



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

February 10, 2014

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 05000334/2013005 AND 05000412/2013005**

Dear Mr. Larson:

On December 31, 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 January 31, 2014 with E. 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.

This report documents one NRC-identified finding and one self-revealing finding of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because these findings were entered into your corrective action program, the NRC is treating these findings as 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 addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Beaver Valley Power Station.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to IMC 0310. Cross-cutting aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-

cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

In accordance with 10 CFR 2.390 of the NRCs "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 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

William A. Cook, Acting Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000334/2013005 and 05000412/2013005
w/Attachment: Supplementary Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-334, 50-412

License Nos.: DPR-66, NPF-73

Report No.: 05000334/2013005 and 05000412/2013005

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA 15077

Dates: October 1, 2013 to December 31, 2013

Inspectors: D. Spindler, Senior Resident Inspector
E. Carfang, Resident Inspector
B. Bickett, Senior Project Engineer
A. Dugandzic, Project Engineer
P. Kaufman, Senior Reactor Inspector
J. Laughlin, Emergency Preparedness Inspector
T. Moslak, Senior Health Physicist Inspector
M. Patel, Reactor Inspector
D. Silk, Senior Licensed Operator Examiner

Approved By: William A. Cook, Acting Chief
Reactor Projects Branch 6
Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY	3
1. REACTOR SAFETY	5
1R01 Adverse Weather Protection.....	5
1R04 Equipment Alignment	5
1R05 Fire Protection	6
1R07 Heat Sink Performance	8
1R08 In-service Inspection Beaver Valley Unit 1.....	8
1R11 Licensed Operator Requalification Program	11
1R12 Maintenance Effectiveness.....	12
1R13 Maintenance Risk Assessments and Emergent Work Control	13
1R15 Operability Determinations and Functionality Assessments.....	13
1R18 Plant Modifications	14
1R19 Post-Maintenance Testing.....	15
1R20 Refueling and Other Outage Activities.....	15
1R22 Surveillance Testing	18
1EP4 Emergency Action Level and Emergency Plan Changes	18
2. RADIATION SAFETY	19
2RS01 Radiological Hazard Assessment and Exposure Controls	19
2RS02 Occupational ALARA Planning and Controls	22
2RS03 In-Plant Airborne Radioactivity Control and Mitigation	24
2RS04 Occupational Dose Assessment.....	25
4. OTHER ACTIVITIES.....	26
4OA1 Performance Indicator Verification.....	26
4OA2 Problem Identification and Resolution	27
4OA3 Follow-Up of Events and Notices of Enforcement Discretion	29
4OA5 Other Activities	29
4OA6 Meetings, Including Exit.....	30
ATTACHMENT: SUPPLEMENTARY INFORMATION.....	30
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-10

SUMMARY

IR 05000334/2013005, 05000412/2013005; 10/01/2013-12/31/2013; Beaver Valley Power Station, Units 1 and 2; Refueling and Other Outage Activities and Radiological Hazard Assessment and Exposure Controls.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. One NRC-identified non-cited violation and one self-revealing non-cited violation of very low safety significance (Green) were identified. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

Cornerstone: Initiating Events

Green. A self-revealing, Green NCV of TS 5.4.1 "Procedures" was identified when an operator did not correctly implement procedure 1OM-52.4.A, Raising Power from 5% to Full Load Operation, Revision 68, during the warm up the moisture separator reheaters. Specifically, a human performance error resulted in a main steam valve being mispositioned that subsequently caused a plant power transient. FENOC entered this issue into the corrective action program under CR 2013-17848 and reviewed the transient under the Reactivity Management Program. The site performed a limited apparent cause evaluation and plans to update the procedure.

The finding is more than minor because it is associated with the Human Performance attribute of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, a human performance error resulted in a main steam valve being mispositioned that subsequently caused a plant power transient. The finding is also similar to the more than minor example 4.b in IMC 0612, Appendix E, Examples of Minor Issues. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition. This finding has a cross-cutting aspect in the area of Work Practices, Human Performance because FENOC did not ensure personnel work practices support human performance. Specifically, FENOC operators did not use an appropriate self-check and peer check during an activity with the potential to affect reactivity [H.4(a)]. (Section 1R20)

Cornerstone: Occupational Radiation Safety

Green. The inspectors identified a Green non-cited violation involving the failure to properly ensure that a device used to control access to a Very High Radiation Area was adequate to prevent an unauthorized entry into the area. Specifically, the licensee used a pliers-style locking device that did not provide a robust locking mechanism to prevent unauthorized access into a VHRA. In response to the concern, FENOC entered the issue into the corrective action

program as CR 2013-18743 and changed the VHRA locking device at the Unit 2 reactor keyway.

The finding is more than minor because it is associated with the Program and Process attribute of the Occupational Radiation Safety Cornerstone and affects the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor refueling operations. The finding is also similar to the more-than-minor example 6.g in IMC 0612, Appendix E, "Examples of Minor Issues" issued August 11, 2009. In accordance with IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012 and IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, the finding was determined to have very low safety significance (Green), because the finding was identified during a routine test and no unauthorized entry occurred, did not result in an ALARA Planning or work control issue, did not result in an overexposure nor was there a substantial potential for an overexposure, and the ability to assess dose was not compromised. The finding has a cross-cutting aspect in the area of Corrective Action Program, Problem Identification and Resolution, in that FENOC did not identify that the locking device was inadequate for the reactor keyway VHRA, and consequently, did not plan to replace the same type of device in place at Unit 2, even after replacing the failed reactor keyway VHRA locking device at Unit 1 [P.1(c)]. (Section 2RS01)

Other Findings

No other findings are identified in this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period in a refueling outage (1R22) and commenced a reactor start up on November 2, 2013. The unit reached and maintained 48 percent power on November 5, 2013 for repairs to the A condensate pump. On November 5, 2013, Unit 1 was manually tripped from 48 percent power due to a divergence between average coolant temperature and reference temperature when steam dumps opened from a turbine trip. The turbine trip was the result of an arc flash and fire in a non-safety related 4 kilovolts (kV) system. Unit 1 commenced a startup on November 8, 2013 and reached full power on November 11, 2013. The unit remained at 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power and remained 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)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of FENOC's readiness for the onset of seasonal cold temperatures. The review focused on the Unit 1 and Unit 2 refueling water storage tanks, intake structure, and emergency diesel generators. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure FENOC personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including FENOC seasonal weather preparation procedures and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. (Documents reviewed for each section of this inspection report are listed in the Attachment.)

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- River water system restoration from reverse flow alignment on October 18, 2013
- 1B low head safety injection boration flow path after the protected train swap on October 21, 2013
- 22A diesel air start compressor after restoration from corrective maintenance on December 11, 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 UFSAR, technical specifications, work orders, 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.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On October 28 through October 30, 2013, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 recirculation spray system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure FENOC appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 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 1 Reactor containment building (Fire Area RC-1) on October 29, 2013
- Unit 2 DF switchgear room (Fire Area SB-2) on November 20, 2013
- Unit 2 Normal switchgear room (Fire Area SB-4) on November 20, 2013
- Unit 2 Transformers TR-MT-2, TR-2C, TR-2D (Fire Area TR-1,2, 3) on November 21, 2013
- Unit 2 AE switchgear room (Fire Area SB-1) on November 21, 2013

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on November 15, 2013, that involved a fire in 2-3 battery room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that FENOC personnel identified deficiencies, openly discussed them in a self-critical manner at the post-drill debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with FENOC's fire-fighting strategies.

b. Findings

No findings were identified.

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

The inspectors reviewed the 1-1 emergency diesel generator jacket water heat exchanger (1EE-E-1A) 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 the results of previous inspections of the 1EE-E-1A and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. 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.

1R08 In-service Inspection Beaver Valley Unit 1 (711111.08 – 1 sample)a. Inspection Scope

A specialist inspector from the NRC Region I office conducted a review of FENOC's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary, risk significant piping and components, and containment systems during the Unit 1, refueling outage 1R22. The sample selection was based on the inspection procedure objectives and risk priority of those pressure retaining components in these systems where degradation would result in a significant increase in risk. The inspector conducted a short onsite inspection which was interrupted due to the temporary furlough of some U.S. government workers, including NRC Region I specialist inspectors. As a result, the inspector subsequently completed an in-office review of non-destructive examination (NDE) procedures and completed NDE records to verify that the non-destructive examination activities performed were conducted in accordance with the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 2001 Edition, 2003 Addenda.

Nondestructive Examination (NDE) and Welding Activities (IMC Section 02.01)

The inspector reviewed the following NDE activities and completed data records:

ASME Code Required Examinations

- Manual Ultrasonic Test (UT), volumetric inspection record, 31-inch diameter reactor coolant system ASME, Class 1, 'B' steam generator to pump crossover pipe to elbow butt weld DLW LOOP2-5-S-01
- Bare Metal Visual Examination record of the reactor vessel lower head and instrument nozzle penetrations

- Manual UT Examination data record, Class 1, pressurizer bottom head to shell circumferential weld, tank RC-TK-1-C-4
- Radiograph Examination report BOP-VE-13-001, Class 2, 3-inch diameter low head to high head safety injection system, pipe to flange weld
- Radiograph Examination report BOP-VE-13-002, Class 2, 3-inch diameter low head to high head safety injection system, tee to pipe weld
- Radiograph Examination report BOP-VE-13-003, Class 2, 6-inch diameter low head to high head safety injection system, tee to pipe weld
- Radiograph Examination report BOP-VE-13-004, Class 2, 6-inch diameter low head to high head safety injection system, pipe to tee weld
- Unit 1 containment liner plate repair, magnetic particle records, ultrasonic testing records, and leak rate pressure testing records
- Visual Exam of Equipment and Components (General) record BOP-VT-13-080 of Unit 1 Containment liner defect (1R22)
- BOP-UT-13-302, 304, 309, 310, 312 and 325, Manual UT Erosion/Corrosion Examination data records of Unit 1 Containment liner plate

The inspector reviewed certifications of the NDE technicians performing the examinations and verified that the inspections were performed in accordance with approved NDE procedures and that the results were reviewed and evaluated by certified Level III NDE personnel.

Re-examination of an Indication Previously Accepted For Service After Analysis

There were no samples available for review during this inspection that involved examinations with recordable indications that had been accepted for continued service following the previous Unit 1 1R21 outage.

Modification/Repair/Replacements Consisting of Welding on Pressure Boundary Risk Significant Systems

Beaver Valley staff completed inspections and assessments of the Unit 1 containment coatings during 1R22 outage and identified a paint blister on October 4, 2013. The blister was removed and a through-wall hole was identified in the 3/8 inch thick steel containment liner plate. The steel liner acts as an impervious membrane. Beaver Valley staff performed a visual examination and UT to characterize the extent of liner plate degradation. The size of the through-wall flaw was determined to be 0.42 inches by 0.29 inches, approximately 0.122 square inches. The hole was located about 7 inches above the containment basement floor between columns 9 and 9.5 near instrument rack 108. Laboratory analysis indicated that the corrosion was initiated from foreign material containing significant moisture which enabled an electrolytic corrosion cell to manifest where material was touching the outside of the containment steel liner when the concrete was poured during initial plant construction. From that interaction a slow acting corrosion cell was established and with time corroded a through-wall hole in the steel liner.

Since a visual examination of 100% of accessible areas of the containment liner had already been performed by a coating inspection contractor during the 1R22 outage the inspector concluded there was no required expansion of scope by the ASME code.

However, Beaver Valley staff responsible for the containment liner inspection program independently performed a 100% visual examination of the containment liner and did not identify additional deficiencies. In addition, Beaver Valley personnel performed UT thickness measurements on eight supplemental examination locations in the lower elevation of the Unit 1 containment building corresponding to the through-wall hole spaced approximately equidistant around the containment. The UT results did not identify evidence of wall loss.

The resident inspectors observed portions of the in-progress Unit 1 containment liner plate repair/replacement activities, including removal of the degraded portion of the containment liner plate, fit-up of replacement 9 inch by 13 inch liner plate, and local pressure testing following the liner repair. The inspector performed an in-office review of engineering change package (ECP) 13-0700-01, material specification BVS-136, welding specifications, welding procedures, welder qualification records, completed magnetic particle and volumetric ultrasonic testing records, and local leak rate pressure testing results to verify that the welding and applicable NDE activities were performed in accordance with FENOC procedure 1/2-NOP-CC-5703, ASME Code Boiler and Pressure Vessel Code, Section III for Class A vessels, Section VIII, 1968, original Codes of construction and Section XI, 2001 Edition, 2003 Addenda.

Pressurized Water Reactor Vessel Upper Head Penetration (RVUHP) Inspection Activities (IMC Section 02.02)

The inspector verified that no inspections were required to be performed of the RVUHP during 1R22.

Reactor Vessel Lower Head Penetration Nozzle Inspection Activities

The inspector reviewed the bare metal visual examination data record VT-13-1032 of the 50 reactor vessel lower head in-core instrument nozzle penetration welds. The inspector assessed the acceptability of the as-found conditions to ensure the integrity of the reactor coolant pressure boundary. No indication of boric acid leakage was observed.

Boric Acid Corrosion Control (BACC) Inspection Activities (IMC Section 02.03)

The inspector reviewed the BACC program, which is performed in accordance with BVPS procedures and sampled photographic inspection records of boric acid found on safety significant piping and components inside the containment structure during walkdowns conducted by licensee personnel which was directly observed by the resident inspectors. The inspector observed the identification and documentation of non-conforming conditions of boric acid leaks in the corrective action program with a focus on areas that could cause degradation of safety significant components.

The inspector verified that potential deficiencies identified during the walkdowns were entered into the corrective action program of the more significant deficiencies documented in the following condition reports (CR 2013-15309, residual heat removal flange 1RH-E1A area leakage, CR 2013-15406, residual heat removal pump 1RH-P-1A mechanical seal leakage, and CR 2013-15303, thermal relief valve RV-1CH-391 for penetration #46 leakage on tailpipe) to verify that the corrective actions were consistent with the requirements of the ASME Code and 10 CFR 50, Appendix B, Criterion XVI. The inspector also reviewed the associated engineering evaluations for the above

condition reports to verify that equipment or components that were wetted or impinged upon by boric acid solutions were properly analyzed for degradation that might impact their function.

Steam Generator (S/G) Tube Inspection Activities (IMC Section 02.04)

The inspector reviewed the BVPS Unit 1 1R21 steam generator degradation assessment SG-SGMMP-12-01. No inspections were performed of the BVPS Unit 1 steam generator tubes during the 1R22 refueling outage. The inspector reviewed 10 Code of Federal Regulations (CFR) Part 50 and the ASME Boiler and Pressure Vessel Code Section XI to verify that no S/G tube examinations were required during the 1R22 refueling outage.

Identification and Resolution of Problems (IMC Section 02.05)

The inspector reviewed a sample of condition reports, which identified NDE indications, deficiencies and other non-conforming conditions since the previous refueling outage. The inspector verified that non-conforming conditions were properly identified, characterized, evaluated, corrective actions identified and dispositioned, and appropriately entered into the corrective action program.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11 – 3 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on November 26, 2013, which included loss of main generator isophase bus cooling, failure of steam generator feedwater level control, and a small break loss of coolant accident. 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 and the technical specification action statements entered by the shift technical advisor. 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 draining to the vessel flange on October 4, 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 Requalification Program

a. Inspection Scope

On December 6, 2013, one NRC region-based inspector conducted an in-office review of results of licensee-administered annual operating tests for 2013, for Unit 1 operators. (There was no Unit 1 written exam this year.) The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, and "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified that the failure rate (individual or crew) did not exceed 20%.

- 1 out of 37 operators failed at least one section of the Annual Exam. The overall individual failure rate was 2.7%.
- 0 out of 9 crews failed the simulator test. The crew failure rate was 0.0%.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 2 emergency switchgear ventilation system (a)(1) evaluation on December 13, 2013 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. The inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and 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.

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.

- Unit 1 elevated (yellow) planned risk for decay heat removal (DHR) with reactor vessel level drained to the flange on October 4 through 6, 2013
- Unit 1 elevated (orange) planned risk for electrical redundancy due to the 4kV DF emergency switchgear electrical bus outage on October 15, 2013
- Unit 1 elevated (yellow) planned risk entry during reactor coolant system depressurization on October 4, 2013
- Unit 1 extended elevated (yellow) risk for spent fuel pool (SFP) cooling due to B SFP cooling pump breaker failure to close on October 18, 2013

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)a. Inspection Scope

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

- Unit 1 pressurizer upper manhole bolts exceeded vendor recommended torque value during removal on October 14, 2013
- 2-1 and 2-2 Emergency diesel generator (EDG) fuel roll pins not classified as safety related, inventoried as non-safety related, and installed in EDG discovered on October 22, 2013
- Grid operator post-trip contingency evaluation for degraded voltage on October 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 – 1 sample)

.1 Permanent Modifications

a. Inspection Scope

The following inspection sample examined a modification associated with a new piping connection installation into the low head safety injection system. The inspection scope for the modification was restricted to those elements necessary to satisfy the stated objectives of IP 71111.18, specifically:

- To verify that modifications have not affected the safety functions of important safety systems;
- To verify that the design bases, licensing bases, and performance capability of risk significant SSCs have not been degraded through modifications; and
- Verify that modifications performed during increased risk-significant configurations did not place the plant in an unsafe condition.

The inspection did not address whether the associated modification(s) satisfactorily addressed the objectives of Japan Lessons Learned Order EA-12-049. The inspectors evaluated a modification of the low head safety injection system implemented by engineering change package 13-0418-005, "Install 6"x6"x3" Blind Pipe Tee Upstream of CVCS Supply Valve MOV-1SI-863B." 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. Inspectors reviewed the weld data sheets and discussed radiography results with engineering. The inspection sample examined was associated with FirstEnergy's modifications in response to Japan Lessons Learned Order EA-12-049, concerning mitigating strategies for beyond-design-basis external events (ML12054A735).

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.

- 2-1 EDG digital reference unit replacement and EDG lockout relay 86-EGSADX1 testing on September 19-20, 2013
- Vital bus battery 1-4 replacement on October 9, 2013
- Unit 1 manipulator crane gripper replacement on October 15, 2013
- 1-2 EDG governor replacement on October 18, 2013
- Unit 1 containment liner repair and local leak rate testing from October 27 through October 29, 2013
- 3A auxiliary feedwater pump packing repair on November 6, 2013

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 2 samples).1 Refueling Outage 1R22a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 maintenance and refueling outage 1R22, which was conducted September 29 through November 2, 2013. The inspectors reviewed FENOC's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting

- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of the primary containment to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to 48 percent power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

Introduction. A self-revealing, Green NCV of Technical Specification (TS) 5.4.1 "Procedures" was identified when an operator did not correctly implement procedure 1OM-52.4.A, "Raising Power from 5% to Full Load Operation," Revision 68, during the warm-up the moisture separator reheaters.

Description. Moisture separator reheaters (MSRs) are part of the main steam system. Steam exits the high pressure turbine into the MSRs and is directed into the low pressure turbines. High pressure steam from the main steam header provides the heating steam to the MSRs. On November 5, 2013, the MSR heat-up was started in accordance with 1OM-52.4.A. The procedure requires that the dial potentiometer associated with the 1A and 1C reheat steam supply valves FCV-1MS-100A and FCV-1MS-100C be taken to the full open position to ensure the valves remain open when the controller is placed in manual. The operator placed the potentiometer in the full closed position instead of full open, and when the controller was taken to manual, the valves closed. Reactor coolant system (RCS) pressure first dropped from 2236 PSIG to 2210PSIG, then increased to 2264 PSIG. Pressurizer level increased from 37% to 46%. Average coolant temperature increased from 560F to 566F and reactor power lowered from 46% to 41%. The valves were reopened, and parameters returned to expected values, concluding the transient.

FENOC entered this issue into the corrective action program under CR 2013-17848 and reviewed the transient under the Reactivity Management Program. The site performed a limited apparent cause evaluation and determined that the operator believed he was operating the potentiometer correctly but did not perform an adequate self-check. FENOC also determined the individual providing the peer check, a trainee, had insufficient knowledge of the system to adequately provide a verification check.

Analysis. The inspectors determined that the operator's failure to correctly operate the moisture separator reheat system in accordance with 1OM-52.4.A was a performance deficiency that was reasonably within FENOC's ability to foresee and correct and should have been prevented.

The finding is more than minor because it is associated with the Human Performance attribute of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, a human performance error resulted in a main steam valve being mispositioned that subsequently caused a plant transient. The finding is also similar to the more than minor example 4.b in IMC 0612, Appendix E, "Examples of Minor Issues." In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition.

This finding has a cross-cutting aspect in the area of Work Practices, Human Performance because FENOC did not ensure personnel work practices support human performance. Specifically, FENOC operators did not use an appropriate self-check and peer check during an activity with the potential to affect reactivity [H.4(a)].

Enforcement. TS 5.4.1, "Procedures," states, in part, that written procedures shall be established, implemented and maintained in accordance with Regulatory Guide (RG) 1.33. RG 1.33 identified that procedures should be written to provide directions for changing reactor power level per Section 2.f, "Changing Load." Contrary to the above, on November 5, 2013, FENOC failed to adequately implement 1OM-52.4.A. Specifically, the procedure provides guidance on MSR warm-up, which was incorrectly followed and resulted in a plant transient. FENOC's immediate corrective actions included entering the misposition event into the corrective action program as condition report 2013-17848, performing a crew stand down, and conducting a limited apparent cause evaluation. Because this issue was of very low safety significance (Green), and FENOC entered this issue into their corrective action program (2013-17848), this violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000334/2013005-01, Moisture Separator Reheater Valve Misposition Results in Plant Transient)

.2 Forced Outage 1FOAC2

a. Inspection Scope

The inspectors reviewed the station's work schedule and risk plan for the Unit 1 forced outage 1FOAC2, which was conducted November 5 through November 8, 2013. The outage was performed following a manual trip of the plant due to a deviation between average coolant temperature and reference temperature when steam dumps opened during a turbine trip. The turbine tripped due to an arc flash and fire in a 4kV cable tray in the turbine building. During the outage, the inspectors observed portions of the startup and power ascension processes and monitored controls associated with the following outage activities:

- Hot shutdown temperature control
- Portions of offsite power transformer cable inspection
- Restart readiness meeting
- Reactor start up and ascension to full power
- Licensee identification and resolution of problems

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:

- 1BVT-1.21.2, Trevi Test Method for Main Steam Safety Valve Setpoint Check, on September 29, 2013
- 1OST-47.3F, Containment System Operating Surveillance Test – Containment Isolation and ASME test Work Week 2, on October 9, 2013 (containment isolation valve)
- 1OST-11.14B, High Head Safety Injection Full Flow Test, on October 22, 2013 (in-service test)
- 2OST-24.4, Steam Driven Auxiliary Feed Pump [2FWE*P22] Quarterly Test, on December 3, 2013

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)a. Inspection Scope

The 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 ML13268A074 and ML13151A048 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. The specific documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

During the period November 18 - 21, 2013, the inspector evaluated FENOC's performance in assessing the radiological hazards and the effectiveness of radiological controls implemented during the fall 1R22 refueling outage and during power operations.

The inspector used the requirements in 10 CFR 20 and guidance in Regulatory Guide (RG) 8.38 Control of Access to High and Very High Radiation Areas (VHRAs) for Nuclear Plants, Technical Specifications, and the FENOC procedures as criteria for determining compliance.

a. Inspection Scope

The inspector reviewed the 2013 Beaver Valley performance indicators for the occupational exposure cornerstone, and relevant condition reports related to occupational radiation safety initiated since the last inspection, to identify performance trends and repetitive problem areas.

Radiological Hazards Control and Work Coverage

The inspector identified work performed in radiological controlled areas in Unit 1 and in Unit 2 and evaluated the licensee's assessment of the radiological hazards. The inspector evaluated the survey maps, exposure control evaluations, electronic dosimeter dose/dose rate alarm set points, air sampling records, and radiation work permits (RWP), associated with these areas, to determine if the exposure controls were acceptable. Specific work activities evaluated included entry into the Unit 2 reactor building, at power, to lubricate the containment air recirculation fans (RWP 213-2019), and characterizing radwaste containers in the waste handling building (RWP 113-1013).

For these tasks, the inspector evaluated the barrier controls and contamination controls applied to the job site, and discussed the radiological controls with the licensee staff.

The inspector reviewed the air sample records for samples taken in various plant areas, to determine if the samples collected were representative of the breathing air zone and analyzed/recorded in accordance with established procedures. During tours of the radiological controlled areas, the inspector evaluated whether the continuous air monitors were strategically located to assure that potential airborne contamination could be promptly identified and that the monitors were located in low background areas.

During walk downs of the Unit 1 and Unit 2 auxiliary buildings, waste handling buildings and spent fuel pool buildings, the inspector evaluated dose rates in selected areas to confirm the accuracy of survey maps, and to verify that Locked High Radiation Areas (LHRA)/VHRAs were properly posted and secured and access properly controlled.

Additionally the inspector reviewed the RWPs developed for work performed during the fall 1R22 refueling outage, including temporary shielding installation, scaffolding construction, and various steam generator tasks to determine if the potential hazards were assessed. In particular, the inspector reviewed the electronic dosimeter (ED) dose/dose rate alarm set points, stated on the RWP, and the condition reports associated with ED actual alarms, to determine if the set points were consistent with the survey indications and plant policy.

Instructions to Workers

The inspector reviewed RWP briefing materials and observed various briefings at the control point to determine if workers, performing radiological significant tasks, were properly informed of electronic dosimeter alarm set points, low dose waiting areas, and work site radiological conditions. Briefing materials reviewed included lubrication of the Unit 2 CAR fans, during power operations (RWP 213-2019).

During tours of Unit 1 and 2 radiological controlled areas (RCA), the inspector determined if LHRAs had the appropriate warning signs and were secured. Additionally, the inspector identified that low dose waiting areas were appropriately surveyed, identified, and used by personnel.

The inspector discussed with radiation protection supervision the procedural controls for accessing LHRAs and VHRAs and determined that no changes have been made to reduce the effectiveness and level of worker protection.

The inspector verified that keys to LHRAs and VHRAs were properly accounted for at the control point, in the control room, and in the radiation protection manager's office.

Contamination and Radioactive Material Control

During tours of the Unit 1 and 2 auxiliary buildings, waste handling building, safeguards building, and spent fuel pool areas, the inspector confirmed that contaminated materials were properly bagged, surveyed/ labeled, and segregated from work areas. The inspector observed workers using contamination monitors to determine if various tools/equipment were potentially contaminated and the material met criteria for releasing the materials from the RCA.

Radiation Worker Performance

During job performance observations, the inspector evaluated if workers complied with RWP requirements and were aware of radiological conditions at the work site. Additionally, the inspector determined if radiation protection technicians were aware of RWP controls/limits applied to various tasks and provided positive control of workers to reduce the potential of unplanned exposure and personnel contaminations.

Problem Identification and Resolution

A review of Nuclear Oversight field observation reports, dose/dose rate alarm reports, personnel contamination event reports, and associated condition reports, was conducted to determine if identified problems and negative performance trends were entered into

the corrective action program and evaluated for resolution and to determine if an observable pattern traceable to a similar cause was evident.

Relevant condition reports, associated with radiation protection control access, initiated between July – November 2013, were reviewed and discussed with the licensee staff to determine if the follow up activities were being conducted in an effective and timely manner, commensurate with their safety significance.

b. Findings

Introduction: The inspectors identified a Green non-cited violation involving the failure to properly ensure that a device used to control access to a Very High Radiation Area was adequate to prevent an unauthorized entry into the area.

Description: A very high radiation area (VHRA) is defined as an area in which radiation levels meet or exceed 500 rads per hour (5 grays), as measured at one meter from a radiation source or any surface through which the radiation penetrates. A VHRA requires installation of a physical device to prevent inadvertent access to the area. Physical devices include locks, keys, heavy gauge chain, gates and doors.

During the period October 5, 2013 through October 11, 2013, while Unit 1 was shut down, the in-core flux thimbles were retracted from the reactor core and stored in the reactor keyway, creating a VHRA in that location. In anticipation of these conditions, FENOC implemented procedures to control access to this area and installed an encumbering device that was intended to ensure that an individual could not gain unauthorized or inadvertent access to the keyway area. On October 11, 2013, during a routine daily physical challenge of the pliers-style locking device, the device failed when twisted by a technician. The 'jaws' of the device separated and no longer prevented personnel access to the VHRA. When this failure occurred, the area was continuously guarded until a more robust locking device was installed and independently verified. The licensee confirmed that, during the period in which the inadequate device was installed, no entry was made into the VHRA. This issue was entered into FENOC's corrective action program under condition report (CR) 2013-16303.

The inspector determined that the pliers-style locking device was not adequate to control access to a VHRA. The inspector reviewed FENOC's disposition of CR 2013-16303. Based on a review of the CR disposition the inspector determined that FENOC's review of the issue did not identify that the pliers-style locking device did not meet the requirements for a VHRA locking device and should not have been used to secure a VRHA access. Secondly, FENOC did not conduct an extent of condition review and failed to identify the application of a similar device on the access to the VHRA in the Unit 2 reactor keyway area. In response to this NRC identified concern, FENOC entered the issue into the corrective action program as CR 2013-18743 and placed administrative controls on access to the Unit 2 reactor keyway until the corrective action to change the VHRA locking device at the Unit 2 reactor keyway was completed. FENOC also looked for improper use of the pliers-style locking device on other VHRAs, but found none.

Analysis: The inspector determined that the use of a pliers-style locking device that did not provide a positive locking mechanism to prevent unauthorized access into a VHRA was a performance deficiency that was reasonably within FENOC's ability to foresee and correct and should have been prevented.

The finding is more than minor because it is associated with the Program and Process attribute of the Occupational Radiation Safety Cornerstone and affects the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine plant operations. The finding is also similar to the more-than-minor example 6.g in IMC 0612, Appendix E, "Examples of Minor Issues," issued August 11, 2009.

In accordance with IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012 and IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, the finding was determined to have very low safety significance (Green), because the finding was identified during a routine test and no unauthorized entry occurred, did not result in an ALARA Planning or work control issue, did not result in an overexposure nor was there a substantial potential for an overexposure, and the ability to assess dose was not compromised.

The finding has a cross-cutting aspect in the area of Corrective Action Program, Problem Identification and Resolution, in that FENOC did not fully identify an issue potentially impacting nuclear safety. Specifically, FENOC did not identify that the locking device was inadequate for the reactor keyway VHRA, and consequently, did not identify a similar misapplication of this device at Unit 2. [P.1(c)].

Enforcement: 10 CFR 20.1602, "Control of access to very high radiation areas," states that "In addition to the requirements of 10 CFR 20.1601, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates." Contrary to the above, on October 5 to October 11, 2013, FENOC did not institute adequate measures to ensure that an individual was not able to gain unauthorized or inadvertent access to the Unit 1 reactor keyway with incore detectors retracted (a VHRA). Specifically, the locking device used to prevent unauthorized access to the VHRA was insufficient and opened when challenged. Because this violation was of very low significance (Green) and FENOC entered this issue into their corrective action program (2013-18743), this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000334/2013005-02, Insufficient VHRA Control Under Vessel)

2RS02 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

During the period November 18 - 21, 2013, the inspector assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA) during the fall 1R22 refueling outage. The inspector used the requirements in 10 CFR Part 20, RG 8.8 - Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be As Low As Is Reasonably Achievable, RG 8.10 - Operating Philosophy for Maintaining Occupational Radiation Exposure As Low as Is Reasonably Achievable, TSs, and FENOC procedures as criteria for determining compliance.

a. Inspection Scope

The inspector reviewed pertinent information regarding the Beaver Valley collective dose history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure accrued for the 1R22 refueling outage. The inspector reviewed the plant's three year rolling average collective exposure, various 1R22 outage ALARA Plans, and the 5-Year Exposure Reduction Plan.

The inspector reviewed site-specific procedures associated with maintaining occupational exposures ALARA, which included a review of processes used to estimate and track exposures from specific work activities.

Radiological Work Planning

The inspector selected the following work activities that were radiologically significant for the 1R22 refueling outage. The effectiveness of the exposure controls for these maintenance and repair activities were evaluated by reviewing the associated post-job ALARA reviews.

RWP 113-4015	Secondary Side Steam Generator Sludge Lance/FOSAR
RWP 113-4018	Reactor Disassembly/Reassembly
RWP 113-4019	Remove and Install Core Exit Thermocouple Assemblies
RWP 113-4021	Move Reactor Head & Upper Internals
RWP 113-4022	Reactor Core Offload/Re-load
RWP 113-4028	Scaffolding Construction
RWP 113-4030	Install/Remove Temporary Shielding

As part of this review, the inspector evaluated whether FENOC had identified appropriate dose reduction techniques; considered alternate dose reduction features; and estimated reasonable dose goals. The inspector determined if FENOC's ALARA assessment had taken into account decreased worker efficiency when using respiratory protection.

The inspector compared the results achieved in reducing dose rates and controlling actual dose with the forecasted dose, established in ALARA planning for these work activities. The inspector compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection (RP) group actual person-hours for the work activity, and evaluated the accuracy of these time estimates. The inspector assessed the reasons for any inconsistencies between estimated and actual work activity doses.

The inspector determined if lessons learned from past outages were applied during the 1R22 outage to effectively control the source term and reduce dose rates in various plant areas.

Verification of Dose Estimates and Exposure Tracking Systems

The inspector reviewed the assumptions and basis for the current operational and outage collective dose estimates and compared these estimates with the actual exposure accrued. The inspector reviewed applicable procedures to determine the

methodology for estimating exposures from specific work activities and for department and station collective dose goals.

The inspector evaluated whether the licensee had established measures to track, trend, and if necessary, to reduce occupational doses for ongoing work activities. The inspector evaluated the dose threshold criteria established to prompt additional reviews and implement additional ALARA planning and controls, by performing Work-In-Progress reviews when actual dose approached dose estimates.

The inspector evaluated the licensee's method of adjusting exposure estimates, by reviewing the Station ALARA Committee evaluations if unexpected changes in dose rate, job scope or emergent work were encountered. The inspector assessed whether adjustments to exposure estimates were based on sound radiation protection and ALARA principles. The inspector reviewed the minutes from recent Station ALARA Committee meetings to perform this assessment and discussed the actions taken by the Station ALARA Committee with the radiation protection manager.

Source Term Reduction and Control

The inspector reviewed the status and historical trends for the Unit 1 source term. Through review of survey maps and interviews with the Radiation Protection manager, the inspector evaluated recent source term measurements and control strategies. Specific strategies being employed by the licensee included operational controls to increase reactor coolant cleanup during shutdown, chemistry controls, use of macro-porous resin, system flushes, and temporary shielding.

Radiation Worker Performance

The inspector observed radiation worker and RP technician performance during work activities being performed in radiation areas and HRAs. The inspector determined if workers demonstrated the ALARA philosophy in practice, by using low dose waiting areas and temporary shielding for their tasks.

Problem Identification and Resolution

The inspector evaluated whether problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program. The inspector assessed FENOC's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

During the period November 18 - 21, 2013, the inspector evaluated whether in-plant airborne concentrations were being controlled consistent with ALARA principles. The inspector used the requirements in 10 CFR Part 20, Regulatory Guide 8.25, "Air Sampling in the Workplace," and the licensee's procedures as criteria for determining compliance.

Airborne Controls

For work performed during 1R22, the inspector determined if the use of respiratory protection was evaluated by conducting Total Effective Dose Equivalent (TEDE) ALARA evaluations for tasks involving potential airborne contamination. The inspector assessed whether the evaluation compared the benefits of wearing respiratory protection with the possible decreases in worker efficiency and subsequent increased worker dose. The inspector confirmed that engineering controls; e.g. portable High Efficiency Particulate Air (HEPA) ventilation units were used at specific job sites to remove airborne contamination away from the work area.

During plant tours, the inspector verified the operability and location of various continuous airborne monitors to assure that areas that were susceptible to airborne contamination were properly monitored.

Problem Identification and Resolution

The inspector evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program. The inspector assessed whether the corrective actions were appropriate for a selected sample of problems involving airborne radioactivity and were appropriately documented by the licensee.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

During the period November 18 - 21, 2013, the inspector evaluated the processes and procedures implemented by the licensee to determine occupational dose. This was performed to determine if the TEDE evaluation, resulting from external and internal exposure, was appropriately monitored and assessed. The inspector used the requirements in 10 CFR Part 20, and the licensee's procedures as criteria for determining compliance.

External Dose

During plant tours, the inspector confirmed that detailed procedures were implemented associated with dosimeter use. The inspector confirmed that dosimeters were appropriately worn by workers, on their body location receiving the highest dose rate.

The inspector reviewed condition reports related to dose and dose rate alarms received on electronic dosimetry to determine if the cause of the alarm was properly determined and that no performance indicator criteria was exceeded

The inspector reviewed exposure records for the ten highest exposed workers occurring in 2013 (through November 17, 2013) and electronic dosimeter alarm reports to verify that no regulatory criteria were exceeded and no performance indicator threshold was met.

Internal Dose

The inspector reviewed internal dose assessments for workers who had the potential to receive a recordable committed effective dose equivalent dose greater than 10 millirem, from inhaling or ingesting radioactive contamination, to evaluate the processes implemented to determine the worker's exposure. Included in this review were the initial and follow up whole body counts for the workers, a determination that the radionuclide library used for the counting system included the gamma-emitting radionuclides that exist at the site, and a review of the calculations used to make the dose assessment.

Declared Pregnant Workers

The inspector assessed the program for controlling and restricting the dose to declared pregnant workers, who had access to performing outage related activities. The inspector reviewed the documentation for three declared pregnant workers to determine if the worker's exposure was properly monitored and controlled.

Problem Identification and Resolution

The inspector assessed whether problems associated with occupational dose assessment were being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee corrective action program. The inspector assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (4 samples)

a. Inspection Scope

The inspectors reviewed FENOC's submittal of the Mitigating Systems Performance Index for the following systems for the period of October 1, 2012 through September 30, 2013:

- Unit 1, Emergency AC Power System
- Unit 2, Emergency AC Power System
- Unit 1, High Pressure Injection System
- Unit 2, High Pressure Injection 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 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 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator Program. Specifically, the inspector reviewed condition reports, and associated documents, for incidents involving locked high radiation areas, very high radiation areas, and unplanned exposures, occurring from October 1, 2012 through October 31, 2013, against the criteria specified NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings were identified.

.3 RETS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspector reviewed relevant effluent release reports for the period October 1, 2012 through October 31, 2013, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences that exceed 1.5 mrem/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; or 5 mrad/quarter gamma air dose, 10 mrad/quarter beta air dose, and 7.5 mrad/quarter for organ dose for gaseous effluents. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 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 (CAP) at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended condition report screening meetings.

b. Findings

No findings were identified.

.2 Annual Sample: TR-2B System Station Service Transformer Doble testing review

a. Inspection Scope

The inspectors performed an in-depth review of FENOC's operational decision making issue analysis and corrective actions associated with CR 2012-15978 concerning elevated Doble test results for the system station service transformer (SSST) TR-2B. Specifically, during the performance of Doble test, the power factor acceptance criteria for CLT (Low to Tertiary) and CT (Tertiary to Ground) winding insulations were not met for the TR-2B transformer.

The inspectors assessed FENOC's operational decision making analysis, cause analyses, extent-of-condition reviews, compensatory actions, and the prioritization and timeliness of FENOC's corrective actions to determine whether FENOC was appropriately identifying, characterizing, and correcting problems associated with the TR-2B SSST and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of FENOC's CAP.

b. Findings and Observations

No findings were identified.

The inspectors determined that FENOC appropriately identified, characterized, and implemented corrective actions associated with elevated Doble test results for the TR 2B SSST. FENOC installed a gas monitoring system with an alarm function to monitor 2B SSST gas conditions and track transformer health. However, inspectors noted that the implementation of the engineering change package, which installed the gas monitoring system, was not communicated effectively through operations. The inspectors interviewed two different shift crews to determine the understanding of the alarm function of the gas monitoring system. Both of the crew members were not able to recall from memory that the gas monitoring system installed for 2B SSST would alarm in the control room. The inspectors reviewed the alarm response procedure and determined that the alarm function of the 2B SSST was appropriately updated; however, inspectors determined that procedural guidance for the Electrical Maintenance department to access data from the TM view software, to analyze and determine which gases are in high alarm conditions, needed to be developed. FENOC entered the inspectors' observations into their corrective action program (CRs 2013-18575, and 18578).

The inspectors determined FENOC's overall response to the issue was commensurate with the safety significance, was timely, and the actions taken and planned were reasonable to resolve the elevated Doble test results for TR-2B.

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

.1 Plant Events

a. Inspection Scope

For the plant event listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," issued October 28, 2011, for consideration of potential reactive inspection activities. As applicable, the inspectors verified that FENOC made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed FENOC's follow-up actions related to the events to assure that FENOC implemented appropriate corrective actions commensurate with their safety significance.

- Unit 1 Notice of Unusual Event declaration due to an explosion in the protected area with subsequent turbine building cable fire and plant trip on November 5, 2013

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000334/2013-002-00: Containment Liner Through Wall Defect Discovered During Planned Visual Inspection

On October 4, 2013, during a planned visual coatings inspection of the Unit 1 interior Reactor Containment Building (RCB) steel liner, a paint blister located at 692 foot elevation was observed. After cleaning the area and removal of the corrosion products a through wall defect was discovered that penetrated the RCB steel liner. Thickness measurements using UT were obtained around the area of the through wall liner corrosion. The affected section of the steel liner plate was removed and sent to a laboratory for examination. The laboratory analysis determined that there were a total of two through wall defects with a possible third through wall penetration. The total area of the three through wall penetrations was calculated to be 0.395 square inches. A new total calculated leakage, which included flow from the discovered defects, did not exceed the maximum leakage rate set by Technical Specification 5.5.12.c, Containment Leakage Rate Testing Program. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA5 Other Activities

.1 Buried Piping and Tanks, TI-2515/182, Phase 2 (1 sample)

a. Inspection Scope

The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.02.a of the Temporary Instruction (TI) 2515/182, and it was confirmed that activities which correspond to the completion dates, specified in the program, which have passed since the Phase 1 inspection was conducted, have been completed.

The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.b of the TI and responses to specific questions found in www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf were submitted to NRC headquarters staff.

b. Findings

No findings were identified.

.2 Institute of Nuclear Power Operations (INPO) Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of Beaver Valley conducted in March 2013. The inspectors evaluated the report to ensure that NRC perspectives of FENOC performance were consistent with any issues identified during the assessments. The inspectors also reviewed the report to determine whether INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

On January 31, 2014, the inspectors presented the inspection results to E. 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.

ATTACHMENT: SUPPLEMENTARY INFORMATION

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

E. Larson	Site Vice President
M. Berg	Electrical Design Engineer
R. Bologna	Director, Site Operations
G. Buck	ISI/NDE, Level III Contractor
E. Crosby	Radiation Protection Superintendent
A. Crotty	Supervisor, Electrical Engineering
B. Duge	Senior Consulting Engineer
K. Farzan	Compliance Engineer
J. Fontaine	Radiation Protection Supervisor – ALARA
J. Gorham	Diesel Engineer
D. Grabski	ISI Coordinator
R. Hayward	Design Engineer
T. Heimel	ISI/NDE, Level III Contractor
S. Hovanec	Manager, Plant Engineering
D. Huff	Director, Site Maintenance
R. Kristophel	Shift Supervisor, Unit 1
S. Kubis	Electrical Systems Engineer
B. Lubert	Supervisor, I&C Electrical Engineering
C. Mancuso	Manager, Design Engineering
K. Martin	Licensed Operator Continuing Training Supervisor
D. McBride	Diesel Engineer
C. McFeaters	Director, Site Engineering
J. Miller	Fire Marshall
M. Mouser	Buried Piping Program Owner, Technical Services Engineering
D. Murcko	Rapid Response Electrical Engineer
L. Musgrave	Non-Destructive Evaluation Inspector
B. Sepelak	Supervisor, Regulatory Compliance
T. Steed	Radiation Protection Manager

Other Personnel

M. Rubadue	Inspector, State of Ohio
L. Ryan	Inspector, Pennsylvania Department of Radiation Protection

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000334/2013005-01	NCV	Moisture Separator Reheater Valve Misposition Results in Plant Transient (Section 1R20)
05000334/2013005-02	NCV	Insufficient VHRA Control Under Vessel (Section 2RS01)

Closed

05000334/2013-002-00	LER	Containment Liner Through Wall Defect Discovered During Planned Visual Inspection (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

1OST-45.11A, Cold Weather Protection Verification Performed in September and October, Revision 0
 1OST-45.11B, Cold Weather Protection Verification Performed in November, Revision 0
 2OST-45.11A, Cold Weather Protection Verification Performed in September and October, Revision 0
 2OST-45.11B, Cold Weather Protection Verification Performed in November, Revision 0

Condition Reports

2013-17694 2013-16619 2013-15544 2013-13345

Section 1R04: Equipment Alignment

Procedures

1OM-30.3.B.1, Valve List – 1RW, Revision 48
 1OST-11.18, Low Head Safety Injection Pump Boric Acid Flow Path Verification, Revision 12
 1OM-13.3.B.2, Valve List-1RS, Revision 7

Condition Reports

2012-06940 2012-11685

Maintenance Orders/Work Orders

200499886 200074211

Miscellaneous

Beaver Valley Unit 1 System Health Report 2013-1, dated 9/12/2013

Drawings

8700-RM-0430-001, Revision 32
8700-RM-0430-002, Revision 21
8700-RM-0430-003, Revision 27
8700-RM-0430-004, Revision 18
8700-RM-0430-005, Revision 22
8700-RM-413-2, Revision 9

Section 1R05: Fire Protection

Procedures

1/2ADM-1900, Fire Protection Program, Revision 21

Miscellaneous

1PFP-RCBX-738-Reactor Containment Building Fire Area RC-1, Revision 1
2PFP-SRVB-730-DF Switchgear Rom Fire Area SB-2, Revision 2
2PFP-SRVB-760-Normal Switchgear Room Fire Area SB-4, Revision 0
2PFP-Yard-735-Transformers TR-MT-2, TR-2C, TR-2D Fire Area TR-1, 2, 3, Revision 0
2PFP-SRVB-730-A Switchgear Room Fire Area SB-1, Revision 3
CR 2013-17400
Fire Drill Scenario, 2SB-3 Battery Room 2-3 dated November 15, 2013

Section 1R07: Heat Sink Performance

Procedures

1MSP-36.22-M, No. 1 Emergency Diesel Generator Filter, Strainer, Heat Exchanger and
Woodward Governor Maintenance, Revision 9

Work Orders

200383368 200439802 200206692 200309350 200125104 200508862

Miscellaneous

Heat Exchanger Inspection Report, April 22, 2009
Heat Exchanger Inspection Report, March 7, 2006
Heat Exchanger Inspection Report, October 9, 2007
Heat Exchanger Inspection Report, April 26, 2012
Heat Exchanger Inspection Report, October 11, 2010
Heat Exchanger Inspection Report, October 21, 2013

Section 1R08: In-service Inspection Beaver Valley Unit 1

Procedures

NDE-UT-308, Component Weld Profiling and Thickness Measurements Using Straight Beam
Ultrasonic Techniques, Revision 14
NDE-UT-329, Ultrasonic Examination of Small-Diameter Piping Butt Welds and Components for
Thermal Fatigue, Revision 0
1/2-ADM-2096, Alloy 600/690 Management Program, Revision 12
1-SM-03, ASME Section IX Welding Procedure Specification, Revision 0
NOP-ER-2001, Boric Acid Control Program, Revision 11
1BVT 1.47.1, Containment Structural Integrity Test, Revision 12
1GT-01, ASME Section IX Welding Procedure Specification, Revision 2

1/2-ADM-2060, Containment Coatings Inspection and Assessment Program, Revision 0
1/2-ADM-2039, BVPS ISI Ten-Year Plans, Revision 13
1/2-ADM-2099, Primary Containment ISI Program, Revision 2
NOP-CC-5703, FirstEnergy Nuclear Operating Company ASME Section XI Repair/Replacement (R/R) Program, Revision 2
NDE-VT-500, General Requirements for Visual Examination, Revision 12
NDE-VT-509, Visual Examination of Welds and Components, Revision 8

NDE Records

UT-13-1001, UT Pipe Weld Examination Report, 31-inch diameter Reactor Coolant System 'B' steam generator to pump crossover pipe to elbow butt weld, October 4, 2013
VT-13-1032, Visual Examination System Leakage (VT-2) report, Reactor Vessel Lower Head nozzle penetration welds, October 4, 2013
UT-13-1008, UT Examination Report, circumferential weld on reactor coolant system tank RC-TK-1-C-4, October 16, 2013
BOP-UT-13-302, 304, 309, 310, 312 and 325, Manual UT Erosion/Corrosion Examination data records of Unit 1 containment liner plate, October 7-16, 2013
BOP-VE-13-001, Radiograph Examination report, 3-inch diameter Safety Injection System, pipe to flange weld SI-321-1-F48, October 17, 2013
BOP-VE-13-002, Radiograph Examination report, 3-inch diameter low head to high head safety injection system, tee to pipe weld, October 21, 2013
BOP-VE-13-003, Radiograph Examination report, 6-inch diameter low head to high head safety injection system, tee to pipe weld, October 21, 2013
BOP-VE-13-004, Radiograph Examination report, 6-inch diameter low head to high head safety injection system, pipe to tee weld
BOP-VT-13-080, Visual Exam of Equipment and Components (General) record of Unit 1 containment liner defect (1R22), October 7, 2013
BOP-VT-13-153, Visual Exam of Equipment and Components, Liner plate repair, October 18, 2013
BOP-MT-13-049, Magnetic Particle Examination record, Unit 1 containment liner patch plate to 2-inch pipe weld, October 31, 2013
BOP-MT-13-051, Magnetic Particle Examination record, Unit 1 Reactor Containment Building, liner repairs, October 31, 2013
BOP-MT-13-053, Magnetic Particle Examination record, Unit 1 containment liner repairs, October 31, 2013
BOP-MT-13-055, Magnetic Particle Examination record, Unit 1 containment liner repairs, October 31, 2013
BOP-MT-13-061, Magnetic Particle Examination record, Unit 1 containment liner repairs, October 31, 2013

Miscellaneous

BVPS Unit 1 Twenty-First Refueling Outage Inservice Inspection Report Revision, FENOC Letter L-12-419, December 28, 2012
SG-SGMMP-12-01, Beaver Valley Power Station Unit 1, 1R21 Refueling Outage Steam Generator Degradation Assessment, February 2012
SG-SGMP-12-7, Beaver Valley Power Station Unit 1: 1R21 Refueling Outage Steam Generator Condition Monitoring and Cycles 22, 23, and 24 Operational Assessment, May 2012
ECP 13-0700-01, Containment Liner Repair -1R22, October 15, 2013
BVPS Unit 1, 10CFR 50.55a Request Number BV1-IWE-2-3, October 7, 2013
ASME Section XI, 2001 Edition, 2003 Addenda

PA-BV-12-01, 1R21 Engineering Systems/Programs Quality Assurance Full Assessment Report, dated June 20, 2012
Sandia Report, SAND2010-8718, Nuclear Containment Steel Liner Corrosion Workshop: Final Summary and Recommendation Report, July 2011

Condition Reports

2012-07778 2013-02832 2013-15843 2012-12224 2013-05934 2013-16426
2012-14682 2013-15303 2013-16951 2012-13882 2013-15309 2013-17557
2012-16585 2013-15406 2012-17241 2013-15766

Section 1R11: Licensed Operator Regualification Program

Procedures

1OM-6.4.N, Draining the RCS for Refueling, Revision 24

Miscellaneous

OTLC-S201306D2-BV2, FENOC Training Simulator Guide, Revision 0

Section 1R12: Maintenance Effectiveness

Condition Reports

2013-13128 2013-12602 2013-10244 2103-11121 2013-13035

Miscellaneous

Maintenance Rule a(1) Evaluation Form, 2HVZ-FN261A, dated 9/26/2013
Beaver Valley Unit 2 System Health Report, 2013-1, dated 9/12/2013
WO600855408

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

1/2ADM-0712, Shutdown Defense in Depth Assessment, Revision 7
1OM-36.4.AL, Clearing and Returning to Service Emergency 4kV Bus 1DF, Revision 9
1/1CMP-75-MCB-1E, Testing of Westinghouse and Cuttler-Hammer Molded Case Circuit Breakers, Revision 13

Condition Reports

2013-16490 2013-16492 2013-15723 2013-16765 2013-16425 2013-16711
2013-16707

Miscellaneous

Defense-in-Depth Protected Equipment During Orange Risk, dated October 15, 2013
Defense-in-Depth Protected Equipment, dated October 18, 2013
WO 200505420
BV Unit 1 Daily Log, dated October 18, 2013

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

2OM-38.5.B.2, 120 VAC Distribution and Lighting, Revision 25

Condition Reports

2013-16939 2013-16392 2013-15679

Maintenance Orders/Work Orders

2004668349 200308586 866123

Miscellaneous

Hytorc XLT/MXT/MXT-SA Series Operational and Spare Parts Manual
 Standing Order No. 13-014, dated November 5, 2013, Revision 1
 Standing Order No. 13-014, dated October 25, 2013, Revision 0
 100808-E-076, Revision 4

Section 1R18: Plant ModificationsProcedures

1-PIP-M06, Quality Class Q Piping Installation, Revision 8
 PIPS-M03.B, Pipe Support Installation, Revision 4
 NOP-OP-4106, Control of Radiography Operation, Revision 3

Maintenance Orders/Work Orders

200564451

Miscellaneous

ECP 13-0418-00, 1R22 Mechanical FLEX Modifications, Revision 0

Section 1R19: Post-Maintenance TestingProcedures

BVBP-SITE-0053, Post Maintenance Test Requirements, Revision 8
 2OST-36.01, Emergency Diesel Generator [2EGS*EG2-1] Monthly Test, Revision 68
 2OST-36.4.AF, Emergency Diesel Generator [2EGS*E22-1] Start-up and Shutdown,
 Revision 29
 1MSP-E-39-003, Vital Bus Batteries, Test and Inspection, Revision 10
 1BVT 1.39.4, Station Battery [BAT-4] Service Test, Revision 6
 1OM-36.4.AU, Diesel Generator No. 2 Post-Maintenance Governor Testing, Revision 3
 1OM-36.4.AN, Diesel Generator No. 2 Fast Start, Revision 5
 1OST-36.2 Diesel Generator No. 2 Monthly Test, Revision 67
 1/2-ADM-0712, Shutdown Defense In Depth Assessment, Revision 7
 1/2-CMP-M-75-031, Pump Parking Instruction, Revision 7
 1PMP-24FW-P-3A-3B-1M, Motor Driven Auxiliary Feedwater Pump Lubrication, Revision 5

Condition Reports

2013-14499	2013-14691	2013-16027	2013-16623	2013-16756	2013-15914
2013-16037	2013-16319	2013-16667	2013-16454	2013-16375	2013-16343
2013-16146	2013-16292	2013-16223	2013-16720	2013-18959	2013-15843
2013-16951	2013-15197	2013-15748			

Maintenance Orders/Work Orders

200577355	200520913	200577319	200437180	200561092	600860464
200457152	200440862	200579191	200579384	200565010	600860615
200506921	200578707	200578712	600858408	600858980	600860508
200582196					

Miscellaneous

ECP 13-0700-000, Containment Liner Modification, Revision 0
 Welding Technique Sheet, Revision 6
 ASME Section IX Welding Procedure Specification, Revision 0
 NDE-UT-308 report BOP-UT-13-302, dated October 4, 2013
 NDE-UT-308 report BOP-UT-13-309, dated October 5, 2013
 NDE-UT-308 report BOP-UT-13-312, dated October 5, 2013
 NDE-UT-308 report BOP-UT-13-314, dated October 8, 2013
 Reactor Containment Building Integrated Leakage Rate Test, Beaver Valley Power Station Unit 1, dated April 4, 2006
 Sandia Report SAND2010-8718, Nuclear Containment Steel Liner Corrosion Workshop, dated July 2011
 NRC Correspondence with BVPS, Subject: Beaver Valley Power Station, Unit No. 1 – Nuclear Regulatory Commission Review of Containment Liner Random and Non-Random Reports, dated April 30, 2013

Section 1R20: Refueling and Other Outage ActivitiesProcedures

1OM-20.4.E, Draining the Refueling Cavity, Revision 37
 1OM-6.4.N, Draining the RCS for Refueling, Revision 24
 1/2-ADM-0712, Shutdown Defense in Depth Assessment, Revision 7
 1OM-52.4.A, Raising Power from 5% to Full Load Operation, Revision 68
 1RST-2.1, Initial Approach to Criticality after Refueling, Revision 15
 1OM-52.4.R.2.A, Station Startup Mode 6 to Mode 1, Revision 33

Condition Reports

2013-16967	2013-16732	2013-17529	2013-17689	2013-17515	2013-16719
2013-17229	2013-16712	2013-16781	2013-16653	2013-16987	2013-16731
2013-17057	2013-17092	2013-15497	2013-16303	2013-16038	2013-16040
2013-16293	2013-15813	2013-15826	2013-15835	2013-15785	2013-15819
2013-15820	2013-15767	2013-15497	2013-15498		

Miscellaneous

EMP Center work hour records, dated 9/30/13-10/13/13
 Site access badging records, dated 9/30/13-10/13/13

Section 1R22: Surveillance TestingProcedures

1BVT-1.21.2, Unit 1 Trevi Test Method for Main Steam Safety Valve Setpoint Check, Revision 16
 1OST-11.14B, HHSI Full Flow Test, Revision 32
 1OST-47.3F, Containment Isolation and ASME Test-Work Week 2, Revision 23
 2OST-24.4, Steam Driven Auxiliary Feed Pump [2FWE*P22] Quarterly Test, Revision 74

Condition Reports

2013-16047	2013-19161	2013-19177
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Miscellaneous

WO 200508904

Analysis of Stroke Time for Being Outside of the ASME Acceptable Range, TV-1SS-112A1, dated October 9, 2013

Section 1EP4: Emergency Action Level and Emergency Plan Changes

1/2-EPP-IP-2.6, "Environmental Assessment and Dose Projection Controlling Procedure,"
Revision 28

Emergency Preparedness Plan, Section 4, "Emergency Conditions," Revision 29

EPP-1-1a, "Recognition and Classification of Emergency Conditions," Revision 15

EPP-1-1b, "Recognition and Classification of Emergency Conditions," Revision 16

**Section 2RS1/2RS2: Radiological Hazard Assessment and Exposure
Controls/Occupational ALARA Planning and Controls**

Procedures

NOP-OP-4005, ALARA Program, Revision 3

NOP-OP-4101, Access Controls for Radiologically Controlled Areas, Revision 9

NOP-OP-4102, Radiological Postings, Labeling, and Markings, Revision 9

NOP-OP-4107, Radiation Work Permit, Revision 12

NOP-OP-4202, Declared Pregnant Worker, Revision 0

NOP-OP-4205, Dose Assessment, Revision 3

NOP-OP-4206, Bioassay Administration, Revision 0

NOP-OP-4301, Respiratory Protection Program, Revision 2

NOP-OP-4702, Air Sampling, Revision 4

Radiation Work Permits/Post Job ALARA Review

RWP 113-4015, Secondary Side Steam Generator Sludge Lance/FOSAR

RWP 113-4018, Reactor Disassembly/Reassembly

RWP 113-4019, Remove and Install CETNAs

RWP 113-4021, Move Reactor Head & Upper Internals

RWP 113-4022, Reactor Core Offload/Re-load

RWP 113-4028, Scaffolding Construction

RWP 113-4030, Install/Remove Temporary Shielding

Condition Reports

3013-16303 2013-14857 2013-13779 2013-17957 2013-16337 2013-14567

2013-16308 2013-15192

ALARA Manager's Committee (AMC) & Subcommittee (ASC) Meeting Minutes:

AMC 13-09 through 13-13 and IR22 meetings 01, 02, 03

ASC 13-10 through ASC 13-15

Miscellaneous

Air Sample Records for Continuous Air Monitors

Dose and Dose Rate Alarm Report for period 1/01/2013 through 11/17/2013

Personnel Contamination Event Reports

2013 Outage Dose Report by Department

Exposure Reduction Plan 2013-2017

ALARA Briefing Materials for RWP 213-2019, Lube CAR Fans

1R22 Outage Milestone Evaluations

Section 4OA1: Performance Indicator Verification

Miscellaneous

System Health Report, System 07 Unit 1 Chemical and Volume Control System 2013-1
System Health Report, System 07 Unit 2 Chemical and Volume Control System 2013-1

Section 4OA2: Problem Identification and Resolution

Procedures

2OM-36.4.AAO, Station Service Transformer 2B Inertaire Trouble or Dissolved Gas High,
Revision 15

Condition Reports

2012-15978 2012-16464 2012-16557 2013-00882 2013-18575 2013-18578

Miscellaneous

ECP 12-0703, Installation of a Dissolved Gas Monitoring System on the Unit 2,
System Station Service Transformer BV-TR-2B, Revision 0

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

Condition Reports

2013-15843

Miscellaneous

1OM-53C.4.1.26.1, Turbine and Generator Trip, Revision 19
Reactor Containment Building Integrated Leakage Rate Test, Beaver Valley Power Station Unit
1, dated April 4, 2006
Sandia Report SAND2010-8718, Nuclear Containment Steel Liner Corrosion Workshop, dated
July 2011

Section 4OA5: Other Activities

Program Documents:

NOP-ER-2007, Underground Piping and Tanks Integrity Program, Revision 5
NOP-CC-1001, Configuration Management Program, Revision 1
NOP-ER-2101, Engineering Program Management, Revision 8
Beaver Valley Underground Piping and Tanks Examination Plan, Revision 1, April 16, 2013
Action Plan to Manage Underground Piping at Beaver Valley Power Station, January 17, 2012
Program Health Reports, Buried Piping 2012-02 and 2013-01
SN-SA-20130350, Beaver Valley NRC Buried Piping Phase 2 Inspection Snapshot Self-
Assessment, December 9, 2013
Corrective Actions, CA-2012-03867-2, 3, & 5
BP Works 2.1, Computer Program

Miscellaneous Documents:

NRC Temporary Instruction 2515/182, 08/08/13; Review of the Implementation of the Industry
Initiative to Control Degradation of Underground Piping and Tanks
NEI 09-14, Revision 3, April 2013; Guideline for the Management of Underground Piping and
Tank Integrity

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as reasonably achievable
ASME	American Society of Mechanical Engineers
BACC	boric acid corrosion control
BVPS	Beaver Valley Power Station
CAP	corrective action program
CFR	Code of Federal Regulations
CLT	criteria for low to tertiary
CR	condition report
CT	criteria for tertiary to ground
CY	calendar year
DHR	decay heat removal
DRS	Division of Reactor Safety
ED	electronic dosimeter
EDG	emergency diesel generator
EPIP	Emergency Plan Implementing Procedures
FENOC	FirstEnergy Nuclear Operating Company
HEPA	high efficiency particulate air
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
ISI	Inservice Inspection
KV	kilovolt
LER	licensee event report
LHRA	locked high radiation area
NCV	non-cited violation
NDE	non-destructive examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSIR	Office of Nuclear Security and Incident Response
PARS	publicly available records
PD	performance deficiency
RCA	radiological controlled area
RCB	reactor containment building
RG	Regulatory Guide
RP	radiation protection
RVUHP	reactor vessel upper head penetration
RWP	radiation work permit
SDP	significance determination process
SFP	spent fuel pool
S/G	steam generator
SSC	structure, system, or component
SSST	system station service transformer
TEDE	total effective dose equivalent
TI	temporary instruction
UFSAR	Updated Final Safety Analysis Report
VHRA	very high radiation area
UT	ultrasonic test



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

**Beaver Valley Resident
Inspector 4th Quarter Exit
Meeting**

January 31, 2014

Jared Nadel (Acting SRI) &
Erin Carfang (RI)

Inspectors

- D. Spindler, Senior Resident Inspector
- Erin Carfang, Resident Inspector
- B. Bickett, Senior Project Engineer
- A. Dugandzic, Project Engineer
- P. Kaufman, Senior Reactor Inspector
- J. Laughlin, Emergency Preparedness Inspector
- T. Moslak, Senior Health Physicist Inspector
- M. Patel, Reactor Inspector
- D. Silk, Senior Licensed Operator Examiner

Summary

- Inspection Report 2013005
- Two Green NCVs
- Feeders: Four RP, ISI, EP, LORP, TI 182
- One PI&R Sample Inspection
 - TR-2B Doble Testing Review
- LER for containment liner defect was closed
- Follow-up of Events – NOUE and cable fire on 11/05/13

Inspection Report Feeders

- Radiological Hazard Assessment and Exposure Controls (2RS1)
- Occupational ALARA Planning and Controls (2RS2)
- In-Plant Airborne Radioactivity Control and Mitigation (2RS3)
- Occupational Dose Assessment (2RS4)
- Inservice Inspection (1R08)
- Emergency Action Level and Emergency Plan Changes (1EP4)
- LORP annual review (1R11)
- TI-2515/182 phase 2 – Buried Piping Inspections (4OA5)
- Resident Baseline Inspections.

Non-cited Violations

- NCV 05000334/2013005-01, Moisture Separator Reheater Valve Misposition Results in Plant Transient (1R20)
 - Description: A human performance error caused isolation of a MSR during post-outage power ascension
 - PD: Failure to follow procedure 1OM-52.4.A
 - Violation: TS 5.4.1 - “Procedures”
 - MTM: Human Performance attribute of the Initiating Events Cornerstone was affected
 - Significance: Green
 - Cross-cutting: H.4(a)

Non-cited Violations Ctd.

- NCV 05000334/2013005-02, Insufficient VHRA Control Under Vessel (2RS1)
 - Description: FENOC did not ensure a VHRA locking device was adequate
 - PD: Failure to comply with 10 CFR 20.1601
 - Violation: 10 CFR 20.1601 - “Control of access to VHRAs”
 - MTM: Program and Process attribute of RP Cornerstone was affected
 - Significance: Green
 - Cross-cutting: P.1(c)

Other Items

Section 40A2:

- Annual Sample: TR-2B System Station Service Transformer Doble testing review
 - No Findings

Section 40A3:

- (Closed) Licensee Event Report (LER) 05000334/2013-002-00: Containment Liner Through Wall Defect Discovered During Planned Visual Inspection
 - No Findings
- Follow-up of Events: U1 NOUE and cable fire on 11/05/13
 - No Findings

Any proprietary information?

Questions?

Inspection Focus Areas

- Cold weather challenges
- Procedure use and adherence

Inspection Observations

- As discussed

Support

- Excellent support so far
 - Quick response to requests and visits from personnel on issues.

Items of Interest

Upcoming inspections

- Radiological Hazard Assessment and Exposure Controls (03/03/14 and 04/25/14)
- Occupational ALARA Planning and Controls (03/03/14 and 04/25/14)
- Unit 2 Inservice Inspection (4/28/14)
- PI&R focused sample to review the root cause for the cable fire (3/3/14)
- ISFSI Crane and HSM Inspection (5/5/14)
- Initial Operator Licensing Exam (06/09/14 and 07/07/14)
- EP Exercise (HA Event) – (06/16/2014)

Personnel Changes

- New Acting Branch Chief – Kevin Mangan