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

January 16, 2014

Mr. Eric Larson
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
P. O. Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION – NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000334/2013008 AND 05000412/2013008

Dear Mr. Larson:

On December 6, 2013, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Beaver Valley Power Station, Units 1 and 2. The enclosed report documents the inspection results, which were discussed on December 6, 2013, with you and other members of your staff.

This inspection examined activities conducted under your license as they relate to identification and resolution of problems and compliance with the Commission's rules and regulations and conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the samples selected for review, the inspectors concluded that FirstEnergy Nuclear Operating Company (FENOC) was generally effective in identifying, evaluating, and resolving problems. FENOC personnel identified problems and entered them into the corrective action program at a low threshold. FENOC prioritized and evaluated issues commensurate with the safety significance of the problems and corrective actions were generally implemented in a timely manner.

This report documents one NRC-identified finding of very low safety significance (Green). The inspectors determined that this finding also involved a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest this non-cited violation, 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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records 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/

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 05000334/2013008 and 05000412/2013008
w/Attachment: Supplementary 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 No.:	05000334/2013008 and 05000412/2013008
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Beaver Valley Power Station, Units 1 and 2
Location:	Shippingport, PA 15077
Dates:	November 18 to December 6, 2013
Team Leader:	D. Kern, Senior Reactor Inspector
Inspectors:	A. Bolger, Project Engineer E. Carfang, Resident Inspector T. O'Hara, Reactor Inspector
Approved by:	W. Cook, Chief (Acting) Reactor Projects Branch 6 Division of Reactor Projects

SUMMARY

IR 05000334/2013008 and 05000412/2013008; 11/18/2013 - 12/06/2013; Beaver Valley Power Station, Units 1 and 2; Biennial Baseline Inspection of Problem Identification and Resolution. The inspectors identified one finding in the area of effectiveness of corrective actions.

This NRC team inspection was performed by three regional inspectors and one resident inspector. The inspectors identified one finding of very low safety significance (Green) during this inspection and classified this finding as a non-cited violation. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated 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 July 9, 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.

Problem Identification and Resolution

The inspectors concluded that FENOC was generally effective in identifying, evaluating, and resolving problems. FENOC personnel identified problems, entered them into the corrective action program (CAP) at a low threshold, and prioritized issues commensurate with their safety significance. Notwithstanding, the inspectors identified several examples of low significance deficiencies which had not been entered into the CAP, despite meeting FENOC's criteria for entry into the CAP. In most cases, FENOC appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent-of-condition, generic issues, and previous occurrences. The inspectors identified one violation of NRC requirements in the area of problem evaluation. The inspectors also determined that FENOC typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner.

The inspectors concluded that, in general, FENOC adequately identified, reviewed, and applied relevant industry operating experience to Beaver Valley operations. In addition, based on those items selected for review, the inspectors determined that FENOC's self-assessments and audits had appropriate scope and generally identified meaningful findings for site improvement.

Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual corrective action program and employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues nor did they identify any conditions that could have had a negative impact on the site's safety conscious work environment.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to FENOC's problem identification and corrective action to address the November 2011 failure of steam driven auxiliary feedwater (SDAFW) pump steam supply valve 2MSS-SOV105C. Specifically, the inspectors identified that FENOC did not promptly identify and correct the elevated valve temperature condition that led to the coil failure of a solenoid operated steam admission valve for the SDAFW pump. Consequently, 2MSS-SOV105C failed again on

June 19, 2012, due to solenoid insulation damage which resulted from elevated valve temperature. FENOC entered this issue into the corrective action program for resolution as condition report 2013-19448, updated procedures to evaluate elevated temperatures on SDAFW pump steam admission valves, and initiated condition report 2013-19250 to evaluate the adequacy of planned maintenance on the valves.

The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, FENOC did not ensure that adequate operational margin was available when 2MSS-SOV105C steam leak-by caused the valve actuator solenoid temperature to exceed 356F. Consequently, seven months following the valve actuator solenoid coil replacement, coil insulation degraded and rendered 2MSS-SOV105C inoperable and unavailable. In accordance with IMC 0609.04, Initial Characterization of Findings, and IMC 0609, Appendix A, The Significance Determination Process for Findings At-Power, dated June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green). This finding has a cross-cutting aspect in the area of Human Performance, Resources, because FENOC did not ensure that personnel, equipment, procedures, and other resources were available and adequate to support operability of safety-related equipment. Specifically, design margin was not maintained for a safety-related solenoid-operated valve which resulted in its failure and the long-standing equipment issue of leak-by past the valve was not addressed through adequate monitoring and preventive maintenance of the valve solenoid. [H.2(a)] [Section 4OA2.1.c]

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution (71152B)

This inspection constitutes one biennial sample of problem identification and resolution as defined by Inspection Procedure 71152. All documents reviewed during this inspection are listed in the Attachment to this report.

.1 Assessment of Corrective Action Program Effectiveness

a. Inspection Scope

The inspectors reviewed the procedures that described FENOC's corrective action program (CAP) at Beaver Valley Power Station. FENOC used two separate processes to identify, track, and resolve issues. Those issues determined to be "Adverse Conditions" (i.e., any event, defect, characteristic, state, activity, or condition that could credibly impact nuclear safety, personnel safety, plant reliability, or non-compliance with federal, state, or local regulations) were documented in condition reports (CRs) and addressed using NOP-LP-2001, Corrective Action Program, Revision 32. Issues not considered adverse conditions (e.g., engineering evaluations, operating experience reviews, lessons learned, procurement evaluations, minor equipment deficiencies, maintenance actions, and document change requests) were documented in notifications and addressed using NOP-SS-8001, FENOC Activity Tracking, Revision 1.

To assess the effectiveness of the corrective action program, the inspectors reviewed performance in three primary areas: problem identification, prioritization and evaluation of issues, and corrective action implementation. The inspectors compared performance in these areas to the requirements and standards contained in 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and FENOC procedures NOP-LP-2001 and NOP-SS-8001. For each of these areas, the inspectors considered risk insights from the station's risk analysis and reviewed CRs and notifications for the period June 2011 to September 2013 selected across the seven cornerstones of safety in the Reactor Oversight Process. Additionally, the inspectors attended multiple Management Ownership and Alignment, Management Review Board, Corrective Action Review Board, and shift turnover meetings. The inspectors selected items from the following functional areas for review: engineering, operations, maintenance, emergency preparedness, radiation protection, physical security, and oversight programs.

(1) Effectiveness of Problem Identification

In addition to the items described above, the inspectors reviewed system health reports, a sample of completed corrective and preventative maintenance work orders, completed surveillance test procedures, operator logs, and periodic trend reports. The inspectors also performed field walkdowns of various systems on site, such as the service water, river water, 120 volt direct current power, auxiliary feedwater, fire protection, control room ventilation, and switchgear room ventilation. Additionally, the inspectors reviewed a sample of CRs written to document issues identified through internal self-assessments, audits, emergency preparedness drills, and the operating experience

program. The inspectors completed this review to verify that FENOC entered conditions adverse to quality into their corrective action program as appropriate.

(2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors reviewed the evaluation and prioritization of a sample of CRs issued since the last NRC biennial Problem Identification and Resolution inspection completed in September 2011. The inspectors also reviewed CRs that were assigned lower levels of significance that did not include formal cause evaluations to ensure that they were properly classified. The inspectors' review included the appropriateness of the assigned significance, the scope and depth of the causal analysis, and the timeliness of resolution. The inspectors assessed whether the evaluations identified likely causes for the issues and developed appropriate corrective actions to address the identified causes. Further, the inspectors reviewed equipment operability determinations, reportability assessments, and extent-of-condition reviews for selected problems to verify these processes adequately addressed equipment operability, reporting of issues to the NRC, and the extent of the issues.

(3) Effectiveness of Corrective Actions

The inspectors reviewed FENOC's completed corrective actions through documentation review and, in some cases, field walkdowns to determine whether the actions addressed the identified causes of the problems. The inspectors also reviewed CRs for adverse trends and repetitive problems to determine whether corrective actions were effective in addressing the broader issues. The inspectors reviewed FENOC's timeliness in implementing corrective actions and effectiveness in precluding recurrence for significant conditions adverse to quality. The inspectors also reviewed a sample of CRs associated with selected non-cited violations and findings to verify that FENOC personnel properly evaluated and resolved these issues. In addition, the inspectors expanded the corrective action review to five years to evaluate FENOC's actions related to Unit 1 and Unit 2 4 kilovolt (kV) power systems and Unit 2 SDAFW pump steam supply valve issues.

b. Assessment

(1) Effectiveness of Problem Identification

Based on the selected samples, plant walkdowns, and interviews of site personnel in multiple functional areas, the inspectors determined that FENOC typically identified problems and entered them into the corrective action program at a low threshold. FENOC staff at Beaver Valley Power Station initiated approximately 14,300 CRs and a similar number of notifications between June 2011 and September 2013. The inspectors observed supervisors at Management Ownership and Alignment, Management Review Board, and Corrective Action Review Board meetings appropriately questioning and challenging condition reports to ensure clarification of the issues. Based on the samples reviewed, the inspectors determined that FENOC trended equipment and programmatic issues, and appropriately identified problems in condition reports and notifications.

The inspectors concluded that station personnel were identifying trends at low levels. The inspectors did not identify any significant issues or concerns that had not been appropriately entered into the corrective action program for evaluation and resolution.

However, the inspectors identified several deficiencies of lower significance, which had not been entered into the CAP despite meeting FENOC's criteria for entry into the CAP. In some cases, workers didn't write CRs because they incorrectly assumed the issues were already in the CAP. In other cases, the degraded condition developed slowly and station personnel did not recognize that the condition had changed or accepted the degraded condition as normal. Examples of these observations included the following issues:

- Unit 1 control room air conditioning condenser circulation water pump 1VS-P-3A had excessive seal leakage (active leak extended a fifteen foot puddle around the base of the pump). Further seal degradation could render the control room air conditioner unavailable and adversely affect operators' ability to maintain designed control room temperature (CRs 2013-18705, 2013-18707, 2013-18720).

- The Unit 1 plant process computer (PPC) inverter had a low current warning light. The vendor manual stated the warning light indicates degrading inverter components and provides an early indication of a potential inverter internal fault. A failed PPC inverter would complicate operators' ability to operate the plant and monitor important plant parameters. A notification was written on January 23, 2013 and subsequently cancelled without notifying the originator. Procedure 1OM-38.4, Uninterruptible Power Supply Startup, Revision 17 proceduralized this alarm light as a normal condition. In response to the inspectors' concern, engineers determined the inverter was functioning normally and the alarm light was an unintended consequence of a plant modification. The inspectors determined that the alarm light now masked the ability to detect early indication of a PPC fault (CR 2013-18774, 2013-18947).

- Heavy debris/dirt partially blocked the Unit 2 vital switchgear ventilation duct grills. The blockage could adversely affect room cooling and adversely affect electrical switchgear relay contact operation (CR 2013-19273).

- Two vital area security access card readers status lights did not indicate correct status when processing personnel badges for area access. Personnel were entering the vital areas without verifying correct reader status. The inspectors discussed access card reader functions with security staff and expressed concerns regarding vital area access control and testing. FENOC verified only authorized personnel accessed the spaces, tested all vital area card readers, corrected the card reader faults, verified the identified circuit card faults did not affect the access latching mechanism or alarms, and initiated changes to the periodic card reader test procedures (CR 2013-19185).

- Combustible material loading (e.g., storage of spare 4 kV electrical breakers) was not monitored and evaluated for the Unit 1 non-vital 4 kV switchgear room (CR 2013-19636).

The inspectors discussed these observations with station management, who promptly initiated CRs, notifications, and/or took immediate action to address the issues. These issues were determined to be minor because no equipment operability was affected. In accordance with IMC 0612, Power Reactor Inspection Reports, the above issues

constituted violations of minor significance that are not subject to enforcement action in accordance with the Enforcement Policy. (CRs listed in the Attachment)

(2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors determined that, in general, FENOC appropriately prioritized and evaluated issues commensurate with the safety significance of the identified problem. FENOC screened CRs for operability and reportability, categorized the CRs by significance, and assigned actions to the appropriate department for evaluation and resolution. The CR screening process considered human performance issues, radiological safety concerns, repetitiveness, adverse trends, and potential impact on the safety conscious work environment.

Based on the sample of CRs reviewed, the inspectors noted that the guidance provided by FENOC CAP implementing procedures was sufficient to support consistency in categorization of issues. The operability and reportability determinations were generally performed when conditions warranted and in most cases, the evaluations supported the conclusion. Causal analyses appropriately considered the extent-of-condition or problem, generic issues, and previous occurrences of the issue. However, the inspectors had observations associated with FENOC's prioritization and evaluation of the following issues:

- The Unit 2 'A' primary component cooling water heat exchanger (HX) tubes degraded due to corrosion and the HX was declared inoperable in 2012 (CRs 2012-13945 and 2012-18146). Corrective action included HX replacement and expansion of periodic HX eddy current testing (ECT) to additional HXs. The inspectors determined the extent-of-condition review had not thoroughly evaluated and documented the basis for continued reliability of the other HXs until their scheduled ECT (CR 2011-01747).

- During two 2013 NRC focused problem identification and resolution inspections (Expansion Joint Degradation and Heat Exchanger Reliability), station personnel were slow to initiate CRs and incorrectly characterized the NRC-identified performance deficiencies as enhancements and performance improvement opportunities, rather than violations of regulatory requirements. Untimely or incorrect issue characterization may challenge station personnel to correct the issues in a timely manner (CRs 2013-14041, 2013-14302).

- The inspectors identified several minor CAP-related procedure deficiencies, including the inadvertent deletion of significant conditions adverse to quality (SCAQ) from NOP-LP-2001. Based on interviews, the inspectors determined station personnel did not have a consistent understanding of the threshold difference between designating an issue as a condition adverse to quality versus an SCAQ (CRs 2013-18750).

- The inspectors also determined that several station personnel did not consistently understand and properly implement the threshold for initiating CRs in lieu of notifications. This was important, because CRs and their resolution receive wider visibility and more levels of review than issues processed as notifications. The

inspectors performed a supplemental review of notifications from 2012 and 2013 and did not identify any significant issues directly affecting safety, which had bypassed the CR process (CRs 2013-18720, 2013-19302).

The inspectors discussed these observations with station management, who promptly initiated CRs, notifications, and/or took immediate action to address the issues. These issues were determined to be minor because no equipment operability was affected and other actions to address HX corrosion were implemented. In accordance with IMC 0612, Power Reactor Inspection Reports, the above issues constituted violations of minor significance that are not subject to enforcement action in accordance with the Enforcement Policy. (CRs listed in the Attachment)

Additionally, the inspectors identified one example of more than minor significance where FENOC personnel were not effective in evaluating and implementing effective corrective actions. This finding is documented in Section 4OA2.1.c.

(3) Effectiveness of Corrective Actions

The inspectors concluded that corrective actions for identified deficiencies were generally timely and adequately implemented. For significant conditions adverse to quality, FENOC identified actions to prevent recurrence. The inspectors concluded that corrective actions to address the sample of NRC non-cited violations and findings since the last problem identification and resolution inspection were timely and effective. The inspectors identified one example of deficiencies in FENOC's resolution of a degraded condition, as follows:

Vital 120 volt battery 2-4 was declared inoperable (with associated 2 hour and 24 hour technical specification (TS) allowed outage times (AOT)) three times during the last operating cycle due to low individual cell voltage. The battery reached the end of useful life in about 7 years, which was about half of normal expected life (CR 2011-01337). FENOC categorized this issue as a condition adverse to quality and performed a full apparent cause evaluation. FENOC determined the failure was due to elevated battery room temperatures. Corrective actions included battery replacement and installation of temporary room chillers. The inspectors determined that corrective actions were adequate to restore operability and reduce battery room temperature. However, implementation of the temporary room chillers was not fully effective. Specifically, alignment of the chiller suction and discharge near the room exhaust duct limited the cooling effect of the chiller. Additionally, procedures for monitoring room temperature did not provide limits or guidance for action. As a result battery room temperature still rose 10-15 degrees Fahrenheit above the vendor recommended temperature during the summer period following implementation of corrective actions. The inspectors concluded the battery remained operable, but continued battery operation above vendor recommended temperature would shorten battery life.

The inspectors independently evaluated this issue for significance in accordance with IMC 0612, Power Reactor Inspection Reports. Battery room temperature continued to exceed the vendor recommended temperature during the summer, which may shorten battery life. However, equipment operability was not affected, the 2-4 battery was newly replaced, a periodic test program to monitor battery condition was implemented in accordance with TS requirements, and engineers were developing a permanent plant

modification to provide reliable battery room cooling. The inspectors determined this issue was of minor significance, and is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

c. Findings

Untimely Problem Identification and Corrective Action for Degraded Auxiliary Feedwater Pump Steam Supply Valve

Introduction. The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to FENOC's problem identification and corrective action to address the November 2011 failure of steam driven auxiliary feedwater (SDAFW) pump steam supply valve 2MSS-SOV105C. Specifically, the inspectors identified that FENOC did not promptly identify and correct the elevated valve temperature condition that led to the coil failure of a solenoid-operated steam admission valve for the SDAFW pump. Consequently, 2MSS-SOV105C failed again on June 19, 2012, due to solenoid insulation damage which resulted from elevated valve temperature.

Description. Unit 2 experienced two SDAFW pump steam supply valve failures over a 7-month period. The SDAFW pump has three independent steam supply lines, each of which has two solenoid-operated isolation valves (SOV) installed in series. Each SOV has a safety function in the open direction to admit steam to the SDAFW pump. The SOV's other safety function is to close to provide a containment isolation function in the event of a steam generator tube rupture. Technical Specifications require two of three steam admission lines to be operable to support SDAFW pump operability. The inspectors reviewed Unit 2 SDAFW steam supply valve maintenance and testing records for the past 5 years to assess whether FENOC properly identified, evaluated, and corrected associated conditions adverse to quality and effectively maintained the valves to support reliable operation.

On November 8, 2011, operators declared one of the SOVs (2MSS-SOV105C) inoperable based on smoke issuing from the solenoid (CR 2011-05088). Operators deenergized the SOV and isolated the associated steam supply line as required by TS. Technicians found the SOV coil and rectifier burnt. Engineers determined elevated valve temperature, caused by steam leak-by past 2MSS-SOV105C, contributed to the failure. Corrective action to repair the valve internals during the next refueling outage (October 2012) was developed to correct the steam leak-by. 2MSS-SOV105C was returned to service following coil and rectifier replacement. The damaged SOV was discarded without further evaluating the heat-related degradation. No corrective actions were established to monitor 2MSS-SOV105C temperatures while exposed to continued valve leak-by or to evaluate accelerated SOV aging due to exposure to elevated temperatures.

On June 19, 2012, a 100Vdc electrical bus ground was identified and isolated to 2MSS-SOV105C. Operators again de-energized the SOV and isolated the associated steam supply line to the SDAFW pump as required by TS. Technicians identified damaged SOV coil insulation. Laboratory testing confirmed the coil insulation damage caused the ground. Engineers determined that steam leak-by past the valve elevated SOV temperature, which caused the SOV coil insulation damage. The SOV had only been in service 7 months prior to its failure.

The inspectors noted the vendor manual states the SOV coil insulation has a continuous operating temperature limit of 356F, which allows for a 2.28 years of service life at that temperature. This was significantly shorter than the existing 14-year SOV replacement preventive maintenance periodicity, which engineers based on nominal SOV temperature without valve leak-by (approximately 170F – 200F). The inspectors concluded that elevated SOV temperature significantly reduced expected SOV operating life. The inspectors reviewed SOV temperature data from December 2011 to July 2012 for 2MSS-SOV105C, acquired from 2OST-24.4, Steam Driven Auxiliary Feed Pump Quarterly Test, Attachment 1-[2MSS-SOV-105A,B,C,D,E,F] Solenoid Coil Temperature Monitoring, Revision 72. The attachment recorded the temperatures of all six SOVs after the pump was secured, and checked for a downward trend. If the downward temperature trend was not observed after 8 hours, engineering was to be contacted for guidance.

The inspectors identified two missed opportunities prior to the second SOV failure for FENOC to identify and evaluate elevated temperatures on 2MSS-SOV105C. On February 2, 2012, temperatures recorded after the surveillance test exceeded 356F in an increasing trend for fifteen hours. The final temperature recorded, 362.6F, started a decreasing trend in temperatures, and measurements were stopped after consulting engineering. On April 25, 2012, temperatures recorded after the surveillance test again exceeded 356F. The initial temperature measured was 388.8F, which declined to 378F over an eight hour period. No additional data was provided to indicate the SOV temperature lowered below 356F. Engineers reviewed the test data, but did not recognize the insulation degraded at temperatures exceeding 356F. No corrective actions were performed to assess and correct the effect of the elevated temperatures. Consequently, 2MSS-SOV-105C was exposed to elevated temperature during the period November 2011 to June 2012, which caused SOV coil insulation breakdown and valve failure.

In November 2012, FENOC revised 2OST-24.4 to require engineering evaluation of SOVs for which recorded temperature exceeded 356F. 2MSS-SOV105C steam leak-by and SOV temperature were notably lower following valve internal repair in October 2012. However, SOV temperatures after surveillance testing remained above 300F following four of the five surveillance tests for the SDAFW pump in 2013. This was much higher than the temperature of the other five SDAFW steam supply SOVs, which indicated the corrective action to stop SOV leak-by was not fully effective. The elevated SOV data was not tracked or evaluated by engineering. FENOC did not reconcile the effect of continued SOV elevated temperature with the existing SOV replacement schedule (14 year replacement interval). The inspectors concluded that FENOC did not promptly identify and correct the adverse condition of elevated SDAFW pump steam supply SOV temperature.

Analysis. The inspectors determined that FENOC's failure to promptly identify and correct elevated temperatures on SDAFW pump steam admission valve 2MSS-SOV105C in accordance with NOP-LP-2001, Corrective Action Program, was a performance deficiency (PD) that was within the ability of FENOC to foresee and correct, and should have been prevented. The PD was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent

undesirable consequences. Specifically, FENOC did not ensure that adequate operational margin was available to maintain operability of 2MSS-SOV105C when temperatures exceeded 356F. Consequently, seven months following SOV coil replacement, the coil insulation degraded and rendered 2MSS-SOV105C inoperable and unavailable.

The inspectors evaluated the significance of this finding using IMC 0609.04, Initial Characterization of Finding, and IMC 0609, Appendix A, The Significance Determination Process for Findings At-Power, dated June 19, 2012. The inspectors determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent actual loss of a safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk-significant due to external events.

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because FENOC did not ensure that personnel, equipment, procedures and other resources were available and adequate to support operability of safety related equipment. Specifically, design margin was not maintained for a safety related solenoid-operated valve which resulted in its failure and the long-standing equipment issue of leak-by past the valve was not addressed through adequate monitoring and preventive maintenance of the valve solenoids. [H.2(a)]

Enforcement. 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, requires that conditions adverse to quality are promptly identified and corrected. Contrary to the above, FENOC did not promptly identify and correct the elevated valve temperature adverse condition that led to the coil failure of a solenoid-operated steam admission valve for the SDAFW pump. Specifically, following the November 8, 2011 valve failure, FENOC recorded elevated 2MSS-SOV105C temperatures on February 2, 2012 and April 25, 2012. However, the elevated temperature trend that challenged operability of the valve was not entered into the corrective action program. The solenoid subsequently failed on June 19, 2012, because the elevated temperature caused solenoid coil insulation damage. FENOC entered this issue into the corrective action program for resolution as CR 2013-19448, updated procedures to evaluate elevated temperatures on SDAFW pump steam admission valves, and initiated CR 2013-19250 to evaluate the adequacy of planned maintenance on the valves. Because this finding was of very low safety significance (Green), and was entered into the corrective action program for resolution this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000412/2013008-01, Untimely Problem Identification and Corrective Action for Degraded Auxiliary Feedwater Pump Steam Supply Valve)**

.2 Assessment of the Use of Operating Experience

a. Inspection Scope

The inspectors reviewed a sample of notifications and CRs associated with review of industry operating experience to determine whether FENOC appropriately evaluated the operating experience information for applicability to Beaver Valley Power Station and had taken appropriate actions, when warranted. The inspectors also reviewed evaluations of operating experience documents associated with a sample of NRC

generic communications to ensure that FENOC adequately considered the underlying problems associated with the issues for resolution via their corrective action program. The inspectors included a number of older NRC generic communications to verify FENOC had maintained associated corrective actions in their current station programs. In addition, the inspectors observed various plant activities to determine if the station considered industry operating experience during the performance of routine and infrequently performed activities.

b. Assessment

The inspectors determined that FENOC appropriately considered industry operating experience information for applicability, and used the information for corrective and preventive actions to identify and prevent similar issues when appropriate. The inspectors determined that operating experience was appropriately applied and lessons learned were communicated and incorporated into plant operations and procedures when applicable. The inspectors also observed that industry operating experience was routinely discussed and considered during the conduct of Management Ownership and Alignment meetings, shift turnover briefs, and pre-job briefs.

c. Findings

No findings were identified.

.3 Assessment of Self-Assessments and Audits

a. Inspection Scope

The inspectors reviewed a sample of audits, including the most recent audit of the corrective action program, departmental self-assessments, and assessments performed by independent organizations. Inspectors performed these reviews to determine if FENOC entered problems identified through these assessments into the corrective action program, when appropriate, and whether FENOC initiated corrective actions to address identified deficiencies. The inspectors evaluated the effectiveness of the audits and assessments by comparing audit and assessment results against self-revealing and NRC-identified observations made during the inspection.

b. Assessment

The inspectors concluded that self-assessments, audits, and other internal FENOC assessments were generally thorough and effective in identifying issues. The inspectors observed that FENOC personnel knowledgeable in the subject completed these audits and self-assessments in a methodical manner. FENOC completed these audits and self-assessments to a sufficient depth to identify issues which were then entered into the corrective action program for evaluation. In general, the station implemented corrective actions associated with the identified issues commensurate with their safety significance.

c. Findings

No findings were identified.

.4 Assessment of Safety Conscious Work Environment

a. Inspection Scope

During interviews with station personnel, the inspectors assessed the safety conscious work environment (SCWE) at Beaver Valley Power Station. Specifically, the inspectors interviewed personnel to determine whether they were hesitant to raise safety concerns to their management and/or the NRC. The inspectors reviewed results of the annual FENOC SCWE Surveys (2011 – 2013) and the Safety Culture Surveys (quarterly, semi-annual, and biennial from 2011 to 2013) to assess the breadth of questions, participation, response trends, and action taken by FENOC to address trends or concerns identified in the surveys. The inspectors also interviewed the station Employee Concerns Program coordinator to determine what actions are implemented to ensure employees were aware of the program and its availability with regards to raising safety concerns. The inspectors reviewed a selection of the Employee Concerns Program (ECP) files from January 2011 to September 2013 to ensure that FENOC entered issues into the corrective action program when appropriate.

b. Assessment

During interviews, Beaver Valley Power Station staff expressed a willingness to use the CAP to identify plant issues and deficiencies and stated that they were willing to raise safety issues. The inspectors noted that no one interviewed stated that they personally experienced or were aware of a situation in which an individual had been retaliated against for raising a safety issue. All persons interviewed demonstrated an adequate knowledge of the CAP and the ECP. Based on the ECP program review and employee/contractor interviews, the inspectors concluded that there was no evidence of an unacceptable safety conscious work environment and no significant challenges to the free flow of information.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On December 6, 2013, the inspectors presented the inspection results to Mr. Eric Larson, Site Vice President and other members of the Beaver Valley Power Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
G. Alberti, Steam Generator NDE Engineer
C. Anderson, Senior Nuclear Specialist
D. Batina, Employee Concerns Program Coordinator,
C. Battistone, Supervisor, Engineering Programs
M. Berg, Design Engineer
R. Bologna, Director, Site Operations
R. Boyle, Superintendent, Nuclear Construction Services
N. Brooks, Fleet Electrical Engineer
G. Cacciani, Senior Design Engineer
S. Cencic, Outage Planner
A. Crotty, Supervisor, Plant Engineering
A. Dometrovich, Regulatory Compliance Engineer
M. Dunning, Manager, Supply
M. Dzumba, System Engineer
K. Farzan, Regulatory Compliance Engineer
G. Fidurski, Supervisor, Security Operations
T. Fox, Maintenance Engineer
J. Gallagher, Maintenance Rule Program Engineer
D. Grabski, NDE Engineer
B. Haney, Supervisor, Performance Improvement
T. Hayward, Manager, Work Management
D. Hecht, Containment Engineer
R. Hecht, Supervisor, Technical Training
S. Hovanec, Manager, Plant Engineering
D. Huff, Director, Site Maintenance
M. Johnston, Operating Experience Coordinator
D. Jones, In-service Testing coordinator
M. Kienzle. System Engineer
T. King, System Engineering Specialist
R. Klindworth, Manager, Maintenance
J. Kowalski, Human Performance Engineer
S. Kubis, System Engineer
E. Larson, Site Vice President
B. Lubert, Supervisor, Design Engineering
J. Ludwig, Maintenance Services
C. Mancuso, Manager, Design Engineering
J. Manolareus, Environmental Qualification engineer
J. Marsh, System Engineer
B. Matty, Manager, Operations
J. Meyers, Design Engineer
C. McFeaters, Director, Site Engineering
D. Miller, Supervisor, Steam Generator Replacement
J. Miller, Site Fire Marshal
R. Miller, Corrective Action Program Coordinator

K. Mitchell, Plant Engineer
L. Montanari, Manager, Site Projects
N. Morrison, Steam Generator Replacement Project
D. Murray, Director, Site Performance Improvement
C. O'Neil, Supervisor, Design Engineering
J. Patterson, Containment Engineer
B. Paul, Electrical Design Engineer
P. Pauvlivich, Manager, Technical Services.
D. Price, Supervisor, Mechanical Design Engineering
M. Ressler, Senior Design Engineer
A. Riordan, System Engineer
R. Romisher, Senior Reactor Operator
A. Ryan, Design Engineer
D. Salera, Manager, Chemistry
F. Schaffner, Emergency Preparedness Coordinator
B. Sepelak, Manager, Regulatory Compliance
S. Sewtschenkcs, Manager, Emergency Preparedness
D. Sharbough, Manager, Outages
J. Sharpless, Supervisor, Security Support
E. Stalnecker, Radiological Protection Services
J. Tanouye, System Engineer
J. Treese, Operations Corrective Action Program Analyst
S. Vincinie, Supervisor, Performance Assessment
D. Wacker, Regulatory Compliance Engineer
Z. Warchol, Supervisor, Balance of Plant Engineering
B. Welt, Measured Maintenance Data Engineer
J. West, Maintenance Rule Program Engineer
R. Winters, Chemist
D. Zelenko, Plant Engineering, Aging Management Program Engineer

NRC Personnel
R. Powell, Chief, NRC Region I Technical Support and Assessment Branch
D. Spindler, NRC Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened and Closed

05000412/2013008-01	NCV	Untimely Problem Identification and Corrective Action for Degraded Auxiliary Feedwater Pump Steam Supply Valve (Section 4OA2.1.c)

LIST OF DOCUMENTS REVIEWED

Section 4OA2: Problem Identification and Resolution

Audits and Self-Assessments

Beaver Valley Power Station Design Basis Assessment Report, First Triennial 2013
CA-SA-11-157, 2011 Corporate Beaver Valley Power Station Safety Culture Assessment
CA-SA-BV-2013-0001, 2013 Corporate Beaver Valley Power Station Nuclear Safety Culture Assessment
IP-SA-11-043, Beaver Valley, 2nd 6 Months of 2010; Integrated Performance Assessment and Trending Section/Program: Corrective Action Program
IP-SA-11-258, Beaver Valley, 1st 6 Months of 2011; Integrated Performance Assessment and Trending Section/Program: Corrective Action Program
MS-C-12-03-01, Fleet Oversight Audit Report – Operations dated April, 27, 2012
MS-C-13-02-22, Fleet Oversight Audit Report – Corrective Action Program dated April 15, 2013
SN-SA-2011-0170, 2011 Beaver Valley Power Station Safety Culture Assessment
SN-SA-2012-0265, Clearance Process, Procedure, and Practices dated January 18, 2013
SN-SA-2012-0324, 2012, 2nd 6-months – Senior Management Team Safety Culture Review
SN-SA-2013-0067, Security Performance Compliance Review dated February 18, 2013
SN-SA-2013-0069, BV Boric Acid Corrosion Control Program Snapshot Assessment dated April 22, 2013
SN-SA-2013-0072, Equipment Failures versus PM Template Strategy dated March 29, 2013
SN-SA-2013-0076, Design Engineering evaluate INPO Guidelines against existing programs and controls dated December 2, 2013
SN-SA-2013-0170, Civil Engineering assessment BV FENOC readiness for NRC Audit of the 2.3 Recommendation Seismic Walkdown and Report dated December 2, 2013
SN-SA-2013-0173, 2013 2nd Quarter Nuclear Safety Culture Monitoring Panel Meeting
SN-SA-2013-0189, Equipment Failures versus PM Template Strategy dated October 1, 2013
SN-SA-2013-0218 2013 Unannounced Emergency Response Organization Drive-in-Drill dated September 26, 2013

Condition Reports *(* indicates that condition report was generated as a result of this inspection)*

2008-49269	2013-06073	2009-58004	2011-02900	2011-04652
2010-86567	2011-01747	2011-01747	2011-96242	2013-06073
2010-86428	2010-83533	2012-13777	2008-41266	2010-86567
2010-86618	2013-15843	2008-41266	2010-81658	2012-00327
2010-86569	2009-57762	2010-81658	2009-65883	2012-01391
2010-86652	2006-01122	2011-01453	2010-84411	2012-04408
2011-05991	2010-69663	2011-04652	2009-65828	2013-06825
2011-01337	2009-60058	2011-00456	2009-56268	2013-01999
2011-06113	2009-56092	2011-01377	2009-58575	2011-01485
2011-04652	2009-58004	2012-13730	2009-60058	2012-02725
2011-00456	2011-95161	2013-09836	2010-69663	2012-05981
2011-01453	2011-94225	2013-02131	2010-86428	2011-01472
2013-09836	2011-90997	2011-06113	2011-95161	2012-16554
2011-96242	2010-84598	2011-06440	2009-56268	2011-04431
2012-19269	2008-40050	2011-05991	2009-65828	2012-01125
2012-19755	2010-84598	2011-04460	2010-84411	2011-01695
2009-60470	2010-86567	2011-03522	2011-96495	2012-15249

2011-07386	2011-06438	2012-16946	2013-11457	2013-18774*
2011-01695	2011-06440	2012-17395	2013-13103	2013-18900*
2013-05364	2011-06441	2012-17608	2013-13331	2013-18947*
2012-01381	2011-06442	2012-18223	2013-13347	2013-18997*
2013-04924	2011-06444	2012-19740	2013-13366	2013-19132*
2012-14839	2011-06445	2013-01972	2013-13385	2013-19185*
2013-06135	2011-06446	2013-03987	2013-14041	2013-19224*
2013-10963	2011-06673	2013-04141	2013-14704	2013-19245*
2011-00492	2011-95744	2013-05115	2013-15723	2013-19250*
2013-04258	2011-98226	2013-05914	2013-16097	2013-19273*
2013-12456	2011-96301	2013-05915	2013-16100	2013-19302*
2011-01802	2012-04086	2013-05916	2013-16102	2013-19636*
2011-00147	2012-07931	2013-05924	2013-17651	
2011-89700	2012-09782	2013-05925	2013-18705*	
2011-91673	2012-10986	2013-05926	2013-18707*	
2010-74003	2012-11763	2013-06042	2013-18720*	
2011-01644	2012-11865	2013-06116	2013-18721*	
2011-02308	2012-12622	2013-08684	2013-18724	
2011-03522	2012-14873	2013-09725	2013-18750*	
2011-04946	2012-14793	2013-09734	2013-18757*	

Drawings

9321-LL-31173, Schematic Diagram 480V Switchgear 31, Sheet 6, Revision 25
9321-LL-31173, Schematic Diagram 480V Switchgear 31, Sheet 7, Revision 11
9321-LL-31173, Schematic Diagram 480V Switchgear 31, Sheet 6B, Revision 4
9321-F-27513, Auxiliary Coolant System, Revision 30
10080-RM-0421-001, Main Steam System, Revision 16
10080-RM-0421-002, AFW Pump Steam & Residual Heat Relief, Revision 17
10080-RM-444F-3, Miscellaneous Area Ventilation System, Orange and Purple Switchgear Rooms, Revision 3
203006, Wiring Schematic 4 switch valve AC, Revision D2

Operating Experience

NRC IN 2000-21, Detached Check Valve Disc Not Detected by Use of Acoustic and Magnetic Nonintrusive Test Techniques
NRC IN 2001-14, Problems with Incorrectly-Installed Swing-Check Valves
NRC IN 2006-17, Recent Operating Experience of Service Water Systems Due To External Conditions
NRC IN 2010-01, Pipe Support Anchors Installed Improperly
NRC IN 2010-27, Ventilation System Preventive Maintenance and Design Issues
NRC IN 2011-04, Contaminants and Stagnant Conditions Affecting Stress Corrosion Cracking in Stainless Steel Piping in Pressurized Water Reactors
NRC IN 2012-11, Age Related Capacitor Degradation
NRC IN 2012-18, Failure to Properly Augment Emergency Response Organizations
NRC IN 2013-01, EAL Thresholds Outside the Range of Radiation Monitors

Non-cited Violations and Unresolved Items

05000334/2011007-04, Offsite Power Non-Conservative Post-Transient Voltage Calculations
05000334(412)/2011009-01, Failure to Implement Effective Corrective Actions to Prevent Recurrence of Socket Weld Failures
05000334(412)/2011003-02, Radiation Monitor Deficiencies Not Corrected in Timely Manner
05000334(412)/2011005-01, Failure to Fully Staff the Radiological Protection and Field Monitoring Team Driver Positions Following 10/25/11 All-Call-Drill
05000334(412)/20123201-04, Failure to Log Safeguard Event
05000412/2012002-02, Failure to Maintain Auxiliary Feedwater Operable during Maintenance
05000412/2012005-01, Unit 2 Over Pressure Protection System Actuation Due to Troubleshooting of 2CHS-FCV122 Failure
URI 05000334; 05000412/2011-03, Degraded Voltage Relay Time Delay: (originally NCV 05000412/2011007-04, Offsite Power Non-Conservative Post-Transient Voltage Calculations)

Licensee Event Reports

LER 05000334/2011-002, Failure to Comply with Technical Specifications 3.7.5 Due to the Inoperability of Two Trains of the Auxiliary Feedwater System
LER 05000412/2011-004, Lead Time Constant for Steam Line Pressure Channel Found Out of Tolerance
LER 05000412/2013-001, Gas Void in ECCS Pump Suction Header Results in a condition Prohibited by TS

Engineering Calculations

8700-B-084, Fire Hazards Analysis , Beaver Valley Unit 1, Revision 3
10080-B-085, Fire Hazards Analysis, Beaver Valley Unit 2, Revision 14
10800-DQC-005, Target Rock Solenoid Valves Qualified Life for 60 Year License and Post Accident Operability Time for EPU, Revision 4
Fire Protection Program Change Evaluation, FPPCE No. 09-064 dated 10/1/03
Unit 2 Service Building – Ventilation, Cooling loads and Air Flow Rates, System 44, Revision 4
BVBP-ENG-0110, BVPS Cantilever Branch Vibration Fatigue Guidance Document; Revision 0

Procedures

1MS-CMP-1, Turbine-Driven AFW Pump Steam Supply Check Valves Disassembly and Inspection CVCM Program Plan, Revision 9
1MSP-24.26-I, F-1FW-476, Loop 1 Feedwater Flow Channel IV Calibration, Revision 21
1OM-38.4.A, Uninterruptible Power Supply Startup, Revision 17
1OM-54.3.PAB1, Unit 1 Primary Auxiliary Building Log Readings, Revision 66
1OM-54.3.Turbine1, Unit 1 Turbine Log Reading, Revision 56
1RC-CMP-2, Type C CNMT Penetration #45 Inside Check Valve CVCM Program Plan, Revision 3
1/2ADM-1906, Control of Transient Combustible and Flammable Materials, Revision 7
1/2ADM-1906, Control of Transient Combustible and Flammable Materials, Revision 8
1/2CMP-75-TARGET ROCK-3M, Target Rock Model No. 83C-007, 83C-012, 83C-019 and 83C-020, Style 1141020-2, 1151020-1, and 1151020-2 SOV Globe Valve Overhaul, Revision 3

1/2PMP-75-SOV-I2, Target Rock SOV Maintenance, Revision 6
2CVCS-CMP-1, Type C CNMT Penetration #43 Inside Check Valve CVCM Program Plan, Revision 5
2LCP-11-F940, 2SIS-F940, High Head Safety Injection Train 'A' Flow Loop Calibration, Revision 8
2OM-54.3.PAB2, Unit 2 Primary Auxiliary Building Log Readings, Revision 41
2OST-24.4, Steam Driven Auxiliary Feed Pump [2FWE*P22] Quarterly Test, Revision 74
2SIS-CMP-6, LHSI to RCS Hot Leg Check Valves CVCM Program Plan, Revision 4
BVPM-ER-3004, Maintenance Rule (MR) Program Supplemental Guidance, Revision 1
BVPS Unit 1, 1DBD-36B, Design Basis Document for 4.16 kV Power Distribution System, Revision 8
BVPS Unit 2, Maintenance Rule System Basis Document, Emergency Diesel Generators & Support Systems, System 36A, Revision 6
BVPS Unit 2, Maintenance Rule System Basis Document, Emergency Diesel Generators & Support Systems, System 36B, Revision 7
MAP-2BV-0719, BVPS Unit 2 Electrical Equipment Qualification Maintenance Assessment, Revision 15
NOBP-ER-3003, FENOC System Performance Monitoring Program, Revision 4
NOBP-ER-3603A, Check Valve Condition Monitoring Program, Revision 0
NOBP-ER-3900, Equipment Reliability Common Definitions and Structure, Revision 3
NOBP-ER-3901, Component Classification ER Workbench Module 1, Revision 5
NOBP-ER-3902, Component Template Development, Revision 5
NOBP-ER-3903, Component Template Implementation, Revision 6
NOBP-LP-2003, Employee Concerns Program, Revision 4
NOBP-LP-2008, FENOC Corrective Action Review Board, Revision 15
NOBP-LP-2011, FENOC Cause Analysis, Revision 15
NOBP-LP-2100, FENOC Operating Experience Process, Revision 9
NOBP-LP-2501, Safety Culture Assessment, Revision 16
NOP-CC-1003, Vendor Manuals and Vendor Technical Information, Revision 1
NOP-CC-2009, Engineering Evaluation Requests, Revision 1
NOP-CC-5004, Pressurized Water Reactor Vessel Internals Program, Revision 2
NOP-ER-1001, Continuous Equipment Performance Improvement, Revision 3
NOP-ER-2001 Boric Acid Corrosion Control Program, Revision 11
NOP-ER-3004, FENOC Maintenance Rule Program, Revision 2
NOP-ER-3100, Cable Aging Management Program, Revision 0
NOP-LP-1103, Reportable Events, Revision 2
NOP-LP-2001, Corrective Action Program, Revision 32
NOP-LP-2100, Operating Experience Program, Revision 9
NOP-OP-1009, Operability Determinations and Functionality Assessments, Revision 3
NORM-ER-3106, Battery Systems, Revision 4
NORM-ER-3311, Instrumentation & Control Loop Components, Revision 8

Work Orders/ Notifications

200422383	200476318	200348077	200348420	200425912	200486818
200427295	200319476	200487906	200463638	600698470	600866981*
600795031					

Miscellaneous

Action Plan; Identification, Evaluation, and Mitigation of Cantilever Branches Suceptible to Vibration Fatigue dated February 28, 2013
Beaver Valley Design Engineering Report Second Triennial 2013, Maintenance Measured Data
BVPS Unit 1 Probabilistic Risk Assessment Update Report, Issue 5A
BVPS Unit 2 Probabilistic Risk Assessment Update Report, Issue 5A
BVPS Unit 2 System Health Report 2013-1, dated September 12, 2013
Engineering Change Package 07-0024, Unit 1 Plant Process Computer System Upgrade, Revision 0
Maintenance Rule (a)(1) Evaluation Form, System 36B dated May 5, 2013
Maintenance Rule (a)(1) Evaluation Form, System 36B, dated July 4, 2012
Maintenance Rule (a)(1) Evaluation Form, System 47 dated February 21, 2013
Maintenance Rule (a)(1) Disposition Review Form, System 36B, dated August 14, 2006
Maintenance Rule (a)(1) Disposition Review Form, System 36B, dated March 20, 2006
Measured Maintenance Data System, BV-2FWS-FT497, dated December 4, 2013
Measured Maintenance Data System, BV-PDIS-1TB-103, dated December 4, 2013
NRC IN 2013-05; Battery Expected Life and its Potential Impact on Surveillance Requirements
NRC Regulatory Guide 1.160; Monitoring The Effectiveness Of Maintenance At Nuclear Power Plants, Revision 3
SANDIA REPORT, SAND2010-8718, Nuclear Containment Steel Liner Corrosion Workshop: Final Summary Report dated July 2011
Unit 2 Maintenance Rule (a)(1) system 47 status report, dated October 11, 2013
Unit 2 Maintenance Rule (a)(1)system 21 status report, dated October 11, 2013
Vendor Manual Revision Notice NOP-CC-1003-01 Rev. 00, Manual Number 2501.540-000-090, Deka Unigy HR5500ET Absorbed Glass Mat Battery, Revision D dated September 30, 2010
Vendor Manual 8700-01.024.0223, Solid State Controls Inc., Instruction and Technical Manual for 35 kVA Three Phase Inverter Units, Revision B

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
AOT	Allowed Outage Time
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
ECP	Employee Concerns Program
ECT	Eddy Current Testing
FENOC	FirstEnergy Nuclear Operating Company
HX	Heat Exchanger
IMC	Inspection Manual Chapter
kV	Kilovolt
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
PD	Performance Deficiency
PPC	Plant Process Computer
SCAQ	Significant Condition Adverse to Quality
SCWE	Safety Conscious Work Environment
SDAFW	Steam Driven Auxiliary Feedwater
SDP	Significance Determination Process
SOV	Solenoid Operated Valve
TS	Technical Specification