reference criteria.

b. Findings

No findings were identified.

4OA2 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 that FENOC entered issues into the corrective action program 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 corrective action program and periodically attended condition report screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by FENOC outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed FENOC's corrective action program database for the first and second quarters of 2013 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed the FENOC trend report for the first trimester of 2013, conducted under NOBP-LP-2023, "Performance Assessment," to verify that FENOC personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

The inspectors evaluated a sample of departments that provide input into the trimester trend reports, including Work Management and Maintenance. The review included a sample of issues and events that occurred over the course of the past two quarters to objectively determine whether issues were appropriately considered adverse trends. The inspectors verified that these issues were within the scope of the corrective action program and included in the department review which inputs into the 2013 first trimester trending report. In the Work Management department, inspectors noted that completion of seasonal readiness tasks as scheduled has been a challenge at the site for several years and resulted in Unit 1 down powering 3.5% due to seasonal high temperatures affecting equipment. The site appropriately identified this issue in the 2013 first trimester report and entered the adverse trend into the corrective action program as CR 2013-00817. Inspectors also observed that the site does not have a formal seasonal readiness procedure in place that ensures timely completion of seasonal activities. FENOC issued CR 2013-17688 to address the observation.

In the Maintenance and Operations departments, the inspectors noted the extended length of time that the spare high head safety injection (HHSI) pump was out of service

due to maintenance and operation personnel errors. The inspectors noted two such occurrences that significantly contributed to the spare (swing) HHSI pump being unavailable for over 140 days this year. During maintenance on the B HHSI pump, the pump failed three post maintenance tests prior to return to service due to maintenance quality issues. Additionally, a self-revealing performance issue occurred when operations personnel restored the C HHSI pump and inadvertently introduced oil into the pump, which required 120 days to remove the oil from the system, prior to return to service. The inspectors determined the performance aspects of this issue were related to inadequate implementation of procedure 1OM-7.4.BH, "Returning the 1C Charging Pump to Service." However, the inspectors determined the performance issue was of minor significance since the A and B HHSI pumps remained fully operable. In accordance with IMC 0612, "Power Reactor Inspection Reports," the above issue constituted a violation of minor significance that is not subject to enforcement action in accordance with the Enforcement Policy. Maintenance workmanship and Operations human performance issues were appropriately identified as declining in performance by FENOC in the 2013 first trimester report and documented in CR 2013-00581 and CR 2013-05529.

The inspectors, consistent with FENOC's identification, noted a declining trend in the increased frequency of missed fire watch patrols at Unit 1 and Unit 2. Hourly fire watch patrols are a compensatory measure implemented when permanently installed fire detection, fire suppression, or fire barriers are impaired. From approximately June 4, 2013 to August 21, 2013, fifteen condition reports were entered into the corrective action program for the failure to complete hourly fire tours within the time limit set by station procedure 1/2-ADM-1904, "Control of Ignition Sources (Hot Work) and Fire Watches." The inspectors noted that FENOC originally identified that hourly fire watches were not completed within 75 minutes on May 12, 2013; however, FENOC did not take more substantive actions to ensure that fire tours were completed on time until August 2013. Similarly, the inspectors based on a review of patrol logs also identified a number of additional patrols not performed that were not documented in the corrective action program. On July 26, 2013, FENOC dedicated a person to complete hourly fire watch patrols, and this action resulted in timely completion of patrols. The enforcement aspects of this issue are discussed in Section 4OA7.

### .3 Annual Sample: Review of the Operator Workaround Program

#### a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in Beaver Valley Power Station procedure NOBP-OP-0012, "Operator Work-Arounds, Burdens, Control Room Deficiencies, and Operations Aggregate Assessment."

The inspectors reviewed FENOC's process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent FENOC self assessments of the program. The inspectors also toured the control room and discussed the current



operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

### Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that FENOC entered operator workarounds and burdens into the corrective action program at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

#### .4 Annual Sample: Safety-related Heat Exchanger Reliability Condition Monitoring Follow-up and Program Review

##### a. Inspection Scope

The inspectors performed an in-depth review of FENOC's apparent cause analysis and corrective actions associated with the subject NCVs and of FENOC's safety-related heat exchanger inspection and monitoring program. The NCVs addressed FENOC's failure to adequately monitor and maintain safety-related heat exchangers (HX) in a reliable condition. Specifically, from December 2008 to February 2011, station personnel did not maintain the Unit 2 RSS HXs in chemical wet layup, which led to corrosion and degraded HX performance. Additionally, fouling and debris buildup accelerated Unit 2 A component cooling primary (CCP) HX tube corrosion causing through-wall leakage in over 300 HX tubes. Corrective actions for the two issues included establishment of measures to periodically add chemicals and monitor the Unit 2 RSS HX chemical wet layup conditions, training for chemistry personnel regarding how to develop and implement preventive maintenance activities, associated case study training for engineering staff, and evaluation of organizational behaviors and ineffective corrective actions which adversely affected reliability of the Unit 2 safety-related HXs. FENOC entered the issues into the licensee's corrective action program under condition reports (CRs) 2011-00145, 2011-02159, 2011-90096, 2011-90430, 2011-93970, 2012-13945, 2012-15413, and 2012-18146.

The inspectors independently reviewed the CRs listed above, selected industry operating experience documents, procedures for chemical additional and monitoring of safety-related HXs, procedures for HX inspections, drawings, training lesson plans, system health reports, maintenance records of selected safety-related HX inspections, the River Water / Service Water Action Plan, and all safety-related HX issues entered in the corrective action program database since January 2010. Additionally, the inspectors interviewed station personnel to assess current practices and programs to assure safety-related HX reliability. The inspectors assessed FENOC's problem identification threshold, documentation of the issues, causal analyses, extent-of-condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether FENOC was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspectors also assessed whether FENOC had identified associated lessons learned and communicated the results to appropriate staff. The inspectors compared the actions taken to the requirements of FENOC's corrective action program and 10 CFR 50, Appendix B.

b. Findings and Observations

No findings were identified.

The inspectors' review of CRs identified trends of Units 1 and 2 HX low flow and fouling, Units 1 and 2 HX isolation valve leak-by, deficient Unit 2 HX chemical layup, and Unit 2 CCP HX tube corrosion and through-wall leakage. FENOC determined the primary cause of the degraded HXs was a lack of management oversight in that station personnel had developed a mindset that rationalized the degraded HX conditions were acceptable if they did not limit plant operation and, as a result, insufficient priority was placed on implementing actions to extend safety-related HX life. The inspectors determined that FENOC thoroughly evaluated the degraded HX issues, understood the primary and contributing causes, established and implemented timely and appropriate corrective actions, and effectively communicated the results to plant staff. Most of the programmatic corrective actions had not been implemented for sufficient duration for the inspectors to assess their effectiveness at the time of this inspection.

Notwithstanding overall improvements to the program for monitoring and maintaining safety-related HX health and reliability, the inspectors identified several observations. For example:

- Operational Decision Making Instruction 2011-02159, which had supported continued operability of the degraded Unit 2 'A' CCP HX from November 2011 to August 2012, did not quantify a trigger value for degraded CCP HX differential pressure at which time actions would be implemented to isolate the HX.
- Procedure NOBP-ER-3002, "Plant Health Committee" (PHC), Revision 6, did not provide clear guidance regarding when to add, replace, or review items on the site Top Ten List potentially limiting the benefit of this multi-disciplined PHC management review of plant issues such as the degraded service water and river water HXs.
- Heat exchanger inspection reports did not document or evaluate several pertinent HX characteristics. Examples included: 1) the equivalent number of blocked HX tubes associated with as-found HX fouling (e.g., corrosion, silt, pipe scale, clams, biological debris, etc.) was not documented; 2) the number of tubes known to be mechanically plugged was not documented; 3) in several instances photographs of the as-found HXs were not close enough to support accurate assessment of tube blockage; 4) the potential for HX divider plate bypass was not assessed; and 5) guidance for how to assess and quantify the impact of partially blocked tubes was not provided or trained upon.

The inspectors discussed each of these issues with engineers and management personnel. These issues were determined to be minor because no equipment operability was affected and the HXs remained capable of fulfilling the intended safety function. In accordance with IMC 0612, "Power Reactor Inspection Reports," the above issues constituted violations of minor significance that are not subject to enforcement action in accordance with the Enforcement Policy. FENOC entered the inspectors' observations into their corrective action program (CRs 2013-14041 and 2013-14302).

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

.1 (Closed) Licensee Event Report (LER) 05000412/2013-001-00: Gas Void in Emergency Core Cooling System Pump Suction Header results in a condition prohibited by Technical Specifications

On June 24, 2013, FENOC discovered during void monitoring checks that one train of Emergency Core Cooling System (ECCS) was inoperable at Unit 2. Gas voids were discovered at the suction of the standby ECCS high head safety injection pump that resulted in the pump being inoperable and unavailable for eight days. As a result, the 21C high head safety injection pump was inoperable from June 17, 2013 to June 24, 2013, and FENOC did not complete actions to restore the pump to operable status within 72 hours or enter Mode 4 during the eight days the pump was inoperable. The enforcement aspects of this issue are discussed in Section 4OA7. The inspectors did not identify any new issues during the review of the LER. The LER is closed.

4OA5 Other Activities

.1 Construction of an ISFSI at Operating Plants (IP 60853 - 1 sample and 60856 - 1 sample)

a. Inspection Scope

On September 9 - 10, 2013, the inspectors conducted a review of licensee and contractor fabrication activities associated with the construction of the Independent Spent Fuel Storage Installation (ISFSI) pad at Beaver Valley Power Station (BVPS). The inspectors walked down the construction area; examined the rebar installation; and verified that the rebar size, spacing, splice length, and concrete coverage on the top, side, and bottom complied with licensee-approved drawings and specifications. The inspectors also evaluated the concrete formwork installation for depth, straightness, and horizontal bracing and verified the overall dimensions and orientation for compliance to the licensee-approved drawings. The inspectors interviewed licensee and contract personnel to verify knowledge of the planned work and appropriate oversight of the construction activities. The inspectors reviewed the concrete truck batch tickets to verify that the concrete delivered to the site met code and specification requirements. The inspectors observed concrete placement, vibration, and finishing for two pad sections, and observed tests for concrete slump and air content, temperature measurements, and the collection and preparation of cylinder samples for compression tests to verify that the work was implemented according to licensee-approved specifications and referenced industry codes and standards. The inspectors also reviewed records of previously placed concrete to assure that the compressive strength test results met the acceptance criteria as specified in the design requirements.

The inspectors performed an in-office review of ISFSI pad design documentation to determine if the storage pad would adequately support both static and dynamic loads, as required by 10 CFR 72.212(b)(5)(ii). The inspectors verified if the licensee used appropriate assumptions in the seismic and liquefaction analyses for the storage pad. The inspectors reviewed the licensee's conclusions about the acceptability of the storage pad's design with respect to the site's hydrology, geology and seismology.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 25, 2013, the inspectors presented the inspection results to Eric Larson, Site Vice President, and other members of the Beaver Valley Power Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by FENOC and are a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

- The Beaver Valley Power Station Unit 2 Technical Specification limiting condition for operation (LCO) 3.5.2 requires two trains of emergency core cooling system (ECCS) to be operable in Modes 1, 2, and 3. Contrary to the above, on June 17, 2013 to June 24, 2013, FENOC failed to have two trains of ECCS operable in Mode 1 which existed for greater than the allowed restoration and shutdown completion times of the LCO due to inadequate procedures that resulted in gas voids in the 21C high head safety injection pump (HHSI) suction piping while the 21A HHSI pump was inoperable due to planned maintenance. FENOC corrective actions include increased void monitoring frequency and updating fill and vent procedures for the HHSI system (CR 2013-09725). In accordance with IMC 0609 Attachment 4, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609 Appendix A, "The Significance Determination Process for Findings at Power," the inspectors identified that the finding screened as potentially risk-significant due to representing an actual loss of function of a single train for greater than its technical specification allowed outage time. Therefore, a detailed analysis was conducted utilizing the Beaver Valley Unit 2 SPAR model, version 8.23 run by SAPHIRE version 8.0.9. The 21C is a spare pump that can be manually aligned to either train. As a result the analysis considered cases in which it was in the standby configuration and also when it would be required to be manually realigned and started. The first case had a fault exposure time of 204 hours and was assumed to have the pump fail to start if called upon. The second condition had an exposure time of 185 hours and was assumed to fail if realigned. The increase in risk from these conditions resulted in a change in core damage frequency of less than 1E-7. The dominant sequence was a loss of containment air along with failures of reactor coolant pump seals, the ability to provide high pressure injection and the failure of secondary side heat removal. Because an increase in core damage frequency was less than 1E-7, further evaluation of external event and large early release risk was not required and the results calculated were determined to be of very low safety significance (Green).
- Technical Specification 5.4.1, "Procedures," requires that written procedures shall be implemented covering the Fire Protection Plan. The FENOC Fire Protection Plan includes 1/2-ADM-1904, "Control of Ignition Sources (Hot Work) and Fire Watches," which requires fire watch patrols be completed every seventy-five minutes. Contrary to the above, between June 4, 2013 and August 21, 2013, FENOC identified fire

watch patrols were not completed in accordance with the Fire Protection Plan procedure 1/2-ADM- on fifteen patrols. FENOC entered this issue into the corrective action program as CR-2013-08322. The inspectors determined that the finding was of very low safety significance (Green) in accordance with Attachment 4, "Initial Characterization of Findings" and IMC 0609, Appendix F, "Fire Protection Significance Determination" Phase 1 Screening, because the reactors were able to reach and maintain safe shutdown conditions.

- 10 CFR 50.54 "Conditions of Licenses," paragraph (q), requires, in part, that licensee's maintain an emergency plan that meets the planning standards in 10 CFR 50.47(b) "Emergency Plans." 10 CFR 50.47(b)(4) requires use of a standard emergency classification and action level scheme. Contrary to the above, on March 20, 2013, FENOC identified that existing instrumentation was inadequate to assess and determine if abnormal radiological conditions existed such that the Emergency Action Level (EAL) declaration process would not declare an Alert or a Site Area Emergency in an accurate and timely manner. Specifically, the maximum readable values for the containment elevated release radiation monitor low-range channel (RM-1VS-110 Channel 5) and for the cooling tower vent radiation monitor mid-range channel (RM-1GW-109 Channel 7) were less than the EAL threshold values specified for an Alert and Site Area Emergency, respectively, in FENOC's EAL scheme. FENOC entered this issue into their corrective action program as CR-2013-04092. The inspectors determined this finding to be of very low safety significance (Green) in accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," and Section 5.4 of IMC 0609 Appendix B, "Emergency Preparedness SDP" because the finding was an example of an ineffective EAL, such that an Alert would not be declared and an example of an ineffective EAL, such that a Site Area Emergency would be declared in a degraded manner.

#### **ATTACHMENT: SUPPLEMENTARY INFORMATION**

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

E. Larson	Site Vice President
R. Bologna	Director, Site Operations
R. Brooks	Fleet Exam Developer
S. Buffington	Senior Mechanical Design Engineer
F. Cousart	Electrical Engineer
E. Crosby	Radiation Protection Supervisor
D. DiGiovanni	Chemistry Advanced Specialist
J. Earle	Chemistry Supervisor
P. Eisenmann	Fleet Exam Developer
R. Egolf,	System Engineer
K. Farzan	Compliance Engineer
J. Freund	Supervisor, Radiation Protection, Support Services
T. Gaydosik	Fleet Exam Developer
J. Gallagher	Maintenance Rule Coordinator
S. Hovanek	Manager, System Engineering
M. Jansto	Plant Engineer, Radiation Monitoring Systems
D. Jones	IST Coordinator
T. King	System Engineer
J. Kubis	Advanced Nuclear Engineer
L. Martin	LOR Program Lead
E. McFarland	Simulator Supervisor
K. McIntyre	ISFSI Project Manager
J. Meyers	Service Water System Engineer
J. Miller	Fire Marshall
J. Ostrowski	Senior Nuclear Engineer
B. Prinkey	Manager, Plant Engineering
M. Ravsten	Quality Control Oversight
L. Renz	Manager, Environmental Programs
D. Salera	Manager, Site Chemistry
S. Sawtschenko	Emergency Preparedness Manager
B. Sepelak	Supervisor, Regulatory Compliance
J. Smierciak	Field Oversight
T. Steed	Site Radiation Protection Manager
S. Vicinie	Supervisor, Performance Assessment
G. Westbrook	Design Engineer
R. Winter	Chemistry Staff Specialist

Other Personnel

L. Ryan	Inspector, Pennsylvania Department of Radiation Protection
---------	--

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**

Closed

05000412/2013-001-00	LER	Gas Void in Emergency Core Cooling System Pump Suction Header results in a condition prohibited by Technical Specifications (Section 4OA3)
----------------------	-----	--

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Procedures

1/2OM-53C.4A.35.1, Degraded Grid, Revision 9  
 1/2OM-35.4A.A, Voltage Schedule Guidance, Revision 9  
 NOP-OP-1003, Grid Reliability Protocol, Revision 5

**Section 1R04: Equipment Alignment**

Procedures

2OST-36.7, Offsite to Onsite Power Distribution System Breaker Alignment Verification, Revision 17

Miscellaneous

RM-0413-001, Containment Depressurization System, Revision 26  
 RM-0413-002, Containment Depressurization System, Revision 13  
 8700-RM-0411-001, Piping and Instrument Diagram Safety Injection System, Revision 26

**Section 1R05: Fire Protection**

Procedures

2PFP-TRBB-730-Turbine Basement East (Fire Area TB-1), Revision 2  
 2PFP-TRBB-752-Turbine Building Mezzanine (Fire Area TB-1), Revision 2  
 2PFP-TRBB-752-Battery Room 2-6 (Fire Area TB-2), Revision 0  
 2PFP-MSCV-735-West Cable Vault (Fire Area CV-1), Revision 4  
 2PFP-MSCV-773-Main Steam Valve Room/Emergency Switchgear Vent Room (Fire Areas MS-1 & CV-4), Revision 0  
 1PFP-AXLB-768-Auxiliary Building General Area (Fire Area PA-1A), Revision 3  
 1OM-56B.4.A Save Shutdown Following a Serious Fire in the Primary Auxiliary Building, Revision 11

Work orders

600539221

Condition Reports

2009-58151    2012-15108    2012-07164    2009-60661

Notifications

600768186    600789233    600748864    600548850

**Section 1R06: Flood Protection Measures**Condition Reports

2013-14679 2013-14666

Miscellaneous

WO 200497181

1/2MI-75-MANHOLE-1E, Inspection of Manholes for Water Induced Damage, Revision 8

**Section 1R07: Heat Sink Performance**Procedures

1/2ADM-2146, BOP Eddy Current Program, Revision 2

Condition Reports

2013-08211

Work Orders

200443476

200562915

**Section 1R11: Licensed Operator Requalification Program**Procedures

2013 Unit 2 Sample Plan

BVBP-TR-0008, Licensed Operator Requalification Exam Development and Administration,  
Revision 7

NOP-TR-1010, Licensed Operator Requalification Exam Development, Revision 2

1/2-ADM-1351, Licensed Operator Continuing Training Program, Revision 12

1OM-52.4.R.1.A, Station Shutdown Mode 1 to Mode 6 Administrative and Local Actions,  
Revision 5

1OM-52.4.R.1.F, Station Shutdown from 100% Power to Mode 5, Revision 26

Job Performance Measures

2CR-056	2CR-524	2CR560	2CR572
2CR-608	2CR-636	2PL-004	2PL-009
2PL-065	2PL-066	2CR-581	2CR-624
2AD-006	2PL-031	2PL-070	

Comprehensive Written Exams (Previously administered in May and June 2013)

2013U2C3E1	2013U2C3E2	2013U2C3E3	2013U2C3E4
------------	------------	------------	------------

Simulator Scenarios

2DRLS-ECA-3.1.004	2DRLS-FR-H.1.001	2DRLS-E-3.008
2DRLS-ECA-0.0.001	2DRLS-E-2.005	2DRLS-FR-S.1.008
2DRLS-E-2.005		

Condition Reports

2012-17172 2012-09241 2012-10283 2013-01972 2013-01129



Simulator Testing

SQT- 6.1 100% Steady State Drift  
 SQT- 6.2 Mid Power Steady State Drift  
 SQT- 6.3 Low Power Steady State Drift  
 SQT- 5.2 Loss of All Feedwater  
 SQT- 5.4 Complete Loss of Reactor Coolant Flow  
 SQT- 14.1.5.4.06.01 Condensate Pump suction Strainer Clogged Test  
 SQT- 14.1.5.4.21.03 Inadvertent Safety Injection Signal  
 SQT- 14.1.5.9.02.03 Boric Acid Tank System Leak Test  
 SQT- 14.1.5.5.02.03 2CNM-P21B Seized Shaft  
 SQT- 14.1.5.2.01.04 Load Following from Full Power to 40 Percent  
 SQT- 14.1.5.2.01.05 Plant Shutdown from 40% to Hot Standby

Simulator Work Requests

SWR 6526    SWR 6539    SWR 6545    SWR 6550    SWR 6554    SWR 6571  
 SWR 6572    SWR 6609

Miscellaneous

Beaver Valley Power Station 2013 Red Team Mini Drill Scope and Objectives Handbook

**Section 1R12: Maintenance Effectiveness**Condition Reports

2013-09461    2013-08508    2013-07104

Work Orders

200507811	200308595	200308596	200558720	200558721	200376345
200440096	200558722	200074201	200558723	200440097	200505442
200374857	200374856	200505365	200507736	200209929	200507737
200209895	200505331	200562674			

Miscellaneous

Unit 1 Maintenance Rule System Basis Document, Revision 13  
 EPRI Report TR-104862, Area and Process Radiation Monitoring Program, Revision 2  
 EVRM-EP-5003, Equipment Important to Emergency Response, Revision 5  
 NRC Information Notice 2013-13: Deficiencies with Efficient Radiation Monitoring System Instrumentation  
 Beaver Valley Unit 1 and 2 System Health Reports, dated September 9, 2013  
 Beaver Valley System Unit 1 Health Report 2012-4, dated February 1, 2013  
 Beaver Valley System Unit 2 Health Report 2012-4, dated February 1, 2013

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

20ST-47.3G Containment Penetration and ASME Valve Test Work Week 2, Revision 19  
 NOP-OP-1007, Risk Management, Revision 16  
 NOP-OP-1003, Grid Reliability Protocol, Revision 5

Condition Reports

2013-10409

Work Orders  
200569189

Miscellaneous

BV Unit 2 Weekly Maintenance Risk Summary for the week of July 8, 2013, Revision 2  
BV Unit 2 Weekly Maintenance Risk Summary for the Week of September 2, 2013, Revision 0  
BV Unit 1 Weekly Maintenance Risk Summary for the Week of September 9, 2013, Revision 1  
BV Unit 2 Weekly Maintenance Risk Summary for the Week of September 9, 2013, Revision 3  
Weekly Maintenance Risk Summary for the Week of September 16, 2013, Revision 1  
Unit 2 Operations Shift Log dated September 18, 2013

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

Procedures

2OST-1.1 Control Rod Assembly Partial Movement Test, Revision 12  
NOP-OP-1009, Operability Determinations and Functionality Assessments, Revision 3  
2OST-30.6A, Service Water Pump [2SWS\*P21C] Test on Train A Header, Revision 29

Condition Reports

2013-11272 2103-11975 2013-12180 2013-12528 2013-09217 2013-10709  
2013-13794 2013-13796

Work Orders/Notifications

600839780 600845987

Miscellaneous

2DBD-36A, Emergency Diesel Generator System, Revision 9  
RE-0007AV, Wiring Diagram Annisol Diesel Generator, Revision 8  
RE-0014Z, Wiring Diag Emer Diesel Gen 1 & 2 Local Annunciators, Revision 9  
2SWS\*P21C Pump Curves, dated August 21, 2013  
2SWS\*P21C Head Ratio Trend on A SWS Header  
BVPS Operator Logs, dated August 23, 2013

**Section 1R18: Plant Modifications**

Procedures

NOP-CC-2003, Engineering Changes, Revision 18  
1/2CMP-75-MSAON-37-15-11, Masoneilan Model 37, Sizes 15, 18 and 18L Actuator  
Maintenance, Revision 0  
1/2-PIP-S04, General Grouting, Revision 5  
1/2-PIP-M13, ANSI B31.1.0 Tubing Installation, Revision 6

Notification

600846637 600758904 600850020

Condition Reports

2013-07516 2013-07406 2013-12755

Engineering Change Packages

13-0501-000, TMOD Safety Class Relief Path Relocation to Non-Nuclear Safety Related Piping & Pie Plate & Lock Open of 2CHS-646, Revision 0

10-0784-002, Replace Control Room AC System Temperature Control Valves TCV-1RW-101 A&B, Revision 0

Drawings

C1-410-940-5AC, Chemical and Volume Control Auxiliary Building, Rev. G

1107173-OJAC, Chemical and Volume Control Reactor Containment, Revision 7

Miscellaneous

ME-CP-1312, BVPS Unit 2 Inspection Report, dated September 3, 1982

2BV-58A Release #1, Guyon Alloys Material Certification, dated April 25, 1977

BOP-PT-13-014, Liquid Penetrant Exam of weld on 2CHS-646, dated July, 24, 2013

WO200396226

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

2OST-47.3.G, Containment Penetration ASME Valve Test Work Week 2, Revision 19

2OST-7.4, Centrifugal Charging Pump [2CHS\*P21A], Revision 36

1OST-7.6, Centrifugal Charging Pump Test [1CH-P-1C], Revision 42

1/2PMP-7CH-P-1A/21A-B-C-2M, Charging/High Head Safety Injection Pump Bearing Inspection, Revision 16

BVBP-SITE\_0053, Post Maintenance Test Requirements, Revision 8

1OST-7.4, Centrifugal Charging Pump Test [1CH-P-1A], Revision 41

1CMP-1SCC-P-1A-B-C-1M, Reactor Plant Component Cooling Water Pump Overhaul and Seal Replacement, Revision 11

2ICP-7-TC150C, 2CHS-TC150C Charging Pump (2CHS-P21C) Lube Oil Temperature Controller Calibration, Revision 6

2OST-6.7, Centrifugal Charging Pump [2CHS\*P21C], Revision 35

Condition Reports

2013-10409    2009-51842    2013-03903    2013-03947    2013-03975    2013-03886

2013-04516    2013-04800    2013-04916    2013-05095    2013-05529    2011-06997

2012-06115    2012-06207

Maintenance Orders/Work Orders

200569189    200568426    200454862    200558172    200570901    200570903

200568498    200326839    200433755

Notifications

600826497    600838476    600637979

Miscellaneous

Dwg 8700-RM-0407-001, Chemical and Volume Control System, Revision 33

Dwg 8700-RM-0407-002, Chemical and Volume Control System, Revision 22

ECP 13-0501-001

## **Section 1R22: Surveillance Testing**

### Procedures

1/2OM-48.3.D, Administrative Control of Valves and Equipment,  
1OST-13.7B, 2B Recirculation Spray Pump Flow Test, Revision 10  
2OST-6.7, Centrifugal Charging Pump [2CHS\*P21C], Revision 35  
1OST-36.01, Diesel Generator No. 1 Monthly Test, Revision 59  
1OST-24.3, Motor Driven Auxiliary Feed Pump Test [1FW-P-3B], Revision 46

### Notifications/Work Orders

600848482 200507139 600731863 200518599

### Drawings

8700-RM-436-001, Emergency Diesel Generator Air Starts System, Revision 11  
8700-RM-436-002, Emergency Diesel Generator Fuel Oil System, Revision 11  
8700-RM-436-003, Lube Oil System, Revision 6  
8700-RM-436-004, EE-EG-1 (a) Water Cooling System, Revision 5

### Miscellaneous

Limiterque Technical Update 05-02, Non-Locking Stem/Stem Nut Thread  
8700-DMC-2807  
CR 2013-12082  
CR 2013-12949

## **Section 1EP2: Alert and Notification System Evaluation**

### Miscellaneous

1/2-ADM-1107, Alert Notification System (Sirens) Maintenance and Testing, Revision 11  
Beaver Valley Emergency Preparedness Plan, Revision 28  
BVPS ANS Maintenance and Testing records, June 2011 – June 2013  
Emergency Warning Notification System Design Report for Beaver Valley Power Station,  
dated 3/5/1984  
Letter from FEMA to PEMA Re: Approval of Revisions to the BVPS Emergency Warning  
Notification System, dated 6/13/2011  
Letter from FEMA to PEMA Re: Backup Alert and Notification System for BVPS EPZ,  
dated 11/28/2012

## **Section 1EP3: Emergency Response Organization Staffing and Augmentation System**

### Procedures

1/2-ADM-1101, Emergency Response Organization Administration, Revision 15  
1/2-EPP-I-2, Unusual Event, Revision 40  
1/2-EPP-I-3, Alert, Revision 38  
1/2-EPP-I-4, Site Area Emergency, Revision 38  
1/2-EPP-I-5, General Emergency, Revision 39  
1/2-EPP-IP-1.4, Technical Support Center Activation, Operation and Deactivation, Revision 35  
1/2-EPP-IP-1.6, Emergency Operations Facility Activation, Operation and Deactivation,  
Revision 25  
2013 Unannounced Emergency Response Organization (ERO) Drive-In Drill Results  
Beaver Valley Emergency Preparedness Plan, Revision 28  
BVPS ERO On-Shift Staffing Analysis Report, Revision 0

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

1/2-EPP-IP-2.6, Environmental Assessment and Dose Projection Controlling Procedure, Revision 27

**Section 1EP5: Maintenance of Emergency Preparedness**Procedures

1/2-EPP-IP-7.1, Emergency Equipment Inventory and Maintenance Procedure, Revision 25  
 Beaver Valley Emergency Preparedness Plan, Revision 28  
 BVPS Development of Evacuation Time Estimates, Field Report KLD TR-495, Rev. 2  
 BVRM-EP-5003, Equipment Important to Emergency Response, Revision 4

Miscellaneous

Drill Reports, dated July 2011 – July 2013  
 Event Report, BVPS Unusual Event, June 14, 2013  
 MS-C-11-11-24, Fleet Oversight Audit Report, dated 12/12/2011  
 MS-C-12-11-24, Fleet Oversight Audit Report, dated 12/7/2012  
 NOP-CC-2003, Engineering Changes, Revision 18  
 NOP-CC-2004, Design Interface Reviews and Evaluations, Revision 10  
 NOP-LP-5002, Evaluation of Changes to Emergency Plans and Supporting Documents, 10 CFR 50.54(q), Revision 5

Condition Reports

2011-04406	2011-04431	2011-05190	2011-05229	2011-06028	2012-01564
2012-08525	2012-09267	2012-10050	2012-12050	2012-12317	2012-12809
2012-13885	2012-18267	2012-18562	2012-18664	2013-02221	2013-02962
2013-04092	2013-04258	2013-09847	2013-10963	2013-11409	2013-12317
2013-13406	2013-13656	2013-13657	2013-13726	2013-13736	2013-13737

**Section 1EP6: Drill Evaluation**Condition Reports

2013-11028 2013-11059 2013-11042 2013-11027

Miscellaneous

2013 Red Team Mini-Drill

**Sections RS05/2RS6: Radiation Monitoring Instrumentation/Radioactive Gaseous and Liquid Effluent Treatment**Procedures

1/2HPP-6.03.018, MGP IDC-HF Calibrator Calibration and Use, Revision 0  
 1MSP-43.48-I, RM-1RM-207, Fuel Pool Bridge, Fuel Building Area Radiation Monitor Calibration, Revision 10  
 2MSP-43.32A-1, Elevated Release Radiation Monitor 2HVS-RQI109A, B, C, D Test, Revision 17  
 1-HPP-4.02.002, Effluent Monitors, Revision 6  
 1-HPP-4.02.003, Area Monitoring System, Revision 10  
 1-HPP-4.02.012, Containment High Range Area Monitors, Revision 9  
 1HPP-4.02.016, Control Room Low Range Area Monitor, Revision 8  
 2-HPP-4.02.019, DRMS Area Monitoring Subsystem, Revision 8,

2-HPP-4.02.020, DRMS Process Monitoring Subsystem, Revision 17  
2-HPP-4.02.021, DRMS Effluent Monitoring Subsystem, Revision 13  
1/2-HPP-4.03.001, Count Rate Meter-Modle E-140 or E-140N/HP-210 or HP-260, Revision 1  
1/2-HPP-4.01.009, Model 89-400, Gamma Calibration System, Revision 6  
1/2-HPP-4.01.010, Response Check Range Determination, Revision 2  
1/2-HPP-4.03.015, Portable Ion Chamber Calibration and Use, Revision 2  
1/2- HPP-4.03.028, Calibration and Use of the MGP Telepole, Revision 1  
1/2-HPP-4.06.012, Eberline, AMS-4 Continuous Air Monitor, Revision 9  
1/2-HPP-6.02.002, FastScan Calibration and Routine Operations, Revision 8  
1/2-HPP-6.02-004, AccuScan II Calibration and Routine Operations, Revision 6  
1/2HPP-4.03.004, GM Survey Meter – Model E520, Revision 1  
1/2-HPP-4.02.018, MGP-iDC-HF Calibrator Calibration and Use, Revision 0  
1/2-HPP-4.04.023, Eberline Personnel Contamination Monitor (PCM-2), Revision 2  
1/2-HPP-3.07.003, Airborne Radioactivity Sampling, Revision 1  
BVBP-RP-0009, Electronic Alarming Dosimeter Control, Revision 1  
1/2 -ENV-07.01, Groundwater Remediation Pump Operations and Sampling, Revision 0

#### Calibrators

Shepherd Calibrator Model 89-400 (Serial Nos. 8216, 8246)  
iDC-HF Electronic Dosimeter Calibrator

#### Portable Survey Instruments

E-520 Serial No. 4985  
RM-14 Serial Nos. 8455, 1122, 1037, 7062, 8443, 8368, and 1976  
RO-2 Serial No. 4606  
RO-2A Serial No. 3863  
Fluke 451B Serial No. 0162  
Telepole Serial Nos. 6604-053

#### Contamination Monitors

SAM-11 Serial Nos. 135, 140  
PCM-2 Serial Nos. 335, 289, 536, 539, and 535  
SPM-906 Serial Nos. 026, 030, 104, 025, 027, and 029  
AMS-4 (Airborne) Serial Nos.1395, 363, 367, 1395, and 1457  
RM-14 (Frisker) Serial Nos. 8668 and 1976

#### Electronic Dosimeters

DMC-2000 Serial Nos. 684601. 673416, 221950, 684530, 010461, 230534, and 853363

#### Neutron Instruments

PNR/ASP-1 Serial Nos. 4364, 2874, 0440, and 0999

#### Area Monitors

RM-1RM-218A, Control Room Monitor  
RM-1RM-207, Fuel Pool Area Monitor

#### Whole Body Counting Systems

FastScan whole body counting system  
AccuScan-II whole body counting system

Laboratory Instruments

Gamma Spectroscopy Detectors Nos. 1, 2, 3, 5, 6, and 7  
Beta Scintillation Counter TR3100

Effluent Radiation Monitor Calibration Records

1MSP-43.48-1, Rev BV-RM-1RM-207, Fuel Pool Area Bridge monitor  
1MSP-43.60-I, RM-1VS-109, Ventilation Vent monitor  
1MSP-43.18-I, RM-1LW-104, Liquid Waste Effluent monitor  
1MSP-43.61A, RM-GW110, Gaseous Waste monitor  
1MSP-43.61C-I, RM-VS-112, Reactor Building/SLCRS monitor  
1MSP-43.23-I, RM-LW-116, Liquid Waste Contaminated Drains monitor  
2MSP-43.32-I, 2HVS-RQI-109, A Elevated Release Particulate monitor  
2MSP-43.33-I, 2HVS-RQI-109, B/C/D Elevated Release Gas monitor  
2MSP-43.38-I, 2HVL-RQI-112, Condensate Polishing Building exhaust monitor  
2MSP-43.39-I, 2SGC-RQI-100, Liquid Waste Effluent Monitor

Condition Reports

2013-11718    2013-11580    2013-11181    2013-01023    2013-02345    2013-03640  
2013-07157    2013-09691    2013-10012

Nuclear Oversight Quarterly Assessment Report/Audit

PA-BV-13-02, Radiation Protection 2nd Trimester Performance  
PA-BV-2013-0025-014, Rad Monitor Trend

Other Documents

Unit 1 and Unit 2 Radiation Monitoring System Health 1st Quarter Report 2013  
iDC-HF Electronic Dosimeter Calibrator Calibration Summary Report, Shepard Model 81  
Beam Calibrator  
Inventory List of Radiation Protection Instruments  
Groundwater Monitoring Analytical Results for June 2013 and March 2013  
Groundwater Monitoring Well Installation Report

Liquid Discharge Permits

RWDA-L- 2-OCT 09-02, Unit 2 Hot Lab Cup Sink  
RWDA-L- 2-JUN-13-02, Unit 2 Hot Lab Cup Sink

**Section 40A1: Performance Indicator Verification**

Procedures

NOBP-LP-4012, NRC Performance Indicators, Revision 4  
1/2-ADM-1111, NRC EPP Performance Indicator Instructions, Revision 8  
Alert Notification System PI data, April 2012 – June 2013  
DEP PI data, April 2012 – June 2013  
ERO Drill Participation PI data, April 2012 – June 2013

**Section 40A2: Problem Identification and Resolution**

Procedures

1/2-ADM-2106, River / Service Water System Control and Monitoring Program, Revision 5  
NOP-OP-1010, Operational Decision Making, Revision 4  
NOBP-OP-0012, Operator Work-Arounds, Burdens, Control Room Deficiencies, and Operations  
Aggregate Assessment, Revision 3

Condition Reports

2003-03592	2006-02289	2009-62277	2011-02204	2011-03909
2012-00144	2012-01376	2012-02291	2012-03198	2012-06299
2012-06436	2012-06790	2012-07848	2012-08450	2012-10500
2012-14503	2012-15697	2012-15815	2012-15853	2013-00336
2013-00581	2013-01681	2013-02582	2013-02617	2013-02764
2013-03221	2013-03492	2013-05337	2013-05529	2013-06047
2013-06365	2013-07152	2013-07466	2013-14585	2013-14586
2013-14588	2013-14589	2013-14591	2013-14592	2013-14596

Maintenance Work Orders/Notifications

200016861	200016927	200017002	200017903	200203457
200316455	200375743	200394796	200394803	200394877
200399629	200420431	200432538	200441062	200448308
200454933	200456660	200456916	200456917	200457477
200465536	200472153	200474535	200480667	200491725
200495702	200496205	200499058	200499219	200500388
200500450	200500664	200500916	200501132	200502128
200502129	200502134	200502135	200502136	200502137
200502827	200509806	200512550	200512875	200513313
200513671	200514347	200515724	200533382	200536212
200536216	200536244	200536255	200536256	200536257
200536258	200536259	200537751	200539555	200539786
200541484	200542950	200547013	200548129	200552173
200552633	200553524	200556768	200557323	200559497
200559514	200559798	200560564	200560674	200561474
200563777	200564479	200564481	200564991	200565743
200566602	600055485	600065430	600073429	600214790
600420576	600499191	600542194	600542196	600556279

Miscellaneous

Beaver Valley Top Ten List dated April 16, 2013

Calculation 10080-N0829, Tube Plugging Criteria for 2CCP-E21A, B, C, Revision 0

ECP 13-0361, Design Concept for Unit 1 Reactor Plant and Turbine Plant River Water Systems, Unit 2 Service Water System, and Fire Protection Chemical Injection and De-chlorination Upgrade, Revision 0

SN-SA-2012-0268, Snap Shot Assessment of Beaver Valley Piping Integrity Maintenance in Support of GL 89-13 Program, dated February 8, 2013

PA-BV-13-01, 1<sup>st</sup> Trimester Report Beaver Valley Fleet Oversight, dated June 2013

1/2-ADM-1904.F02, Fire Watch Log, Revision 0, dated June 9, 2013 through June 30, 2013

Aggregate Impact Review Unit 1 (4<sup>th</sup> Quarter 2012)

Aggregate Impact Review Unit 1 (1<sup>st</sup> Quarter 2013)

Aggregate Impact Review Unit 2 (4<sup>th</sup> Quarter 2012)

Aggregate Impact Review Unit 2 (1<sup>st</sup> Quarter 2013)

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**Condition Reports

2013-09725



Other

3BVT-01.11.04, Void Monitoring, Revision 10  
2OM-50.4.L, RCS Startup, Revision 9

**Section 4OA5: Other Activities**

Calculations

BV012-CALC-005, Settlement and Bearing Stability Analysis of the BVPS ISFSI Site, Revision 0  
BV012-CALC-007, Development of the Time Histories of the BVPS ISFSI Site, Revision 0

Drawings

2006.890-000-001, Revision 0	2006.890-000-002, Revision 0	
2006.890-000-003, Revision 0	2006.890-000-004, Revision 0	
2006.890-000-005, Revision 0	2006.890-000-006, Revision 0	
2006.890-000-007, Revision 0	2006.890-000-008, Revision 0	
2006.890-000-009, Revision 0		
RC-0085A, Revision 0	RE-0085A, Revision 0	RE-0085B, Revision 0
RE-0085C, Revision 0	RE-0085D, Revision 0	RE-0085E, Revision 0
RE-0085F, Revision 0	RY-0085A, Revision 0	

Engineering Evaluations

ECP 12-0245-000  
ECP 12-0245-001

Miscellaneous

BV012-PS-003, Project Specification for the FirstEnergy Beaver Valley Power Station ISFSI  
Pad and Apron Construction, Revision 1  
Concrete Batch Ticket Number 35660 for Truck 280 on September 10, 2013  
Concrete Batch Ticket Number 35661 for Truck 296 on September 10, 2013  
ISFSI Concrete Control Log on September 10, 2013

**Section 4OA7: Licensee Identified Violations**

Condition Reports

2013-09725 2013-08322 2013-04092

Procedures

1/2-ADM-1904, Control of Ignition Sources (Hot Work) and Fire Watches, Revision 2

**LIST OF ACRONYMS**

AC	alternating current
ADAMS	Agencywide Documents Access and Management System
ANS	Alert and Notification System
BVPS	Beaver Valley Power Station
CCP	component cooling primary
CFR	Code of Federal Regulations
CR	condition report
EAL	emergency action level
ECCS	emergency core cooling system
EDG	emergency diesel generator
EP	emergency preparedness
EPIP	emergency plan implementing procedures
ERF	emergency response facilities
ERO	emergency response organization
FEMA	Federal Emergency Management Agency
FENOC	FirstEnergy Nuclear Operating Company
GPI	Ground Water Protection Initiative
HHSI	high head safety injection
HX	heat exchanger
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	job performance measures
kV	kilovolt
LCO	limiting condition for operation
LER	licensee event report
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSIR	Office of Nuclear Security and Incident Response
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PHC	plant health committee
PI	performance indicator
RSS	recirculation spray system
SDP	Significance Determination Process
SSC	structure, system, or component
UFSAR	Updated Final Safety Analysis Report