



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

February 13, 2013

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard, NUCSB3
Berwick, PA 18603

**SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC INTEGRATED
INSPECTION REPORT 05000387/2012005 AND 05000388/2012005**

Dear Mr. Rausch:

On December 31, 2012, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station (SSES) Units 1 and 2. The enclosed inspection report (IR) presents the inspection results, which were discussed on January 25, 2013, with you and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC identified findings and one self-revealing finding of very low safety significance (Green). Additionally, NRC inspectors identified two traditional enforcement Severity Level IV violations. These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because all the violations are entered into your correction action program (CAP), the NRC is treating the findings as a non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC's Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this IR, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station. In addition, if you disagree with the cross-cutting aspect of any finding in this report, you should provide a response within 30 days of the date of this IR, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspectors at the SSES.

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 Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosures: Inspection Report 05000387/2012005 and 05000388/2012005
w/Attachment: Supplemental Information

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U.S NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-387, 50-388

License No: NPF-14, NPF-22

Report No: 05000387/2012005 and 05000388/2012005

Licensee: PPL Susquehanna, LLC (PPL)

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: October 1, 2012 through December 31, 2012

Inspectors: P. Finney, Senior Resident Inspector
J. Greives, Resident Inspector
R. Edwards, Acting Resident Inspector
A. Rosebrook, Senior Project Engineer
J. Richmond, Senior Reactor Inspector
J. Furia, Senior Health Physicist
J. Caruso, Senior Operations Engineer
A. Bolger, Reactor Engineer
R. Rolph, Health Physicist
C. Lally, Operations Engineer

Approved By: Mel Gray, Chief
Reactor Projects Branch 4
Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY OF FINDINGS	3
REPORT DETAILS	6
1. REACTOR SAFETY	6
1R01 Adverse Weather Protection	6
1R04 Equipment Alignment	7
1R05 Fire Protection	8
1R11 Licensed Operator Requalification Program	10
1R12 Maintenance Effectiveness	11
1R13 Maintenance Risk Assessments and Emergent Work Control	16
1R15 Operability Determinations and Functionality Assessments	17
1R19 Post-Maintenance Testing	18
1R20 Refueling and Other Outage Activities	18
1R22 Surveillance Testing	20
1EP6 Drill Evaluation	20
2. RADIATION SAFETY	23
2RS6 Radioactive Gaseous and Liquid Effluent Treatment	23
2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation	28
4. OTHER ACTIVITIES	30
4OA1 Performance Indicator Verification	30
4OA2 Problem Identification and Resolution	32
4OA3 Follow-up of Events and Notices of Enforcement Discretion	47
4OA5 Other Activities	51
4OA6 Meetings, Including Exit	54
4OA7 Licensee-Identified Violations	54
ATTACHMENT: SUPPLEMENTAL INFORMATION	54
SUPPLEMENTAL INFORMATION	A-1
KEY POINTS OF CONTACT	A-1
LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED	A-2
LIST OF DOCUMENTS REVIEWED	A-3
LIST OF ACRONYMS	A-13

SUMMARY OF FINDINGS

IR 05000387/2012005, 05000388/2012005 10/01/2012 – 12/31/2012; Susquehanna Steam Electric Station, Units 1 and 2; Maintenance Effectiveness, Drill Evaluation, Problem Identification and Resolution, Follow-up of Events and Notices of Enforcement Discretion.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified two Severity Level IV non-cited violations (NCVs) and three NCVs of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated June 7, 2012. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

Cornerstone: Initiating Events

- Green. A self-revealing Green NCV of 10 CFR 50 Appendix B, Criteria III, "Design Control," was identified related to a leak on the Unit 1 'A' reactor recirculation pump suction line decontamination flange weld. Specifically, PPL personnel used an incorrect value for stress intensification factor in the vibration analysis in 2004 to support an extended power uprate (EPU). When the correct stress intensification factor was applied, American Society of Mechanical Engineers (ASME) OM-3 code limits for endurance and fatigue stress were exceeded. The weld failure resulted in pressure boundary leakage in excess of TS 3.4.4 limits from approximately June 16 through 19, 2012. PPL staff entered the problem in the PPL corrective action program (CAP) as CR 1589390, repaired and modified the flange line, and revised the calculation.

The inspectors reviewed the performance deficiency using NRC IMC 0612, Appendix B, "Issue Screening," and determined to be more than minor because it affected the Initiating Events cornerstone attribute of design control. The issue adversely affected the associated cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated using Section A of IMC 609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." Since the finding result could not have reasonably exceeded the leak rate for a small loss of coolant accident (LOCA) and did not likely affect other systems used to mitigate a LOCA resulting in a total loss of their function (e.g., inter-facing system LOCA), the finding screened to very low safety significance (Green). This finding was determined to not be indicative of current performance because the deficiency occurred in 2004 and procedures and training are in place that would have precluded the issue. Therefore, no cross-cutting aspect is assigned. (Section 4OA2)

Cornerstone: Mitigating Systems

- Green. Inspectors identified a Green NCV of 10 CFR 50.65(a)(2) for PPL staff not demonstrating that the performance of the Unit 2 125 volt direct-current (VDC) system was being effectively controlled through appropriate preventive maintenance. Specifically, PPL did not properly classify a functional failure of the Unit 2 125 VDC system on November 23, 2011 as maintenance preventable until prompted by questions from the inspectors. Consequently, PPL staff declared the functional failure as maintenance preventable, determined a maintenance rule performance criteria was exceeded and moved the Unit 2 125 VDC system from a(2) to (a)(1) status in order to establish goals and monitoring as required by 10 CFR 50.65. PPL staff entered this issue in their CAP as CRs 1496655 and 1643158.

This finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, this finding was similar to example 7.d of IMC 0612, Appendix E. Using Section A of Exhibit 2 of NRC IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," inspectors determined this finding was of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more non-TS 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 cross-cutting aspect in the area of Problem Identification and Resolution (PI&R), CAP, because 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. The inspectors determined that PPL staff not thoroughly evaluating the maintenance preventable aspects of a functional failure was due to the CAP process evaluation not fully addressing the cause such that appropriate classification under the maintenance rule could be made [P.1(c)] (Section 1R12).

Cornerstone: Emergency Preparedness

- Green. Inspectors 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 personnel did not identify an Emergency Response Organization (ERO) performance weakness associated with an untimely notification of an emergency declaration during their critique following the full-scale emergency preparedness (EP) drill. In the case of ERO performance, simulator equipment issues prevented the ability of drill controllers to satisfactorily evaluate performance of the ERO and PPL staff did not identify that all off-site response organizations (OROs) were not notified within fifteen minutes. The critique deficiency was entered into PPL's CAP as CR 1648380.

The finding is more than minor because it is associated with the ERO attribute of the Emergency Preparedness cornerstone and affected the cornerstone objective to ensure that PPL staff are capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors assessed the issue, related to the failure to make a timely notification to the OROs, using NRC IMC 0609 Appendix B, "Emergency Preparedness Significance Determination Process." PPL's drill critique not identifying the untimely notification met the NRC's definition of a weakness in a

full-scale drill. However, because of the unique nature of the equipment failures associated with the notification of the first ORO, inspectors determined that the failure to critique the drill weakness only constituted a degradation of the planning standard (PS) function. Therefore the finding is characterized as very low safety significance (Green). The finding is related to the cross-cutting area of PI&R, CAP, in that PPL staff did not identify a risk significant planning standard (RSPS) performance issue completely, accurately, and in a timely manner commensurate with the safety significance. Specifically, during the critique of the full-scale drill conducted on October 14, 2012, PPL staff did not recognize and critique that an RSPS was not met and did not place this issue into the CAP until prompted by inspectors. [P.1(a)] (Section 1EP6)

Cornerstone: Miscellaneous

- Severity Level IV. Inspectors identified a SL IV NCV of 10 CFR 50.73 (a)(2)(vii) for PPL's failure to submit a licensee event report (LER) of a common cause inoperability of two independent trains of reactor protection system (RPS) electrical power monitoring associated with several Unit 1 RPS breakers on May 8, 2012. PPL staff entered the issue into the CAP as CR 1663785 and took action to issue the required LER.

This finding was evaluated using the traditional enforcement process because the failure to accurately report events has the potential to impact or impede the regulatory process. The finding was determined to be a Severity Level IV violation based on example 6.9.d.9 of the NRC Enforcement Policy. This example states that a licensee failing to make a report required by 10 CFR 50.72 or 10 CFR 50.73 is an example of a Severity Level IV violation. Because this violation involves the traditional enforcement process and does not have an underlying technical violation that would be considered more-than-minor, inspectors did not assign a cross-cutting aspect to this violation in accordance with IMC 0612, Appendix B. (Section 1R12)

- Severity Level IV. The inspectors identified a SL IV NCV of 10 CFR 50.72(b)(3)(iv)(A) and (B) when PPL operators did not report a valid actuation of the Unit 2 RPS on November 9, 2012 within eight hours of occurrence as required. The concern was entered into PPL's CAP as CR 1643096 and an Emergency Notification System (ENS) report was submitted restoring compliance.

This finding was evaluated using the traditional enforcement process because the failure to accurately report events has the potential to impact or impede the regulatory process. The finding was determined to be a Severity Level IV violation based on example 6.9.d.9 of the NRC Enforcement Policy. This example states that a licensee failing to make a report required by 10 CFR 50.72 or 10 CFR 50.73 is an example of a Severity Level IV violation. Because this violation involves the traditional enforcement process and does not have an underlying technical violation that would be considered more-than-minor, inspectors did not assign a cross-cutting aspect to this violation in accordance with IMC 0612, Appendix B. (Section 4OA3)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at or near 100 percent power. On October 2, 2012, operators reduced Unit 1 to 85 percent power to address potential problems with some low pressure (LP) turbine blades consistent with their adverse condition monitoring plan (ACMP). On October 6, Unit 1 was further reduced to 65 percent power in accordance with the ACMP. On October 8, the ACMP supported a Unit 1 power increase to 75 percent. Unit 1 was shut down from 75 percent power on October 19 and reached Mode 4 the following day in support of a maintenance outage for the LP turbine blades. A reactor startup commenced on November 6, and Unit 1 reached 100 percent power on November 12. Operators reduced Unit 1 power to 70 percent power on December 7, for a control rod sequence exchange and scram time testing. Unit 1 returned to 100 percent power on December 9. On December 14, operators reduced Unit 1 power to approximately 79 percent power in response to entry into TS 3.0.3, for problems with both control room chilling units. After restoring a control room chiller, operators restored Unit 1 to 100 percent later that day and remained at 100 percent for the remainder of the inspection period.

Unit 2 began the inspection period at or near 100 percent power. On October 2, operators reduced Unit 2 to 85 percent power to address potential problems with some low pressure (LP) turbine blades consistent with their ACMP. On October 6, Unit 2 was further reduced to 65 percent power in accordance with the ACMP to mitigate potential degradation of LP turbine blades in accordance with the ACMP. On October 8, the ACMP supported a Unit 2 power increase to 75 percent. On November 9, operators manually scrammed Unit 2 due to a failure of the integrated control system (ICS). Unit 2 remained shutdown for a maintenance outage on LP turbine blades and reached Mode 4 on November 11. On November 18, operators commenced a Unit 2 reactor startup. On November 19, operators placed the Unit 2 main turbine on the grid, but commenced a reactor shutdown due to an electro-hydraulic control (EHC) fluid leak on a main turbine bypass valve. Unit 2 reached Mode 4 on November 21. Operators commenced a Unit 2 reactor startup on November 25, and reached approximately 10 percent power when another EHC leak was identified. Operators shutdown Unit 2 and reached Mode 4 on November 26. Operators commenced a Unit 2 reactor startup on November 28, and reached 100 percent power on December 3. On December 14, operators reduced Unit 2 to approximately 79 percent power in response to entry into TS 3.0.3 for problems with both control room chilling units. After restoring a control room chiller, operators restored Unit 2 to 100 percent later that day. On December 16, an automatic reactor scram occurred during testing of the main turbine control valves and Unit 2 entered Mode 3. On December 18, operators commenced a Unit 2 reactor startup. On December 19, Unit 2 automatically scrammed at approximately 18 percent power during a feedwater system mode shift. Operators commenced a Unit 2 reactor startup on December 26, and reached approximately 90 percent power at the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Imminent Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PPL's preparations in advance of and during warnings and advisories issued by the National Weather Service. The inspectors performed walkdowns of areas that could be potentially impacted by the weather conditions, such as the emergency and station blackout (SBO) diesel generators (DGs), station transformers, and switchyards, and verified that station personnel secured loose materials staged for outside work prior to the forecasted weather. The inspectors verified that PPL staff monitored the approach of adverse weather according to applicable procedures and took appropriate actions as required. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TSs) control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PPL personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PPL's seasonal weather preparation procedure and applicable operating procedures. Documents reviewed for each section of this IR are listed in the Attachment.

- Common, preparations for Hurricane Sandy

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of PPL's readiness for the onset of seasonal low temperatures. The review focused on the condensate system and the Engineering Safeguards Service Water (ESSW) pump house. The inspectors reviewed the UFSAR, TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PPL personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PPL's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this IR are listed in the Attachment.

- Common, winter preparations

b. Findings

No findings were identified.

1R04 Equipment Alignment

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

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2, Division II residual heat removal (RHR) during 'C' emergency diesel generator (EDG) inoperability
- Common, 13.8 kilovolts (kV) offsite power during startup transformer T20 outage
- Common, 'B' emergency service water (ESW)

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSS, work orders (WOs), CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PPL staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

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

a. Inspection Scope

On November 20, 2012, the inspectors performed a complete system walkdown of accessible portions of the common 'A' EDG to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication, equipment cooling, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure PPL appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q - 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PPL controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, lower relay room (Fire Zone 0-24D) on December 12, 2012
- Unit 1, lower cable spreading room, (Fire Zone 0-25E) on December 12, 2012
- Unit 2, heat exchanger and pump access area (Fire Zone 2-3A) on October 23, 2012
- Unit 2, containment access area (Fire Zone 1-4A-N, S, W) on November 9, 2012
- Unit 2, high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) pump rooms (Fire Zones 2-1C, 2-1D) on December 17, 2012

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed unannounced fire drills conducted on September 17 and October 17, 2012, which involved fires in the Unit 1 EHC room and Unit 1 Remote Shutdown room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that PPL personnel identified deficiencies, openly discussed them in a self-critical manner at debriefs, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

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

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

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 4 samples).1 Quarterly Review of Licensed Operator Requalification Testing and Traininga. Inspection Scope

The inspectors observed licensed operator requalification examinations on October 10, 2012. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures (EOPs). The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings of significance were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Rooma. Inspection Scope

The inspectors observed operator performance in the main control room during the evolutions listed below. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in PPL's Operations Section Expectations Handbook and PPL's Administrative Procedure OP-AD-004, "Operations Standards for Error and Event Prevention," Revision 25. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

- Unit 1, reactor shutdown for a maintenance outage on October 20, 2012 and subsequent startup on November 6, 2012
- Unit 2, operator response to reactor pressure vessel stratification on November 10, 2012

b. Findings

No findings were identified.

.3 Annual Review of Pass/Fail Results for Licensed Operator Requalification Examsa. Inspection Scope

On December 6, 2012, NRC region-based inspectors conducted an in-office review of results of PPL-administered annual operating tests and comprehensive written examinations for 2012. The inspection assessed whether pass rates were consistent

with the guidance of NRC IMC 0609, Appendix I, "Operator Requalification Human Performance SDP." The inspectors verified that:

- Crew pass rates were greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rates on the written examination were greater than 80 percent. (Pass rate was 95.1 percent)
- Individual pass rates on the job performance measures of the operating examination were greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rates on the dynamic simulator test were greater than 80 percent. (Pass rate was 93.4 percent)
- Overall pass rate among individuals for all portions of the examination was greater than or equal to 80 percent. (Overall pass rate was 90.2 percent)

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 5 samples)

a. Inspection Scope

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

- Unit 1, RPS electrical power monitoring assembly failures on May 8, 2012
- Unit 1, nuclear instrumentation (NI) equipment challenges during maintenance shutdown from October 20 through November 6, 2012
- Unit 2, rod position information system (RPIS) relay card failures on July 25, August 8, and August 9, 2012
- Common, ESW pinhole leaks on November 26 and November 28, 2012
- Unit 2, RCIC inverter trip while placing 125V DC system in equalize charge on November 23, 2011

b. Findings

- .1 Introduction. Inspectors 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. Specifically, PPL staff did not properly classify a functional failure of the Unit 2 125 VDC system on November 23, 2011 as maintenance preventable until prompted by questions from the inspectors.

Consequently, PPL staff declared the functional failure as maintenance preventable, determined that a maintenance rule performance criteria was exceeded and moved the Unit 2 125 VDC system from a(2) to (a)(1) status to establish goals and monitoring as required by 10 CFR 50.65.

Description. On November 23, 2011, PPL operators placed the Unit 2 'D' 125 VDC system battery charger to "equalize" as a standard maintenance practice after adding water to a battery to maintain adequate electrolyte level. Immediately after placing the battery charger in equalize, the main control room received alarms related to the Unit 2 RCIC system. In accordance with the alarm response procedure, PPL operators confirmed that the RCIC inverter was de-energized. With the RCIC inverter de-energized, there was no control power to the RCIC flow controller, and PPL operators declared the RCIC system inoperable and unavailable. PPL staff further investigated and determined that the 'D' battery charger "equalize" voltage was not within the criteria of 138 to 141 volts, as discussed in OP-202-001, "125V DC System," Section 2.4. Subsequently, the 'D' battery charger was placed to "float" and the RCIC inverter immediately reset. PPL staff determined that the RCIC inverter tripped on the high voltage setpoint during equalize charging of the 'D' battery charger. RCIC was unavailable for a total of 2 hours and 16 minutes prior to the automatic reset of the inverter.

On March 28, 2012, PPL Engineering completed the ACE (CR 1496655), which concluded that the November 23, 2011 issue was a maintenance rule function failure (MRFF) of the 125 VDC system. This function is defined in the Maintenance Rule Basis Document as the ability to energize channel 'A' of the class 1E 125 VDC system. The ACE also determined that the MRFF was not a maintenance preventable functional failure (MPFF) because adequate tasks were already in place to identify and correct setpoint drift of the RCIC inverter high voltage trip setpoint via a biennial calibration. On October 25, 2012, PPL's Maintenance Rule Expert Panel (MREP) reviewed the Unit 2 125 VDC system functional failure and agreed with the MRFF and MPFF determinations in the ACE.

The inspectors performed a review of the MRFF issue, including the ACE, the Expert Panel meeting minutes, procedures NDAP-QA-0413, "Maintenance Rule Program," and OP-202-001, "125V DC System," Unit 2 RCIC inverter calibration data history, and discussed the issue with PPL engineers and the Maintenance Rule Coordinator. PPL staff had determined that an apparent cause of the Unit 2 RCIC inverter high voltage trip was attributed to inadequate design margin between the operating range of the battery chargers and the shutdown setpoint of the RCIC inverters. The ACE indicated that when the charger is switched from "float" to "equalize," the sudden change in potential to the battery causes an initial voltage overshoot by the charger. The ACE also indicated that the RCIC system Topaz-style inverters have exhibited up to a three-volt setpoint drift decrease in the high voltage trip setpoint during routine as-found calibration testing. The inspector review of historical as-found calibration data for a sample of PPL's Topaz-style inverters found up to a six-volt setpoint decreasing drift. The inspectors determined that PPL's operating experience review for Topaz-style inverter trips as a result of placing batter chargers in equalize was appropriate, and noted that several examples were identified, including past examples at Susquehanna. Corrective action item number 4 of the ACE, which addressed the apparent cause, performed a change to the 125 VDC system procedure to perform a quarter-turn decreasing voltage adjustment of the battery charger equalizing potentiometer just prior to taking the switch from "float" to "equalize."

The inspectors noted that NDAP-QA-0413, "Maintenance Rule Program," step 7.4.2.b, contains specific guidance that MRFFs due to incorrect maintenance procedures are MPFFs.

Ultimately, the inspectors determined that the ACE's apparent cause incorrectly described the failure as inadequate design margin with respect to the operating voltage range of the battery chargers. Despite this, the inspectors concluded that the corrective actions were appropriate. Specifically, revising the system procedural steps for placing the battery on an equalizing charge, during a maintenance activity, ensured the equipment was maintained and operated within the low design margin. The inspectors determined that had the apparent cause been more accurately described, the evaluator could have reasonably concluded that the MRFF was maintenance preventable, or the MREP would have had sufficient information to challenge the MRFF classification.

The inspectors questioned PPL staff regarding the determination documented in the ACE and confirmed by October 25, 2012 MREP, that the 125 VDC system functional failure was not maintenance preventable. Specifically, the inspectors questioned whether the November 23, 2011 action to place the Unit 2 'D' battery charger to equalize would have been considered implementation of an incorrect maintenance procedure, since the procedure was changed as a corrective action to address the apparent cause of the problem. The inspectors also questioned whether PPL's staff were performing the RCIC inverter calibration at a proper frequency to address the as-found calibration testing examples of high voltage trip setpoint drift.

On December 13, 2012, PPL staff performed a second Maintenance Rule Expert Panel review of the Unit 2 125 VDC system MRFF to consider the potential maintenance preventable aspects, as identified by the inspectors. PPL staff determined that additional changes to the 125 VDC system procedure would be appropriate, to provide guidance on promptly switching the charger from "equalize" back to "float" to promptly restore the RCIC inverter in the event of an inverter trip on high voltage, thereby minimizing the duration of any adverse impact on the RCIC system. Based on the maintenance preventable aspects associated with the Unit 2 125 VDC system steps prior to the procedure changes, PPL staff determined that the MRFF did constitute a MPFF. PPL staff determined that because the Unit 2 125 VDC system was scoped as a high safety significant system under the Maintenance Rule, the system would be moved from (a)(2) to (a)(1) per procedure NDAP-QA-0413, step 7.4.3.c. PPL staff determined that an (a)(1) action plan would be developed under the original CR. Regarding the examples of RCIC inverter as-found high voltage setpoint drift, PPL staff evaluated a broad scope of historical data and determined that there was no obvious trend of low setpoint drift. PPL staff did acknowledge that low setpoint drift could have contributed to the MRFF and created an action to obtain the as-found data in the next two-year calibration under WO 1434638 (ACE item 6). PPL staff entered these items in their CAP under CRs 1496655 and 1643158.

The inspectors noted that NDAP-QA-0413, steps 4.7.4.a and step 4.8.2.a require that MRFFs shall be presented to the Expert Panel within 60 days of the failure date. Step 7.1.4 allows for the control of extensions relative to the 60-day requirement and states that extensions are controlled to ensure that the determination of (a)(1) classification meets "timeliness requirements." The inspectors questioned PPL staff on the approximate 11-month gap between the November 23, 2011 MRFF and the October 25, 2012 initial expert panel review. PPL staff stated that this delay was attributed to a high

backlog of functional failures for expert panel review. See section 4OA2.2 of this inspection report for further discussion of this adverse trend.

Additionally, inspectors noted that NDAP-QA-0413, section 7.1.3 states that "CRs involving MRFFs shall, as a minimum, be assigned the Apparent Cause evaluation type defined in NDAP-QA-0702, "Action Request and CR Process." Section 7.2.2 of NDAP-QA-0413, which describes the requirements for processing MRFF CR evaluation reports as it applies to the Maintenance Rule, states that the responsible system engineer shall ensure that the CR evaluation report contains a "determination of whether the failure was/was not maintenance preventable" and that this "must be consistent with the cause(s) of the failure." Based on this requirement, inspectors determined that the ACE did not appropriately evaluate the issue to ensure the functional failure was classified as maintenance preventable.

Analysis. The inspectors determined that PPL staff did not demonstrate performance of the Unit 2 125 VDC system was being effectively controlled through the appropriate preventive maintenance. Specifically, PPL staff did not properly classify a functional failure of the Unit 2 125 VDC system as maintenance preventable, which when appropriately classified, required establishing goals and monitoring the Unit 2 125 VDC system in accordance with 10 CFR 50.65(a)(1). This finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that response to initiating events to prevent undesirable consequences. Additionally, this finding was similar to IMC 0612 Appendix E example 7.d. Specifically, PPL staff determined, based on inspector-identified issues of concern, that equipment performance problems were such that effective control of performance through appropriate preventive maintenance of the 125 VDC system under 10 CFR 50.65(a)(2) could not be demonstrated. The inspectors evaluated this finding using Section A of Exhibit 2 of NRC IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," and determined this finding was of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more non-TS 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 cross-cutting aspect in the area of PI&R, CAP, because 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 ACE identified and addressed 125 VDC system procedural deficiencies. However, it did not consider the procedural deficiencies in the MPFF determination until prompted by the inspector's questions. The inspectors determined that PPL's failure to thoroughly evaluate the maintenance preventable aspects of a functional failure was the result of a CAP failure to address the cause such that appropriate classification under the maintenance rule could be made [P.1(c)].

Enforcement. 10 CFR 50.65(a)(1) requires, in part, that holders of an operating license shall monitor the performance or condition of SSCs within the scope of the monitoring programs as defined in 10 CFR 50.65(b) against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. 10 CFR 50.65 (a)(2) requires, in part, that monitoring as specified in 10 CFR 50.65(a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the perfor-

mance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function. Contrary to the above, PPL staff did not demonstrate that performance of the Unit 2 125 VDC system was being effectively controlled through the performance of appropriate preventive maintenance in that an MPFF of 125 VDC occurred on November 23, 2011. PPL's ACE determined the failure was not maintenance preventable, a determination that was accepted at the October 25, 2012 maintenance rule expert panel meeting. This determination resulted in PPL staff not placing the Unit 2 125 VDC system under 10 CFR 50.65(a)(1) for establishing goals and monitoring against the goals until December 13, 2012 when the system was placed in a(1) status. This violation is being treated as an NCV, consistent with section 2.3.2 of the NRC Enforcement Policy because it was of very low safety significance and has been entered into PPL's CAP under CRs 1496655 and 1643158. **(NCV 05000388/ 2012005-01, Failure to Demonstrate Effective Preventive Maintenance Under 50.65(a)(2))**

- .2 Introduction. Inspectors 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.

Description. 10 CFR 50.73 (a)(2)(vii) requires, in part, that licensees submit an LER for any event where a single cause or condition caused two independent trains or channels to become inoperable in a single system designed to shut down the reactor within 60 days of discovering the event.

On May 8, 2012, three of eight RPS electrical power monitoring assemblies (EPA breakers) did not trip open as required during TS required surveillance testing on Unit 1. TS 3.3.8.2 requires two RPS EPA breakers to be operable for each in-service RPS motor generator set or alternate power supply. The function of the breakers is to open on under-voltage, over-voltage, or under-frequency conditions to prevent failures in the safety-related RPS due to the non-safety related power supplies. Extended operation of RPS in an under-voltage condition could result in the scram solenoids chattering and potentially losing their pneumatic control capability, resulting in a loss of the primary scram function. The inoperable breakers were sent to a vendor for failure analysis and an ACE was initiated (CR 1570413).

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. This determination was based on completion of a past operability review (CRA 1572356) which provided discussion that there was "no evidence or past indication to support degraded past operability prior to the point of discovery." It also discussed that, based on which breakers were inoperable; there was no loss of safety function. Inspectors determined that this information was sufficient and reasonable to support the condition not being reportable as an event or condition that could have prevented fulfillment of a safety function per 10 CFR 50.73(a)(2)(v) or as an operation or condition prohibited by TSs per 10 CFR 50.73(a)(2)(i)(B). However, the past operability review stated that "the cause of the EPA breakers failing to trip is unknown (failed breakers have been returned for evaluation)." Based on this statement, inspectors determined that there was insufficient evidence on September 5th to determine that the event was not reportable for other reasons and the potential for common cause inoperability should have still been considered.

By letter dated September 21, 2012, the vendor informed PPL staff that two of the three breakers did not trip due to the calibration screws being out of adjustment on the under-voltage relays (UVRs) which caused an, “insufficient force balance between the torsional spring and the plunger spring.” This resulted in inadequate force being applied to trip the breaker. Additionally, the vendor determined that, “marginal calibration...over time and cycling resulted in the UVR to lose calibration.” The third breaker not tripping could not be repeated in the laboratory and therefore its cause was indeterminate. Inspectors reviewed the failure analysis and PPL’s ACE and determined that the condition constituted a common cause failure mode for independent trains, which should have been reported to the NRC via an LER no later than November 20, 2012.

Analysis. The inspectors determined that PPL not reporting a common cause inoperability of independent trains of TS required equipment was a performance deficiency and impacted the NRC’s ability to perform its regulatory function. The finding was evaluated using the traditional enforcement process because the failure to accurately report events has the potential to impact or impede the regulatory process. The finding was determined to be a Severity Level IV violation based on example 6.9.d.9 of the NRC Enforcement Policy. This example states that a licensee failing to make a report required by 10 CFR 50.72 or 10 CFR 50.73 is an example of a Severity Level IV violation.

Because this violation involves the traditional enforcement process and does not have an underlying technical violation that would be considered more-than-minor, inspectors did not assign a cross-cutting aspect to this violation in accordance with IMC 0612, Appendix B.

Enforcement. 10 CFR 50.73 (a)(2)(vii) requires, in part, that licensees submit an LER for any event where a single cause or condition caused two independent trains or channels to become inoperable in a single system designed to shut down the reactor within 60 days of discovering the event. Contrary to the above, PPL staff did not submit a report within 60 days of September 21, 2012, after a failure analysis determined that two independent trains of RPS electrical power monitoring were inoperable due to a common cause or condition. PPL staff entered the deficiency into their CAP as CR 1663785 and initiated action to submit the required LER. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was Severity Level IV and was entered into the PPL’s CAP. **(NCV 05000387/2012005-02, Failure to Report Common-Cause Inoperability of Independent Trains)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that PPL staff performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that PPL personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PPL performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of

the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 1, yellow risk during division II RHR minimum flow valve work
- Unit 2, yellow risk during the November 9, 2012 manual reactor scram
- Common, risk assessment during startup transformer T20 maintenance
- Common, 'B' EDG room temperature calibration
- Common, yellow risk during 'B' ESW flow transmitter replacement

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Unit 1, anomalous bypass valve (BPV) indications during plant shutdown
- Unit 2, elevated suction pressure on RCIC
- Unit 2, reactor pressure vessel (RPV) bottom head cooldown in excess of 100° F/hour following the November 9, 2012, reactor scram and reactor vessel stratification
- Unit 2, '2A' residual heat removal service water (RHRSW) pump in-service test failure
- Common, control structure (CS) boundary leak during testing
- Common, compliance with TS surveillance requirement (SR) 3.4.2.1 for jet pump operability

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to PPL's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PPL. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)a. Inspection Scope

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

- Unit 1, standby liquid control (SBLC) planned maintenance
- Unit 1, corrective maintenance on source range monitors (SRMs) and intermediate range monitor (IRMs)
- Unit 1, '1A' reactor recirculation pump (RRP) seal replacement and motor-generator set maintenance
- Unit 2, division I core spray minimum flow valve maintenance
- Unit 2, drywell cooler fan breaker repair following failure to start in slow speed
- Unit 2, division II RHR planned maintenance
- Common, planned maintenance on startup transformer T20

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 2 samples).1 Unit 1 Maintenance Outage for Low Pressure (LP) Turbine Blade Replacementa. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 maintenance outage, which was conducted on October 19 through November 6, 2012. The inspectors reviewed PPL's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

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

- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Tracking of startup prerequisites and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

.2 Unit 2 Maintenance Outage for LP Turbine Blade Replacement

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance outage, which was conducted on November 9 through November 28, 2012. The inspectors reviewed PPL's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. The outage was commenced early due to a manual reactor scram following an integrated control system failure. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Tracking of startup prerequisites and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and PPL procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Unit 1, RCIC comprehensive flow surveillance
- Unit 2, main turbine valve testing
- Unit 2, fuel pool cooling (FPC) system flow test
- Unit 2, quarterly calibration of RPV pressure channels for low pressure emergency core cooling system permissive signals

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors evaluated the conduct of a routine PPL emergency drill on November 13, 2012 to identify weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator to determine whether the event classifications, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by PPL staff in order to evaluate PPL's critique and to verify whether the PPL staff was properly identifying weaknesses and entering them into the CAP.

- Common, green team full-scale drill on November 13, 2012

b. Findings

Introduction. 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 a RSPS during their critique following the full-scale EP drill.

Description. 10 CFR 50.47(b)(14) requires that periodic drills be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills be

corrected. Section IV.F.2.g of 10 CFR 50 Appendix E requires that all exercises, drills, and training that provide performance opportunities to develop, maintain, or demonstrate key skills include a formal critique in order to identify weak or deficient areas that need correction. Additionally, it requires that any weaknesses or deficiencies be corrected.

On November 13, 2012, inspectors observed PPL's full-scale EP drill. In accordance with the drill scenario, the Control Room Emergency Director declared an Unusual Event (UE) at 8:28 a.m. Inspectors observed performance of the initial notification to offsite response organizations (OROs). The station's emergency plan specifies three OROs that PPL has responsibility to notify: Pennsylvania Emergency Management Agency (PEMA), Luzerne County Emergency Management Agency (LCEMA), and Columbia County Emergency Management Agency (CCEMA). Inspectors noted two observations of significance with respect to performance of this notification.

First, in accordance with PPL emergency planning procedure EP-PS-126, "Emergency Plan Communicator: Emergency Plan Position Specific Instruction," Revision 28, the communicator attempted to make contact with the OROs via a bridge line, which simultaneously dials all three OROs, and then attempted to dial the OROs individually. These attempts were unsuccessful because the phone had no dial tone. The lead drill controller contacted a phone technician who restored some connectivity. It was subsequently determined that at the start of the drill, the crew manipulated the setup of the handset and portable headset. In doing this, the operator mistakenly disconnected the handset that was required to be used by the communicator for ORO notifications. The phone technician resolved this issue and the communicator was able to attempt to continue the notification process. Again, notification via the bridge was unsuccessful and the communicator asked the lead drill controller for guidance. The drill controller prompted the communicator to continue with the procedure and attempt to dial the OROs individually. This attempt was successful and the communicator made initial contact with PEMA at 8:43 a.m., fifteen minutes after the UE declaration.

Secondly, inspectors observed that not all OROs were notified within 15 minutes of the declared UE. Specifically, though initial contact was made with PEMA at 8:43 a.m., initial contact was not initiated with LCEMA and CCEMA until 22 minutes and 24 minutes after the emergency declaration, respectively.

Inspectors observed the drill critique conducted on November 14, 2012 and noted these deficiencies were not adequately captured. Specifically, Drill Objective 1.5 for the control room emergency plan communicator states to "perform timely notifications to offsite authorities...until relieved of this duty by the TSC" and was evaluated by the drill controllers as "Met." CR 1643107 was generated stating that phone problems challenged the ability of the emergency plan communicator to make the required 15 minute notification. However, the CR also mentioned that the notification to outside agencies was successfully initiated just within the 15-minute time limit. Additionally, inspectors reviewed the drill and exercise performance (DEP) PI opportunities for the drill and noted that drill controllers evaluated the DEP PI opportunity for timely notification of the UE as successful. There was no mention in the CR or drill critique presentation that the second and third OROs were not notified within fifteen minutes of the declared emergency or that equipment performance or controller intervention potentially interfered with adequate observation of ERO performance.

For the first observation, inspectors reviewed NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and noted that page 46 of the guidance states "for sites with multiple agencies to notify, the notification is considered to be initiated when contact is made with the first agency to transmit the initial notification information." However, inspectors were concerned that the level of interaction between the drill controller and the ERO member was sufficient to prevent adequate observation and evaluation of performance. In particular, NEI 99-02 page 47 states that "if a controller intervenes (e.g., coaching, prompting) with the performance of an individual to make an independent and correct classification, notification, or PAR, then that DEP PI opportunity shall be considered a failure." In this case, inspectors determined, after consultation with regional EP specialists, that it was incorrect for the evaluators to determine the DEP PI opportunity was successful when controller intervention was required to resolve the equipment failures. Inspectors reviewed the nature of the equipment failures and determined that they were unique to the simulator such that there was reasonable assurance the same deficiency could not exist in the plant control room during an actual emergency.

For the second observation, inspectors determined the CR and the drill critique did not correctly document that the crew had not met regulatory requirements associated with notification of the second and third OROs following the emergency declaration. Specifically, 10 CFR 50.47(b)(5) requires, in part, that procedures be established for notification by the licensee of State and local response organizations. Additionally, 10 CFR 50, Appendix E, Section IV.D.3 requires, in part, that a licensee have the capability to notify responsible State and local governmental agencies within 15 minutes of declaring an emergency. IMC 0609 Appendix B classifies the function of notifying OROs as a RSPS. This RSPS is further described in PPL's emergency plan and EP implementing procedures and the OROs are defined as PEMA, LCEMA, and CCEMA. Since initial notification was not made with all OROs within fifteen minutes of the declared emergency, inspectors determined that an ERO performance deficiency existed which was not adequately assessed and critiqued. PPL staff entered the critique weakness into their CAP as CR 1648380.

Analysis. Inspectors determined that PPL staff not identifying a drill weaknesses related to emergency notification during their drill critique was a performance deficiency that was reasonably within their ability to foresee and prevent. The finding is more than minor because it is associated with the ERO performance attribute of the EP corner-stone and affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, PPL staff did not effectively identify a drill weakness associated with an RSPS and caused a missed opportunity to identify and correct a drill-related performance weakness.

The inspectors assessed the issue using the NRC IMC 0609 Appendix B, "Emergency Preparedness Significance Determination Process." Inspectors noted two examples provided in IMC 0609 Appendix B table 5.14-1 that were similar to the performance deficiency. First, an example of a loss of planning standard (PS) function occurs when the critique process fails to identify a weakness associated with an RSPS that is determined by the NRC to be a DEP PI opportunity failure during a full-scale drill. Second, an example of a degradation of PS function occurs when the critique process fails to identify a weakness associated with a RSPS that is determined by the NRC to be a DEP PI successful opportunity during a full-scale drill. PPL not critiquing the untimely

notification met the NRC's definition of a weakness in a full-scale drill. However, because of the unique nature of the equipment failures associated with the notification of the first ORO, inspectors determined that not identifying and critiquing the drill weakness only constituted a degradation of the PS function. Therefore the finding is characterized as very low safety significance (Green).

The finding is related to the cross-cutting area of PI&R, CAP, in that PPL did not identify an RSPS issue completely, accurately, and in a timely manner commensurate with the safety significance. Specifically, during the critique of the full-scale drill conducted on October 14, 2012, PPL staff did not recognize and critique that an RSPS was not met and did not place this issue into the CAP until prompted by the inspector's questions. [P.1(a)]

Enforcement. 10 CFR 50.54(q)(2) requires, in part, that a licensee shall follow and maintain the effectiveness of an emergency plan that meets the requirements in 10 CFR 50, Appendix E and, for nuclear power reactor licensees, the planning standards of 10 CFR 50.47(b). 10 CFR 50.47(b)(14) requires, in part, that periodic drills be conducted to develop and maintain key skills, and deficiencies identified as a result of drills be corrected. 10 CFR Part 50, Appendix E, section IV.F.2.g requires that all training, including drills, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Additionally, it requires that any identified weaknesses or deficiencies be corrected.

Contrary to the above, during the November 14, 2012, critique of the November 13, 2012, Susquehanna Steam Electric Station full-scale emergency drill, PPL did not identify performance weaknesses. Specifically, PPL did not identify that timely notification was not made with two of the OROs as required by regulatory requirements and the SSES Emergency Plan. Additionally, PPL evaluated a performance indicator opportunity as a success despite drill controller action precluding satisfactory observation of ERO performance. PPL entered the drill critique deficiency into their CAP as CR 1648380 and initiated action to correct the performance indicator deficiency. Because this violation is of very low safety significance (Green) and PPL entered this into their CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387;388/2012005-03: Failure of Full-Scale Drill Critique to Identify an RSPS Weakness)**

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety (PS)

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 1 sample)

a. Inspection Scope

From November 5 to 9, 2012, the inspectors verified that gaseous and liquid effluent processing systems are maintained so radiological discharges are properly reduced, monitored, and released. The inspectors also verified the accuracy of the calculations for effluent releases and public doses.

The inspectors used the requirements in 10 CFR Part 20; 10 CFR 50.35(a) TSs; 10 CFR Part 50 Appendix A - Criterion 60, "Control of Release of Radioactivity to the

Environment,” and Criterion 64, “Monitoring Radioactive Releases;” 10 CFR 50 Appendix I, “Numerical Guides for Design Objectives and Limiting Condition for Operations (LCOs) to Meet the Criterion “As Low as is Reasonably Achievable (ALARA)” for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents;” 10 CFR 50.75(g), “Reporting and Recordkeeping for Decommissioning Planning;” 40 CFR Part 141, “Maximum Contaminant Levels for Radionuclides;” 40 CFR Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations;” Regulatory Guide (RG) 1.109, “Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents;” RG 1.21, “Measuring, Evaluating, Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste;” RG 4.1, “Radiological Environmental Monitoring for Nuclear Power Plants;” RG 4.15, “Quality Assurance for Radiological Monitoring Programs;” NUREG-1301 or 1302, “Offsite Dose Calculation Manual (ODCM) Guidance: Standard Radiological Effluent Controls;” applicable Industry standards; and PPL procedures required by Susquehanna’s TSs/ODCM as criteria for determining compliance.

Inspection Planning and Program Reviews

Event Report and Effluent Report Reviews

The inspectors reviewed the SSES Radiological Effluent Release Reports for 2010 and 2011 to determine if the reports were submitted as required by the Offsite Dose Calculation Manual (ODCM) and TSs. The inspectors reviewed anomalous results, unexpected trends, and abnormal releases that were identified. The inspectors determined if these effluent results were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors identified radioactive effluent monitor operability issues reported in the Annual Radioactive Effluent Release Reports, and reviewed these issues and determined if the issues were entered into the CAP and were adequately resolved.

ODCM and UFSAR Review

The inspectors reviewed the SSES UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths to identify system design features and required functions.

The inspectors reviewed changes to the SSES station ODCM made by PPL, since the last inspection. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change and determined whether they were technically justified and maintained effluent releases ALARA.

The inspectors reviewed documentation to determine if any non-radioactive systems that have become contaminated were disclosed either through an event report or the ODCM. The inspectors reviewed selected 10 CFR 50.59 evaluations and made a determination if any newly contaminated systems had an unmonitored effluent discharge path to the environment. The inspectors also reviewed whether it required revisions to the ODCM to incorporate these new pathways and whether the associated effluents were reported in accordance with RG 1.21.

Groundwater Protection Initiative (GPI) Program

The inspectors reviewed reported groundwater monitoring results and changes to PPL's written program for identifying and controlling contaminated spills/leaks to groundwater.

Procedures, Special Reports, and Other Documents

The inspectors reviewed licensee event reports (LERs), event reports and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

The inspectors reviewed effluent program implementing procedures, including those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations.

The inspectors reviewed copies of third party (independent) evaluation reports of the effluent monitoring program since the last inspection to gather insights into the effectiveness of the program.

Walkdowns and Observations

The inspectors walked down selected components of the gaseous and liquid discharge systems to verify that equipment configuration and flow paths align with the descriptions in the UFSAR and to assess equipment material condition. Special attention was made to identify potential unmonitored release points, building alterations which could impact airborne, or liquid, effluent controls, and ventilation system leakage that communicate directly with the environment.

The inspectors reviewed effluent system material condition surveillance records, as applicable, for equipment or areas associated with the systems selected for review that were not readily accessible due to radiological conditions.

The inspectors walked down filtered ventilation systems to verify there are no degraded conditions associated with high efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent to verify that appropriate treatment equipment was used and the processing activities align with discharge permits.

The inspectors determined that PPL had not made any changes to their effluent release paths.

As available, the inspectors observed selected portions of the routine processing and discharge of liquid waste. The inspectors verified that appropriate effluent treatment equipment is being used and that radioactive liquid waste is being processed and discharged in accordance with procedures.

Sampling and Analyses

The inspectors selected three effluent sampling activities, and assessed whether adequate controls have been implemented to ensure representative samples were obtained.

The inspectors selected three effluent discharges made with inoperable effluent radiation monitors to verify that controls are in place to ensure compensatory sampling is performed consistent with the TSs/ODCM and that those controls are adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility is routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the inter-laboratory and intra-laboratory comparison program to verify the quality of the radioactive effluent sample analyses. The inspectors also assessed whether the intra- and inter-laboratory comparison program includes hard-to-detect isotopes, as appropriate.

Instrumentation and Equipment

Effluent Flow Measuring Instruments

The inspectors reviewed the methodology that PPL uses to determine the effluent stack and vent flow rates to verify that the flow rates are consistent with TSs/ODCM and UFSAR values. The inspectors reviewed the differences between assumed and actual stack and vent flow rates to ensure that they do not affect the calculated results of public dose.

Air Cleaning Systems

The inspectors assessed whether surveillance test results for TS-required ventilation effluent discharge systems meet TS acceptance criteria.

Dose Calculations

The inspectors reviewed all significant changes in reported dose values compared to the previous radioactive effluent release report to evaluate the factors which may have resulted in the change.

The inspectors reviewed more than three radioactive liquid and no gaseous waste discharge permits, as no batch releases were made, to verify that the projected doses to members of the public were accurate and based on representative samples of the discharge path. The inspectors reviewed the analysis of continuous releases.

The inspectors evaluated the methods used to ensure that all radionuclides in the effluent stream source term are included, within detectability standards. The review included the current waste stream analyses to ensure hard-to-detect radionuclides are included in the effluent releases.

The inspectors reviewed changes in PPL methodology for offsite dose calculations since the last inspection to verify the changes are consistent with the ODCM and RG 1.109. The inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to ensure appropriate dispersion/deposition factors are being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to verify changes that affect public dose pathways have been factored into the dose calculations and environmental sampling/analysis program.

The inspectors evaluated whether the calculated doses are within 10 CFR 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Condition for Operations (LCOs) to Meet the Criterion "As Low as is Reasonably Achievable (ALARA)" for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents;" and TS dose criteria.

The inspectors reviewed records of any abnormal gaseous or liquid tank discharges to ensure the abnormal discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages were reviewed to ensure that an evaluation was made of the discharge to account for the effluent release and were included in the calculated doses to the public.

Groundwater Protection Initiative (GPI) Implementation

The inspectors reviewed monitoring results of the voluntary Nuclear Energy Institute GPI to determine if PPL has implemented the GPI as intended.

For anomalous results or missed samples, the inspectors assessed whether PPL has identified and addressed deficiencies through its CAP.

The inspectors reviewed identified leakage or spill events and entries made into PPL's decommissioning files. The inspectors reviewed evaluations of leaks or spills, and reviewed the effectiveness any remediation actions. The inspectors reviewed onsite contamination events involving contamination of groundwater and assessed whether the source of the leak or spill was identified and isolated/terminated.

For unmonitored spills, leaks, or unexpected liquid or gaseous discharges, the inspectors assessed whether an evaluation was performed to determine the type and amount of radioactive material that was discharged by: assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and assessing whether a survey/evaluation has been performed; and determining whether PPL completed offsite notifications, as provided in its GPI implementing procedures.

The inspectors did not review any evaluation of discharges from onsite surface water bodies as none currently exist at the site.

The inspectors assessed whether on-site groundwater sample results and a description of any significant on-site leaks/spills into groundwater for each calendar year are documented in the Annual Radioactive Effluent Release Report.

For significant, new effluent discharge points, such as significant or continuing leakage to groundwater that continues to impact the environment, the inspectors evaluated

whether the licensee's ODCM was updated to include the dose calculation method for the new release point and the associated dose calculation methodology.

Problem Identification and Resolution

Inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the PPL staff at an appropriate threshold and properly addressed for resolution in the PPL's licensee CAP. In addition, the inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 – 1 sample)

a. Inspection Scope

This area was inspected to verify the effectiveness of PPL's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 10 CFR Parts 20, 61, and 71, and 10 CFR Part 50, Appendix A, - Criterion 63, "Monitoring Fuel and Waste Storage," and PPL procedures required by the TSs/Process Control Program (PCP) as criteria for determining compliance.

The inspectors reviewed the solid radioactive waste system description in the FSAR, the PCP, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed.

The inspectors reviewed the scope of quality assurance (QA) audits performed for this area since the last inspection. The inspectors reviewed the results of the audits performed since the last inspection of this program and evaluated the adequacy of PPL's corrective actions for issues identified during those audits.

The inspectors observed areas where containers of radioactive waste were stored, and verified that the containers were labeled in accordance with 10 CFR 20.1904, "Labeling Containers," or controlled in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements," as appropriate.

The inspectors verified that the radioactive materials storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20, "Standards for Protection Against Radiation." For materials stored or used in the controlled or unrestricted areas, the inspectors verified that they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801, "Security of Stored Material," and 10 CFR 20.1802, "Control of Material not in Storage," as appropriate.

The inspectors verified that PPL had established a process for monitoring the impact of long-term storage (e.g., buildup of any gases produced by waste decomposition, chemical reactions, container deformation, loss of container integrity, or re-release of free-flowing water) sufficient to identify potential unmonitored, unplanned releases, or

nonconformance with waste disposal requirements. The inspectors verified that there were no signs of swelling, leakage, or deformation.

The inspectors walked down accessible portions of liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions in the FSAR, offsite dose calculation manual, and PCP.

The inspectors identified radioactive waste processing equipment that was not operational and/or was abandoned in place, and verified that PPL had established administrative and/or physical controls to ensure that the equipment would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors verified that PPL had reviewed the safety significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments."

The inspectors reviewed the adequacy of any changes made to the radioactive waste processing systems since the last inspection. The inspectors verified that changes from what was described in the FSAR were reviewed and documented in accordance with 10 CFR 50.59, as appropriate.

The inspectors identified processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers. The inspectors verified that the waste stream mixing, sampling procedures, and methodology for waste concentration averaging were consistent with the PCP, and provided representative samples of the waste product for the purposes of waste classification as described in 10 CFR 61.55, "Waste Classification."

For those systems that provide tank recirculation, the inspectors verified that the tank recirculation procedure provided sufficient mixing.

The inspectors verified that the licensee's PCP correctly described the current methods and procedures for dewatering waste.

The inspectors identified radioactive waste streams, and verified that PPL's radiochemical sample analysis results were sufficient to support radioactive waste characterization as required by 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The inspectors verified that PPL's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analyses.

For the waste streams identified above, the inspectors verified that changes to plant operational parameters were taken into account to (1) maintain the validity of the waste stream composition data between the annual or biennial sample analysis update, and (2) verified that waste shipments continued to meet the requirements of 10 CFR Part 61.

The inspectors verified that PPL had established and maintained an adequate QA program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55, "Waste Classification" and 10 CFR 61.56, "Waste Characteristics."

The inspectors reviewed the records of shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and verification of shipment readiness. The inspectors verified that the requirements of any applicable transport cask certificate of compliance had been met. The inspectors verified that the receiving licensee was authorized to receive the shipment packages.

The inspectors determined that the shippers were knowledgeable of the shipping regulations and that shipping personnel demonstrated adequate skills to accomplish the package preparation requirements for public transport with respect to PPL's response to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communication, Emergency Response Information, Training Requirements, and Security Plans," Subpart H, "Training." The inspectors verified that PPL's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

The inspectors identified non-excepted package shipment records and verified that the shipping documents indicate the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and shipping identification number. The inspectors verified that the shipment placarding was consistent with the information in the shipping documentation.

The inspectors verified that problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by PPL at an appropriate threshold, were properly characterized, and were properly addressed for resolution in PPL's CAP. The inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by PPL that involve radioactive waste processing, handling, storage, and transportation. PPL generated six CRs to document material condition deficiencies identified during this inspection.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 8 samples)

.1 Mitigating Systems Performance Index (MSPI) (4 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittal of the MSPI for the following systems for the following systems for the period of October 1, 2011 through September 30, 2012:

- Units 1 and 2, emergency alternating current power systems (MS06)
- Units 1 and 2, RHR systems (MS09)

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

b. Findings

No findings were identified.

.2 Radiological Effluent TS/Offsite Dose Manual (ODCM) Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

During November 5-9, 2012, the inspectors sampled PPL submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI (PR01) for the period from the 1st quarter 2011 through 4th quarter 2011. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment PI Guideline," Revision 6, dated October 2009, to determine if the PI data was reported properly during this period.

The inspectors reviewed PPL's corrective action report (AR) database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations for selected dates between 1st quarter 2011 through 4th quarter 2011, to determine if indicator results were accurately reported. The inspectors also reviewed PPL's methods for quantifying gaseous and liquid effluents and determining effluent dose.

b. Findings

No findings were identified.

.3 Emergency Preparedness (3 samples)

a. Inspection Scope

The inspectors reviewed data for the three EP Performance Indicators (PI), which are: (1) Drill and Exercise Performance (ER01); (2) Emergency Response Organization Drill Participation (ER02); and, (3) Alert and Notification System Reliability (ER03). The last NRC EP inspection at Susquehanna was conducted in the fourth quarter of 2011. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the fourth quarter of 2011 through the third quarter of 2012 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 6, was used as reference criteria.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of Problem Identification & Resolution (PI&R) Activities

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review (1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by IP 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by PPL staff outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed PPL's CAP database for the third and fourth quarters of 2012 to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1). The inspectors reviewed PPL staff's quarterly trend reports for the first three quarters of 2012, conducted under NDAP-QA-0710, "Station Trending Program," to verify that PPL personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

Evaluation of Trends Related to CAP Evaluations (P.1(c)).

PPL staff has designated CAP as a gap to excellence and a subset of the metrics PPL uses to monitor CAP progress are attributable to the P.1(c) Evaluation substantive cross-cutting issue (SCCI). Additionally, PPL completed an evaluation (CR 1633700) after the NRC's 2012 mid-cycle assessment letter (ML12248A066), dated September 4, 2012, continued the SCCI. The evaluation concluded there were no additional performance gaps that have not been identified and addressed with corrective actions.

The evaluation used three performance indicators (PIs) (discussed below) to confirm PPL staff's conclusion. The inspectors performed a review of these metrics, and other PIs deemed by the inspectors to be pertinent to the SCCI, to determine what standards PPL had established and whether corrective actions were identified as a result of PPL's monitoring of their internal metrics.

- Quality of CARB Reviewed CR Evaluations (SL52) – This metric measures the quality of CARB-reviewed root cause analyses (RCAs) and ACEs and plots both the six-month average and the monthly percent rejection rate. The metric has been White for the duration of 2012. In September, PPL concluded that the improving trend had stalled the past several months. In October and December, PPL concluded that the trend was slowly and consistently improving. During review, the inspectors questioned the rise in evaluation rejection rate from 12.5 percent in both July and August, to 25 percent in September, to 50 percent for October and November, without a corresponding decline in overall metric performance. PPL examined the input data to the PI and determined that the metric was incorrect. PPL entered this issue into their CAP (CR 1657686). The PI was revised and while the trend for rejection rate percentages changed, the overall metric color did not change.
- Effectiveness Review Results (GWE40) – This metric was Green for October after being White since January 2012. October data showed 9 of 10 effectiveness reviews rated as being effective. PPL changed the thresholds in June 2011 to be more challenging and the rolling average was reduced from 12 to 6 months. In response to inspector questioning of SL52 accuracy, PPL also reviewed the data for this PI and identified that this PI was also incorrect. PPL incorporated additional effectiveness reviews that had been unaccounted for, including five effectiveness reviews rated as being ineffective. The incorporation of this data caused the revised PI to be changed from Green to Yellow. PPL entered this issue into their CAP (CR 1659032).
- Repeat of Significant Events (SL90) – This PI is based on the same root cause occurring twice in a three-year rolling period and has been White for 2012. The PI is based, in part, on a cognitive review of root causes and is expected to be reduced to a one-year rolling average in 2013.
- CAP Engagement (SL82) – This metric, covering Performance Improvement Review Board (PIRB), CAP Health, Management Review Committee (MRC), and CARB meeting attendance by senior management, has been consistently Green. Notwithstanding, PPL staff's November update documented that senior leadership struggles during outage periods for oversight of screening, MRC, CARB, and CAP recovery meetings. The update stated that while this metric is monitored during outages, it does not have any bearing on establishing a recovery plan since the metric is "extremely impacted by outages." The inspectors noted that a substantial amount of 2012 was spent in outages to include the Unit 1 refueling and Unit 2 maintenance outages in the spring, the Unit 1 shutdown for pressure boundary leakage in the summer, fall maintenance outages on both Units, and two Unit 2 reactor scrams in December. Additionally, the inspectors noted that PIRB and CAP Health were consistently above the average and most often had a score over 200 percent while MRC, a daily meeting, was consistently less than 100 percent. MRC engagement remained

less than the goal at 26 percent in October and 68 percent in November. PPL staff documented that no recovery plan is necessary.

- Operability Determinations – The inspectors observed that PPL does not have metrics to monitor effectiveness of Operability Determinations. The inspectors noted that weaknesses in Operability Determinations resulted in several NRC findings with a P.1(c) cross cutting aspect that contributed to the SCCI and corrective actions have been developed to address weakness in this area.

Finally, both the Biennial PI&R inspection and a fourth quarter inspection sample identified ACEs that did not evaluate deeper than the direct cause, contrary to station procedures. Despite this, Departmental Corrective Action Review Board (DCARB) scores were relatively high, none of the DCARBs were cross-functional, and all five ACEs were not reviewed by CARB. PPL subsequently identified two additional ACEs with similar issues. PPL has implemented cross-functional DCARBs as an interim measure that will be evaluated for effectiveness.

Review of Trend Related to Procedure Quality (H.2(c))

At the station level, PPL staff has designated procedure quality, use, and adherence as a gap to excellence. A subset of the metrics PPL uses to monitor progress in this area is attributable to the procedure quality (H.2.(c)) substantive cross-cutting issue. The inspectors performed a review of the applicable metrics to determine what standards PPL had established and whether corrective actions were identified as a result of PPL's monitoring of their internal metrics.

- Procedure Request Average Age by Priority (SL104) – This metric is based on priority 1 and 2 requests exceeding 180 days. The metric was Red from July through October 2012. Of the four levels of Operations Procedure Group (OPG) priority levels, there was a rise in the number of Level 3 and Level 4 requests by age and a drop in the monthly number of Level 2 requests by age. Of the four levels of Maintenance Procedure Group (MPG) priority levels, there was a general rise in the number of Level 2 requests by age and general stability without reduction in the number of Level 3 and 4 requests by age. Recovery plans for this metric include procedure action item burndown curves that target a total of 590 procedure requests by June 2013 and 350 by the end of 2013. The recovery plan for the MPG concluded that resource issues and a large number of incoming items resulted in the high percentage of high priority items. There were also open positions in the organization that PPL management anticipated would assist in backlog reduction, once filled.
- Incoming Procedure Change Request (SL106) – This metric is based on the total number of change requests with a distinct mechanism that each procedure affected by a request is counted individually. The metric has been consistently Green with a threshold of 100 change requests.
- Procedure Quality Issues Identified (SL109) – This metric was changed in June 2012 to represent both technical and quality procedure issues. The metric has been predominantly Red based on technical quality procedure issues exceeding 60 per month. The BOP procedures were not yet prioritized and incorporated into this PI. The Green threshold is less than or equal to 40 per month. PPL

staff generated OPG and MPG recovery plans that consist of burndown curves through the end of 2013.

- Procedure Request Total Backlog Quantity (SL110) – This metric has been Red from June through October 2012 based on the total backlog (technical, quality, enhancement, and editorial) exceeding 1500. PPL staff's assessment stated that the industry average for a two-unit site is 1200 items. The BOP procedures were not yet prioritized and incorporated into this PI.

Emerging Trend in Work Control (H.3(a))

There was one NRC finding in each of the first three quarters of 2012 in this cross-cutting area. In response, PPL staff conducted a common-cause analysis (CCA) (CR 1616738) that was not CARB-approved by the end of the inspection period. The inspectors had one observation regarding the corrective actions planned.

The station's lowest work levels, work lists, were partly responsible for two of the three NCVs. The lower threshold of these work list items enabled some work activities to initiate without appropriate management or programmatic review. Corrective actions regarding these work lists are due greater than a year from when the initial NCV with an H.3(a) aspect was issued.

Emerging Trend in Preparations for Adverse Weather

During a winter readiness inspection sample, the inspectors noted that the preparatory checklist in NDAP-00-0024, Winter Operation Preparations, Revision 18, had not been completed by November 1 of each year, as required, from 2008 through 2012 (CRs 1088314, 1198388, 1323433, 1489677, and 1638078). Additionally, the summer operations preparation procedure, NDAP-00-0334, was not completed prior to May 15, 2012 as required (CR 1575139). Finally, in the 2012 third quarter inspection report, the NRC issued a Green NCV regarding an inadequate procedure for high winds. The inspectors concluded that there is an adverse trend in PPL personnel preparing for seasonal and adverse weather conditions in a timely manner.

Emerging Trend in CAP- Problem Identification (P.1(a))

The inspectors observed an issue with respect to problems being identified and placed into the CAP based on recent inspection results.

During implementation of Temporary Instruction (TI)-187 and TI-188, inspector observations during a walkdown of the Unit 2 HPCI room floor degradations were initially assessed by Engineering as not warranting CAP entry. Inspectors reviewed NDAP-QA-0702, Action Request and Condition Report Process, and determined the issues met the station defined threshold for CR generation. Following additional discussions with PPL staff, the items were entered in the CAP.

Three NCVs in 2012 had aspects of problem identification. The first had a cross-cutting aspect in P.1.(a) based on personnel not entering issues into the CAP when they discovered a lack of procedural guidance, qualification, and non-compliance with instructions associated with the motor-operated valve program (NCV 2012002-01).

The second had a cross-cutting aspect in P.1(a) based on PPL not entering procedural issues into the CAP during a periodic procedure review or after inspectors provided the issues to PPL staff (NCV 2012004-01). The third had a cross-cutting aspect in P.1(a) and is documented in this report (Section 1EP6). Based on having three findings with the same cross-cutting aspect in a four quarter period, PPL generated CR 1664721 to perform a CCA on the collective issues.

Inspectors identified a missed risk assessment when one division of ESW was removed from service on an operable EDG to support testing. The issue was communicated to the work week manager who confirmed that the item had not been included in the station's risk assessment; however, when it was added, the overall risk to the station remained Green. Since this issue was a minor violation of 10 CFR 50.65(a)(4), it was required to be entered into the station's CAP by PPL's CAP procedures. The issue was not entered into the CAP until inspectors discussed the issue with senior PPL management.

Inspectors reviewed an ACE on TS SR 3.4.2.1 requirements that concluded that the station's performance was "not in strict compliance" with the SR. No CR was generated to ensure corrective actions were taken to restore compliance until identified by the inspectors. PPL staff took subsequent actions to revise the ACE.

Emerging Trend in Maintenance Rule Program Implementation

The inspectors noted challenges in PPL staff's implementation of the Maintenance Rule.

- Maintenance Rule Expert Panel (MREP) backlog – In August 2012, the inspectors became aware of a 17-item backlog in MRFFs that required MREP review and that no MREP meetings occurred from April through August 2012. PPL staff attributed the cause to extended plant outages and limited, qualified expert panel members. This condition had existed from July 2011 when CR 1437589 documented the same situation. Additionally, PPL staff identified that the station routinely failed to generate actions to track MREP review of the MRFFs. In response, PPL management took action to qualify additional MREP members and held six MREP meetings from September to the end of 2012. Notwithstanding, the inspectors concluded the problem has not been sufficiently resolved. For example, there were still five MRFFs requiring MREP review that were in excess of the 60-day procedural requirement. This included one MRFF on an inboard 'D' MSIV LLRT with an MREP due date ten months after identification. Inspectors identified two additional MRFFs that both exceeded the 60 day guideline and did not have associated action item for MREP review.
- Scoping – Inspectors identified that the ability to substitute the 'E' EDG for other EDGs was not scoped into the Maintenance Rule despite being used in EOPs (CR 1630387).
- Timeliness of 10 CFR 50.65(a)(1) classification – In the discussion of the Maintenance Rule NCV in Section 1R12 of this report, there was approximately a year delay for a RCIC system issue designated as a MRFF to be reviewed by the MREP. As a result, it took over a year before the system was reclassified as (a)(1). Additionally, in the summer of 2012, the inspectors identified that PPL staff had not classified Unit 2 RCIC as an a(1) system despite meeting the

performance criteria in the summer of 2011 (CR 1619848). The system was subsequently presented to MREP in September of 2012 where it was classified as a(1). In both cases, the delays in the review of issues by the MREP resulted in actions to reclassify the systems to a(1) and establishment of goals as required by 10 CFR 50.65(a)(1) to be untimely.

- Quality of MPFF determinations– This report documents an NRC-identified violation of 10 CFR 50.65(a)(2) which occurred when a MRFF was inappropriately classified as not maintenance preventable in Section 1R12. Additionally, inspectors reviewed an ACE for a gasket failure in the control room emergency outside air supply (CREOAS) system which concluded that no vendor guidance for periodic replacement existed and determined the MRFF was not maintenance preventable. Inspectors reviewed the vendor manual and identified that it did in fact provide recommendations for inspection and periodic replacement. This resulted in the issue becoming an MPFF and required a revision to the ACE. The CREOAS system remained in a(2); therefore, the issue was determined to be of minor safety significance.

.3 Annual Sample - 1A Reactor Recirculation Pump Suction Decontamination Flange Weld Through-Wall Leak (1 Sample)

a. Inspection Scope

The inspectors assessed the adequacy of and associated corrective actions from the root cause analysis (RCA) for the development of a through wall leak of the Unit 1 'A' reactor recirculation pump suction decontamination flange weld VRR-B31-1-14F. The inspectors reviewed the RCA report (CR 1589390), to determine the root cause and contributing causes for the through wall leak, and the adequacy and status of corrective actions.

The inspectors assessed PPL staff's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether PPL staff was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of PPL's CAP and 10 CFR 50 Appendix B. In addition, the inspectors conducted interviews with the root cause team leader, and other engineering and operations personnel who were familiar with the event and the investigation.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified related to the development of a through-wall leak of the Unit 1 'A' reactor recirculation pump suction line decontamination flange weld. This through-wall leak resulted in an unexpected increase in unidentified drywell leak rate and a shutdown of Unit 1 on June 19, 2012, in order to make repairs. Specifically, PPL personnel used an incorrect value for stress intensification factor in the vibration analysis in 2004 to support an extended power uprate (EPU). When the correct stress intensification factor was used, American Society of Mechanical Engineers (ASME) OM-3 code limits for endurance and fatigue stress were exceeded. The through-wall leak resulted in

pressure boundary leakage in excess of TS 3.4.4 limits from approximately June 16 to June 19, 2012.

Discussion. Operators commenced a reactor startup for Susquehanna Unit 1 from a refueling outage on June 7, 2012. From plant startup until June 15, the drywell unidentified leak rate slowly increased to 0.13 gallons per minute (gpm). On June 16, operators observed a step increase in the unidentified leak rate from 0.13 to 0.50 gpm was observed. Unidentified leak rate continued to trend upward over the next several days to a maximum of 1.80 gpm. On June 18, PPL management made the decision to conduct a controlled plant shutdown of Unit 1 due to this increasing trend in unidentified drywell leakage and drywell pressure. On June 19, Unit 1 was shutdown and a through-wall crack was identified on 1A reactor recirculation pump suction decontamination flange weld, VRR-B31-1-14F. Investigation revealed that a through-wall cyclic fatigue-driven circumferential crack measuring 3 1/8" outside diameter (OD) and 2 5/8" inside diameter (ID), initiated from the outside diameter, was the source of the leakage. In addition, an axial, intergranular stress corrosion and cracking (IGSCC)-driven crack was also found. However, that crack had been arrested in the weld material and was not through-wall.

The decontamination line is a flanged connection provided to facilitate decontamination of the recirculation system. Connections are provided in each recirculation loop on the suction and discharge side of the pump inboard of the pump suction and discharge valves. These connections are arranged for attachment of temporary piping to permit flushing and decontamination of the pump and adjacent piping. The suction line connection was an unsupported four inch flanged line.

PPL calculated the natural frequency of this line to be 129.6 Hz and the primary frequency of vibration is 128.5 Hz. These frequencies are in the range of vibrations experienced at the high end of the design operating range of the reactor recirculation pumps. At these frequencies, the decontamination flange pipe is exposed to large bending moments and stresses in the decontamination pipe branch connection. The primary concern is the five-times (5X) vane passing frequency developed from the recirculation pump when operating at pump speeds greater than 1515 rpm and system flow rates greater than 103 Mlbm/hr.

In 1995, following the Unit 1 stretch power uprate (5 percent), flow rates of up to 108 Mlbm/hr were included in the new power to flow envelope. General Electric (GE) testing programs in June 1994 following the same power uprate on Unit 2, identified abnormal increases in RCS system vibrations at recirculation pump speed of 1570 to 1580 rpm. These vibrations were generated by the 5X vane pass frequency of the recirculation pumps. This was the subject of NRC Information Notice (IN) 95-16, "Vibration Caused by Recirculation Flow in a Boiling Water Reactor." However prior to 2001, recirculation pumps were not operated above 1480 rpm by procedure. Following a power uprate in 2001, PPL's procedures were revised to authorize flow rates of up to 104 Mlbm/hr.

The PPL RCA team discovered, in 2004, PPL had contracted an outside engineering firm to recalculate the vibrations stresses on the RCS piping systems in preparation for an EPU. PPL provided the weld profiles for the welds within the reactor recirculation piping system to the contractor to perform this analysis. PPL procedure, NDAP-QA-1208, "Control of Welding," contained the PPL specifications for the weld and the specifications for in-service inspection (ISI) of girth butt welds which required welds in

stainless steel material to be “essentially flush.” Weld detail P5 of NDAP-QA-1208 illustrated the specification. However, the weld profile for weld VRR-B31-1-14F was not consistent with this specification. This weld did not meet the ASME design requirements for a flush weld; therefore, a stress intensification factor of 1.8 vice 1.1 needed to be applied to determine the stresses felt by the weld. However, the PPL RCA team discovered that the contractor did not identify that the weld was not flush and used the incorrect stress intensification factor. This resulted in an incorrect conclusion that alternating stresses due to vibrations were within specification and ASME code fatigue curve values at 10^{11} cycles were also within specification yielding an infinite life with an input frequency of 128.5 Hz.

The decontamination lines were instrumented for post EPU testing and vibrations limits were established based upon the 2004 piping stress calculations. In July of 2010, measured peak acceleration exceeded the level 2 vibration limits established. However, the action for exceeding level 2 limits was to review the measured accelerations data and resulting stresses against the stress limits established in the 2004 calculation. As a result PPL determined the test data to have been within limits which supported continued operations.

Following the discovery of the through-wall leak in 2012, PPL contracted a vendor and provided them with the 2004 weld profile and specifications and requested that they recalculate the stresses for VRR-31-1-14F and compare the results to the data taken during the 2010 EPU. Using the proper stress intensification factor, the vendor determined the ASME OM-S/G-2009 Part 3 stress limit was 10,880 psi, and the stresses measured during EPU acceptance testing were 13,674 psi (approximately 26 percent greater than the endurance limit). Likewise, the ASME fatigue curve values at 10^{11} cycles was recalculated for the measured stresses which calculated an expected lifetime of only 4.9 years at a frequency of 128.5 Hz. These results would not have justified continued operation in 2010 and corrective actions would have had to be taken. Correct calculations could have precluded the weld failure.

PPL’s corrective actions included, modifying the length of the 1A reactor recirculation pump suction decontamination flange to change the natural frequency of the line such that it was no longer within the operating range of the reactor recirculation pumps, the 1B reactor recirculation was also modified. Unit 2’s reactor recirculation pump suction decontamination flanges were reviewed and their natural frequencies were found to be above the operating range of the reactor recirculation pumps and the post EPU testing data confirmed this. Extent of condition reviews included identifying other susceptible components, conducting volumetric examinations of those welds, reviewing the piping stress analysis weld data to determine if any addition welds were mischaracterized as being flush.

The crack resulted in an unidentified leak rate of 1.8 gpm at the time the unit was shutdown. The critical flaw size for structural integrity of the flange was calculated to be a crack measuring 7.7” and the crack discovered was 3 1/8” long. The TS limit for unidentified leakage is 5.0 gpm; however, a through-wall leak from a weld is considered pressure boundary leakage and the TS limit for pressure boundary leakage is zero. Thus, Susquehanna Unit 1 had operated in a condition prohibited by TSs. Notwithstanding, PPL’s evaluation determined that the flaw characterization was such that complete failure could not have resulted in leakage that exceeded the leak rate for a small break loss of coolant accident (LOCA).

Analysis. PPL not identifying weld VRR-B31-1-14F was not flush and applying the improper stress intensification factor in accordance with the ASME code in 2004 was a performance deficiency within PPL's ability to foresee and correct. The performance deficiency was reviewed using IMC 0612, Appendix B, "Issue Screening," and was determined to be more than minor because it affected the Initiating Events Cornerstone attribute of design control. The issue adversely affected the associated cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated using Section A of IMC 0609 Appendix A, Exhibit 1, "Initiating Events Screening Questions." Since the finding result could not have reasonably exceeded the leak rate for a small LOCA and did not likely affect other systems used to mitigate a LOCA resulting in a total loss of their function (e.g., Interfacing System LOCA), the finding screened to very low safety significance (Green). This finding was determined to not be indicative of current performance since the performance deficiency occurred in 2004 and procedures and training are in place that would have precluded the issue. Thus no cross-cutting aspect is assigned.

Enforcement. 10 CFR 50 Appendix B, Criterion III, "Design Control," states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Additionally, Criterion III states that "design control measures shall be applied to items such as the following: reactor physics, stress, thermal, hydraulic, and accident analyses; compatibility of materials; accessibility for in-service inspection, maintenance, and repair; and delineation of acceptance criteria for inspections and tests." TS 3.4.4, "RCS Operational LEAKAGE," states, in part, "RCS operational LEAKAGE shall be limited to: (a) No pressure boundary LEAKAGE; and (b) < 5 gpm unidentified LEAKAGE." Contrary to the above from 2004 until June 19, 2012, PPL failed to accurately translate design basis requirements to ensure Unit 1 RCS piping systems met ASME Code requirements to pipe stress analysis calculations and acceptance criteria due to using an incorrect stress intensification factor. The weld in question subsequently failed resulting in pressure boundary leakage in excess of Technical Specification 3.4.4 limits from June 16 to June 18, 2012. PPL took action to make repairs to the piping and review other areas for extent of condition. Because of the very low safety significance of this finding and because the finding was entered into PPL's CAP as CR 1589390, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387/2012005-04, Improper Stress Intensification Factor Results in RCS Pressure Boundary Leak)**

c. Observations

The inspectors assessed PPL's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of PPL's corrective actions to determine whether PPL's was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of PPL's corrective action program and 10 CFR 50, Appendix B. The inspectors concluded that PPL's evaluations and corrective actions for this issue were timely and appropriate. The RCA (CR 1589390, Revision 1) for the issue identified the causes of the through-wall leak, developed appropriate extent of condition and extent of cause reviews and the corrective actions were timely and reasonable.

.4 Annual Sample: Failure to Report Changes in Medical Conditions as Required by 10 CFR 50.74, "Notification of Change in Operator or Senior Operator Status" (1 sample)

a. Inspection Scope

In February 2012, PPL staff commenced a root cause investigation (CR 15167640) in response to a series of NRC findings from 2007 to present involving required NRC notifications not being made that affected license conditions of licensed operators. The root cause report was issued on April 17, 2012. As a result of PPL's review, on July 20, 2012, PPL submitted ten medical updates to the NRC. Four of the ten submittals reported permanent changes in medical conditions that were not submitted in a timely manner as required and six others were submitted to the NRC as "Information Only." On August 28 to 29, 2012, inspectors conducted a Problem Identification and Resolution (PI&R) inspection. Since there had been a history of unreported medical issues at Susquehanna dating back four years, the focus of this inspection was to determine the site process for conducting the 10 CFR 55 required biennial licensed operator medical exams. The inspectors reviewed appropriate medical documents, PPL procedures and conducted interviews with PPL Staff, the PPL Medical Reviewing Officer (MRO) and other knowledgeable individuals. This inspection also evaluated PPL's actions to restore compliance and address SLIV NOV 50-387 & 388 2011-004-01. However, due to the additional issues discovered and discussed below, the NOV could not be closed.

b. Findings

Introduction. The inspectors identified an unresolved item (URI) related to licensed operator medical examinations and qualifications required by 10 CFR 55.53 and 10 CFR 55.21. Specifically, over a period of approximately four years, a number of licensed operators developed potentially disqualifying medical conditions which were not properly evaluated by PPL in accordance with ANSI/ANS-3.4-1983, "American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants." In addition, during this same time frame, there were a number of cases (i.e., both historical and current) where PPL potentially failed to notify the NRC of a change in medical condition within 30 days as required by 10 CFR 55.25. The inspectors concluded that there are a number of recently submitted submittals of PPL medical status updates that will require independent evaluation by the NRC's contract physicians before the NRC is able to determine whether the medical issues represented disqualifying conditions and; therefore, would constitute a violation of NRC requirements.

Description. In February 2012, PPL launched a root cause evaluation (CR 15167640) in response to a series of NRC findings from 2007 to present involving required NRC notifications not being made that affected license conditions of licensed operators. The root cause report was issued on April 17, 2012. As a result of this evaluation, on July 20, 2012, PPL submitted ten medical updates to the NRC. Four of the ten submittals reported permanent changes in medical conditions that were not submitted in a timely manner as required and six others were submitted to the NRC as "Information Only." PPL later resubmitted three of the six "Information Only" submittals adding conditions to the licenses after follow-up questioning from the NRC contract doctor. Examples of license conditions included "Solo Operations is Not Authorized" and "Shall Submit Medical Status Report Every 12 Months."

In addition, PPL staff initiated CR 1597808 on July 12, 2012, when PPLs interviews conducted with the MRO and site nurse as part of a root cause corrective action (CRA 1567782) revealed they are not adequately familiar with regulatory responsibilities contained in 10 CFR 55.23, ANSI 3.4, and the NRC Medical FAQs. During the week of July 16, 2012, the inspectors conducted a follow-up interview with the Licensed Operator Requalification Training (LORT) supervisor who was assigned overall responsibility for follow-up to the root cause investigation and corrective actions. On July 17, 2012, the inspectors asked the LORT supervisor why neither the primary root cause (“Susquehanna lacks a formal process to maintain NRC licensed operator status to ensure appropriate notifications are made”) or causal factors pointed to the inadequate training and oversight of the MRO and examining physician or assigned corrective actions to address these issues. On July 18, 2012, PPL revised the root cause (CRA 1600109) to include training of the MRO and nurse as a root cause and assigned corrective actions to address this issue.

On August 16, 2012, the MRO called the NRC inspectors to discuss questions that had been previously posed to PPL staff by the inspectors. The MRO stated that he was assigned to his position in 2008. The MRO stated that he was not given any turnover or training regarding ANSI 3.4 or 10 CFR 55 requirements and that he relied on the in-house nurse for her experience and insights. Through this discussion, the inspectors identified that licensed operator medical examinations were coordinated by the site nurse but the examinations were actually conducted at the Berwick Hospital by another physician.

The site nurse, the MRO of record, and the doctor that actually performed the medical examinations at Berwick Hospital were interviewed by the inspectors to determine their process for conducting these examinations and for notifying the NRC when a change in medical condition requires the operator’s license to be conditioned. The interviews also established their prior understanding of the ANSI standard and 10 CFR 55. As a result of their interviews the inspectors identified the following information which was not identified in PPL’s Root Cause Analysis:

- The inspectors confirmed that the MRO was not provided a turnover or training regarding ANSI 3.4 or 10 CFR 55 but learned by on-the-job performance as discussed in the August 16 call with NRC inspectors.
- The inspectors identified that the MRO does not actually perform the operator medical examinations and, as a rule, he does not actually meet with or examine the licensed operators during the medical exam process. The exams were actually performed by a physician and his staff at Berwick Hospital and then the records were faxed back to the nurse for later review by the nurse and the MRO.
- The inspectors identified that the NRC Form 396s, “Certification of Medical Examination by Facility Licensee,” sent to the NRC had not been completed accurately in the past since the physician’s name that had actually performed the medical examinations was not entered on the part A of the form as required.
- The inspectors identified that, in April 2010, Susquehanna Form 4294, “Licensed Operator Medical Requirements,” was incorrectly revised by the MRO (i.e., the revisions did not accurately reflect disqualifying conditions as indicated in ANSI/ANS-3.4-1983). This Form was given to the physician actually performing the medical examinations at Berwick Hospital as a checklist to highlight ANSI disqualifying medical conditions.

- The inspectors identified that the doctor at Berwick Hospital, who had been performing the physical examinations for the past twenty years, had not been trained on either ANSI 3.4 or 10 CFR 55.

The licensed operator medical issues identified in the past four years (i.e., both current as well as historical) appear to be associated with PPL's failure to properly train and provide oversight for their MRO and the Berwick examining physician regarding compliance with the requirements of ANSI/ANS-3.4-1983 and 10 CFR 55. The medical issues identified during this time frame appear to be related to a lack of knowledge and inadequate oversight. The inspectors noted the following guidance applies:

- ANSI/ANS-3.4-1983, states in part, "3. Health Evaluation Responsibility, 3.1 General Aspects. The primary responsibility for assuring that qualified personnel are on duty rests with the facility operator. The health requirements set forth herein are considered the minimum necessary to determine that the physical condition and general health of the individual are not such as might cause operational errors endangering public health and safety. The designated medical examiner shall be conversant with this standard and should have a general understanding of activities required of a nuclear reactor operator."
- Susquehanna Procedure, NTP-QA-31.12, Revision 5, "Preparation and Submission of NRC Form 396 - Certification of Medical Examination by facility Licensee and NRC Form 398 - Personal Qualifications Statement - Licensee," section 6.3.11, states in part, "The Consulting Physician reviews the results against the medical standards set forth in ANSI/ANS 3.4 -1983... completes the medical section of Form NRC- 396 for employees seeking Initial Licensure and Six-Year License Renewal or any change in medical condition. Consulting Physician may also request a "waiver" or a "specifically limited approval" when an employee's general medical condition does not meet the minimum standard, i.e., wear corrective lenses. These requests are documented on Form NRC-396 and other medical history and pertinent medical documentation are attached."
- NRC Form 396, "Certification of Medical Examination by Facility Licensee," Part A, Medical Examination Information, provides the physicians name, license number, and most recent biennial medical examination date for the applicant that was examined and states in part, "I certify that in reaching this determination the guidance in the ANSI standard...was followed, and that documentation is available for review by the NRC." In addition, page two of the "Instructions for NRC FORM 396," states in part, "...the physician has the ultimate responsibility for certifying that the medical examination was conducted in accordance with the ANSI standard and the applicant meets the medical requirements."

The inspectors concluded that PPL's failure to properly identify potentially disqualifying medical conditions resulted in failure to notify the NRC of these changes in medical conditions within 30 days, and in some cases may have affected the operators' ability to comply with operator license conditions that should have been in affect while standing watch. This was a performance deficiency within PPL's ability to foresee and correct and should have been prevented. The NRC has issued conditioned individual operator licensees which address the potentially disqualifying conditions for the operators.

PPL has recently submitted several PPL medical status updates for the cases in question that will require independent evaluation by the NRC's contract physicians. The inspectors determined that these concerns represent a URI. Completion of an independent evaluation by the NRC contract doctors is required before the NRC is able to determine whether medical issues represented disqualifying conditions and, therefore, would constitute a violation of NRC requirements. **(URI 05000387;388/2012005-05, Concerns Regarding PPLs Program for Conducting Biennial Medical Exams for Licensed Operators and Reporting Changes in Medical Conditions).**

.5 Annual Sample: Instances of Inoperable Main Steam Safety Relief Valves (SRVs)
(1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of PPL's evaluations and corrective actions associated with CR 1587108, for main steam SRV test failures. Specifically, during the 2012 Unit 1 refueling outage, two out of 5 SRVs tested did not meet the setpoint criteria of +3 to -5 percent set forth in TS 3.4.3. Both SRVs actuated at a setpoint less than the -5 percent criteria.

The inspectors assessed PPL's problem identification threshold, problem analysis, extent of condition reviews, compensatory actions, and the prioritization and timeliness of PPL's corrective actions to determine whether PPL was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of PPL's CAP and 10 CFR 50 Appendix B. The inspectors interviewed engineering and licensing personnel to assess the effectiveness of the implemented corrective actions, the reasonableness of the planned corrective actions, and to evaluate the extent of any ongoing SRV problems. Specific documents reviewed are listed in the attachment to this report.

b. Findings and Observations

No findings of significance were identified.

PPL staff determined the cause of the lower actuation was attributed to valve internal misalignment. PPL staff determined the event to be a common cause inoperability of independent trains or channels and reportable under 10 CFR 50.73(a)(2)(vii). However, both SRVs would have relieved pressure before exceeding +3 percent. Therefore, the SRV safety function, described in UFSAR 5.2.2.1.1, to prevent over-pressurization of the reactor coolant pressure boundary, was not adversely impacted. In addition, TS 3.4.3 required the safety function of 14 of the 16 SRVs to be operable. With both SRVs outside of their allowable TS setpoint criteria, 14 SRVs still remained operable and there was no TS violation. PPL staff coordinated with the SRV vendor to address the misalignment issues.

The inspectors determined PPL staff's overall response to the issue was commensurate with the safety significance and included conservative decision-making and appropriate engineering analysis. The inspectors determined that the actions taken or planned were reasonable to resolve the identified SRV issues.

.6 Annual Sample: Evaluation of PPL's Corrective Action Plans to Address Substantive Cross-Cutting Issues P.1(c), "Evaluation of Identified Problems," and H.2(c), "Procedure Quality."

a. Inspection Scope

The inspectors reviewed PPL's corrective actions to address substantive cross-cutting issues P.1(c), "Evaluation of Identified Problems," and H.2(c), "Procedure Quality/Procedure Use and Adherence." The inspectors evaluated PPL staff's performance in addressing the P.1(c) and H.2(c) SCCI and corrective action plan implementation. The standards applied to the inspection are the performance attributes contained within NRC inspection procedure 71152, "Problem Identification and Resolution," as related to corrective action implementation and effectiveness reviews. Documents reviewed are listed throughout the body of the report and in the Attachment.

The P.1(c) cross-cutting theme was first identified in the 2010 Annual Assessment Letter (ML110620317), dated March 4, 2011, and remained open as documented in the 2011 End-of-cycle Assessment (ML12061A021) and 2012 Mid-cycle Assessment (ML12248A066) letters. The H.2(c) cross-cutting theme was first identified in the 2011 Mid-cycle Assessment Letter (ML112430469), dated September 1, 2011, and remained open as documented in the 2012 Mid-cycle Assessment Letter (ML12248A066).

b. Findings and Observations

No findings were identified.

PPL Corrective Actions Related to CAP – Evaluations (P.1(c))

PPL staff implemented corrective actions to address the P.1(c) substantive cross-cutting issue as identified in their Performance Improvement Integrated Matrix (PIIM). This document describes seven elements intended to improve PPL's CAP performance. The inspectors determined that PPL made progress in implementing corrective actions with the following observations:

- In 2011, PPL staff identified a significant contributing cause to for quality issues with corrective action program (CAP) evaluations was insufficient staff skill and understanding of process for performing root cause, apparent cause and lower level cause evaluations. To correct this, since 2011, PPL implemented qualification-based CAP training to employees and supervisors responsible for performing evaluations. The training was developed to improve evaluation quality and enhance staff knowledge on how to perform, review, and approve CAP evaluations. Corrective actions to improve evaluation quality are in progress and include PPL's actions to discuss evaluation quality in leadership and all-hands meetings, increased management participation in corrective action review boards (CARBs), and Training Needs Analyses (1547326) to make adjustments to evaluation training as needed.
- Since May 2011, PPL instituted Departmental Corrective Action Review Boards (DCARBs), which are intended to improve evaluation quality before the evaluations are submitted to the station's CARB for approval. The inspectors reviewed PPL procedure NDAP-00-0761, "Departmental Corrective Action

Review Board,” and determined that PPL engineering department staff did not adhere to the procedure requirement (step 2.2.2) for sampling level 3 evaluations at DCARB. The inspectors determined this issue was a performance deficiency and a minor finding related to PPL’s procedural requirements. However, this issue is not a violation of NRC requirements. PPL staff entered this issue into the CAP (1651434).

- PPL staff completed an evaluation (1502875) of the quality of operability determinations, which determined that the appropriate level of rigor was not being consistently applied in the performance of initial operability determinations by operations personnel. In response, PPL staff completed a training needs analysis (1383039). Full training for senior reactor operators (SROs) on operability determinations has not yet been completed due to the availability of the desired training vendor. In the interim, PPL staff has provided supplemental training on operability determinations to SROs, and instituted additional peer checks of operability determinations. Self assessments completed since the interim training began (1521473) have concluded there is improvement in operability evaluation quality. The inspector also noted there were no NRC findings related to Operability Determinations over the last two quarters.
- In December 2011, PPL staff determined that from a risk perspective, many Level 3 CR evaluations within the station’s backlog did not require evaluations but were important to include in the CAP for trending. Corrective Action Program Coordinator – Performance Improvement Coordinators (CAPCO PICs) review these items periodically (CAP Health Days) and have determined many of the items could be rescreened to a lower significance level in accordance with site procedures. PPL staff also determined that many CRs were written with insufficient problem descriptions, which made it difficult for the evaluators and the Management Review Committee (MRC) screening team to understand the scope of the problem. PPL staff has rescreened many of these CRs in accordance with site procedures. Additionally, PPL staff instituted training for evaluators and supervisors to improve upon the problem descriptions in CRs they approve. These actions are attributed to a reduction in backlog with over 1030 corrective actions closed since May 2012.

PPL Corrective Actions Related to Procedure Quality (H.2(c))

PPL implemented corrective actions to address procedure quality issues as identified in the PIIM, which is intended to improve procedure quality, usage, and adherence. Included in these corrective actions is the establishment of a site procedure group and a procedure upgrade project. These items were inspected by the NRC during the conduct of the NRC 95002 supplemental inspection follow-up in November 2012. The inspection results for the site procedure group and procedure upgrade project are documented in NRC inspection report 05000387/2012011.

The inspector determined that PPL has made progress in creating and implementing corrective actions to address the H.2(c) substantive cross-cutting issue; however, some items in the plan are in their early stages. The inspector noted the following observations:

- In April 2011, PPL completed a root cause evaluation (1389530) that determined the station had less than adequate procedures due to a failure to incorporate best industry guidance for procedure quality. Additionally, the root cause evaluation identified that PPL had less than adequate management oversight in reinforcing expectations for procedure use and adherence. Training sessions conducted in January 2012 on procedure use and adherence revealed that many supervisors were not adhering to or were not knowledgeable of existing procedure usage standards (verifying current revision, place-keeping, signoffs, use of “not applicable,” and general adherence requirements). A four-hour classroom-based course was created and given to over 1000 PPL employees, which focused on establishing rules and standards for procedure use to ensure safe, effective control of work activities.
- PPL evaluated the site’s progress in procedure use and adherence through effectiveness reviews, CR trending, and the use of Observation Way (an employee observation database). Since January 2012, PPL has completed 15 effectiveness reviews which have shown through interviews that personnel are being more critical, are demonstrating the desired procedure use and adherence behaviors, and are identifying procedure issues during their work activities. CR trending data shows that a total of 1589 CRs have been issued since January 2012 which identify procedure issues for action and evaluation. Additionally, 581 more procedure issues have been identified in 2012 than in 2011. The CRs also indicate that the number of procedure noncompliance events have decreased from 32 events in the 3rd quarter 2011 to 11 events in the 3rd quarter 2012.
- Observation Way data indicated a difference in behaviors associated with procedure use and adherence fundamentals. In 2012, 1019 observations were made of individuals who demonstrated a questioning attitude and stopped a job when unsure about a procedure issue. PPL staff has interpreted this data as evidence that the corrective actions from the root cause evaluation (1389530) have resulted in the station personnel identifying more issues related for procedure quality while procedures are in use in the field, and initiating actions to address those issues vice working around procedure issues.

The inspectors reviewed the progress of the site procedure upgrade group to improve procedure quality and found that at the time of the inspection the station had completed 333 procedure upgrades of the 700 high priority procedures. The station currently has more than 4000 additional procedures that are being considered for upgrade over the next several years. Though many of these non-upgraded procedures are in use in the field, comments in Observation Way and interviews with plant personnel indicate employees are raising concerns about existing procedures that have quality and usage issues. PPL has corrective actions in place to continue reviewing and upgrading the balance of the procedures.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 6 samples)

.1 Plant Events

a. Inspection Scope

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

- Unit 2, Manual reactor scram following failure of the integrated control system on November 9, 2012
- Unit 2, Automatic reactor scram during control valve testing on December 16, 2012
- Unit 2, Automatic reactor scram during plant startup on December 19, 2012

b. Findings

Introduction. Inspectors identified a Severity Level IV NCV of 10 CFR 50.72(b)(3)(iv)(A) and (B) when PPL operators did not report a valid actuation of the Unit 2 reactor protection system (RPS) on November 9, 2012 within eight hours of occurrence as required.

Description. On November 9, 2012 at 1:17 a.m., Unit 2 was manually scrammed following a failure in the integrated control system (ICS) and a subsequent lowering of reactor water level. This failure rendered the control of reactor feedwater and recirculation pump speed ineffective. Following the scram, reactor water level lowered, the RCIC and HPCI systems automatically initiated, reactor recirculation pumps tripped and containment isolations occurred as designed. Operators entered the appropriate procedures. The operators overrode HPCI to prevent its injection, and restored reactor water level using RCIC to a band of 13 to 30 inches in accordance with station procedures.

During the post-transient response, a reactor operator was controlling RCIC using a wide range reactor vessel level indicator in the vicinity of the RCIC control station. As reactor temperature and pressure decreased due to cooldown, the level indications displayed on wide range and narrow range began to diverge due to the fact these instruments are calibrated under hot and full pressure conditions. At 4:20 a.m., while wide range reactor water level indicated 24", narrow range level reached approximately 15 inches, and an automatic RPS scram was generated. Investigation determined that the low reactor water level scram switches are conservatively calibrated to 15 inches. Operators again entered applicable procedures and completed the scram response actions. Although no rod motion occurred due to all rods having been previously inserted, a valid reactor scram was initiated and the system responded as required.

PPL submitted a four-hour report in accordance with 10 CFR 50.72(b)(2)(iv)(A) and (B) at 03:03 on November 9 (EN 48496) for the original scram as required. However, the following day the inspectors questioned whether PPL operators had made an eight-hour report regarding the second reactor scram and associated containment isolation signals. 10 CFR 50.72 (b)(3)(iv)(A) requires an eight hour report for any valid actuation of the RPS system unless part of a preplanned test or in accordance with a procedure (such

as reactor shutdown). The inspectors raised the concern to the PPL management and PPL staff determined that a second report had not been made, and as a result of the inspectors' questions determined a report one was required. PPL staff subsequently submitted the report at 4:20 p.m. on November 10, 2012 (EN 48500).

The inspectors noted that NUREG 1022 Revision 2, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," clarifies that the event was reportable. Examples listed for RPS actuation include a scram signal generated with the plant in mode 3. "An ENS notification and LER are both required because, although the systems' safety functions had already been completed, the RPS scram and primary containment isolation signals were valid and the actuations were not part of the planned procedure. The automatic signals were valid because they were generated from the sensor by measurement of an actual physical system parameter that was at its set point."

The NRC was aware of both scrams, and no regulatory decisions were impacted due to the report for the second scram being made late.

Analysis. Not making a timely eight hour notification in accordance with 10 CFR 50.72 was a performance deficiency within PPL's ability to foresee and correct. The performance deficiency was evaluated in accordance with IMC 0612, Appendix B, and traditional enforcement was determined to apply because this was a reporting failure and therefore had the potential to impact the regulatory process. The issue was evaluated using the Enforcement Policy and determined to be similar to example 6.9.d.9, "a licensee fails to make a report required by 10 CFR 50.72 or 10 CFR 50.73." This is an example of a Severity Level IV violation.

Because this violation involves the traditional enforcement process and does not have an underlying technical violation that would be considered more-than-minor, inspectors did not assign a cross-cutting aspect to this violation in accordance with IMC 0612, Appendix B.

Enforcement. 10 CFR 50.72(b)(3)(iv)(A) requires, in part, that "any event or condition that results in valid actuation of any of the systems listed in paragraph (b)(3)(iv)(B) of this section shall be reported within eight hours, except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation." 10 CFR 50.72(b)(3)(B) states, in part, "The systems to which the requirements of paragraph (b)(3)(iv)(A) of this section apply are: (1) Reactor protection system (RPS) including: Reactor scram and reactor trip." Contrary to the above, PPL did not make a timely notification within eight hours of a valid RPS actuation, which occurred on November 9, 2012. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into PPL's CAP (CR 1643098), this violation is being treated as an NCV consistent with the NRC Enforcement Policy. **(NCV 05000388/2012005-06, Failure to Make a Timely Report for a Valid Actuation of RPS)**

.2 (Closed) Licensee Event Report (LER) 05000387/2012-005-00: Valve Internal Misalignment resulting in Multiple Inoperable Main Steam SRVs

a. Inspection Scope

In April 2012, during the Unit 1 outage, two main steam SRVs failed to meet the setpoint criteria of +3 to -5 percent set forth in TS 3.4.3. Both SRVs actuated at a setpoint less

than the -5 percent criteria. The cause of the lower actuation was attributed to valve internal misalignment. PPL determined the event to be a common cause inoperability of independent trains or channels and reportable under 10 CFR 50.73(a)(2)(vii). Both SRVs would have relieved pressure before exceeding +3 percent. Therefore, the SRV safety function, described in UFSAR 5.2.2.1.1, to prevent over-pressurization of the reactor coolant pressure boundary, was not violated. In addition, TS 3.4.3 required the safety function of 14 of the 16 SRVs to be operable. With both SRVs outside of their allowable TS setpoint criteria, 14 SRVs still remained operable. There were no actual adverse consequences as a result of this event.

The inspectors reviewed this LER, including PPL's evaluations and associated corrective actions. The inspectors did not identify any additional performance deficiencies related to this issue. This LER is closed.

b. Findings

No findings were identified.

.3 (Closed) Licensee Event Report (LER) 05000387/2012-007-00 and LER 05000387/2012-007-01: Unplanned Shutdown due to Unidentified Drywell Leakage

a. Inspection Scope

On June 19, 2012, PPL conducted a reactor shutdown of Unit 1 and entered the drywell to investigate the source of an increasing trend in drywell unidentified leakage. PPL discovered that the source of the leakage was from a through-wall crack on the 'A' reactor recirculation loop decontamination connection. The crack was determined to have been a fatigue-related failure due to cyclic vibration. LER 50-387/2012-007-00 was issued on Aug 17, 2012 and LER 50-387/2012-007-01 was issued November 20, 2012 to update the original LER with the results of the RCA.

The inspectors reviewed this LER, including PPL's evaluations and associated corrective actions. The inspectors did not identify any additional issues during the review of the LERs. These LERs are closed.

b. Findings

A self-revealing Green NCV was identified and is discussed in section 4OA2 of this report.

.4 (Closed) Licensee Event Report (LER) 05000388/2011-002-01: Condition Prohibited by Technical Specification due to Unknown RCIC Inoperability

a. Inspection Scope

On June 29, 2011, during startup from a refueling outage, operations personnel conducted the Unit 2 reactor core isolation cooling (RCIC) system quarterly flow surveillance. During the testing, RCIC tripped on overspeed. Subsequent troubleshooting determined the problem to be failure of the ramp generator signal converter (RGSC). An engineering evaluation determined that RCIC had been inoperable as a result of the RGSC problem on June 27, 2011 when the plant exceeded 150 psig and

the RCIC LCO became applicable. This constituted a condition prohibited by plant TSs and was reported to the NRC as LER 05000388/2011-002-00. This LER reported the apparent cause as unexpected, random failure of the RGSC. The NRC reviewed this LER and closed it in inspection report 05000388/2011005 with a Green NCV that identified the failure was maintenance induced. Revision 1 to this LER was submitted in May 2012 with results of a revised RCA.

The inspectors reviewed this LER, PPL's revised RCA, and associated corrective actions. This LER is closed.

b. Findings

No findings were identified.

4OA5 Other Activities

. 1 (Closed) NRC Temporary Instruction (TI) 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns

a. Inspection Scope

Inspectors verified that the PPL's walkdown packages for 1) ESSW pump house Area 55 elevation 685' and 660', 2) EDG building Area 43 elevation 660', 3) Unit 1 Reactor Building (RB) Area 25 elevation 645', and 4) 'E' EDG building Area 81 elevation 656', contained the elements as specified in NEI 12-07 Walkdown Guidance document:

The inspectors accompanied PPL staff on their walkdown of both Unit 1 RB Area 25 elevation 645' and 'E' EDG building Area 81 elevation 656' and verified that PPL staff confirmed the following flood protection features:

- Visual inspection of the flood protection feature was performed if the flood protection feature was relevant. External visual inspection for indications of degradation that would prevent its credited function from being performed was performed.
- Critical SSC dimensions were measured.
- Available physical margin, where applicable, was determined.
- Flood protection feature functionality was determined using either visual observation or by review of other documents.

The inspectors verified that noncompliance with current licensing requirements, and issues identified in accordance with the 10 CFR 50.54(f) letter, Item 2.g of Enclosure 4, were entered into PPL's CAP. In addition, issues identified in response to Item 2.g that could challenge risk significant equipment and PPL's ability to mitigate the consequences will be subject to additional NRC evaluation.

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction (TI) 2515/188 - Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns

a. Inspection Scope

The inspectors accompanied PPL on their seismic walkdowns of 1) Unit 2 Reactor Building 645' on August 15, 2012, 2) Unit 1 Reactor Building 719' on September 25, 3) Unit 2 Reactor Building 670' on September 26, and 4) Unit 2 Control Structure 771' on September 21, and verified that PPL confirmed that the following seismic features associated with the Unit 2 HPCI Steam Supply Valve (HV255F001), Unit 1 120 VAC Instrument Distribution Panel (1Y236), Unit 2 ESS Division I 480V MCC (2B219), and Unit 2 RHR/RCIC Relay Panel Division 2 (2C618), respectively, were free of potential adverse seismic conditions as applicable:

- Anchorage was free of bent, broken, missing or loose hardware.
- Anchorage was free of corrosion that is more than mild surface oxidation.
- Anchorage was free of visible cracks in the concrete near the anchors.
- Anchorage configuration was consistent with plant documentation.
- SSCs will not be damaged from impact by nearby equipment or structures.
- Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls are secure and not likely to collapse onto the equipment.
- Attached lines have adequate flexibility to avoid damage.
- The area appears to be free of potentially adverse seismic interactions that could cause flooding or spray in the area.
- The area appears to be free of potentially adverse seismic interactions that could cause a fire in the area.
- The area appears to be free of potentially adverse seismic interactions associated with housekeeping practices, storage of portable equipment, and temporary installations (e.g., scaffolding, lead shielding).

The inspectors independently performed walkdowns of the following equipment and verified they were free of the above listed adverse seismic conditions, as applicable:

- Unit 1, 1D653A, 250VDC engineering safeguard system (ESS) Division I Battery Charger 'A', in the Control Structure, on November 21, 2012
- Common, HD07812B, CREOAS Inboard Air Supply Damper, in the Control Structure, on November 21, 2012
- Common, 0E506B, EDG 'B' Lube Oil Cooler, in the Diesel Generator building, on November 21, 2012

Observations made during the walkdown that could not be determined to be acceptable were entered into PPL's CAP for evaluation.

PPL personnel determined that there were no items that could allow the spent fuel pool (SFP) to drain down rapidly. No items from the SFP were added to the SWEL.

b. Findings and Observations

No findings were identified.

.3 (Closed) Unresolved Item (URI) 05000387;388/2011005-05, RCIC Low Pressure Surveillance Requirement (SR)

a. Inspection Scope

Inspectors reviewed URI 05000388/2011005-05. This URI was initiated to determine whether PPL's implementation of TS SR 3.5.3.4 appropriately verified RCIC system operability. Specifically, the implementing procedure, SO-250-005, "24 Month RCIC Flow Verification," Revision 17, did not initiate RCIC with its flow controller in automatic at reactor pressure of 150 psig and verify the RCIC pump provided rated flow within 30 seconds. This procedure tested the RCIC system in manual at 150 psig and in automatic at rated pressure. Inspectors reviewed PPL's evaluations and operability determinations, the UFSAR, power uprate analysis and discussed the potential issue with Nuclear Reactor Regulation staff (NRR).

b. Findings

No findings were identified.

Based on a conference call with NRR technical staff and inspectors on October 11, 2012, inspectors determined that PPL did not establish the conditions assumed in the accident analysis in their implementing procedure SO-250-005, "24 Month RCIC Flow Verification," Revision 17, for the low pressure RCIC surveillance test. This determination was based, in part, on the UFSAR and power uprate analysis which assume that the RCIC system will start automatically. These requirements were translated into power uprate test criteria which states that "the average RCIC pump discharge flow shall be equal to or greater than the 100% rated value within 30 seconds from automatic initiation at any reactor pressure between 150 psig and rated."

The inspectors identified a violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," which states, in part, that "a test program shall be established to assure that all testing required to demonstrate that SSCs will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Contrary to this, PPL did not ensure that test conditions specified in TS SR implementing procedures were consistent with conditions assumed in the UFSAR accident analysis and test the RCIC system in automatic at both 150 psig and rated pressure. Inspectors determined this violation was not more than minor based on review of PPL's operability determination, which provided reasonable assurance of operability for the short period of exposure that the issue covered (reactor pressure of at approximately 150 psig which only occurs during plant startup and shutdown.) Additionally, PPL staff subsequently revised the surveillance procedure and satisfactorily performed the low-pressure surveillance test with the flow controller in automatic on each unit. This failure to comply with 10 CFR 50, Appendix B, Criterion XI, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This URI is closed.

40A6 Meetings, Including Exit

On January 25, 2013, the inspectors presented the inspection results to Mr. T. Rausch, Chief Nuclear Officer (CNO), and other members of the PPL staff. PPL acknowledged the findings. No proprietary information is contained in this report.

40A7 Licensee-Identified Violations

No findings were identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Alley, Medical review Officer
T. Case, Licensing Engineer
M. Crowthers, Manager, Licensing
N. Davis, Senior Engineer, Performance Improvement
R. Edwards, Mechanical Engineer
C. Goff, Training Director
J. Goodbred, Jr., Operations Manager
K. Griffith, Licensed Operator Requalification Program Lead
J. Grisewood, Manager, Performance Improvement
D. Hackenberg, Mechanic Leader
J. Helsel, Site Vice President (Acting), Plant General Manager
F. Hickey, Senior Health Physicist, Chemistry
C. Hoffman, Manager, Nuclear Fuels
T. Iliadis, General Manager, Nuclear Operations
J. Jennings, Manager, Performance Improvement
G. Kanouse, Medical Doctor, Berwick Hospital
T. Magrone, Chemistry Technician
M. Micca, Radwaste Shipper
S. Muntzenberger, Supervisor, Mechanical Engineering
B. O'Rourke, Licensing Engineer
C. Parks, Site Nurse
G. Pennycoff, Chemistry Technician
J. Petrilla, III, Supervisor, Regulatory Affairs
B. Rigotti, Senior Engineer
C. Ringer, Instrument and Control (I&C) Technician – Level II
R. Rodriguez-Gilroy, Radiological Operations Supervisor
R. Thomann, Support Engineer
R. Thompson, Simulator Instructor
J. Tripoli, Manager Regulatory Affairs
J. Seroka, System Engineer, Ventilation
K. Spako, McCarl's Worker
R. Stigers, Radwaste Specialist
R. Streeper, Operations Training Manager

NRC Personnel

K. Hoffman, Materials Engineer
K. Mangan, Senior Reactor Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened

05000387;388/2012005-05	URI	Concerns Regarding PPLs Program for Conducting Biennial Medical Examinations for Licensed Operators and Reporting Changes in Medical Conditions (Section 40A2)
<u>Opened/Closed</u>		
05000388/2012005-01	NCV	Failure to Demonstrate Effective Preventive Maintenance Under 50.65(a)(2) (Section 1R12)
05000387/2012005-02	NCV	Failure to Report Common-Cause Inoperability of Independent Trains (Section 1R12)
05000387;388/2012005-03	NCV	Failure of Full-Scale Drill Critique to Identify an RSPS Weakness (Section 1EP6)
05000387/2012005-04	NCV	Improper Stress Intensification Factor Results in RCS Pressure Boundary Leak (Section 40A2)
05000388/2012005-06	NCV	Failure to Make a Timely Report for a Valid Actuation of RPS (Section 40A3)

Closed

05000387/2012-005-00	LER	Valve Internal Misalignment resulting in Multiple Inoperable Main Steam SRVs
05000387/2012-007-00	LER	Unplanned Shutdown due to Unidentified Drywell Leakage
05000387/2012-007-01	LER	Unplanned Shutdown due to Unidentified Drywell Leakage
05000388/2011-002-01	LER	Condition Prohibited by Technical Specification due to Unknown RCIC Inoperability
05000387;388/2011-005-05	URI	RCIC Low Reactor Pressure SR

Discussed

05000387;388/2011-004-01	NOV	Failure to Report a Disqualifying Operator Medical Condition (Section 40A2)
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LIST OF DOCUMENTS REVIEWED
(Not Referenced in the Report)

Section 1R01: Adverse Weather Protection

Procedures:

ON-104-001, Unit 1 Response to Loss of All Offsite Power, Revision 20
ON-000-002, Natural Phenomena, Revision 28
NDAP-00-0030, Severe Weather Preparations (Winter Storm, Hurricane), Revision 3
NDAP-QA-0024, "Winter Operation Preparations," Revision 18

Condition Reports:

1522033, 1634874, 1654254*, 1654346, 1653636, 1640160*, 1639176, 1638800*, 1649975,
1647930, 1644298, 1644295, 1632320, 1631176, 1635181, 1635281, 1635250,
1617475, 1619820, 1624490, 1631176, 1612958, 1606545

Work Order:

1578318

Section 1R04: Equipment Alignment

Procedures:

CL-003-0011, Common 13.8kV System, Revision 2
CL-003-0012, Startup Transformers T10 and T20 (OX103 and OX 104), Revision 4
OP-003-003, Startup Bus 20 0A104 T20 Outage and Restoration, Revision 1
CL-054-0012, Common ESW System Mechanical, Revision 19
CL-054-0014, Unit 1 ESW System Mechanical, Revision 17
OP-054-001, ESW System, Revision 35
OP-249-001, "RHR System," Revision 41
SO-249-001, "Monthly RHR Alignment Check," Revision 25
CL-249-0015, "Unit 2 RHR System – Division II Mechanical," Revision 18
CL-249-0018, "Unit 2 RHR System – Common Mechanical," Revision 12
CL-249-0014, "Unit 2 RHR System – Division II Electrical," Revision 11
OP-024-001, "DG," Revision 64
SO-024-001A, "Monthly DG A Operability Test," Revision 12

Condition Reports (* NRC identified):

1638800*, 1644374, 1524795, 1524808, 1610241, 1355642, 1425464, 1528173

Drawings:

M-134, Sheet 1, "Common P&ID A, B, C, D DG Auxiliaries," Revision 49
M-134, Sheet 2, "P&ID A-D Diesel Auxiliaries – Starting Air," Revision 18
M-134, Sheet 3, "P&ID A-D Diesel Auxiliaries – Starting Air," Revision 16
M-134, Sheet 4, "P&ID A-D Diesel Auxiliaries – Jacket Water and Lube Oil Storage Systems,"
Revision 9

Miscellaneous:

Operations Logs for Units 1 and 2, dated October 27 – 30, 2012
TM-OP-024-ST, EDG A-D, Revision 11
TM-OP-024-ST, "EDGs A-D," Revision 12

Section 1R05: Fire Protection

Procedures:

OP-234-002, RB Heating, Ventilation, and Air Conditioning (HVAC) Zones 2 and 3, Revision 44
ON-013-001, Response to Fire, Revision 33
FP-213-245, HE and Pump Access Area (Fire Zone 2-3A), Elevation 683', Revision 5
FP-113-113, Containment Access Area (I-401, I-404, I-405) Fire Zones 1-4A-N, -S, -W,
Elevation 719'
FP-013,139, "Unit 1 Lower Relay Room C-203 Fire Zone O-24D, Elevation 698'-0"," Revision 8
FP-013-150, "Unit 1 Lower Cable Spreading Room C-300 Fire Zone 0-25E, Elevation 714'-)","
Revision 6
FP-213-239, "RCIC Pump Room (II-12), Fire Zone 2-10, Elevation 645'0"," Revision 7
FP-213-238, "HPCI Pump Room (II-11), Fire Zone 2-1C, Elevation 645'0"," Revision 5

Section 1R11: Licensed Operator Requalification Program

Procedures:

EO-100-102, RPV Control, Revision 8
EO-100-103, Primary Containment Control, Revision 9
EO-100-112, Rapid Depressurization, Revision 7
GO-100-002, Plant Startup, Heatup, and Power Operation, Revision 79
GO-100-005, Plant Shutdown to Hot/Cold Shutdown, Revisions 55 and 56
GO-100-004, Plant Shutdown to Minimum Power, Revision 60

Miscellaneous:

10CFR55.46, 49, 59, 55.45a(2) – a(3)
RG 1.149
NUREG 1021
OP002-406
OP002-310
Startup Control Rod Sequence A1, Unit 1, Cycle 18

Section 1R12: Maintenance Effectiveness

Procedures:

OP-202-001, 125V DC System, Revision 19
NEPM-GA-1170, "Through Wall Leakage in Class 3 Rain Water Systems," Revision 1
SI-178-201D, "Weekly Functional test of Intermediate Range Monitor (IRM) Channel 1D,"
Revision 6

Condition Reports:

1570413, 627323, 793337, 725347, 1571290, 1571862, 1571988, 1572356, 1571200, 1575809,
1636870, 1636945, 1083716, 725352, 1571862, 1571290, 1083716, 1468821, 1571988,
1091728, 1496655, 1498290, 1575062, 1501084, 1649605, 1646629, 1647950,
1647156, 1648135, 1646704, 1646788, 1646629, 1646792*, 1646005, 1646237,
1286903, 1138347, 1636752*, 1636746, 1635356, 1634937, 1635728, 1634551,
1635356, 1632988, 1637562, 1633113, 1633341, 1633101, 1527146, 1602279,
1607032, 1607178, 1603839, 1602376, 1602373, 1607037

Work Orders:

1497855, 1497848, 1511889, 1527055, 1638746, 1577438, 1496680, 1643158, 1643161

Miscellaneous:

Engineering Work Request (EWR) 1643161
Maintenance Rule Expert Panel Meeting Minutes, Meeting Number 2012-1025
MRFF Evaluation Summary, MRFF CR Number: 1496655/1501084, October 25, 2012 Expert Panel
Maintenance Rule Basis Document – System 02, 125V DC, dated October 9, 2012
Maintenance Rule Basis Document – System 50, RCIC, dated October 9, 2012
ASME Code Case N-513-3, “Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division I”
M&P Laboratory Report QR-0297, dated March 9, 2006
GE SIL 496, “Electrical Protection Assembly Performance, Revision 1
Maintenance Rule Basis Document, System 58, RPS
Maintenance Rule Basis Document, System 78, Nuclear Instrumentation
TM-OP-056A-ST, “Reactor Manual Control System,” Revision 5
Maintenance Rule Basis Document, System 56, Control Rod Manual Control

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures:

NDAP-QA-0340, Protected Equipment Program, Revision 18
NDAP-QA-1902, Integrated Risk Management, Revision 9
NDAP-QA-1902, Integrated Risk Management, Revision 9

Condition Reports (* NRC-identified):

162875, 1634526*

Action Request:

1510008

Work Orders:

1468533, 1603991, 1101487, 1376695, 1440681, 1616046, 1599832

Miscellaneous:

PEPETF for 149F007B
Equipment-Out-of-Service (EOOS) Run for Unit 1, October 15, 2012
Sapphire 8 Spar Model
PEPETF for ‘B’ ESW
EOOS Run for Unit 1 and Unit 2, October 17, 2012

Section 1R15: Operability Evaluations

Procedures:

NDAP-QA-0703, Operability Assessments and Requests for Enforcement Discretion, Revision 21
NDAP-QA-0423, Station Pump and Valve Testing Program, Revision 24
SO-216-A03, Quarterly RHRSW Flow Verification Division I, Revision 6
AR-208-001, RCIC System 2C601, Revision 21
SO-250-002, Quarterly RCIC Flow Verification, Revision 43
SO-100-007, Revisions 56 and 57
SO-200-007, Revisions 55 and 56
RE-ITP-023, Revision 11

RE-ITP-024, Revision 10
NDAP-QA-0752, Cause Analysis, Revision 16
SO-200-011, Reactor Vessel Temperature and Pressure Recording, November 11, 2012,
Revision 18

Calculations:

EC-062-0573, Study to Support the Bases Section of TS 3.4.10, Revision 1
EC-062-1072, Revised Pressure Temperature Curves for Units 1 and 2, Revision 0
EC-062-0595, Evaluation of Out of Limit Reactor Pressure Vessel (RPV) Cooldown and Heatup
Rate Occurring on February 12, 1989

Condition Reports (* NRC-identified):

1626384, 1627430, 1625663, 1632998, 1633011, 1633216, 1594228, 1594716, 1632238,
1444679, 1632488, 1549881, 1599794, 1499803, 1599447, 1514292, 1630823*,
1622882*, 1537511, 1639429*, 1639432*, 1639428*, 1639403*, 1636681, 1584097*,
1643198*

Work Orders:

154772, 1643156

Miscellaneous:

Operations Logs Assistant Operations Manager Directive 12-04
IOM 182, "CS, RB, TB, and RW Building Supply and Exhaust Filters," Revision 15
TS and TSB 3.7.3, 5.5.7, 5.5.14
FSAR Chapter 6, 15, and 915
ML040300694
NEI 99-03, Control Room Habitability Assessment, June, 2001
RG 1.197
PLA-3654, Response to RAI: Enforcement Action 89-042
TS 3.4.10, TSB 3.4.10
GE SIL 430, RPV Temperature Monitoring
GE-SIL 251, Control of RPV Bottom Head Temperatures and Supplement 1
NRC IR 05000387;388/1991-18

Section 1R19: Post-Maintenance Testing

Procedures:

MT-GE-005, Westinghouse 15KV Circuit Breaker and Switchgear Inspection and Maintenance,
Revision 31
SO-153-004, October 4, 2012
MT-GM-011, Valve Packing/Live Loading/Investigation, Revision 25
NDAP-QA-0515, Control and Calibration of Plant Measuring and Test Equipment (M&TE),
Revision 8
OP-164-001, Reactor Recirculation System, Revision 64
NDAP-QA-0482, Post-Maintenance Testing, Revision 6
MT-64-013, N-7500 Reactor Recirculating Pump Seal Installation and Removal, Revision 5
SO-260-001, "Quarterly LOCA Test of Drywell Area Unit Coolers/Fans," Revisions 11, 12,
and 13
SO-249-805, Quarterly RHR LOOP 'B' Valve Exercising, Revision 12
SO-249-802, Quarterly RHR System Flow Verification, Division II, Revision 17

Condition Reports (*NRC-identified):

1627252, 1627553, 1627632, 1627635, 1628266, 1630826, 1629644, 1629159, 1634913,
1634440, 1634485, 1638291*, 1639382*, 1630214, 1631025, 1611369, 208309,
207934, 1527004, 1640858, 1639840, 1646899*, 1643759, 1643087*

Work Orders:

1068151, 1078195, 1538898, 1595917, 1451837, 1042880, 1046251, 1597911, 1635411,
1631976, 1630834, 11630223, 1632384, 1640404, 1640974, 1605927, 1640859,
1437034, 897318, 1527017, 1635559

Drawings:

E-224, Sheet 4, Unit 2 Schematic Diagram Drywell Area Cooling Fans , Revision 20

Miscellaneous:

Field test Evaluation HV252F031A, October 9, 2012
Unit 1 Operations Logs, October 26, 2012
ASME Section XI IWA-4540 and IWA 5243, 1995 Edition with 1997 Addenda and 1998 Edition
with 2000 Addenda, ML 092740004
TS and TSB 3.6.1.5, 3.6.3.2
FSAR 9.4.5, 6.2.5

Section 1R20: Refueling and Other Outage Activities

Procedures:

GO-100-002, Plant Startup, Heatup, and Power Operation, Revision 79
GO-100-005, Plant Shutdown to Hot/Cold Shutdown, Revisions 55 and 56
GO-100-004, Plant Shutdown to Minimum Power, Revision 60
GO-200-004, Plant Shutdown to Minimum Power, Revision 58
GO-200-005, Plant Shutdown to Hot/Cold Shutdown, Revision 54
OP-249-002, RHR Shutdown Cooling, Revision 52

Condition Reports (*NRC identified):

1637660*, 1637564, 1637558*, 1633107, 1633109, 1633108, 1633256, 1633295, 1633074,
1633307, 1628763, 1628764, 1644287

Miscellaneous:

Startup Control Rod Sequence A1, Unit 1, Cycle 18

Section 1R22: Surveillance Testing

Procedures:

SE-235-301, Revision 9
Non-Destructive Examination (NDE)-Visual Examination (VT)-002, Revision 4
SI-280-301, Quarterly Calibration of Reactor Vessel Pressure Channels (Core Spray System
and LPCI Permissive) Reactor Pressure Greater Than Setting (420 psig)
SO-150-006, "RCIC Comprehensive Flow Verification," Revision 10
SO-150-002, "RCIC Quarterly Flow Verification," Revision 47
SO-150-004, "RCIC Quarterly Flow, Valve Exercising," Revision 29
SO-293-001, "Quarterly Turbine Valve Cycling," Revisions 37, 38, and 39

Condition Reports (* NRC identified):

1629100, 1230833, 1230823, 1217911, 162470, 1620757, 1652315, 1652821

Miscellaneous:

BOP-VT-12-209, October 1, 2012

SSES Switching Order, dated December 18, 2012

Section 1EP6: Drill Evaluation

Procedure:

EP-PS-126, "Emergency Plan (EP) Communicator: EP-Position Specific Instructions,"
Revision 28

Condition Reports:

1641893, 1641933, 1641944, 1643229, 1641405, 1641923, 1641902, 1641881, 1641878,
1641860, 1641932, 1642144, 1642137, 1641923, 1641907, 1641860, 1649645,
1643107, 1643092, 1643184, 1641934, 1642205, 1641940

Miscellaneous:

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6

IN 2012-18, "Failure to Properly Augment Emergency Response Organizations (ERO)"

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures:

CH-ON-001, SPING Alarm Response, Revision 18

CH-ON-003, Chemistry Requirements for Plant Events, Revision 25

CH-RC-032, Tritium Analysis - Sample Preparation and Analysis, Revision 13

CH-RC-076, Gamma Spectral Analysis, Revision 11

CH-YS-014, SPING Data Collection and System Monitoring, Revision 15

ODCM-QA-003, Effluent Monitor Setpoints, Revision 7

ODCM-QA-008, Radiological Environmental Monitoring Program, Revision 14 and 15

NDAP-QA-1180, Radiological Effluent Monitoring and Control, Revision 7

SC-069-001, Liquid Radwaste Sampling and Pre-Release Analysis, Revision 21

SC-070-001, Standby Gas Treatment Vent Iodine and Particulate Activity, Revision 18

SC-070-002, Standby Gas Treatment Vent Iodine and Particulate Activity, Revision 16

SC-133-101, Unit-1 Turbine Building Vent Iodine and Particulate Activity, Revision 16

SC-133-102, Unit-1 Turbine Building Vent Tritium and Noble Gas Grab Sample Analysis,
Revision 13

SC-134-101, Unit-1 RB Vent Iodine and Particulate Activity, Revision 16

SC-134-102, Unit-1 RB Vent Tritium and Noble Gas Grab Sample Analysis, Revision 13

SC-233-101, Unit-2 Turbine Building Vent Iodine and Particulate Activity, Revision 16

SC-233-102, Unit-2 Turbine Building Vent Tritium and Noble Gas Grab Sample Analysis,
Revision 16

SC-234-101, Unit-2 RB Vent Iodine and Particulate Activity, Revision 16

SC-234-102, Unit-2 RB Vent Tritium and Noble Gas Grab Sample Analysis, Revision 15

Condition Reports:

1348108, 1376390, 1485588, 1491557, 1507526

Audits, Self-Assessments, and Surveillances

QA Audit 1343694, Chemistry/ Effluents Audit Report
Updated Hydrogeologic Investigation Report, January 2011

Release Permits:

2011013, 2011028, 2011071, 2011087, 2011097, 2011141

Release Permits (with out-of-service radiation monitors)

2011003, 2011004, 2012006, 2012077, 2012076, 2012106, 2012109

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Procedures:

NDAP-QA-0646, Solid Radioactive Waste Process Control Program, Revision 12
WM-PS-150, 10CFR61 Non-Process Waste Stream Sampling, Revision 2
WM-PS-155, 10CFR61 Sample Shipping and Correlation Factor Determination, Revision 4
WM-PS-160, Radioactive Waste Curie Calculations, Revision 4

Condition Reports (* NRC identified):

1321067; 1351082; 1401530; 1447145; 1488491; 1527095; 1605044; 1508719; 1579742;
1578509; 1543806; 1629175; 1380959; 1505160; 1406109; 1504510; 1402236;
1543803; 1633075; 1633077; 1633078; 1633080; 1633089; 1633091

Miscellaneous:

Radioactive Material Shipments Nos. 12-011; 12-015; 12-025; 12-064; 12-076
Teledyne Brown Engineering Report of Analysis for: control rod drives (CRDs); dry active waste;
condensate bead resin; liquid radwaste filter media; reactor water clean-up; condensate
filtration system backwash media; U-1 SPF clean-up; U-2 SPF clean-up
Quality Assurance Audit #1340786, dated 3/25/11, RP/Solid Radwaste Report
Walkup Assessment of Low Level Radioactive Waste Holding Facility, dated 2/16/12 & 3/2/12
PPL Audit No. 23091, February 15-16, 2011, Toxco Materials Management Center

Nuclear Utilities Procurement Issues Council (NUPIC) Audits:

#22876, December 13-16, 2011, Studsvik Processing Facility – Erwin, LLC
22572; 22698; 22603; 22601; 22600, April 13-29, 2010, EnergySolutions
#22937, January 24-27, 2011, Teledyne Brown Engineering
#22873, November 14-18, 2011, GEL Laboratories, LLC

Training Material:

HP230, Revision 1, HAZMAT Training for Health Physics (HP) Technicians
HS053, Revision 2, HAZMAT Training for Container Handlers
EF009, Revision 2, Load Securement Training

Section 4OA1: Performance Indicator Verification

Condition Reports (* NRC identified):

1656747*, 1517915, 1357297, 1656747*

Miscellaneous:

NEI 99-02, "Regulatory Assessment PI Guideline," Revision 6
PL-NF-06-002, "MSPI Basis Document," Revision 6
NDAP-QA-0737, Reactor Oversight Process (ROP) Performance Indicators, Revision 9
EP-AD-022, Nuclear Emergency Planning Performance Indicators, Revision 3
Alert and Notification System Reliability PI Data, October 2011 – September 2012
Drill and Exercise Performance PI Data, October 2011 – September 2012
Emergency Response Organization Drill Participation PI Data, October 2011 – September 2012

Section 40A2: Identification and Resolution of Problems

Procedures:

OP-AD-010, Control of Licensed Operator License Status, Restrictions and Requirements, Revision 6
NTP-QA-31.12, Preparation and Submission of NRC Form 396 - Certification of Medical Examination by Facility Licensee and NRC Form 398 - Personal Qualifications Statement – Licensee, Revision 5
ANSI/ANS-3.4-1983, "American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants"
NDAP-00-0761, Departmental Corrective Action Review Board, Revision 2
NDAP-QA-0702, Action Request and Condition Report Process, Revision 38
OP-023-001, Diesel Fuel Oil System, Revision 32
OP-023-001, Diesel Fuel Oil System, Revision 33

Condition Reports (* NRC identified):

1630609*, 1632818*, 1633719*, 1633700*, 1639335*, 1563931, 1587108, 1602093, 1602094, 1632000, 1632281, 16511165*, 1651391*, 1651419*, 1651434*, 1651844, 1651311, 1651824, 1502875, 1521513, 1602210, 1651434*, 1651844, 1651311, 1651824, 1502875, 1521513, 1602210, 1521488, 1582719, 1549115, 1619762, 1634551, 1633700, 1406091, 1461742, 1541936, 1541933, 1601934, 1643405, 1641039, 1635196, 1446224, 1642609, 1344049, 1575787, 1464711, 1629414, 1629416, 1547326, 1619762, 1651119, 1650638, 1650638, 1650020, 1456122, 1570413, 1557151, 1554948, 1557394, 1549033, 1538286, 1383039, 1521473, 1389530, 1653022*, 1653454*

Licensing and Design Basis Documents

Susquehanna Operating License Amendment and NRC Safety Evaluation Report (SER) to Revise SRV Setpoint Tolerance from +/-1 percent to +/-3 percent (ML020520018), dated March 7, 2002
Susquehanna Operating License Amendment and NRC SER to Revise SRV Setpoint Tolerance from +/-3 percent to +3 percent, -5 percent (ML11291A137), dated November 17, 2011
TS 3.4.3 Basis, Safety/Relief Valves, Revision 4
TS 3.4.3, Safety/Relief Valves, Amendment 246
UFSAR Section 5.2.2, Overpressure Protection, Revision 64
UFSAR Section 7.7.1.12 Nuclear Pressure Relief System, Revision 64
UFSAR Table 15C.0-2, Input Parameters & Initial Conditions for Transients, Unit 1 Cycle 16, Revision 64

Calculations, Analysis, and Engineering Evaluations

Apparent Cause Evaluation (ACE) for CR 1399810, Revision 1
ACE for CR 1587108, Revision 0

Miscellaneous:

LaSalle Operating License Amendment and NRC SER to Allow Surveillance of the Relief Mode of SRV Operation with the Relief-Mode Actuator Uncoupled (ML013170087), dated December 13, 2001

LER 50-387/2012-005-00, Valve Internal Misalignment Resulting in Multiple Inoperable Main Steam SRVs, dated August 2, 2012

LER 50-388/2009-001-00, Multiple Test Failures of Main Steam SRVs, dated October 12, 2009

LER 50-388/2011-001-00, Multiple Inoperable Main Steam SRVs, dated July 1, 2011

Main Steam SRV Test Results History from 1985 to 2012

Maintenance Rule Basis Document, Unit 1 Main Steam System, dated September 12, 2012

NRC IR 05000387/2009003 AND 05000388/2009003, dated August 11, 2009

NRC IR 05000387/2010006 AND 05000388/2010006, dated March 15, 2010

NRC IR 05000387/2011005 AND 05000388/2011005, dated February 14, 2012

River Bend Operating License Amendment and NRC SER to Revise SRV Setpoint Tolerance from +/-3 percent to +3 percent, -5 percent, and Allow Surveillance of the Relief Mode of SRV Operation with the Relief-Mode Actuator Uncoupled (ML030450307), dated February 13, 2003

Wyle Labs Test Records for SRVs Serial Numbers N63790-00-0019-112 and N63790-00-0019-133, dated April 24, 2012 and February 25, 2012, Respectfully

OP002 CSI, "Licensed Operator Requalification Program (Training Material)," dated May 4, 2012

AD281, "Justification of Interim Operation – Operability and Functionality Processes (Training Material), dated July 23, 2012

AD264, "Procedure and Work Instruction Use and Adherence," dated March 17, 2012

AD260, "Procedure Writer Training," dated March 15, 2012

Procedure Quality/Procedure Use and Adherence PIIM, dated December 7, 2012

Procedure Quality/Procedure Use and Adherence PIIM, dated November 19, 2012

Station CAP PIIM, dated December 7, 2012

Station CAP PIIM, dated November 5, 2012

Station PIIM, dated September 4, 2012

Quick Hit Self-Assessment, "Procedure Use and Adherence," dated September 12, 2012

Susquehanna Station Quarterly Trend Report, 3rd Quarter, 2012

Section 4OA3: Event FollowupProcedures:

EO-200-102, "Reactor Vessel Level Control," Revision 8

ON-200-001, "Reactor Scram, Reactor Scram Imminent," Revision 23

OP-AD-001, Operations Standards for System and Equipment Operation, Revision 49

OP-AD-327, Post Reactor Transient/Scram/Shutdown Elevation, Revision 26

OP-245-001, RFP and Lube Oil System, Revision 66

AR-204-001, RPS Division 2 2C651, Revision 32

ON-200-101, Scram, Scram Imminent, Revision 23

OP-AD-338, Reactivity Manipulations Standards and Communication Requirements, Revision 19

GO-200-002, Plant Startup, Heatup, and Power Operation, Revision 67

SO-293-001, Quarterly Turbine Valve Cycling, Revision 37

SI-264-503, "24 Month Logic System Functional Test (LSFT) – Reactor Recirculation Pump Trip System," Revision 11

SI-264-303, "24 Month Calibration – Reactor Vessel Low Low Level Channels (ATWS – RPT and ARI)," Revision 16

Condition Reports:

1641025, 1643210, 1643098*, 1643098*, 1652339, 1652338, 1652507, 1652316, 1652377,
1652357, 1652391, 1652494, 1652316, 1652315, 1653679, 1653477, 1653479,
1455447, 1655159, 1654635, 1654555, 1654037, 1654158, 1653480, 1653762,
1655563, 1654991, 1654915, 1654258, 1653477, 1654235*, 1653633, 1148033,
1421109

Calculations:

EC-INST-1955, "I&C Maintenance Calculation for LISB212N025D," Revision 0
EC-INST-1956, "I&C Maintenance Calculation for LISB212N025D," Revision 0

Work Order:

1456387

Drawings:

E-129, Sheet 1, "FW RFP Discharge and Bypass Valves," Revision 14
E-129, Sheet 2, "FW RFP Discharge and Bypass Valves," Revision 9
M-2142, Sheet 1, "Unit 2 P&ID Nuclear Boiler Vessel Instrumentation," Revision 48
MI-B31-275, Sheet 8, "Reactor Recirculation Pump and MG Set," Revision 12
M1-B31-275, Sheet 7, "Reactor Recirculation Pump and MG Set," Revision 15

Miscellaneous:

NUREG 1022, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," Revision 2
EN 48496 dated November 09, 2012
EN 48500 dated November 10, 2012
Administrative Directive 12-07
TM-OP-045I-ST, Reactor Feedwater Level Control System (ICS/DCS), Revision 03
Startup Control Rod Sequence A1, Unit 2, Cycle 16
Engineering Journal, System 64, Journal ID 1316

Section 40A5: Other Activities

Condition Reports:

1637421, 1635348, 1635279, 1635281, 1634516, 1634527, 1634536, 1634540, 1634541,
1634557, 1634560, 1634561, 1634562, 1634563, 1634544, 1634554, 1634555,
1634550, 1634559, 1632786, 1631806, 1630573, 1631474, 1630575*, 1630573,
1628346, 1627138*, 1623021, 1623016, 1601043, 1599743, 1599747, 1599726,
1599748, 1596549, 1599391, 1609708*, 1625702*, 1624965*, 1625645*, 1623008*,
1623018*, 1623022*, 1626973*, 1624965*, 1646231*, 1644480*, 16326521624541,
1613781, 1613752, 1613734, 1610459, 1609310, 1609332, 1609320, 1587132,
1618860, 1618312, 1613774, 1613798, 1613805, 1624632, 1624541, 1606132,
1644480*, 1659709

Miscellaneous:

Seismic Walkdown Checklist for: 0E506B, 1D653A, HV255F001, 2C618, 2B219, 1Y236,
HD07812B
Flooding Walkdown Record for: Unit 1 Reactor Building Penetrations on X-25-1 Sh.2
Section A-A, 'E' EDG Building Penetrations on X-81-1 Sh.1 Section A-A

LIST OF ACRONYMS

AC	Alternating Current
ACE	Apparent Cause Evaluation
ACMP	Adverse Condition Monitoring Plan
ADAMS	Agencywide Document and Access Management System
ALARA	As Low As Is Reasonably Achievable
ANS	Alert and Notification System
AR	Action Report
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CAPCO-PIC	Corrective Action Program Coordinator – Performance Improvement Coordinators
CARB	Corrective Action Review Board
CCA	Common Cause Analysis
CCEMA	Columbia County Emergency Management Agency
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
CR	Condition Report
CRA	Condition Report Action
CRD	Control Rod Drive
CREOAS	Control Room Emergency Outside Air Supply
CS	Control Structure
DCARB	Departmental Corrective Action Review Boards
DEP	Drill and Exercise Performance
DG	Diesel Generator
DH	Decay Heat
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EHC	Electrohydraulic Control
ENS	Emergency Notification System
EOOS	Equipment Out-of-Service
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPA	Electrical Protective Assembly
EPU	Extended Power Uprate
ERO	Emergency Response Organization
ESS	Engineering Safeguard System
ESW	Emergency Service Water
ESSW	Engineering Safeguards Service Water
EWR	Engineering Work Request
FIN	Finding
FPC	Fuel Pool Cooling
GE	General Electric
HP	Health Physics
HPCI	High Pressure Coolant Injection
HVAC	Heating, Ventilation and Air-Conditioning
HX	Heat Exchanger
ICS	Integrated Control System
I&C	Instrumentation and Controls

IN	Information Notice
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	NRC Inspection Report
ISI	Inservice Inspection
JP	Jet Pump
kV	Kilovolts
LCEMA	Luzerne County Emergency Management Agency
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LP	Low Pressure
LSFT	Logic System Functional Test
MPFF	Maintenance Preventable Functional Failure
MPG	Maintenance Procedure Group
MRC	Management Review Committee
MREP	Maintenance Rule Expert Panel
MRFF	Maintenance Rule Functional Failures
MRO	Medical Review Officer
MSPI	Mitigating Systems Performance Index
M&TE	Measuring and Test Equipment
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NI	Nuclear Instrumentation
NRC	Nuclear Regulatory Commission
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
ODM	Operational Decision Making
OE	Operating Experience
ORO	Off-site Response Organization
PARS	Publicly Available Records
PCP	Process Control Program
PEMA	Pennsylvania Emergency Management Agency
PI	[NRC] Performance Indicator
PI&R	Problem Identification and Resolution
PIIM	Performance Improvement Integrated Matrix
PIM	Plant Issues Matrix
PIRB	Performance Improvement Review Board
PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
PS	Planning Standard
QA	Quality Assurance
RB	Reactor Building
RCA	Radiologically Controlled Area
RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RG	[NRC] Regulatory Guide

RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RMA	Risk Management Actions
ROP	Reactor Oversight Process
RP	Radiation Protection
RPIS	Rod Position Information System
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RSPS	Risk Significant Planning Standard
SBO	Station Blackout
SCBA	Self-Contained Breathing Apparatus
SCCI	Substantive Cross-Cutting Issue
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SRM	Source Range Neutron Monitoring
SRO	Senior Reactor Operator
SRV	Safety Relief Valve
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
SW	Service Water
TI	Temporary Instruction
TS	Technical Specifications
T20	T20 Startup Transformer
UFSAR	Updated Final Safety Analysis Report
UVR	Under-Voltage Relay
VDC	Volt Direct-Current
VT	Visual Examination
WO	Work Order