UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 30, 2012

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

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000334/2012002 AND 05000412/2012002

Dear Mr. Harden:

On March 31, 2012, 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 April 5, 2012 with you 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 three NRC-identified findings of very low safety significance (Green). Two findings were determined to be a violation of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of their very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCVs in this report, you should provide a written 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.

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

Sincerely,

/RA/

Gordon K. Hunegs, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosures: Inspection Report 05000334/2012002; 05000412/2012002
w/ Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 50-334, 50-412

License Nos. DPR-66, NPF-73

Report Nos. 05000334/2012002 and 05000412/2012002

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA 15077

Dates: January 1, 2012 through March 31, 2012

Inspectors: D. Spindler, Senior Resident Inspector
E. Bonney, Resident Inspector
P. Kaufman, Senior Reactor Inspector
N. Lafferty, Project Engineer
J. Laughlin, Emergency Preparedness Inspector
T. Moslak, Health Physicist
D. Silk, Senior Operations Engineer
T. Ziev, Project Engineer

Approved by: Gordon K. Hunegs, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000334/2012002, IR 05000412/2012002; 01/01/2012 - 03/31/2012; Beaver Valley Power Station, Units 1 & 2; Adverse Weather Protection, and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional and headquarters inspectors. The inspectors identified three findings of very low safety significance (Green), of which two were non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Initiating Events

- Green. The inspectors identified a Green finding (FIN) for FENOC's failure to adequately control loose debris as required by FENOC procedures related to switchyard condition. Specifically, the inspectors identified unsecured debris in a large waste receptacle (dumpster) near the 1B System Station Service Transformer (SSST) which provides off-site power. FENOC took immediate corrective action to remove the debris, and performed frequent walkdowns of the switchyard and offsite power sources. The issue was entered into the licensee's corrective action program for resolution as CR 2012-02958.

  This finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Additionally, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the loose material could have affected off-site power during periods of high winds. The inspectors evaluated the finding using Phase 1, "Initial Screening and Characterization" worksheet Attachment 4 to IMC 0609, "Significance Determination Process." The inspectors determined this finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Therefore, inspectors determined the finding to be of very low safety significance.

  This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because FENOC personnel did not institutionalize operating experience based changes to station procedures regarding material storage in switchyard areas [P.2(b)]. (Section 1R01)

- Green. The inspectors identified a Green NCV of TS 5.4.1 "Procedures" for FENOC's failure to adequately implement and maintain a replacement program for expansion joints installed in safety related systems. Specifically, rubber expansion joint REJ-1RW-24B was in service beyond the service life and degraded unacceptably while in service in the Unit 1 river water system. Corrective actions included replacing the expansion joint and addressing expansion joint preventive maintenance issues. FENOC entered the issue into the licensee's corrective action program under CR 2012-03347.

The finding is more than minor because it is similar to IMC 0612, “Power Reactor Inspection Reports,” Appendix E, Examples of Minor Issues,” example 4.f in that a condition adverse to quality degraded after initial identification and affected the operability of the river water system. This finding is associated with the procedure quality attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors determined the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Therefore, the finding is considered to be of very low safety significance.

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because FENOC failed to ensure procedures supported maintaining long term plant safety by minimizing preventive maintenance deferrals [H.2(a)]. (Section 4OA2)

Cornerstone: Mitigating Systems

- Green. The NRC inspectors identified a Green NCV of TS 3.7.5, in that FENOC performed maintenance on the Unit 1 auxiliary feed water (AFW) system that resulted in three inoperable AFW trains. Specifically, during maintenance, FENOC removed the auto-open feature of the AFW pumps discharge valves. Corrective actions included addressing programmatic issues related to maintenance guidance and operator performance. FENOC entered the issue into the corrective action program for resolution as CR 2012-01025.

  The finding is more than minor because it affects the configuration control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined this finding was not a design qualification deficiency resulting in the loss of functionality, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding or severe weather initiating event. Therefore, the finding is considered to be of very low safety significance.

  This finding has a cross-cutting aspect in the area of Human Performance, Work Control, because FENOC failed to plan work activities with appropriate risk insights and understanding of job conditions that impacted the AFW system [H.3(a)]. (Section 4OA2)

Other Findings

A violation of very low safety significance that was identified by First Energy Nuclear Operating Company (FENOC) was reviewed by the inspectors. Corrective actions taken or planned by FENOC have been entered into the licensee’s corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power and remained at or near 100 percent power until March 17, 2012, when the unit entered end-of-cycle coastdown operations.

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On February 24, 2012, the inspectors evaluated FENOC's readiness during a high wind advisory and subsequent entry into abnormal operating procedure (AOP) 1/2OM-53C.4A.75.1, "Acts of Nature - Tornado or High Winds." The inspectors' efforts focused on review of specific unit actions based on actual environmental conditions and adherence to mitigating procedures. The inspectors performed a walkdown of each unit's external structures, areas that could potentially impact safety related equipment, and emergency response facilities to verify the adequacy of protection from high winds. The inspectors verified completion of actions required by the AOP. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

Introduction. The inspectors identified a Green finding (FIN) for the licensee's failure to adequately control loose debris as required by FENOC procedures related to switchyard condition. Specifically, the inspectors identified unsecured debris in a large waste receptacle (dumpster) in close proximity to the 1B System Station Service Transformer (SSST) which provides off-site power. Once identified, the licensee removed the debris from the area. No violation of regulatory requirements occurred.

Description. From February 22 to 24, 2012, the inspectors conducted walkdowns to determine the station readiness in the event of a tornado or high winds. The inspectors identified a dumpster filled with scrap metal, including sheet metal, close to the 1B SSST. The inspectors concluded that the loose material in the dumpster combined with high velocity winds increased the potential to lose an offsite power transformer because the discarded materials could become a missile hazard and damage the offsite power transformer or power lines.

FENOC procedure 1/2OM-53C.4A.75.1, "Acts of Nature - Tornado or High Wind Condition," directs plant personnel to conduct a tour of the switchyard area and then evaluate for additional restraints or removal of any equipment or debris discovered in the area. The 1B SSST is included in the switchyard tour. Procedure NOP-OP-1012, "Material Readiness

and Housekeeping Inspection Program" states material or debris that has the potential to become airborne with high winds and cause the loss of off-site power sources shall be restrained or removed. The inspectors found no means of securing the dumpster, such as a lid, in the event of a high wind or tornado condition. Additionally, no evaluation for the loose material near the 1B SSST had been performed. The station did enter 1/2OM-53C.4A.75.1 on February 24 for a high wind advisory two days after the inspectors discovered the unsecured material. All unsecured material in the vicinity of station transformers and switchyard had been removed prior to the high wind advisory being issued.

Analysis. FENOC's failure to control loose debris near risk-significant equipment is contrary to the standards contained within NOP-OP-1012 and is considered a performance deficiency that was within FENOC's ability to foresee and correct. The inspectors determined that the finding is not similar to any examples in IMC 0612, Appendix E, "Examples of Minor Issues." This finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Additionally, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the loose material could have affected off-site power during periods of high winds. The inspectors evaluated the finding using Phase 1, "Initial Screening and Characterization" worksheet Attachment 4 to IMC 0609, "Significance Determination Process." The inspectors determined this finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Therefore, inspectors determined the finding to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because FENOC personnel did not institutionalize operating experience based changes to station procedures regarding material storage in switchyard areas [P.2(b)].

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement and has very low safety significance. There were no actual safety consequences because the 1B SSST remained capable of performing its safety function. FENOC took immediate corrective action to remove the debris, documented the issue in CR 2012-02958, and performed frequent walkdowns of the switchyard and offsite power sources. **(FIN 05000334/2012002-01, Failure to Adequately Control Loose Debris Near Off-site Power Transformer)**

.2 External Flooding

a. Inspection Scope

During the week of February 20, 2012, the inspectors performed an inspection of the external flood protection measures for Beaver Valley Power Station (BVPS) Unit 1 and Unit 2. The inspectors reviewed the UFSAR, Chapter 2.3, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by internal flooding. The inspectors conducted a general site walkdown of all external areas of the plant, including the turbine building, auxiliary building, and intake structure to ensure that First Energy Nuclear Operating Company (FENOC) erected flood protection measures in accordance with design specifications. The inspectors also

reviewed operating procedures for mitigating external flooding during severe weather to determine if FENOC planned or established adequate measures to protect against external flooding events.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, 'B' motor-driven auxiliary feedwater (AFW) train during 'A' motor-driven AFW pump testing on March 7, 2012
- Unit 2, 2-2 emergency diesel generator (EDG) walkdown with the 2-1 EDG inoperable on January 9, 2012
- Unit 2, 'B' service water pump during testing of the 'A' service water (SW) pump on March 8, 2012

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 licensee 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 January 26, 2012, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 charging system (CHS) 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

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 East cable vault (CV-2) on January 26, 2012
- Unit 1 Safeguards area (PT-1) on January 26, 2012
- Unit 2 Instrumentation and relay area and cable tunnel (CB-1 and CT-1) on January 11, 2012
- Unit 2 Fuel building (FB-1) on January 17, 2012

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed Unit 1 licensed operator simulator training on March 15, 2012, which included high winds resulting in a loss of offsite power and a station blackout condition from the loss of the remaining onsite power. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager 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 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed control room activities in both Unit 1 and Unit 2 control rooms on March 14 and March 28, 2012. The inspectors observed evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefing met the criteria of NOBP-LP-2604, "Effective Pre-job Briefs," Revision 6. Additionally, inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that FENOC was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by licensee staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that licensee staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Unit 1 and 2 emergency response facility diesel generator (a)(1) evaluation on January 19, 2012
- Unit 1 reactor controls and protection system (a)(1) evaluation on March 7, 2012

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 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 licensee 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, planned maintenance on 'B' AFW pump and 1-2 EDG on January 23, 2012
- Unit 1, emergent work on 'B' river water header on January 27-29, 2012
- Unit 1, turbine electrohydraulic control power supply failure risk evaluation on January 30, 2012
- Unit 1, weekly risk management for the week of February 13, 2012
- Unit 2, emergent work on 2-1 EDG annunciator on February 6, 2012

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Unit 1, fire protection piping pinhole leak on January 19, 2012
- Unit 1, AFW past operability review on January 25, 2012
- Unit 2, 2-2 EDG aggregate impact on January 9, 2012
- Unit 2, AFW snubber, 2MS-C-12-01-13, did not meet licensing requirements surveillance (LRS) 3.7.4.1 completion during 2R15 refueling outage on January 19, 2012
- Unit 2, 2-1 EDG annunciator circuit ground repair on February 3, 2012
- Unit 2, spurious opening of 138kV supply breaker to 2A SSST on February 4, 2012

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 the licensee. 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)

a. Inspection Scope

The inspectors evaluated a permanent modification to Unit 1 smoke detector locations in the emergency and normal switchgears implemented by engineering change package 11-0078-000. 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. The inspectors interviewed engineering and operations personnel to ensure adequate installation and testing could be performed.

Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities 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.

- Unit 1, 'A' low head safety injection pump planned maintenance on January 9, 2012
- Unit 1, 'C' high head safety injection pump reach rod planned maintenance on January 10, 2012
- Unit 1, 1-2 EDG air start solenoid operated valve and crankcase pressure switch replacement on January 18, 2012
- Unit 1, river water expansion joint replacement on January 29, 2012

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 7 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 licensee 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:

- Unit 1, 1OST-7.6 Centrifugal Charging Pump Test on January 13, 2012
- Unit 1, 1RST-2.5, Moderator Temperature Coefficient Determination on January 18, 2012
- Unit 1, 1OST-11.1, Safety Injection Pump Test on January 19, 2012 (in-service test)
- Unit 1, 1OST-24.3, Motor Driven Auxiliary Feed Pump Test on January 24, 2012
- Unit 1, 1OST-1.3A, Train 'A' Containment Isolation Phase 'A' Signal On-Line Slave Relay Test on March 27, 2012
- Unit 2, 2OST-6.2, Reactor Coolant System Water Inventory Balance on January 17, 2012 (leak rate test)
- Unit 2, 2OST-15.1, Primary Component Cooling Water Pump Test on March 9, 2012

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (IP71117.04 – 1 sample)

a. Inspection Scope

The Nuclear Security and Incident Response (NSIR) headquarters staff performed an in-office review of FENOC's Emergency Plan Implementing Procedure (EPIP) 1/2-EPP-IP-1.7, "Emergency Response Organization (ERO) Teams," Revision 22, located under ADAMS accession number ML 12047A230.

The licensee transmitted this EPIP revision to the NRC pursuant to the requirements of 10 CFR 50, Appendix E, Section V, "Implementing Procedures." 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 document reviewed is listed in the attachment.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine FENOC emergency drill on March 15, 2012 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, technical support center and emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by licensee staff in order to evaluate FENOC's critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

During the period February 27 – March 1, 2012, the inspector conducted the following activities to verify that the licensee was evaluating, monitoring, and controlling radiological hazards for work performed, during power operations, in locked high radiation areas (LHRA) and other radiological controlled areas (RCA). Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, Technical Specifications, and the licensee's procedures.

Radiological Hazards Control and Work Coverage

The inspector identified work performed in radiological controlled areas in Unit 1 and 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, and radiation work permits (RWP), associated with these areas, to determine if the exposure controls were acceptable. In particular, the inspector reviewed the electronic dosimeter dose/dose rate alarm set points, stated on the RWP, to determine if the set points were consistent with the survey indications and plant policy. Specific work activities evaluated included an entry at power into the Unit 2 reactor building containment (RBC) to lubricate containment air recirculation (CAR) fans (RWP 2-12-2019) and a replacement of de-borating demineralizer isolation valves (CH-53/54) in Unit 1 (RWP 1-12-1024). For these tasks, the inspector attended the pre-job briefings and discussed the job assignments with the workers.

The inspector reviewed the air sample records for samples taken for replacing the CH-53/54 valves to determine if the samples collected were representative of the breathing air zone and analyzed/recorded in accordance with established procedures. During tours of Units 1 and 2, the inspector verified that continuous air monitors were strategically located to assure that potential airborne contamination could be timely identified and that the monitors were located in low background areas.

The inspector toured accessible radiological controlled areas in Units 1 and 2, including the auxiliary buildings, spent fuel pool areas, and radwaste processing building; and performed independent radiation surveys of selected areas to confirm the accuracy of survey data, the adequacy of postings, and that selected locked high radiation areas were properly secured. During tours, radiation protection technicians were questioned regarding their knowledge of plant radiological conditions for selected jobs, and the associated controls.

Instructions to Workers

By attending pre-job briefings, the inspector determined that workers performing radiological significant tasks were properly informed of electronic dosimeter alarm set points, low dose waiting areas, stay times, and work site radiological conditions. Jobs observed included replacement of de-borating demineralizer outboard isolation valves (CH-53/54) and preparations for an entry into the Unit 2 RBC, at full power, to lubricate CAR fans.

During tours, the inspector determined that 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 Very High Radiation Areas (VHRA) and determined that no changes have been made to reduce the effectiveness and level of worker protection. The inspector inventoried LHRA and VHRA keys to confirm that keys were properly accounted for.

Contamination and Radioactive Material Control

During plant tours, 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 met criteria for releasing the materials from the RCA.

Radiological Hazards Control and Work Coverage

By observing the replacement of the CH-53/54 valves, the inspector determined that workers wore the appropriate protective equipment, had dosimetry properly located on their bodies, and were under the positive control of radiation protection personnel. Components were enclosed in containment tents to control contamination. Air samples were appropriately taken. Supervisory personnel controlled the movements of the workers to assure that exposure was minimized and that RWP requirements were met.

Radiation Worker Performance

During job performance observations, the inspector determined that workers complied with RWP requirements and were aware of radiological conditions at the work site. Additionally, the inspector determined that 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 a nuclear oversight audit, dose/dose rate alarm reports, personnel contamination reports, and 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 program implementation, initiated between July 2011 - March 2012, 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

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

During the period February 27 - March 1, 2012, the inspector conducted the following activities to verify that the licensee was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as is reasonably achievable (ALARA) for tasks performed during power operations. The inspector also reviewed the ALARA preparations for the Unit 1 spring refueling outage (1R21). Implementation of this program was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

Radiological Work Planning

The inspector reviewed pertinent information regarding site cumulative exposure history, current exposure trends, and the exposure challenges for the Unit 1 spring 2012 outage. The inspector reviewed the 1R21 Outage ALARA Plan and the site's five year dose reduction plan.

The inspector reviewed the exposure status for tasks performed during power operations in 2011 and compared actual exposure with forecasted estimates contained in various project ALARA Plans (AP).

The inspector evaluated the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering to identify missing ALARA program elements and interface problems. The evaluation was accomplished by interviewing site

staff, reviewing recent ALARA Managers Committee (AMC) meeting minutes, and reviewing ALARA Plans that will be used for the spring 2012 Unit 1 refueling outage.

Verification of Dose Estimates

The inspector reviewed the assumptions and basis for the 1R21 outage forecasted exposure. Particular attention was given to dose intensive tasks. These tasks included refueling activities, erection/removal of temporary scaffolding, installation of permanent work platforms, and replacement of the 'A' residual heat removal (RHR) motor/pump.

The inspector also reviewed the temporary shielding program that will be used during the outage for various projects. Shielding packages reviewed included the reactor head stand, pressurizer spray piping, steam generator penetrations, fuel transfer keyway, RHR components, and primary coolant piping/valves.

The inspector evaluated the licensee's procedures associated with monitoring and re-evaluating dose estimates and additional dose allocations when the forecasted cumulative exposure for tasks was approached. Included in the review were the criteria for initiating work-in-progress reports and involvement by the AMC to assess the effectiveness of ALARA measures and address shortcomings in the original dose estimates.

Additionally, the inspector reviewed the exposures for the ten (10) workers receiving the highest doses for 2011 to confirm that no individual exceeded the regulatory limits or performance indicator thresholds.

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 Senior Nuclear Specialist-ALARA, the inspector evaluated past source term measurements and control strategies. Specific strategies employed included use of macro-porous clean up resin, increased filtration flow, decreasing filter pore size, enhanced chemistry controls, system flushes, and temporary shielding.

Job Site Inspections

The inspector reviewed the ALARA controls specified in ALARA Plans and RWPs, for ongoing jobs. The ALARA controls were evaluated for replacing the Unit 1 de-borating system isolation valves and for a Unit 2 RBC entry, at power, to lubricate CAR fans. Workers were questioned regarding their knowledge of job site radiological conditions and ALARA measures applied to their tasks.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the ALARA program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, condition reports related to programmatic dose challenges, personnel contaminations, dose/dose rate alarms, and the effectiveness in predicting and controlling worker exposure were reviewed.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Initiating Events (6 Samples)

a. Inspection Scope

The inspectors sampled licensee submittals for Performance Indicators (PI) listed below for both Unit 1 and Unit 2 to verify accuracy of the data recorded from January 2011 through December 2011. The inspectors reviewed Licensee Event Reports, condition reports, portions of various plant operating logs and reports, and PI data developed from monthly operating reports. Methods for compiling and reporting the PIs were discussed with cognizant engineering and licensing personnel. To verify the accuracy of the PI data reported during this period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 6, were used for each data element.

- Unit 1 Unplanned Scrams per 7000 Critical Hours
- Unit 1 Unplanned Power Changes per 7000 Critical Hours
- Unit 1 Unplanned Scrams with Complications
- Unit 2 Unplanned Scrams per 7000 Critical Hours
- Unit 2 Unplanned Power Changes per 7000 Critical Hours
- Unit 2 Unplanned Scrams with Complications

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that FENOC entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended condition report screening meetings.

b. Findings

Introduction. The inspectors identified a Green NCV of TS 3.7.5, in that FENOC performed maintenance on the Unit 1 AFW system that resulted in three inoperable AFW trains. Specifically, during maintenance, FENOC removed the auto-open feature for the discharge throttle valves on all three trains of AFW while the unit was at power.

Description. On January 25, 2012, during a review of CR 2012-01025, the inspectors indentified that maintenance resulted in the inoperability of 3 trains of AFW. CR 2012-01025 described maintenance performed on the steam driven AFW pump and relay contacts for the 'A' and 'B' motor driven AFW pumps simultaneously on September 20, 2011. Upon further questioning by the inspectors, it was determined that the protective tagout on the steam driven AFW pump initially caused the inoperability of all 3 AFW trains by removing the auto-open feature of all six discharge throttle valves. During the steam driven AFW pump maintenance, work performed on relay contacts for the 'A' and 'B' motor driven AFW pump breakers also caused the inoperability of the associated train discharge throttle valves during the contact's removal from service.

The auto-open function of the AFW pumps discharge throttle valves are controlled by a timing circuit that activates on one of 2 signals. The first signal is the opening of the steam driven AFW pump trip throttle valve and the second signal is received through contacts on the breaker closure of each motor driven AFW pump. By removing the contacts on the breaker of the motor-driven AFW pumps, an invalid signal was locked into the timing circuit for the discharge throttle valves, which removed the ability of the contacts to receive a valid demand signal to open for that train. The same impact on the circuit occurred when a trip throttle valve for the steam driven AFW pump was opened for a protective tagout. SR 3.7.5.3 requires that all automatic features of valves be available, therefore, the protective tagout that opened the 'A' and 'B' trip throttle valves caused all discharge throttle valves to be inoperable. With the discharge throttle valves inoperable, all of the AFW trains are inoperable.

During the maintenance, the steam driven AFW train was declared inoperable, but FENOC failed to recognize that all AFW trains were inoperable for the 17 hour maintenance on the system. Throughout the maintenance on the system, the six affected discharge throttle valves remained open. However, the automatic open signal that retains the throttle valves open for 30 seconds became inoperable. FENOC identified a potential operability concern with the maintenance on January 20, 2012, but failed to identify the full impact on the operability of the AFW trains. Maintenance on the contacts was previously performed only during outages and shifted to performance online in 2008 for the 'A' motor driven AFW pump and 2011 for the 'B' motor driven pump. The inspectors noted that a 2005 review from a maintenance supervisor indicated that the relay maintenance required an outage.

Analysis. The inspectors determined that performing maintenance that resulted in the inoperability of three auxiliary feedwater trains is a performance deficiency that was within FENOC's ability to foresee and correct. The inspectors determined that the finding is not similar to any examples in IMC 0612, Appendix E, "Examples of Minor Issues." The finding is more than minor because it affects the configuration control attribute of the Mitigating Systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the finding using Phase 1, "Initial Screening and Characterization" worksheet in Attachment 4 of IMC 0609, "Significance Determination Process." The inspectors determined this finding was not a design qualification deficiency resulting in a

loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding or severe weather initiating event. Therefore, inspectors determined the finding to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Work Control, because FENOC failed to plan work activities with appropriate risk insights and understanding of job conditions that impacted the AFW system [H.3(a)].

Enforcement. TS 3.7.5 requires, in part, that three auxiliary feed water trains and three auxiliary feedwater injection headers shall be operable in Mode 1. SR 3.7.5.3 requires that all automatic features of valves be available for operability. Contrary to the above on September 20, 2011, three auxiliary feed water trains and three auxiliary feed water injection headers were not operable in Mode 1. FENOC had removed an automatic safety feature of valves, which affected the operability of all three auxiliary feedwater trains. There were no actual safety consequences because the AFW system remained capable of performing its safety function. Corrective actions included addressing programmatic issues related to maintenance guidance and operator performance. Because this deficiency is considered to be of very low safety significance (Green) and was entered into the corrective action program as CR 2012-01025, the violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000334/2012002-02, Failure to Maintain Auxiliary Feedwater Operable During Maintenance)**

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by FENOC outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed The licensee’s corrective action program database for the third and fourth quarters of 2011 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed the licensee quarterly trend report for the fourth quarter of 2011, conducted under (insert licensee procedure) to verify that FENOC personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

Introduction. The inspectors indentified a Green NCV of TS 5.4.1, “Procedures” for FENOC’s failure to adequately implement and maintain a replacement program for expansion joints in safety-related systems. Specifically, rubber expansion joint REJ-1RW-24B was in service beyond the recommended service life and degraded unacceptably while in service in the Unit 1 river water system.

Description. On January 27, 2012, the quarterly surveillance test was performed for the 'C' river water (RW) pump on the 'B' RW header. During the surveillance test, a rubber expansion joint, REJ-1RW-24B, with a previously identified bulge was found significantly changed. FENOC implemented additional monitoring of the joint due to the bulge and deemed the degradation unacceptable. Due to the degradation of the joint, the 'B' RW header was declared inoperable for 43 hours during the expansion joint replacement from January 27 to 29, 2012.

The Garlock rubber expansion joint was installed in December 1995 and has a recommended vendor service life of 10 years. 1/2-ADM-2046 "Beaver Valley Rubber Expansion Joint Inservice Inspection Program" service life duration also lists 10 years for Garlock joints, while NORM-ER-3413, "Piping Expansion Joints," allows 14 years of service life for critical joints in mild service.

EPRI "Expansion Joint Maintenance Guide" outlines a basic assessment program for extension of service life from the vendor recommend life to 14 years of service life. The FENOC service life extension was based on in-service inspection, post-service visual inspection of three high duty cycle expansion joints, and destructive testing of the same three expansion joints. EPRI guidance also includes using post-service hydrostatic tests with no leakage or abnormal deformation detected, measurement of the physical properties of the post-service expansion joint, and accelerated aging tests on new elastomer samples removed during destructive testing that suggests significant service life remains. The inspectors identified that FENOC did not perform hydrostatic testing or perform measurements and tests to determine aging effects on the expansion joints post-service to ensure adequate service life remained available in similar expansion joints.

In June 2010, the planned replacement of expansion joints was extended based on conclusions from FENOC inspections. The service life of critical, high duty cycle expansion joints in severe service conditions was extended from 12 to 14 years. The service life of critical, high duty cycle expansion joints in mild service conditions was extended to 15 years and critical, low duty cycle expansion joints in mild conditions was extended to 16 years. 1/2-ADM-2046 allows an additional 1.5 year grace period to be added to the service life.

REJ-1RW-24B was six years past the recommended vendor service life and two years past the service life extension discussed in EPRI guidance. Based on post-service inspection and vendor discussions, severe degradation of REJ-1RW-24B was consistent with age-related service failure.

Analysis. The inspectors determined that the extension of service life for rubber expansion joint REJ-1RW-24B without appropriate testing is a performance deficiency that was within FENOC's ability to foresee and correct and directly contributed to the inoperability of the B RW header for 43 hours. The finding is more than minor because it is similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 4.f in that a condition adverse to quality degraded after initial identification and affected the operability of the river water system. This finding is associated with the procedure quality aspect of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as at power. The inspectors evaluated the finding using Phase 1, "Initial Screening and Characterization" worksheet Attachment 4 to IMC 0609, "Significance Determination Process." The inspectors determined this finding did not contribute to both

the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Therefore, inspectors determined the finding to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because FENOC failed to ensure procedures supported maintaining long term plant safety by minimizing preventive maintenance deferrals [H.2(a)].

Enforcement. TS 5.4.1, "Procedures," requires that procedures be established, implemented, and maintained as required in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, Section 9.b requires, in part, that preventive maintenance schedules should be developed to specify inspections of equipment, replacement of such items, and inspection or replacement of parts that have a specific lifetime. Contrary to the above, from July 31, 2008 to January 27, 2012, FENOC failed to implement and maintain an expansion joint replacement program in accordance with vendor and industry guidance. Inspectors determined that guidance provided by 1/2-ADM-2046, "Beaver Valley Rubber Expansion Joint Inservice Inspection Program" and NORM-ER-3413, "Piping Expansion Joints" were inadequate to ensure timely replacement of rubber expansion joints installed in safety-related systems. There were no actual safety consequences because the RW system remained capable of performing its safety function. FENOC's corrective actions included replacing the expansion joint and addressing expansion joint preventive maintenance issues. Because this deficiency is considered to be of very low safety significance (Green) and FENOC entered this issue into the corrective action program as CR 2012-03347, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. (**NCV 05000334/2012002-03, Expansion Joint Degradation Resulted in River Water Inoperability**)

.3 Annual Sample: Reactivity Control Management

a. Inspection Scope

Due to recent reactivity-related events occurring within the industry, the inspector conducted a review of the licensee's reactivity management program. The inspector reviewed the procedures governing this program and interviewed site personnel regarding various aspects of its implementation. The inspector also reviewed licensee responses to industry communications, NRC information notices, self-assessments, and effectiveness reviews pertaining to reactivity management. The inspector sampled the implementation of selected corrective actions that resulted from corrective actions associated with this topic. The inspector also reviewed licensed operator training lesson plans and observed licensed operators in the simulator implement reactivity plans in four scenarios.

b. Findings and Observations

No findings were identified.

The inspector determined that the licensee has a comprehensive reactivity management program. Procedural guidance establishes a conservative operating philosophy regarding reactivity manipulations. Job planning and condition report screenings include consideration for the potential impact on reactivity management. Issues/events that impact reactivity management are categorized by severity level and trended. The licensee also participates in a peer review (with individuals from within the corporate fleet) to ensure

reactivity management issues, both internal and external to the fleet, are evaluated for applicability and corrective action. Implementation of corrective actions from a reactivity-related Unit 2 trip on April 10, 2011, was completed in a comprehensive manner. Various licensee self-assessments or effectiveness reviews were thorough and comprehensive. For example, licensee comparisons of predicted reactivity calculations with actual plant conditions were within acceptable ranges. The inspector verified that reactivity plans for various power changes were present and current for each unit as required by licensee procedure. Persons interviewed during this inspection were aware of recent industry reactivity events and sensitive to the significance of such events. Just-in-time (JIT) training occurs for planned significant reactivity evolutions. Reactor engineering personnel participate with licensed operators in this JIT training conducted in the simulator. Finally, the inspector observed a crew in the simulator demonstrate deliberate and cautious implementation of the reactivity plans during four scenario sessions.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples)

.1 (Closed) Licensee Event Report (LER) 05000334/2011-002-00, 01: Failure to Comply with Technical Specifications 3.7.5 Due to the Inoperability of Two or More Trains of the Auxiliary Feedwater System

On November 4, 2011, FENOC initially discovered that the station had performed maintenance activities in December 2010 that were not in compliance with TS 3.7.5, and two trains of auxiliary feedwater (AFW) were made inoperable through the removal of the auto-open feature of pump discharge throttle valves during maintenance. FENOC did not enter Mode 3 within six hours as required by TS 3.7.5 Condition D. This was reported through LER 05000334/2011-002-00, “Failure to Comply with Technical Specifications 3.7.5 Due to the Inoperability of Two Trains of the Auxiliary Feedwater System.” On January 20, 2012, FENOC identified 4 instances of maintenance that affected the operability of all three trains of AFW in LER 05000334/2011-002-01, which is prohibited by TS 3.7.5 Condition E, where FENOC did not immediately restore an AFW train to an operable status. One finding was identified, and is discussed in section 4OA2. These LERs are closed.

.2 (Closed) Licensee Event Report (LER) 05000412/2011-004-00: Lead Time Constant for Steam Line Pressure Channel Found Out of Tolerance

On November 4, 2011, FENOC discovered that the lead time was incorrectly adjusted outside of the TS value for the main steam P486 loop ‘B’ steam line pressure protection channel. An incorrect voltage range was used to determine the lag time, which contributed to the lead time constant being incorrectly set for the channel. As a result, the main steam P486 loop ‘B’ steam line pressure protection channel was set below the TS value from June 17, 2010 through November 4, 2011. During the time P486 was inoperable, the other two channels (P484 and P485) for loop ‘B’ steam line protection were removed from service during surveillance testing for more than one hour. TS 3.3.2 has no provision for two of three channels being out of service, requiring an entry into TS 3.0.3. Although channel P486 was inoperable, TS 3.0.3 was not entered as required. The enforcement aspects of this issue are discussed in Section 4OA7. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA5 Other Activities

.1 Temporary Instruction 2515/182, Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase I (1 Sample)

a. Inspection Scope

The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.01.a through 03.01.c of the Temporary Instruction (TI) and was found to meet all applicable aspects of the Nuclear Energy Institute (NEI) document 09-14, Revision 1, as set forth Table 1 of the TI.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On April 5, 2012, the inspectors presented the inspection results to Mr. Paul Harden, Site Vice President, and other members of the Beaver Valley Power Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

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

- Technical specification 3.3.2, Table 3.3.2-1, Functions 1.e and 4.d.(1), require three operable channels per steam line. With one channel inoperable, the channel is required to be placed in trip within 72 hours or be in Mode 3 within 78 hours and Mode 4 within 84 hours. The condition of two inoperable channels for one steam line is not allowed by technical specification 3.3.2 and requires an entry into LCO 3.0.3. LCO 3.0.3 requires within one hour to place the unit in Mode 3 within seven hours and Mode 4 within 13 hours. Contrary to the above, steam line channel P486 was inoperable from June 17, 2010 through November 4, 2011, and FENOC did not place the channel in trip or enter Mode 3 or Mode 4. FENOC also removed a second channel from service while channel P486 was inoperable and subsequently failed to enter technical specification LCO 3.0.3. The cause of the inoperability of channel P486 was an incorrect input into the lead time constant calculation. FENOC entered this issue into the corrective action program as CR 2011-04946. The inspectors determined that the finding was of very low safety significance (Green) in accordance with NRC IMC 0609, Attachment 4, "Phase 1-Initial Screening and Characterization of Findings," Mitigation Systems, because the finding was not a design qualification deficiency resulting in a loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding or severe weather initiating event.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Baker	Radiation Protection Manager
M. Banko	Nuclear Oversight Manager
K. Deberry	System Engineer
M. Dzumba	System Engineer
G. Ebeck	Design Engineering Supervisor
K. Forzan	Compliance Engineer
J. Fontaine	Radiation Protection ALARA Supervisor
B. Furdak	Chemistry Supervisor
D. Grabski	Senior Consulting Engineer, Technical Services Engineering
D. Gyms	Fire Protection Engineer
P. Harden	Site Vice President
L. Hollencamp	Senior Nuclear Specialist
R. Huston	Staff Nuclear Engineer
M. Kogelschatz	Shift Manager
R. Lieb	Director, Site Operations
J. Matsko	Superintendent, Nuclear Maintenance Services
J. Mauck	Regulatory Compliance Engineer
D. McBride	Staff Nuclear Engineer
J. Miller	Site Fire Marshall
K. Mitchell	System Engineer
M. Mouser	Buried Piping Program Owner, Technical Services Engineering
D. Murray	Director, Performance Improvement
D. Reeves	Manager, Technical Services Engineering
B. Sepelak	Supervisor, Regulatory Compliance
D. Schwer	Operations Services Superintendent
M. Williams	Superintendent, Radiation Protection

Other Personnel

L. Ryan	Inspector, Pennsylvania Department of Radiation Protection

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000334/2012002-01	FIN	Failure to Adequately Control Loose Debris Near Off-site Power Transformer (Section 1R01)
05000334/2012002-02	NCV	Failure to Maintain Auxiliary Feedwater Operable During Maintenance (Section 4OA2)
05000334/2012002-03	NCV	Expansion Joint Degradation Resulted in River Water Inoperability (Section 4OA2)

Closed

05000412/2011-002-00	LER	Failure to Comply with Technical Specifications 3.7.5 Due to the Inoperability of Two Trains of the Auxiliary Feedwater System (Section 4OA3)
05000334/2011-002-01	LER	Failure to Comply with Technical Specifications 3.7.5 Due to the Inoperability of Two or More Trains of the Auxiliary Feedwater System (Section 4OA3)
05000412/2011-004-00	LER	Lead Time Constant for Steam Line Pressure Channel Found Out of Tolerance (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
1OST-33.35, Fire Protection System Operating Surveillance Test, Revision 2
1/2OM-53C.4A.75.1, "Acts of Nature – Tornado or High Winds, Revision 14

Drawings
8700-10.001-0683, Emergency Switchgear Rooms 1 & 2 El. 713' -6", Revision E
8700-RM-63A, Penetration Seals Elev. 713' – 6", Revision 9
8700-RM-63B, Penetration Seals Elev. 735' – 6", Revision 13

Section 1R04: Equipment Alignment

Procedures
2OM-36.3.B.5, Valve List-2EGS, Revision 11
1OM-7.3.B.1, Valve List-1CH, Revision 27
1OM-7.3.A, System and Component Arrangement, Revision 1
1OM-7.3.C, Power Supply and Control Switch List, Revision 13
1OM-24.3.B.1, Valve List - 1FW, Revision 20
2OM-30.3.B.1, Valve List - 2SWS, Revision 41

Condition Reports
2011-01644 2011-02562 2011-00479 2011-00977 2011-01057 2011-04664
2011-07313 2012-01324

Maintenance Orders/Work Orders
200485377 100432096 200285028 200308508 200393199 200435185
200446751 200448745 200245062

Drawings
8700-RM-407-5, Valve Oper No Diagram 1CH-P1A, 1B & 1C Lube Oil System, Revision 8
8700-RM-0407-002, Valve Oper No Diagram – Chemical and Volume Control System, Revision 3

8700-RM-0407-003, Valve Oper No Diagram – Charging system VCT and Makeup, Revision 21
8700-RM-0407-004, Valve Oper No Diagram – Chemical and Volume Control System, Revision 23
8700-RM-0424-001, Valve Oper No Diagram – Main Feedwater System, Revision 17
8700-RM-0424-002, Valve Oper No Diagram – Main Feedwater System, Revision 14
8700-RM-0424-003, Valve Oper No Diagram – Main Feedwater System, Revision 14

Section 1R05: Fire Protection

Procedures
2PFP-FULB-735-766, Fuel Building Fire Area FB-1, Revision 1
2PFP-CNTB-707, Instrumentation and Relay Area Fire Area CB-1, Revision 4
2PFP-CBLT-712, Cable Tunnel Fire Area CT-1, Revision 4
1PFP-SFGB-722, Safeguards Area Fire Area PT-1, Revision 0
1PFP-SFGB-735, East Cable Vault Fire Area CV-2, Revision 1
2PFP-TRBB-744, Turbine Building Operating Deck Fire Area TB-1, Revision 2

Condition Reports
2012-01378

Maintenance Orders/Work Orders
200447836 200450564 200431459

Section 1R11: Licensed Operator Requalification Program

Procedures
NOP-OP-1002, Conduct of Operations, Revision 5
1/2-ADM-1351, Licensed Operator Continuing Training Program, Revision 10
1OM-53A.1.ECA.-0.0, Loss of All Emergency 4KV Power, Revision 9

Miscellaneous
White Team Mini-drill Controller Book, Dated March 15, 2012

Section 1R12: Maintenance Effectiveness

Procedures
NOP-ER-3004, FENOC Maintenance Rule Program, Revision 1

Condition Reports
2012-00235 2012-00746 2012-00352 11-98233 11-98242

Miscellaneous
Beaver Valley Unit 1 System Health Report 2011-3

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
1/2 ADM-2033, Risk Management Program, Revision 4

Condition Reports
2011-03305 2011-00779 11-89982 11-90138

Maintenance Orders/Work Orders
200466793 200498301

Miscellaneous
BV Unit 1 Weekly Maintenance Risk Summary for the week of January 25, 2012
BV Unit 1 Weekly Maintenance Risk Summary, Revision 3 dated January 27, 2012
BV Unit 2 Weekly Maintenance Risk Summary for the week of February 6, 2012, Revisions 1-4
BV Unit 1 Weekly Maintenance Risk Summary for the week of February 13, 2012, Revisions 1-9

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
NOP-OP-1009, Operability Determinations and Functionality Assessments, Revision 3
NOP-OP-1009-02, Prompt Functionality Assessment Form, Revision 3
1/2ADM-2140, Snubber Program, Revision 8

Condition Reports
2011-06094 2011-04786 2012-00565 2012-01866 2012-01864 2012-00947
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Maintenance Orders/Work Orders
200448695

Miscellaneous
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Section 1R18: Plant Modifications

Procedures
1OST-33.161, Early Warning Smoke Detector Instrumentation, Test Service Building & Control Room, Revision 1

Condition Reports
09-59808 09-60360 09-55020 09-55019 2012-02790 2012-02683

Miscellaneous
ECP 11-0078-000 ECP 11-0078-001 ECP 11-0078-002

Section 1R19: Post-Maintenance Testing

Procedures
1OST-11.1, Safety Injection Pump Test [1SI-P-1A], Revision 22
1OST-7.6, Centrifugal Charging Pump Test [1CH-P-1C], Revision 4
1/2-PMP-E-75-001, 4160VAC Motor Inspection and Lubrication, Revision 11
1/2-PMP-M-75-002, Inspection and Lubrication of Manual Reach Rod Mechanisms, Revision 9
1OST-36.2, Diesel Generator No. 2 Monthly Test, Revision 61
1MSP-36.70A-1, No. 1 Emergency Diesel generator Air Start Solenoid Valve [SOV-1EE-101] Replacement, Revision 0
1MSP-36.69-I, PS-1EE-360B, No. 2 Emergency Diesel Generator Crankcase Pressure Switch Replacement, Revision 5

2OST-13.4, Recirculation Spray Pump [2RSS*P21B] Dry Test, Revision 4
2OST-13.4A, Recirculation Spray Pump [2RSS*P21B] Automatic Circuit Test, Revision 3
NDE-VT-507, Visual Examination of Rubber Expansion Joints, Revision 10

Condition Reports
2012-00292

Maintenance Orders/Work Orders
200372601 200420016 200468897 20044697

Drawings
8700-RM-0436-001, Valve Oper. No. Diagram – Diesel Fuel Oil, Revision 11

Section 1R22: Surveillance Testing

Procedures
1OST-7.6, Centrifugal Charging Pump Test [1CH-P-1C], Revision 4
1RST-2.5, Moderator Temperature Coefficient Determination, Revision 11
1OST-11.1, Safety Injection Pump Test [1SI-P-1A], Revision 1
1OST-24.3, Motor Driven Auxiliary Feed Pump Test [1FW-P-3B], Revision 43
1OST-1.3A, Train "A" CIA On-Line Slave Relay Test, Revision 0

Condition Reports
2012-00800 2011-02073 2011-02613 2012-03839 09-52877

Maintenance Orders/Work Orders
200372601

Miscellaneous
BVPS Unit 1 Logs, dated January 18, 2012

Section 1EP4: Emergency Action Level and Emergency Plan Changes

1/2 –EPP-IP-1.7, "Emergency Response Organization (ERO) Teams," Revision 22

Section 1EP6: Drill Evaluation

Condition Reports
2012-03962 2012-04052 2012-04096 2012-04121 2012-04131
2012-04081 2012-04107 2012-04115 2012-04176

Miscellaneous
White Team Mini-drill Controller Book, Dated March 15, 2012

Sections 2RS01/2RS02: Radiological Hazard Assessment/ALARA Planning and Controls

Procedures
1/2-ADM-0500, Reactor Containment Entries, Revision 11
1/2-ADM-1601, Radiation Protection Standards, Revision 20
1/2-ADM-1611, Radiation Protection Administrative Guide, Revision 12
1/2-HPP-3.01.001, Radioactive Source Accountability, Revision 8

1/2-HPP-3.05.001, Exposure Authorization, Revision 8
1/2-HPP-3.07.002, Radiation Survey Methods, Revision 7
1/2-HPP-3.07.013, Barrier Checks, Revision 8
1/2-HPP-3.08.003, Radiation Barrier Key Control, Revision 13
BVBP-RP-0013, Radiation Protection Risk Assessment Process, Revision 3
BVBP-RP-0020, RP Job Coverage General Guidance, Revision 16
NOP-OP-4005, Operational ALARA Program, Revision 2
NOP-OP-4107, Radiation Work Permit, Revision 8
NOP-OP-4601, Contamination Control Program, Revision 2
NOP-OP-4101, Access Controls for Radiological Controlled Areas, Revision 5
NOP-OP-4102, Radiological Postings, Labeling, and Markings, Revision 8
NOP-OP-4702, Air Sampling, Revision 2
NOP-OP-4206, Bioassay Program, Revision 0
1/2-HPP-7.03.002, Airborne Exposure (DAC-Hr) Tracking, Revision 0
BVBP-RP-003, Dosimetry Practices, Revision 9
NOP-OP-4201, Routine External Exposure Monitoring, Revision 1
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NOP-OP-4205, Dose Assessment, Revision 3

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2012-00395	2011-98260	2011-98271	2011-00368	2011-01472	2011-01618
2011-02268	2011-00147	2011-01203	2011-01485	2011-01629	2011-01632
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MS-C-11-08, Radiation Protection/Radwaste Audit

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Meeting Nos. 12-01, 12-02, 12-03, 12-04, 12-05, 12-06, 11-14, 11-15

1R21 ALARA Plans
AP 12-1-21, Steam Generator Platform/Channel head work 1R21
AP 12-1-22, Reactor Disassembly/Re-assembly
AP 12-1-30, Scaffolding 1R21 RBC
AP 12-1-33, ECP RH-P-1A Coupling upgrade and Pump Overhaul

Miscellaneous Documents
Electronic Dosimeter Dose/Dose Rate Alarm Reports, July 2011– February 2012
Beaver Valley Power Station 1R21 Outage ALARA Plan
Top Ten Individual Exposure Records for 2011
1R21 Temporary Shielding Plan
Beaver Valley 5-Year Dose Reduction Plan 2012-2016

Section 4OA1: Performance Indicator Verification

Procedures
NOBP-LP-4012, NRC Performance Indicators, Revision 3

Section 4OA2: Problem Identification and Resolution

Condition Reports:
10-79724 10-79721 10-79718 10-79717 10-79715 11-92603
2011-00782 2011-01865 2012-00539 2012-01451 2012-01687

Procedures
NOP-OP-1004, Reactivity Management, Revision 8
BVBP-NF-0005, Reactivity Plans, Revision 2
NOPL-OP-1002, Reactivity Management, Revision 0
NOBP-OP-1004, Reactivity Planning, Revision 1
1/2-ADM-2046, Beaver Valley rubber Expansion Joint Inservice Inspection Program, Revision 0
NORM-ER-3413, FENOC Piping Expansion Joints, Revision 3

Other Reports/Documents
SOER 07-01 Recommendations 1, 2, 5, & 6 Final Effectiveness Review
SOER 07-01, Reactivity Management (Recommendation 3 Effectiveness Review)
SOER 07-01, Reactivity Management Recommendation 4, Performance Improvement Effectiveness Review for BVPS
Operating Experience Evaluation (NRC Information Notice 2011-02, Operator Issues Involving Reactivity Management at Nuclear Power Plants)
Snapshot Assessment SN-SA-10-170 (BVPS Reactivity Management Related Condition Report Trends 2008 and 2009)
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Operations IPAT/Self-Assessment IP-SA-11-033 (Reactivity Management Program)
Reactivity Management Committee Package, November 3, 2011
NRC Information Notice 96-69, Operator Actions Affecting Reactivity
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Guidelines for Initial Training and Qualification of Licensed Operators (ACAD 00-003, Revision1)
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Unit 2 Cycle 16 Startup and Reactivity Notes Study Guide (3LRT-CYC SU&CP SSG ATT 8)
2R15 Just In Time Startup Training with System Malfunctions (OTLC-JITSTUP2R15_BV2)
BVPS Rubber Expansion Joint Report, Dated June 27, 1996
Garlock Sealing Technologies Expansion Joints Installation and Maintenance Manual, Revision C

Notifications
600435043 600614395 600614398

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

Condition Reports
2011-04946 2012-01025 2011-04934 2012-01440 2011-06633 2011-00771

Miscellaneous
2MSP-21.24-I, Loop B Steamline Pressure Protection Channel IV Calibration, Revision 15
WO 200435914
8700-RE-0021HF, MOV-1FW-151A through F Control Circuit

Section 4OA5: Temporary Instruction 2515/182

Condition Reports
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Program Documents
Calculation No. 3201.100-01, Beaver Valley Power Station Buried Piping Program Basis Document, October 23, 2008
NORM-ER-3707, FENOC Tanks, Revision 1
SN-SA-10-147, Self-Assessment, Evaluate the Buried Pipe Integrity Program, 09/15/2010
SN-SA-2012-0087, Self-Assessment, Implementation of NEI 09-14 Guidance for the Management of Underground Piping and Tank Integrity, 03/19/2012
Program Health Reports, 2011-1 and 2011-2
Completed List of Buried Piping Examinations Performed to Date Spreadsheet

Miscellaneous Documents
NRC Temporary Instruction 2515/182, 11/17/11; Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks
NEI 09-14, Revision 1, December 2010; Guideline for the Management of Underground Piping and Tank Integrity

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ADM	Administrative Procedure
ALARA	As Low As is Reasonably Achievable
AMC	ALARA Managers Committee
AP	ALARA Plans
BCO	Basis for Continued Operations
BVPS	Beaver Valley Power Station
CAP	Corrective Action Program
CAR	Containment Air Recirculation
CFR	Code of Federal Regulations
CR	Condition Report(s)
EDG	Emergency Diesel Generator
EPIP	Emergency Plan Implementing Procedure
FA	Functionality Assessments
FENOC	First Energy Nuclear Operating Company
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IOD	Immediate Operability Determination
IP	Inspection Procedure
ISI	Inservice Inspection
JIT	Just In Time
KV	Kilovolt
LCO	Limiting Conditions for Operations
LER	Licensee Event Report

LHRA	Locked High Radiation Area
LRS	Licensing Requirements Surveillance
MR	Maintenance Rule
MSP	Maintenance Surveillance Package
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSIR	Nuclear Security and Incident Response
OD	Operability Determinations
OST	Operations Surveillance Test
PARS	Publicly Available Records
PI	Performance Indicator
PI&R	Problem Identification and Resolution
POD	Prompt Operability Determination
PMT	Post Maintenance Testing
RBC	Reactor Building Containment
RCA	Radiological Controlled Area
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RWP	Radiation Work Permits
SDP	Significance Determination Process
SSC	Structure, System, or Component
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VAC	Volts Alternating Current
VHRA	Very High Radiation Area