



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 1, 2014

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603-0467

**SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC PROBLEM
IDENTIFICATION AND RESOLUTION INSPECTION REPORT AND NOTICE
OF VIOLATION 05000387/2014009 AND 05000388/2014009**

Dear Mr. Rausch:

On June 20, 2014, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station (SSES), Units 1 and 2. The enclosed report documents the inspection results discussed on June 20, 2014, with Mr. Jon Franke and other members of your staff.

This inspection examined activities conducted under your licenses as they relate to identification and resolution of problems and compliance with the Commission's rules and regulations and conditions of your licenses. 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 although PPL Susquehanna, LLC (PPL) had developed adequate program procedures for identifying, evaluating, and resolving problems; however, there were several continuing weaknesses associated with the implementation of certain aspects of PPL's corrective action program. Specifically, the inspectors determined that PPL did not consistently prioritize and evaluate issues commensurate with the safety significance of the identified problem, as described in the documented weaknesses in evaluations of operability. In addition, based on the samples reviewed, the inspectors concluded that corrective actions for identified deficiencies were not always complete and adequate with several weaknesses noted in the areas of efficacy and timeliness. Of note, the inspectors identified issues with corrective actions to address the sample of NRC non-cited violations and findings since the last biennial problem identification and resolution inspection.

One violation of very low safety significance (Green) is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in the subject inspection report. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforcement-pol.html>). This violation is being cited in the Notice because all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation were not satisfied. Specifically, PPL failed to restore compliance within a

reasonable amount of time after the issue was discussed in a formal exit meeting on January 24, 2014 and documented in NRC Inspection Report 05000387;388/2013005 on February 14, 2014.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether enforcement action is necessary to ensure compliance with regulatory requirements.

Also, this report documents three NRC-identified findings of very low safety significance (Green). The inspectors determined that each of these findings also involved a violation of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest these non-cited violations, 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 the Susquehanna Steam Electric 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 Susquehanna Steam Electric 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 (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/

Fred L. Bower, III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-387; 50-388
License Nos.: NPF-14, NPF-22

Enclosure: Inspection Report 05000387/2014009 and 05000388/2014009
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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Docket Nos.: 50-387; 50-388
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Enclosure: Inspection Report 05000387/2014009 and 05000388/2014009
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*Concurrence by email

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NOTICE OF VIOLATION

PPL Susquehanna, LLC
Susquehanna Steam Electric Station

Docket Nos. 50-387 & 50-388
License Nos. NPF-14 & NPF-22

During an NRC inspection conducted on June 2 through June 20, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50.54(q)(2) requires, in part, that licensee's shall follow and maintain the effectiveness of an emergency plan that meets the requirements of the planning standards of 50.47(b).

10 CFR 50.47(b)(4) requires, in part, that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility.

Contrary to the above, since October 2003, PPL did not follow and maintain a standard emergency classification and action level scheme. Specifically, PPL did not take timely corrective actions to provide an adequate means to measure temperature in nine out of 21 areas, where reactor building temperatures are considered for the fission product barrier degradation emergency action levels (EALs). As a result, this deficiency adversely affected PPL's ability to classify an emergency such that a Site Area Emergency would be declared in a degraded manner.

This violation is associated with a Green Significance Determination Process finding.

Pursuant to the provisions of 10 CFR 2.201, PPL Susquehanna, LLC is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 1st day of August, 2014

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-387; 50-388

License Nos.: NPF-14, NPF-22

Report Nos.: 05000387/2014009 and 05000388/2014009

Licensee: PPL Susquehanna, LLC (PPL)

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: June 2 through June 6, 2014
June 16 through June 20, 2014

Team Leader: J. Ambrosini, Senior Resident Inspector, Millstone

Inspectors: C. Bickett, Senior Project Engineer
T. Daun, Resident Inspector
A. DeFrancisco, Project Engineer

Approved by: Fred L. Bower III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2014009, 05000388/2014009, 06/02/2014 – 06/20/2014; Susquehanna Steam Electric Station, Units 1 and 2; Identification and Resolution of Problems. The inspectors identified four findings in the areas of Effectiveness of Problem Identification, Effectiveness of Prioritization and Evaluation of Issues, and Effectiveness of Corrective Actions.

This NRC team inspection was performed by two resident inspectors and two regional inspectors. The inspectors identified four findings of very low safety significance (Green) during this inspection and classified these findings as one cited violation and three non-cited violations. 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 December 19, 2013. 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 5.

Problem Identification and Resolution (PI&R)

The inspectors concluded that PPL Susquehanna, LLC (PPL) was generally effective in identifying, evaluating, and resolving problems. PPL personnel identified problems and entered them into the corrective action program at a low threshold. However, the inspectors noted several examples of missed identification of conditions adverse to quality during the onsite weeks of inspection and throughout the two year period. The inspectors identified one violation for the failure to identify and correct significant piping corrosion.

The inspectors concluded that, although PPL Susquehanna, LLC (PPL) had developed adequate program procedures for identifying, evaluating, and resolving problems; there were several continuing weaknesses associated with the implementation of certain aspects of PPL's corrective action program. Specifically, based on the samples reviewed, the inspectors concluded that PPL did not consistently prioritize and evaluate issues commensurate with the safety significance of the identified problem, as described in the documented weaknesses in evaluations of operability. The inspectors identified two violations and two documented observations in this area. Specifically, the inspectors identified programmatic weaknesses in the timely completion of operability evaluations and the failure to identify and correct the effects of excessive vibrations and water hammer events in a safety related system. In addition, the inspectors noted that causal analyses did not always appropriately consider the extent of condition or previous occurrences of the issue, such as the documented examples for alarms during High Pressure Coolant Injection (HPCI) surveillance testing and corrective actions for emergency operating procedure deviations.

Based on the sample reviewed, the inspectors determined that PPL had several weaknesses in the areas of efficacy and timeliness of corrective actions. Of note, the inspectors identified issues with corrective actions to address the sample of NRC non-cited violations, and findings since the last biennial problem identification and resolution inspection. The inspectors identified one violation for the continuing failure to restore compliance for a degraded condition related to EAL implementation.

The inspectors concluded that PPL adequately identified, reviewed, and applied relevant industry operating experience to Susquehanna operations. In addition, based on those items selected for review, the inspectors determined that PPL's self-assessments and audits were adequate.

Based on the limited 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.

The inspectors took action to ensure that the scope of this problem identification and resolution inspection did not overlap the upcoming 95002 inspection at Susquehanna, currently scheduled for July 2014. The limited review of safety culture was performed in accordance with Inspection Procedure 71152 requirements, and the inspectors did not review any of the root or apparent causes related to the affected performance indicators subject to further 95002 inspection.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to take adequate corrective actions for a condition adverse to quality involving the emergency service water (ESW) and residual heat removal service water (RHRSW) systems. Specifically, PPL did not take timely and appropriate corrective actions to address carbon steel pipe wall thinning on the B ESW and B RHRSW discharge piping on the lower level of the ESW pump house. PPL completed immediate corrective actions including cleaning the affected piping, conducting ultrasonic testing (UT) thickness testing of the affected piping, calculating acceptance criteria for the UT tests (minimum wall thickness), and calculating a degradation rate of the piping given worst case historical corrosion and water in the environment. Additional actions included initiation of multiple condition reports (CR) to enter the issues into the corrective action program (CR-2014-18803, CR-2014-18945, CR-2014-18932), and plans to add the piping to the PPL Pipe Corrosion Program (PCP) for trending and future examination consideration.

The finding is more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, the wetting and associated external corrosion of the piping without appropriate monitoring could adversely impact the structural integrity of the B RHRSW and ESW headers. In addition, the finding is similar to the example 3.i in Inspection Manual Chapter (IMC) 0612 Appendix E, "Examples of Minor Issues," because PPL had to perform calculations to assess whether the actual wall thickness met minimum structural integrity requirements. In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the finding does not represent an actual loss of function of one or more non-Tech Spec Trains of equipment designated as high safety-significant in accordance with PPL's maintenance rule program for greater than 24 hours. The inspectors determined that this finding had a human performance cross-cutting aspect

related to Consistent Process because PPL did not use their decision making process consistently to re-evaluate decisions to ensure they remained appropriate when previous decisions were called into question. Specifically, despite repeated identification of pipe wetting conditions and observations of worsening corrosion, plant personnel did not re-evaluate structural integrity. Additionally, plant personnel used an inconsistent approach in dealing with the issue, as was demonstrated by the difference in treatment to prevent corrosion on the A train of the RHRSW and ESW systems. [H.13] (Section 4OA2.1.c(1)).

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for PPL's failure to complete and document initial operability determinations in a timely manner in accordance with station procedures. Specifically, station personnel failed to complete and document initial operability determinations in a timely manner, consistent with PPL procedure NDAP-QA-0703, "Operability Assessments and Requests for Enforcement Discretion," Revision 24. In response to this issue, PPL issued Operations Directive 14-01 to reiterate the expectation that operations complete the initial operability screening within eight hours or the end of shift, whichever is shorter, as delineated in NDAP-QA-0703. Additionally, the station continues to conduct Periodic Operability Review Meetings to review a sample of operability determinations for consistency with NDAP-QA-0703. The station entered this issue into the corrective action program as condition reports 2014-18806 and 2014-19008 for further evaluation.

This finding is more than minor because if left uncorrected, the continued performance of untimely initial operability determinations could become a more significant safety concern. Specifically, the failure to assess operability in a timely manner can lead to exceeding technical specification allowed completion times and required actions, up to and including required plant shutdowns. Additionally, this issue is similar to items 3.j and 3.k in IMC 0612, Appendix E, "Examples of Minor Issues." Given the duration of time the deficiency has existed, combined with the number of examples identified during the inspection, the inspectors considered this issue to be programmatic. In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) since question A.1 was answered 'Yes' because the performance deficiency did not result in the loss of operability or functionality of any structure, system, or component. Additionally, the inspectors did not identify any instances where an untimely initial operability screening resulted in exceeding a TS allowed outage time.

The inspectors determined that this finding had a Human Performance cross-cutting aspect related to change management. In this case, PPL revised procedure NDAP-QA-0703 in March 2013 to change the guidance on timeliness without executing a change management plan to determine if the organization would be able to adhere to the more restrictive guidelines given that other corrective actions were in place to increase the required documentation for an initial operability determination. The inspectors determined that this finding had a human performance cross-cutting aspect related to

Change Management. In this case, PPL revised procedure NDAP-QA-0703, in March 2013, to change the guidance on timeliness without executing a change management plan to determine if the organization would be able to adhere to the more restrictive guidelines given that other corrective actions were in place to increase the required documentation for an initial operability determination. [H.3] (Section 40A2.1.c(2)).

- Green. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," because PPL did not take measures to promptly correct an identified condition adverse to quality associated with the Emergency Service Water (ESW) supply lines to the 1C, 1D, 2C, and 2D Residual Heat Removal (RHR) pump motor oil coolers. PPL entered these conditions into their CAP as CR-2014-20129 and is continuing to evaluate corrective actions. Based on PPL's evaluation conducted in CR-2014-20129, that the ESW and RHR systems will perform their required safety functions and compensatory measures are in place to limit and monitor the pipe vibration, the inspectors determined that the noncompliance does not present an immediate safety concern.

The finding is more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Additionally, it was similar to example 4.a in IMC 0612 Appendix E, "Examples of Minor Issues," in that PPL had several opportunities to perform engineering evaluations on this condition and later evaluation determined that safety-related equipment was adversely affected. Specifically, no engineering evaluations were performed from 2009 through 2012, and post-2012 engineering evaluations did not fully bound the condition. Analysis performed after NRC identification resulted in additional evaluation and compensatory actions being implemented under CR 2014-20129. In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) since question A.1 was answered 'Yes' because the deficiency only affected the qualification of the ESW and RHR systems, but the ESW and RHR systems maintained operability. The inspectors determined that this finding had a human performance cross-cutting aspect related to Conservative Bias because PPL failed to use decision making-practices that emphasized prudent choices over those that are simply allowable. Specifically, PPL was relying on a leak-before-break assumption to support the continued operability of the safety related piping to the RHR pump motor oil coolers without sufficient priority to correct the condition adverse to quality. [H.14] (Section 40A2.1.c(3)).

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green cited violation of 10 CFR 50.54(q)(2) for PPL's failure to follow and maintain an emergency plan that meets the requirements of the planning standards in 10 CFR 50.47(b), in that, since October 2003, PPL did not follow and maintain a standard emergency classification and action level scheme. Specifically, PPL did not take timely corrective actions to provide an adequate means to measure temperature in nine out of 21 areas, where reactor building temperatures are considered

for the fission product barrier degradation emergency action levels (EALs). As a result, this deficiency adversely affected PPL's ability to classify an emergency such that a Site Area Emergency would be declared in a degraded manner. The violation is being cited because PPL has failed to restore compliance or demonstrate objective evidence of plans to restore compliance at the first opportunity in a reasonable period of time following discussion in a formal exit meeting on January 24, 2014 and documented in NRC Inspection Report 05000387;388/2013005 on February 14, 2014.

The finding is more than minor because it is associated with the Facilities and Equipment attribute of the emergency preparedness cornerstone, and adversely affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the continuing lack of installed temperature instrumentation or any other compensatory measures and the reliance on personnel dispatched to take temperature readings were insufficient to ensure a timely and accurate EAL classification could be made. Using IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process", section 5.4, the finding is of very low safety significance (Green) because the finding was determined to be an example of an ineffective EAL initiating condition, such that a Site Area Emergency would be declared in a degraded manner.

The inspectors determined that this finding had a problem identification and resolution cross-cutting aspect related to Resolution because PPL did not take corrective actions in a timely manner nor did they take appropriate interim corrective actions to mitigate the issues while more fundamental causes are being assessed. Specifically, PPL had no corrective actions planned or taken to address the degraded EALs until NRC approval of their new EAL scheme, currently scheduled to be implemented no earlier than December 2015. [P.3] (Section 40A2.1.c(4)).

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 PPL's corrective action program (CAP) at Susquehanna. To assess the effectiveness of the CAP, 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 PPL procedures NDAP-QA-0702, "Action Request and Condition Report Process" and LS-125, "Corrective Action Program." For each of these areas, the inspectors considered risk insights from the station's risk analysis and reviewed condition reports selected across the seven cornerstones of safety in the NRC's Reactor Oversight Process. Included in this sample were condition reports (CRs) that documented PPL's evaluation and corrective actions for a selective sample of NRC-identified non-cited violations (NCVs) and findings that had been identified since the last biennial problem identification and resolution (PI&R) inspection completed in July 2012. Additionally, the inspectors attended Corrective Action Review Board (CARB) and Management Review Committee (MRC) meetings. The inspectors selected items from the following functional areas for review: engineering, operations, maintenance, emergency preparedness, radiation protection, chemistry, 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 completed field walkdowns of various systems on site, such as residual heat removal service water (RHRSW), emergency service water (ESW), and residual heat removal (RHR). 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 PPL entered conditions adverse to quality into their CAP 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 PI&R inspection completed in July 2012. 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 PPL'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 PPL'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 NCVs and findings to verify that PPL personnel properly evaluated and resolved these issues. In addition, the inspectors expanded the corrective action review to five years to evaluate PPL actions related to RHR system 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 PPL identified problems and entered them into the CAP at a low threshold. For example, PPL staff initiated over 20,000 CRs during the two year period of review (August 2012 through May 2014). However, the inspectors noted the following examples of missed identification of conditions adverse to quality throughout the two year period of review. In addition, the inspectors identified a weakness in the identification and evaluation of corrosion issues of the RHRSW and ESW systems, as described in the finding documented in Section 4OA2.1c(1). The inspectors concluded that PPL missed opportunities to correct these adverse conditions.

1. Failure to initiate AR or CR for Feedwater Control Issues. In IR 2013007, the NRC documented a self-revealing Green finding (FIN) because PPL's staff did not initiate an action request (AR) or CR after determining that ICS digital feedwater (FW) valve control needed to be placed in Manual Valve Control mode prior to de-energizing the 3A motor operated valve (MOV) in order to prevent a loss of all FW flow. This issue went unaddressed and subsequently on December 19, 2012, Unit 2 scrambled on low reactor pressure vessel water level when operators, while attempting to open the

stuck 3A valve, opened the 3A valve power supply breaker with the 'A' reactor feed pump FW valve controls in automatic causing a loss of all normal FW. (FIN 2013007-03)

2. Inadequate Emergency Operating Procedures (EOP) for ATWS Scenario. In IR 2013004, the NRC identified a Green NCV of TS 5.4.1.a, "Procedures," because PPL's EOP does not terminate injection from the HPCI system during the transient, as recommended by the EOP guidelines, and EOP guidance is insufficient to ensure that operators will maintain level in the prescribed level band. PPL's documentation of deficiencies identified during evaluated simulator scenarios was inadequate to identify that guidance in the EOP basis document was insufficient to ensure that operators maintained level in the anticipated transient without scram (ATWS) band during the duration of a rapid depressurization. (NCV 2013004-01) Resolution of this issue is also discussed further as an observation in Section 4OA2.1.b(2) of this report.
3. Failure to Identify a RSPS Weakness During an EP Drill. In IR 2012005, the NRC identified a Green NCV associated with emergency preparedness planning standard 10 CFR 50.47(b)(14) and the requirements of Section IV.F.2.g of 10 CFR 50, Appendix E. Specifically, PPL staff did not identify a performance weakness related to an RSPS during their critique following the full-scale emergency preparedness drill. (NCV 2012005-03)
4. Inadequate Procedures for Acts of Nature. In IR 2012004, the NRC identified a Green NCV of TS 5.4.1, "Procedures," when PPL did not maintain adequate procedures to respond proactively to acts of nature. PPL did not identify that the Off Normal procedure was inadequate during: the 2011 periodic procedural review; or, the documentation of inspector observations in May 2012 as part of CR 1579977. (NCV 2012004-01)

(2) Effectiveness of Prioritization and Evaluation of Issues

Based on the samples reviewed, the inspectors concluded that PPL did not consistently prioritize and evaluate issues commensurate with the safety significance of the identified problem, as described in the documented weaknesses in evaluations of operability. The inspectors identified two violations and two documented observations in this area. Specifically, the inspectors identified programmatic weaknesses in the timely completion of operability evaluations documented in Section 4OA2.1.c(2) and the failure to identify and correct the effects of excessive vibrations and water hammer events in a safety related system as documented in Section 4OA2.1.c(3). In addition, the inspectors noted that causal analyses did not always appropriately consider the extent of condition or previous occurrences of the issue, such as the documented examples for lube oil level alarms during High Pressure Coolant Injection (HPCI) surveillance testing and corrective actions for emergency operating procedure deviations. Also documented below are several additional examples of ineffective prioritization or evaluation that occurred during the two year period.

(a) Inspection Observations

The inspectors identified two documented observations for weaknesses in the prioritization and evaluation of issues:

1. HPCI ATWS NCV – Extent of Condition Issue

In IR 2013004, the inspectors identified a NCV (2013004-01) related to inadequate emergency operating procedures in that the procedure to address rapid depressurization during an ATWS event did not adequately control reactor pressure vessel level. PPL has a deviation from the Boiling Water Reactor Owners Group Emergency Procedure Guidelines (EPGs) that allows the HPCI system to remain available for injection during a rapid depressurization. However, the procedures contained insufficient guidance to allow level control with HPCI during this event. PPL documented this issue in CR 1745775, dated October 25, 2013, and revised the procedure to address this deficiency. As part of the extent of condition review, PPL also issued DI-1675582 to request that engineering reevaluate all of the deviations related to the Boiling Water Reactor Owners Group EPGs. The station closed DI-1675582 on January 29, 2014 without completing review of the other deviations.

Station personnel presented the apparent cause evaluation associated with CR 1745775 to the CARB on February 12, 2014. The CARB did not approve the evaluation and directed station personnel to “clearly bound the extent of condition, ensure all deviations are clearly evaluated, and a conclusion has been provided for each deviation.” Station personnel presented a revised version of the apparent cause evaluation to the CARB on April 2, 2014, and this was approved with the following comment: “Re-review all deviations from the EPGs.” The final version of the apparent cause evaluation references DI-1675582 as the extent of condition action with a status of complete even though the extent of condition directed by the CARB was not performed. PPL entered this issue into the CAP as CR 2014-19403. The inspectors identified that the extent of condition to ensure all EPG deviations were reevaluated was not performed.

The inspectors independently screened this issue in accordance with IMC 0612, Appendix B, “Issue Screening,” and IMC 0612, Appendix E, “Examples of Minor Issues,” and determined that this issue was minor. Specifically, PPL is currently in the process of updating their emergency operating procedures to the Boiling Water Reactor Owners Group EPGs, Revision 3. This revision will remove all of the deviations, with the exception of those related to plant-specific equipment, from the emergency operating procedures. PPL is tracking the emergency operating procedure revision under AR-1731628.

2. HPCI Lube Oil Level Alarm – Repetitive Issues Without Thorough Evaluation

During performance of the Unit 2 HPCI Quarterly Flow Surveillance (SO-252-002) on March 29, 2014, the HPCI turbine oil tank HI-LO level alarm reflashed several times. PPL generated CR 2014-10144 to document the condition, and indicated that prior to the start of the surveillance run, oil level was slightly higher than midscale. The CR also stated that, during the run, the level was observed at the LO level on the indicator and Maintenance needed to add oil to prevent the alarm condition during future HPCI system operation. PPL performed an initial operability determination and concluded that HPCI was operable based on the fact that there was no oil leakage noted during system operation, operators observed normal oil pressures during the run, and the fact that operators noted

the reservoir oil level was just above the minimum mark with the system in service. The requested action was to add additional oil to provide margin to the alarm point in service. On April 1, 2014, the CR screening team classified this CR as "Not Adverse to Quality" (NAQ) and screened the CR to "level 4 close" with no further action since oil had been added to the system under work order (PCWO) 1796933. PCWO 1796933 indicated that as found oil level in the reservoir was mid-level. About 2 gallons of oil was added and final level went to about 3/8", approximately a 1/2" below the high mark.

On June 6, 2014, the Unit 2 HPCI Quarterly Flow Surveillance was performed and again the HPCI turbine oil tank HI-LO level alarm reflashed several times. The HI-LO alarm locked in as the operability run progressed. There was no visible indication of oil leakage and lube oil parameters were normal during the run. PPL initiated CR 2014-19076 to document the condition and again performed an initial operability determination that based HPCI operability on oil level indicating at the lower end of the acceptable level in the sight glass. Again, the CR requested maintenance to add oil and also indicated there is a known calibration issue with the level switch that provides this alarm function, which may be a contributor to this repeat issue. Operations requested a prompt operability determination (POD) to address this issue. Through the POD evaluation PPL determined that the marks on the sight glass did not correspond to the HI-LO alarms during operation, and concluded that the HI-LO level alarm was actually indicating a HI level alarm during the previous two surveillances. The inspectors noted PPL's initial evaluations were not thorough, in that, information supporting that the LO level alarm and not the HI level alarm was alarming was readily available in HPCI operating procedures and design basis documentation, but PPL did not review this information until the POD process prompted its review.

The inspectors independently screened this issue in accordance with IMC 0612, Appendix B, "Issue Screening," and IMC 0612, Appendix E, "Examples of Minor Issues," and determined that this issue was minor. Specifically, the delay in evaluating the condition of the HPCI lube oil system did not result in a degradation of the safety function of the system. PPL generated CR 2014-18863 and CR 2014-20333 to further evaluate the issue.

(b) Period Observations

The NRC has previously documented specific examples of ineffective prioritization or evaluation of issues over the two year period of review such as:

1. Inaccurate Performance Indicator (PI) Data Submitted. In IR 2013002, the NRC identified a Green finding related to implementation of NDAP-QA-0737, "Reactor Oversight Process (ROP) Performance Indicators," Revision 9, and associated severity level (SL) IV NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information" because PPL staff did not accurately report the Unplanned Scrams with Complications (USwC) performance indicator (PI) for the period of October 2012 through December 2012. Specifically, PPL did not report the Unit 2 reactor scram, which occurred on December 16, 2012, in this PI because PPL did not properly evaluate the scram in accordance with NEI 99-02 guidance. (NCV 2013004-02)

2. Transient Combustibles Stored Without Proper Evaluation. In IR 2013002, the NRC identified a Green NCV of Unit 2 Operating License Condition 2.C.(3) when PPL stored transient combustibles in restricted areas (red zone) without an evaluation by the site fire protection group. (NCV 2013002-01)
3. Inadequate Operability Determination for Failed Synchroscope Switch. In IR 2013003, the NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when PPL staff performed an inadequate operability determination for a synchroscope switch failure that rendered offsite power and all four emergency diesel generators (EDG) inoperable. This resulted in PPL being in violation of Unit 1 TSs 3.8.1, 3.8.2, and 3.0.3, and Unit 2 TSs 3.6.4.1 and 3.8.2. An inadequate evaluation was conducted when PPL initially entered the synchroscope failure into CAP as a "Level 4 Correct, Condition Not Adverse to Quality" and determined no operability review was required. (NCV 2013003-01)
5. Failure to Report Common Cause Inoperability of Independent Trains. In IR 2012005, the NRC identified a SL IV NCV of 10 CFR 50.73 (a)(2)(vii) for PPL staff not submitting an LER within 60 days of discovery of a common cause inoperability of two independent trains of RPS electrical power monitoring. Inspectors reviewed PPL's CAP and identified that condition report action (CRA) 1571200, which tracked the reportability follow-up determination, was closed on September 5, 2012. PPL personnel had determined that the event was not reportable because it did not result in a loss of safety function or condition prohibited by plant TSs, but did not complete an evaluation for a potential common cause failure mechanism in a timely fashion. (NCV 2012005-02)
6. Failure to Demonstrate Effective Preventive Maintenance. In IR 2012005, the NRC identified a Green NCV of 10 CFR 50.65(a)(2) for PPL staff not demonstrating the performance of the Unit 2 125 VDC system was being effectively controlled through appropriate preventive maintenance. PPL staff did not thoroughly evaluate the Unit 2 125 VDC system functional failure such that the resolution addressed the cause, to include proper classification. Specifically, PPL's apparent cause evaluation (ACE) identified and addressed 125 VDC system procedural deficiencies. However, the ACE did not consider the procedural deficiencies in the maintenance preventable functional failure (MPFF) determination until prompted by the inspector's questions. (NCV 2012005-01)

(3) Effectiveness of Corrective Actions

Based on the sample reviewed, the inspectors determined that PPL had several weaknesses in the areas of efficacy and timeliness of corrective actions. Of note, the inspectors identified issues with corrective actions to address the sample of NRC non-cited violations, and findings since the last biennial problem identification and resolution inspection. The inspectors identified one violation (Section 40A2.1.c(4)) for the continuing failure to restore compliance for a degraded condition related to EAL implementation.

(a) Inspection Observations

In addition, the inspectors noted weaknesses in implementation of corrective actions for a previously identified NRC NCV (2013004-02). For example, on June 6, 2014, the nuclear safety risk category did not acknowledge medium operational safety risk required for a Yellow risk work window which included overlap of the RHR service water-RHR crosstie valve diagnostic while the E EDG was unavailable for substitution. Lack of rigor in procedural adherence and documentation of the Attachment F risk assessment worksheet was demonstrative of a failure to fully address lessons learned from the July 2013, 10 CFR 50.65(a)(4) violation. This issue is minor because appropriate risk management actions were taken, and PPL took efforts to minimize the duration of the yellow risk profile by reducing the scope of the diagnostic work.

(b) Period Observations

The NRC has previously documented specific examples of ineffective corrective actions over the two year period of review such as:

1. Failure to Take Appropriate Compensatory Actions for Failing to Meet Emergency Plan Requirements. In IR 2013004, the NRC identified a Green finding and an associated NCV of 10 CFR 50.54(q) for failing to follow and maintain an emergency plan that meets the requirements of emergency planning standard 10 CFR 50.47(b)(4). Specifically, PPL failed to take timely corrective actions to restore a degraded flood alarm in accordance with station procedures. The alarm was out-of-service from December 21, 2012 until September 23, 2013 without adequate compensatory measures in place. (NCV 2013004-03)
2. Inadequate Procedure Leads to Exceeding Technical Specifications (TS) Reactor Vessel Heatup Rate. In IR 2013003, the NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Procedures," because PPL's surveillance implementing procedure for monitoring adherence to pressure and temperature requirements during plant heatup and cooldown did not adequately incorporate the acceptance criteria for heatup rate specified in the plant TSs and TS bases. The inspectors noted that during a previous plant startup in June 2012, inspectors questioned whether procedure SO-200-011 adequately incorporated the heatup rate limits prescribed by TS 3.4.10. CR 1584097 was generated to address the inspector's concerns and actions were taken in September 2012 to clarify the procedure. Inspectors determined that the actions taken in 2012 were inadequate to correct the deficient procedure. (NCV 2013003-03)
3. Unacceptable Preconditioning of Unit 2 Turbine Control Valve (TCV) Fast Closure Function. In IR 2013003, the NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," because PPL performed unacceptable preconditioning by performing corrective maintenance prior to recording the as-found time response for the Unit 2 TCV fast closure function. During review of performance history associated with pressure switch, PSL-C72-2N005C, inspectors identified that unacceptable preconditioning occurred that masked the as-found condition. Although degraded performance was identified during previous testing, PPL did not take timely and effective corrective actions to ensure the required maintenance did not unacceptably precondition the 24-month surveillance test. (NCV 2013003-02)

c. Findings

(1) Inadequate Corrective Action for Degraded Emergency Service Water (ESW) and Residual Heat Removal Service Water (RHRSW) Piping

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to take adequate corrective actions for a condition adverse to quality involving the ESW and RHRSW systems. Specifically, PPL personnel did not take timely and appropriate corrective actions to address carbon steel pipe wall thinning on the B ESW and B RHRSW discharge piping on the lower level of the ESW pump house.

Description. On June 4, 2014, the inspectors observed corrosion on the B ESW and B RHRSW discharge headers in the lower elevation of the ESW pump house. The corrosion included non-adherent and non-superficial pieces of rust varying in size and thickness. The inspectors noted that the worst case of corrosion on the B ESW piping had occurred directly below an electrical box which showed evidence of groundwater leakage. The inspectors observed that the A trains of ESW and RHRSW piping in another area of the ESW pump house, were fully coated, unlike the B trains.

Through interviews with site personnel, the inspectors confirmed that the uncoated RHRSW and ESW piping in the lower elevation of the pump house is subjected to water exposure. In addition to evidence of leakage via the electrical box, during a follow-up walkdown performed on June 17, 2014, site personnel accompanying the NRC also noted that condensation is common on the piping in this location, particularly during the winter.

The inspectors noted that the 2010 NRC component design basis inspection team had identified groundwater entering the lower elevation of the ESW pump house and collecting on the underside of the common discharge line of the B and D ESW pumps in 2010 (CR 1308498; NRC IR 20010007). An evaluation for CR 1308498, written in 2010 as a result of the observed corrosion, stated, "...the basement of the pump house is relatively warm year-round. When cool pond water is pumped through each of the pipes, water condenses on the outside of the pipe due to the difference in temperature...this creates an environment conducive to corrosion." As a result of the identified condition, PPL performed an ultrasonic examination (UT) of the ESW piping (corrosion on the RHRSW piping was not recorded at that time). Because the piping UT results on the ESW line revealed that piping was still above nominal thickness, 0.385 inches, PPL did not assess the rate of degradation. In 2011, action requests were initiated to clean the rust off of the B RHRSW and B ESW piping and to coat the piping and pipe supports (ARs 1320400; 1320413; 1320417). A work order was also opened in 2011 to seal a penetration to prevent groundwater in-leakage through the electrical box above the ESW line (PCWO 1505054).

On January 25, 2013, PPL initiated CR 1664318, to document that a field unit supervisor had walked down the lower level of the ESW pump house B division and had noted the electrical box dripping water onto the ESW piping, causing corrosion. Corrosion was noted on the RHRSW piping as well. It was also noted that other locations that were not directly below the electrical box were also found to be wet and rusting. The prompt operability assessment stated that the water on the piping was not a result of a leak from

within the ESW system, and that if the ESW piping did leak, its operability could be bounded by previous operability assessments performed on the B emergency diesel generator ESW piping which had exhibited pinhole leaks.

The Inspectors learned that a UT of the most affected area of the ESW piping, located below the electrical box, had not been performed since 2010. In addition, there were no UT records for the RHRSW piping. During 2012, PPL performed guided wave UTs for information purposes only, which demonstrated decreases in wall thickness. The inspectors also observed that the piping on the B trains had not been cleaned or coated. The inspectors questioned PPL regarding the status of any corrective actions to address the piping corrosion or to monitor the piping for integrity, based on the wet conditions in the pump house lower level, the documented historical corrosion, and observed significant corrosion present at the time of the inspection.

The work order to repair the groundwater in-leakage through the electrical box above the ESW line (PCWO 1505054, initiated December 14, 2011) was scheduled for July 2014. The work order to clean and coat the B RHRSW line (PCWO 1320738, initiated November 3, 2010) was scheduled for September 2014. The work order (PCWO 1325373, initiated November 17, 2010) to clean and coat the B ESW line, the area most vulnerable to the groundwater in-leakage and the most corroded area, was currently still in a planning phase (remained unscheduled). In addition, there were no actions to assess the structural integrity of the piping and determine the minimum wall thickness requirements. When PPL documented CR 2014-18932 based on the team's June 4, 2014 piping corrosion observation, the CR referenced the nominal thickness of 0.385" as the piping minimal wall thickness.

Subsequent to questioning, PPL performed a calculation on June 6, 2014 (AR 2014-19095) to determine the minimum wall thickness for the piping, which resulted in 0.288" and 0.238" for the ESW and RHRSW piping, respectively. On June 7, 2014, PPL cleaned the affected areas of the ESW and RHRSW piping to the extent possible (the largest remaining pit measured approximately 1/50th of an inch) and performed UTs on the most significantly corroded areas of the RHRSW and ESW piping (PCWOs 1817490 and 1817487). The UT results showed the lowest wall thickness reading to have been 0.338" on the ESW piping and 0.378" on the RHRSW piping.

The inspector questioned PPL as to whether a degradation rate had been calculated based on the change in wall thickness between the 2010 and 2014 UT examinations. On June 18, 2014, PPL calculated that, in the worst case, given present wetting conditions, the piping would see 29 mils per year of degradation on a localized area on the underside of the ESW pipe. Also, on June 18, 2014, PPL performed further calculations which reduced conservatism in the minimum wall thickness, to show the revised minimum wall thickness for the ESW line was actually 0.189".

Therefore, the inspectors considered this a condition adverse to quality because the conditions of the piping continued to degrade, unmonitored by any licensee program, below PPL's initial assumptions for minimum acceptable wall thickness.

Analysis. The inspectors determined that PPL did not take adequate corrective actions for an adverse condition associated with the B ESW and RHRSW piping was a performance deficiency that was reasonably within PPL's ability to foresee and prevent. Specifically, PPL did not take timely and appropriate corrective actions to assess the

corrosion, address wetting conditions, and perform an appropriate operability determination that included assessing the piping degradation rate and calculating the minimum wall thickness to ensure that structural integrity requirements were maintained. The finding was determined to be more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, the wetting and associated external corrosion of the piping, without appropriate monitoring, could adversely impact the structural integrity of the B RHRSW and ESW headers. In addition, the finding is similar to the example 3.i in IMC 0612, Appendix E, "Examples of Minor Issues," because subsequent to the NRC identifying the material condition of the piping, which did not meet the previously stated required wall thickness, PPL performed calculations to assess whether the actual wall thickness met minimum structural integrity requirements.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the finding does not represent an actual loss of function of one or more non-Tech Spec Trains of equipment designated as high safety-significant in accordance with PPL's maintenance rule program for greater than 24 hours.

The inspectors determined that this finding had a human performance cross-cutting aspect related to Consistent Process because PPL did not use their decision making process consistently to re-evaluate decisions to ensure they remained appropriate when previous decisions were called into question. Specifically, despite repeated identification of pipe wetting conditions and observations of worsening corrosion, plant personnel did not re-evaluate structural integrity. Additionally, plant personnel used an inconsistent approach in dealing with the issue, as was demonstrated by the difference in treatment to prevent corrosion on the A train of the RHRSW and ESW systems. [H.13]

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as deficiencies, defective material, and non-conformances are promptly identified and corrected. Contrary to the above, PPL staff did not promptly correct the degraded condition of the B RHRSW and B ESW piping from November 2010 to June 2014. PPL completed immediate corrective actions including cleaning the affected piping, conducting UT thickness testing of the affected piping, calculating acceptance criteria for the UT tests (minimum wall thickness), and calculating a degradation rate of the piping given worst case historical corrosion and water in the environment. Additional actions included the initiation of multiple CRs to enter the issues into the CAP (CR 2014-18803, CR 2014-18945, CR 2014-18932), and planning to add the piping to the PPL Pipe Corrosion Program (PCP) for trending and future examination consideration. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000387;388/2014009-01, Inadequate Corrective Action for Corroded ESW and RHRSW Piping)**

(2) Failure to Conduct Timely Initial Operability Determination

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for PPL's failure to complete and document initial operability determinations in a timely manner in accordance with station procedures. Specifically, station personnel failed to complete and document initial operability determinations in a timely manner, consistent with PPL procedure NDAP-QA-0703, "Operability Assessments and Requests for Enforcement Discretion," Revision 24.

Description. Per PPL procedure LS-120, "Issue Identification and Screening Process," Revision 0, after an individual initiates a condition report for a deficiency, it undergoes a supervisory review, and the supervisor then routes the condition report to the main control room for an initial operability screening by operations shift management. PPL procedure NDAP-QA-0703, "Operability Assessments and Requests for Enforcement Discretion," Revision 24, describes the responsibilities and actions necessary to complete this initial operability screening. Section 2 of NDAP-QA-0703 requires that when degraded or non-conforming conditions are identified, equipment operability must be assessed for impact on continued safe plant operation. Guidance for timeliness of this operability screening is provided in Section 6.1.9, which states, in part, that the initial operability screening should be completed within 8 hours or the end of shift, whichever comes first. Additionally, Attachment C to this procedure reinforces this expectation and states, in part, the initial operability assessment should be made as soon as possible after the condition is discovered, and shall be within 8 hours or end of shift, whichever is shorter. In addition to timeliness requirements, NDAP-QA-0703, Section 6.1.6 requires that the initial operability screening be documented in the CAP.

This is consistent with NRC Inspection Manual Chapter (IMC) 0326, "Operability Determinations and Functionality Assessments for Conditions Adverse to Quality or Safety," guidance on immediate operability determinations which states that the determination be completed without delay and must not be postponed for results of detailed evaluations.

The inspectors noted multiple occasions where PPL did not complete and document immediate operability determinations in a timely manner. Specific examples include:

- On May 16, 2013, PPL issued condition report 1704558 because reactor protection system limit switches on the main stop valves would not return to the trip position while manipulating the switch arms. Station personnel did not document the initial operability screening until May 31, 2013.
- On October 30, 2013, PPL issued condition report 2013-02230 due to a low oil level in the Unit 1 reactor core isolation cooling system outboard bearing. After the NRC resident inspectors questioned the status of the issue, the station completed the initial operability screening on the condition on November 8, 2013.
- On November 6, 2013, PPL issued condition report 2013-03009 based on a deficiency identified by the NRC resident inspectors related to a missing seal plug on an electrical terminal box at the Unit 1 'C' residual heat removal pump. After the resident inspectors questioned the status of the deficiency, station personnel completed the initial operability screening on this issue on November 15, 2013.

In addition to the examples above, the inspectors reviewed the screening meeting reports for June 3, 4, and 6, 2014, and observed many examples where the station's documentation of the initial operability review did not occur within the expectations discussed in NDAP-QA-0703.

- Of the 67 condition reports in 'screening' status for the June 3 report, 49 did not meet the expectations for timeliness. Of those 49 condition reports, 36 had the initial operability review documented greater than 24 hours after the condition report had been initiated.
- Of the 56 condition reports in 'screening' status for the June 4 report, 50 did not meet the expectation for timeliness. Of those 50 condition reports, 44 had the initial operability review documented greater than 24 hours after the condition report had been initiated.
- Of the 75 condition reports in screening for the June 6 report, 57 did not meet the expectation for timeliness. Of those 57 condition reports, 32 had the initial operability review documented greater than 24 hours after the condition report had been initiated.

The resident inspectors began trending items in PPL's condition report backlog on April 30, 2014. Items in this backlog included a snapshot of the total number of condition reports in initiate, supervisor review, or operability review workflow status when the report was printed for that day (i.e., potentially degraded conditions that have not yet received an initial operability determination). From April 30 through May 27, 2014, the backlog of items that fell into these categories ranged anywhere from 55 to 208 condition reports.

The inspectors determined that PPL had multiple opportunities to address this issue prior to this inspection.

- In March 2013, PPL revised NDAP-QA-0703 to change the guidance on timeliness of initial operability determinations from 24 hours to a more restrictive eight hours or the end of shift, whichever comes first. This was completed without executing a change management plan to determine if the organization would be able to adhere to the more restrictive guidelines given that other corrective actions were in place to increase the required documentation for an initial operability determination.
- In May 2013, the NRC resident inspectors identified a trend related to PPL's implementation of the operability determination process, including issues with timeliness of initial operability determinations. PPL documented this trend in condition report 1704034, and performed a Level 3 evaluation on the issue. The cause evaluation noted that timeliness is addressed in NDAP-QA-0703, and "with in-hand use of the procedure, this should be less of an issue." The station developed an enhancement action on June 20, 2013 to communicate the expectation that operators have NDAP-QA-0703 in-hand when performing operability determinations. At the time of this inspection, this action was not yet complete and had a due date of July 18, 2014.
- In October 2013, PPL's Nuclear Oversight organization conducted an audit of operations which included a review of operability determinations. This audit resulted in one condition report (2013-02357) specifically related to timeliness of initial operability determinations. PPL categorized this condition report as a 'Level 4 Close', track and trend.

On June 6, 2014, PPL issued Operations Directive 14-01 to reiterate the expectation that operations complete the initial operability screening within eight hours or the end of shift, whichever is shorter, as delineated in NDAP-QA-0703. The directive further specifies that if plant conditions do not allow this requirement to be met, the station shall generate a condition report to document the issue.

Analysis. The inspectors determined that failure to complete and document an initial operability screening in accordance with station procedures was a performance deficiency that was within PPL's ability to foresee and correct. This performance deficiency is more than minor because if left uncorrected, the continued performance of untimely initial operability determinations could become a more significant safety concern. Specifically, the failure to assess operability in a timely manner can lead to exceeding technical specification allowed completion times and required actions, up to and including required plant shutdowns. Additionally, this issue is similar to items 3.j and 3.k in IMC 0612, Appendix E, "Examples of Minor Issues." Given the duration of time the deficiency has existed, combined with the number of examples identified during the inspection, the inspectors considered this issue to be programmatic.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) since question A.1 was answered 'Yes' because the performance deficiency did not result in the loss of operability or functionality of any structure, system, or component. Additionally, the inspectors did not identify any instances where an untimely initial operability screening resulted in exceeding a TS allowed outage time.

The inspectors determined that this finding had a human performance cross-cutting aspect related to Change Management. In this case, PPL revised procedure NDAP-QA-0703, in March 2013, to change the guidance on timeliness without executing a change management plan to determine if the organization would be able to adhere to the more restrictive guidelines given that other corrective actions were in place to increase the required documentation for an initial operability determination. [H.3]

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Contrary to this requirement, from May 24, 2013 through June 6, 2014, PPL failed to accomplish activities affecting quality in accordance with prescribed procedures. Specifically, station personnel failed to complete and document initial operability determinations in a timely manner, consistent with PPL procedure NDAP-QA-0703, "Operability Assessments and Requests for Enforcement Discretion," Revision 24. In response to this issue, PPL issued Operations Directive 14-01 to reiterate the expectation that operations complete the initial operability screening within eight hours or the end of shift, whichever is shorter, as delineated in NDAP-QA-0703. Additionally, the station continues to conduct Periodic Operability

Review Meetings to review a sample of operability determinations for consistency with NDAP-QA-0703. The station entered this issue into the corrective action program as condition reports 2014-18806 and 2014-19008 for further evaluation. This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000387;388/2014009-02, Failure to Conduct Timely Initial Operability Determinations)**

(3) Failure to Correct Condition Adverse to Quality Related to Fatigue Stress in ESW Supply Lines to RHR Pump Motor Oil Cooler

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," because PPL did not take measures to promptly correct an identified condition adverse to quality associated with the Emergency Service Water (ESW) supply lines to the 1C, 1D, 2C, and 2D Residual Heat Removal (RHR) pump motor oil coolers.

Description. In 2009, PPL completed the installation of a 1" ESW cross-tie piping for Unit 1 and 2 C and D RHR pump motor oil coolers under Engineering Change (EC) 739040. The piping was installed with long threaded rod type hangers that provided support in the vertical plane, but do not prevent motion in the horizontal plane. EC 739040 also installed check valves in each supply line to prevent a failure of one ESW division from affecting the other.

From April 30, 2009 through 2014, inspectors identified seven CRs that described shaking and banging noises on Unit 1 and/or Unit 2 ESW supply piping to the C and/or D RHR motor oil coolers when ESW pumps were started and stopped or when Residual Heat Removal Service Water (RHRSW) was in operation without ESW in service. The inspectors reviewed the following CRs: CR 1140371, CR 1140829, CR 1140944, CR 1542115, CR 1563884, CR 1717214, and CR 2014-10859. Several of these CRs were repetitive in nature and closed to analysis and actions for CR 1542115.

PPL initiated CR 1542115 on March 10, 2012, which identified a concern with pipe movement and loud banging on the 1" ESW supply lines to the 1D RHR pump motor oil cooler when ESW pumps were started. PPL completed the evaluation on May 4, 2012, and concluded that further investigation and long term corrective actions were prudent to preclude undue cyclic stress/fatigue on the piping in question but that the piping was operable with no degraded condition. PPL revised CR 1542115 on January 31, 2013, to add: 1) one additional corrective action (AR/WO-1666287) for performing dye penetrant exams on the motor oil cooler supply lines to 1P202C; and, 2) two enhancement actions; one to replace the springs in the eight affected check valves (AR/WO-1666288) and a second to track the installation of the springs and generate other actions to evaluate the effectiveness of the change (EWR-1666356).

The inspectors reviewed the status of the listed corrective actions for the associated CRs. Nondestructive examination (NDE) inspections assigned under CR-1542115 under PCWO-1666288 were assigned to PCWO-1675073. In review of PCWO-1675073, it was discovered that the stated NDE was performed on one weld (SPHBC139-2) on November 11, 2013 but not on another (SPHRC103-3) due to the need for scaffolding and the weld being painted with thick green paint. The inspectors questioned the status of NDE on SPHRC103-3. PPL wrote CR 2014-19089 and on June 7, 2014, NDE was performed on SPHRC103-3. When inspectors questioned if

liquid penetrant surface exam NDE methods were appropriate for identification of fatigue cracking, PPL wrote CR 2014-19988 and determined it was not appropriate since fatigue cracking would occur on the inner diameter of the piping which would not be detected by liquid penetrant exams.

PPL initiated CR 2014-20129 to document this issue and performed a POD to address the current operability of the system and potential unanalyzed failure modes. The POD assessed the effects on the Ultimate Heat Sink (UHS), ESW, and the surrounding areas in the RHR pump rooms where the welds are located and determined ESW and the UHS would remain operable in the event of a weld failure. Two compensatory actions were initiated under this POD: 1) do not unnecessarily operate RHRSW without ESW in operation; and, 2) any time RHRSW or ESW is placed in service, the ESW crosstie lines to 1C, 1D, 2C, and 2D RHR motor oil coolers shall be walked down at least once per shift and within 12 hours after securing the last RHRSW pump to confirm no leakage.

On June 19, 2014, additional data on the ESW supply line to the 1C RHR pump motor oil cooler was obtained to support the ESW vibration POD under AR 2014-20505. The evaluation of the data resulted in carbon steel pipe stresses which exceed the code allowable fatigue stresses identified in the ASME Boiler Pressure Vessel Code, Section III, 1971 Edition and ASME OM-S/G-2003, Standards and Guides for Operation and Maintenance of Nuclear Power Plants. The conclusion of this evaluation recommended that the condition be corrected in an expedient manner. However, PPL's evaluation conducted in CR-2014-20129 concluded that the ESW and RHR systems will perform their required safety functions and compensatory measures are in place to limit and monitor the pipe vibration; therefore, the inspectors determined that the noncompliance does not present an immediate safety concern.

Analysis. The inspectors determined that the failure to take measures to promptly correct an identified condition adverse to quality associated with the ESW supply lines to the 1C, 1D, 2C, and 2D RHR pump motor oil coolers was a performance deficiency within PPL's ability to foresee and correct. The inspectors determined that the performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Additionally, it was similar to example 4.a in IMC 0612 Appendix E, "Examples of Minor Issues," in that PPL had several opportunities to perform engineering evaluations on this condition and later evaluation determined that safety-related equipment was adversely affected. Specifically, no engineering evaluations were performed from 2009 through 2012, and post-2012 engineering evaluations did not fully bound the condition. Analysis performed after NRC identification resulted in additional evaluation and compensatory actions being implemented under CR 2014-20129.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," inspectors determined this performance deficiency affected the Mitigating Systems Cornerstone. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) since question A.1 was answered 'Yes' because the deficiency only

affected the qualification of the ESW and RHR systems, but the ESW and RHR systems maintained operability.

The inspectors determined that this finding had a human performance cross-cutting aspect related to Conservative Bias because PPL failed to use decision making-practices that emphasized prudent choices over those that are simply allowable. Specifically, PPL was relying on a leak-before-break assumption to support the continued operability of the safety related piping to the RHR pump motor oil coolers without sufficient priority to correct the condition adverse to quality. [H.14]

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, measures shall be established to assure that conditions adverse to quality, such as deficiencies and nonconformances are promptly identified and corrected. Contrary to the above, since April 30, 2009, PPL had not established measures to assure a condition adverse to quality had been corrected. Specifically, PPL had not taken measures to eliminate pipe vibration and water hammer that are causing fatigue stress in the ESW supply lines to the 1C, 1D, 2C, and 2D RHR pump motor oil coolers during various system alignments. PPL entered these conditions into their CAP as CR-2014-20129 and is continuing to evaluate corrective actions. Based on PPL's evaluation conducted in CR-2014-20129, that the ESW and RHR systems will perform their required safety functions and compensatory measures are in place to limit and monitor the pipe vibration, the inspectors determined that the noncompliance does not present an immediate safety concern. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the PPL's CAP as CR-2014-21114. **(NCV 05000387;388/2014009-03, Failure to Correct Condition Adverse to Quality Related to Fatigue Stress in ESW Supply Lines to RHR Pump Motor Oil Cooler)**

(4) Failure to Take Action to Restore Degraded Emergency Action Level (EAL) Scheme

Introduction. The inspectors identified a Green cited violation of 10 CFR 50.54(q)(2) for PPL's failure to follow and maintain an emergency plan that meets the requirements of the planning standards in 10 CFR 50.47(b), in that, since October 2003, PPL did not follow and maintain a standard emergency classification and action level scheme. Specifically, PPL did not take timely corrective actions to provide an adequate means to measure temperature in nine out of 21 areas, where reactor building temperatures are considered for the fission product barrier degradation emergency action levels (EALs). As a result, this deficiency adversely affected PPL's ability to classify an emergency such that a Site Area Emergency would be declared in a degraded manner.

Description. In 2012, during a review of Operating Experience (OE) related to inadequate instrumentation to support EAL declarations, inspectors questioned whether installed instrumentation to measure reactor building temperatures was required to support entry into the fission product barrier EAL. Specifically, 9 of the 21 areas that are considered PPL EALs for "Potential Loss of RCS Barrier" and "Loss of Primary Containment Barrier" do not have installed temperature indicators to determine if those areas exceed maximum normal and maximum safe temperature limits. Absent installed temperature instrumentation, operator action is required to measure temperature locally. PPL stated that this was consistent with industry practice and consistent with assumptions made during PPL's transition from the NUREG-0654 EAL scheme to the NEI 99-01, Revision 4 EAL scheme in 2003. Specifically, PPL asserted that the table

was taken directly from PPL's Emergency Operating Procedures (EOPs) and it was recognized that not all EOP criteria have installed instrumentation. For the areas that do not have installed temperature indication, PPL staff stated that they would rely on local temperatures taken manually by operators. The inspectors disagreed with this approach and opened URI 05000387;388/2012002-03: "Installed Instrumentation Necessary for EAL Declaration" in 2012 to include further review and consultation with the Office of Nuclear Security and Incident Response (NSIR).

Upon further review, in a July 2013 discussion with PPL, NSIR disagreed with PPL's approach to rely on local temperature readings taken by operators. NSIR stated that PPL's method was not acceptable to meet the intent of the EAL and would not allow for a timely assessment and classification or declaration. The lack of installed temperature indication had the potential to impact declaration of all four emergency classifications, however; due to the redundancy within the fission product barrier matrix, the inspectors determined that it was reasonable that a General Emergency would be declared in a timely manner. The inspectors determined that the lack of installed instrumentation could result in untimely declarations of a Site Area Emergency, Alert, or Unusual Event. This would result in these classifications being declared in a degraded manner. The inspectors documented NCV 05000387; 388/2013005-04, Inadequate Instrumentation to Implement EALs for Fission Product Barrier Degradation in 2013 to close the URI. This violation was treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy and PPL entered this issue into their CAP as CR 1727229 and CR 2014-05421.

During the biennial Problem Identification and Resolution inspection, the inspectors selected NCV 05000387;388/2013005-04 for follow up review and determined that the evaluation performed to determine a need for compensatory measures due to the lack of temperature indication in response to CR 1727229 was deficient. Specifically, the evaluation stated that the current approach had been submitted to the NRC and had been reviewed and approved at the time that the conversion to NEI EAL's was implemented. In addition, PPL asserted that the current approach provides a more thorough evaluation of possible primary system leakage than would be possible if only those areas with installed temperature indication had been included in the EAL scheme/table. As a result, PPL concluded there was no need to implement interim compensatory measures for those areas of the plant that do not have installed temperature indication and are considered for EAL entry.

PPL's conclusion is directly contradicted by the previous conclusions of the inspectors who, working in consultation with agency experts in NSIR, determined in inspection report 2013005 that the EAL scheme as written was not sufficient to provide timely emergency declarations, as described in the NCV. Despite PPL's documented continued disagreement with the inspectors' conclusions, the evaluation for CR 1727229 listed three enhancements for their response method: (1) development of an "Operations Hot Box" with added information on the use of heat guns to assess potentially elevated area temperatures; (2) incorporation of this information into plant operating procedures; and (3) obtain additional heat guns to be maintained in select plant areas to facilitate measurements. None of these enhancements were complete at the time of the biennial Problem Identification and Resolution inspection in June 2014.

Permanent proposed corrective actions for this issue include changing PPL's EAL scheme to NEI 99-01 Revision 6, which is subject to NRC review and approval and is projected to be completed in December 2015, nearly 4 years from the time of initial issue

identification. These permanent actions and the causal evaluation which supports them were still waiting for corrective action review board (CARB) approval at the time of the inspection.

The violation is being cited because PPL has failed to restore compliance or demonstrate objective evidence of plans to restore compliance at the first opportunity and in a reasonable period of time following discussion in a formal exit meeting on January 24, 2014 and documented in NRC Inspection Report 05000387;388/2013005 on February 14, 2014.

Analysis. The inspectors determined that PPL did not take timely and effective corrective actions by not providing an adequate means to measure reactor building temperatures, which are required to support entry into the fission product barrier matrix and to make emergency classifications. The inspectors determined that this issue was reasonably within PPL's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency is more than minor because it is associated with the Facilities and Equipment attribute of the emergency preparedness cornerstone, and adversely affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the continuing lack of installed temperature instrumentation or any other compensatory measures and the reliance on personnel dispatched to take temperature readings were insufficient to ensure a timely and accurate EAL declaration could be made.

Using IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process", issued February 24, 2012, section 5.4, the finding is of very low safety significance (Green) because the finding was determined to be an example of an ineffective EAL initiating condition, such that a Site Area Emergency would be declared in a degraded manner.

The inspectors determined that the cause of the finding had a cross cutting aspect in problem identification and resolution because PPL did not take corrective actions in a timely manner nor did they take appropriate interim corrective actions to mitigate the issues while more fundamental causes were being assessed. Specifically, PPL had no corrective actions planned or taken to address the degraded EALs until NRC approval of their new EAL scheme that was scheduled to be implemented no earlier than December 2015. [P.3]

Enforcement. 10 CFR 50.54(q)(2) states, in part, that a licensee shall follow and maintain the effectiveness of an emergency plan that meets the requirements in Appendix E to this Part and, for power reactor licensees, the planning standards in 10 CFR 50.47(b). 10 CFR 50.47(b)(4) requires, in part, that a standard emergency classification and action level scheme is in use by the licensee, the bases of which include facility system and effluent parameters. Contrary to the above, since October 2003, PPL did not follow and maintain a standard emergency classification and action level scheme. Specifically, PPL did not take timely corrective actions to provide an adequate means to measure temperature in nine out of 21 areas, where reactor building temperature is considered for the fission product barrier degradation and is used for emergency classification. As a result, this deficiency adversely affected PPL's ability to classify an emergency such that a Site Area Emergency would be declared in a degraded manner.

PPL's corrective actions to correct this deficiency will not be complete until PPL implements NEI 99-01 Revision 6, which is subject to NRC review and approval and is projected to be completed in December 2015, nearly 4 years from the time of initial issue identification and nearly twelve years since the issue first existed.

Because PPL failed to restore compliance with NRC requirements within a reasonable time after the issue was discussed in a formal exit meeting on January 24, 2014 and documented in NRC Inspection Report 05000387;388/2013005 on February 14, 2014, this violation is being treated as a cited violation, consistent with the NRC Enforcement Policy, Section 2.3.2, which states, in part, that a cited violation will be considered if the licensee fails to restore compliance within a reasonable time after a violation is identified. This is a violation of 10 CFR 50.54(q)(2) and 10 CFR 50.47(b)(4). A Notice of Violation is attached. **(NOV 05000387;388/2014009-04, Failure to Take Action to Restore Degraded Emergency Action Level Scheme).**

.2 Assessment of the Use of Operating Experience

a. Inspection Scope

The inspectors reviewed a sample of CRs associated with review of industry operating experience to determine whether PPL appropriately evaluated the operating experience information for applicability to Susquehanna 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 PPL adequately considered the underlying problems associated with the issues for resolution via their CAP. 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 for the sample of issues reviewed, PPL 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 NRC has previously documented examples of weaknesses in the use of operating experience over the two year period of review such as:

1. Failure to Verify Adequacy Design of Molded Case Circuit Breakers (MCCB). In IR 2013010-01, the NRC identified a Green finding involving an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," in that, PPL failed to verify or check the adequacy of design of MCCBs as described in NRC Information Notice (IN) 93-64, "Periodic Testing and Preventive Maintenance of Molded Case Circuit Breakers." The NRC issued this IN to alert the licensees to the problem of age-related degradation of molded case circuit breakers and to provide sources of information on MCCB periodic testing and preventive maintenance. (NCV 2013010-01)

2. Inadequate Procedure to Control Reactor Coolant Heatup Rate. In IR 2013003, the NRC documented a Green, self-revealing NCV of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, that procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, the inspectors determined that PPL's RHR shutdown cooling procedure failed to ensure that water properties (pressure and temperature) in the suction piping were controlled to ensure a water hammer event would not happen when establishing a low pressure injection lineup. As a result, a water hammer occurred in the piping and caused the suction relief valve to fail open. Similar issues were discussed in NRC IN 2010-11, "Potential for Steam Voiding Causing Residual Heat Removal System Inoperability." PPL reviewed the IN under CR 1274633 and determined that OP-249-002 adequately addressed the concerns discussed in the IN. Inspectors determined that the recommendations in the IN had not been adequately incorporated into the OP-249-002 and that PPL's review of the operating experience was inadequate. (NCV 2013004-04)
3. Reactor Scram due to Loss of Integrated Control System (ICS). In IR 2013011, a Green self-revealing finding was documented for the failure to evaluate operating experience for the ICS when Unit 2 lost control of reactor vessel level on November 9, 2012, requiring insertion of a manual scram. The cause of the loss of level control was the lockup of one of the two ICS network switches due to a data storm, a condition which had been described in various OE communications from April 2007 through September 2012. (NCV 2013011-01)

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 CAP, departmental self-assessments, and assessments performed by independent organizations. Inspectors performed these reviews to determine if PPL entered problems identified through these assessments into the CAP, when appropriate, and whether PPL 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 PPL assessments were adequate, critical, and effective in identifying issues. The inspectors observed that personnel knowledgeable in the subject usually completed these audits and self-assessments in a methodical manner. PPL completed these audits and self-assessments to a sufficient depth to identify issues which were then entered into the corrective action program for evaluation.

The NRC has previously documented examples of weaknesses in the performance of self-assessments and audits such as:

1. Inadequate Procedure Guidance for Flooding in Emergency Core Cooling System (ECCS) Room. In IR 2013005, the NRC identified a Green NCV of TS 5.4.1, "Procedures," because PPL's procedures EO-000-104, "Secondary Containment Control" and ON-169-002, "Flooding in the Reactor Building," were inadequate in that actions directed in the procedures could complicate an internal flooding event and may adversely affect aspects of PPL's flood design. Specifically, the procedures directed operators to enter a potentially flooded room to assess the extent and source of the flooding; an action which could render multiple trains of ECCS inoperable due to communicating two watertight rooms. Despite PPL's process requiring periodic verification that event driven procedures are technically and functionally correct, the periodic review completed in April 2013 failed to identify that actions specified in the procedure could invalidate the flood design. (NCV 2013005-01)

c. Findings

No findings were identified.

.4 Assessment of Safety Conscious Work Environment

a. Inspection Scope

The inspectors interviewed individuals from the Operations, Maintenance, Security, Engineering, Radiation Protection, Chemistry, and Nuclear Oversight departments, via individual interviews, to evaluate their willingness to raise nuclear safety issues. Specifically, the inspectors interviewed personnel to determine whether they were hesitant to raise safety concerns to their management and/or the NRC. The inspectors selected the individuals randomly based on availability from the various departments on site. The inspectors also interviewed the station Employee Concerns Program coordinators and the General Work Environment 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 the Employee Concerns Program files to ensure that PPL entered issues into the CAP when appropriate. For this inspection area in particular, the inspectors ensured the PI&R inspection scope did not overlap the upcoming 95002 inspection at Susquehanna, scheduled for July 2014. This limited review of safety culture was performed in accordance with Inspection Procedure 71152 requirements.

b. Assessment

During the limited interviews conducted, PPL 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 Employee Concerns Program. Based on these limited 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 June 20, 2014, the inspectors presented the inspection results to Mr. Jon Franke, Site Vice President and other members of the Susquehanna 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

A. Jardine, Operations Director
P. O'Malley, Nuclear Oversight Manager
D. Deretz, Manager of Programs Engineering
S. Yaros, General Work Environment Coordinator
I. Missien, Supply Chain
T. Case, Engineering
D. Crispell, Employee Concerns
R. Hoffert, Employee Concerns
P. Brady, Design Engineering
R. Brown, Operations Discipline Scheduler
W. Demler, Operations Discipline Scheduler
D. Fries, Supervisor Security Programs
K. Klass, Emergency Operating Procedure Coordinator
K. Kluk, Maintenance Rule Coordinator
M. Radvansky, Design Engineering
M. Robinson, System Engineer
M. Ryberg, Operations Engineering Support
M. Thorpe-Kavanaugh, Nuclear Oversight Operations Assessor
T. Walters, System Engineer
S. Peterkin, Radiation Protection
K. Kluk, Maintenance Rule Coordinator
T. Turner, Maintenance
J. Rodriguez, Work Week Manager
S. Sienkiewicz, PNC Supervisor (Engineering)
A. Kuklis, System Engineer
M. Hanover, Design Engineer
M. Dziedzic, Level III ISI
R. Specht, Level II ISI
S. Muntzenberger, Engineering
F. Habib, Piping Corrosion Program

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened and Closed

05000387;388/2014009-01	NCV	Inadequate Corrective Actions for Degraded ESW and RHRSW Piping (4OA2.1.c)
05000387;388/2014009-02	NCV	Failure to Conduct Timely Initial Operability Determinations (4OA2.1.c)
05000387;388/2014009-03	NCV	Failure to Correct Condition Adverse to Quality Related to Fatigue Stress in ESW Supply Lines to RHR Pump Motor Oil Cooler (4OA2.1.c)

Opened

05000387;388/2014009-04	NOV	Failure to Take Action to Restore Degraded Emergency Action Level Scheme (4OA2.1.c)
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LIST OF DOCUMENTS REVIEWED

Section 40A2: Problem Identification and Resolution

Audits and Self-Assessments

Self-Assessment 1704822, Prep for 2013 NRC EP Program Inspection
 Self-Assessment 1339438, NRC/FEMA Readiness Self-Assessment
 2013-04299, Pre-PIR Focused Self-Assessment, February 2014
 AR 1344373, 2012 Security and Fitness for Duty/Access Authorization Audit
 NOS Audit 1519921, Operations Audit Report
 AR-1519828, "2013 Radiation Protection / Solid Radwaste Audit Tracking"
 AR-1669634, "Review of Hope Creek Radiation Protection Procedures Use and Revision Frequency."
 AR-1705918, "Perform a Focused Self-Assessment of the HP CAP related to proper closure of corrective actions. Actions to meet the requirements of CRA1434446 reads as follows:
 Conduct a focused self-assessment as part of the effectiveness review of implementation of CAP in HP."
 ACT-06-CR-2013-04801 / DI-2014-03405, "Duane Arnold Maintenance Benchmark"
 Self-Assessment Number NCE-01-02, Configuration Management of ESSW Pumphouse area 55, July 1 – 11, 2001
 Duane Arnold Maintenance Benchmark, ACT-06-CR-2013-04801/DI-2014-03405, Report Date April 9, 2014
 Maintenance Performance Assessment Report Rev 6, 1st Quarter 2014 dated April 7, 2014
 First Quarter 2014 Performance Assessment Report, PPL Susquehanna Station, dated April 29, 2014

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

ACT 1383037	CR 1605366	CR 1662640
ACT 1593322	CR 1610982	CR 1664318
ACT 1599412	CR 1614207	CR 1664390
ACT 1708885	CR 1616448	CR 1664721
CR 1140371	CR 1616456	CR 1666158
CR 1140829	CR 1616525	CR 1667817
CR 1496655	CR 1616535	CR 1668524
CR 1532763	CR 1628452	CR 1668529
CR 1538286	CR 1628452	CR 1669664
CR 1541882	CR 1634113	CR 1670117
CR 1541904	CR 1638800	CR 1671968
CR 1541932	CR 1641555	CR 1675741
CR 1542115	CR 1641556	CR 1675885
CR 1543454	CR 1642297	CR 1676150
CR 1562326	CR 1643158	CR 1681032
CR 1563884	CR 1643229	CR 1681578
CR 1578871	CR 1647145	CR 1700407
CR 1590009	CR 1648380	CR 1703293
CR 1596633	CR 1648380	CR 1704034
CR 1602339	CR 1659720	CR 1704558
CR 1604926	CR 1661848	CR 1717212

CR 1717214	CR 2014-04128	CR 2014-18685*
CR 1719605	CR 2014-04334	CR 2014-18687*
CR 1721928	CR 2014-04427	CR 2014-18803*
CR 1721929	CR 2014-05280	CR 2014-18804*
CR 1723620	CR 2014-05285	CR 2014-18806*
CR 1731212	CR 2014-05421	CR 2014-18863*
CR 1734446	CR 2014-06074	CR 2014-18932
CR 1736823	CR 2014-06257	CR 2014-18932*
CR 1738906	CR 2014-06356	CR 2014-18945
CR 1739098	CR 2014-06455	CR 2014-18945*
CR 1739135	CR 2014-06949	CR 2014-19008*
CR 1743680	CR 2014-06956	CR 2014-19076*
CR 1745775	CR 2014-07916	CR 2014-19086*
CR 1748386	CR 2014-08307	CR 2014-19089*
CR 1750661	CR 2014-09041	CR 2014-19090
CR 1753485	CR 2014-09386	CR 2014-19105*
CR 2013-01857	CR 2014-09947	CR 2014-19403*
CR 2013-02357	CR 2014-09955	CR 2014-19762
CR 2013-02519	CR 2014-10017	CR 2014-19981*
CR 2013-03323	CR 2014-10859	CR 2014-19988*
CR 2013-03327	CR 2014-12699	CR 2014-19991*
CR 2013-04008	CR 2014-13427	CR 2014-20057*
CR 2013-04827	CR 2014-13566	CR 2014-20129*
CR 2013-07306	CR 2014-14655	CR 2014-20218*
CR 2013-07307	CR 2014-15985	CR1140944
CR 2014-03561	CR 2014-17950	DI 1675582
CR 2014-03562	CR 2014-17998	DI 2013-02355
CR 2014-03720	CR 2014-18004	DI 2014-09963
CR 2014-03750	CR 2014-18679*	DI 2014-10022

Drawings

E106216, Common P&ID Emergency Service Water, Sheet 1, Revision 50
 E106216, Common P&ID Emergency Service Water, Sheet 4, Revision 4
 E106216, Unit 1 P&ID Emergency Service Water System A Loop, Sheet 2, Revision 53
 E106216, Unit 1 P&ID Emergency Service Water System B Loop, Sheet 3, Revision 23
 E106255, M-150, Revision 34, RCIC Turbine - Pump
 E162640, Unit 2 P&ID Emergency Service Water System A Loop, Sheet 1, Revision 45
 E162640, Unit 2 P&ID Emergency Service Water System B Loop, Sheet 2, Revision 7
 M-112 P&ID RHRSW Revision 52
 M-2112 P&ID RHRSW Revision 29

Operating Experience

NRC IN 2013-14, Potential Design Deficiency in Motor Operated Valve Control Circuitry
 Part 21 No. 2014-19-00
 CR-1742444, CR-1200895

Non-Cited Violations and Findings

NCV 2013004-03, Inadequate and Untimely Actions to Address a Failed Instrument Necessary for Diagnosis of Emergency Conditions
 NCV 2012005-03, Failure of Full-Scale Drill Critique to Identify an RSPS Weakness
 NCV 2013005-04, Inadequate Instrumentation to Implement EALs for Fission Product Barrier Degradation
 NCV 2013003-01, Inadequate Operability Assessment of Synchroscope Switch
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LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
ATWS	Anticipated Transient without Scram
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CFR	Code of Federal Regulations
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedures
EP	Emergency Preparedness
EPG	Emergency Procedure Guidelines
ESW	Emergency Service Water
FMEA	Failure Modes and Effects Analysis
FW	Feedwater
ICS	Integrated Control System
IMC	Inspection Manual Chapter
MCCB	Molded Case Circuit Breakers
MRC	Management Review Committee
MREP	Maintenance Rule Evaluation Panel
MRFF	Maintenance Rule Functional Failure
NCV	Non-cited Violation
NDE	Non-destructive examination
NRC	Nuclear Regulatory Commission
NSIR	Office of Nuclear Security and Incident Response
OE	Operating Experience
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PPL	PPL Susquehanna, LLC
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RSPS	Risk Significant Planning Standard
SDP	Significance Determination Process
TCV	Turbine Control Valve
TS	Technical Specifications
URI	Unresolved Item