

February 9, 2011

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 05000387/2010005 AND 05000388/2010005

Dear Mr. Rausch:

On December 31, 2010, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station Units 1 and 2. The enclosed integrated inspection report presents the inspection results, which were discussed on January 6, 2011, with you and other members of your staff.

This inspection examined activities completed 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), and one Severity Level IV traditional enforcement finding. Three of these findings were determined to involve violations of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance and because they are entered into your correction action program (CAP), the NRC is treating these findings as 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 inspection report, 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, United States 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 inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at the Susquehanna Steam Electric Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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/

Paul G. Krohn, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosures: Inspection Report 05000387/2010005 and 05000388/2010005
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: 05000387/2010005 and 05000388/2010005

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: October 1, 2010 through December 31, 2010

Inspectors: P. Finney, Senior Resident Inspector
J. Greives, Resident Inspector
A. Rosebrook, Senior Project Engineer
J. Furia, Senior Health Physicist
M. Patel, Operations Engineer
T. Hedigan, Operations Engineer

Approved By: Paul G. Krohn, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2010005, 05000388/2010005, 10/01/2010 – 12/31/2010; Susquehanna Steam Electric Station, Units 1 and 2; Maintenance Risk Assessments and Emergent Work Control, Performance Indicator (PI) Verification, Identification and Resolution of Problems.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by regional reactor inspectors. Two Green NCVs, one Green finding, and one SL-IV violation were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated February 2010. Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process (ROP)," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green: An NRC-identified NCV of 10 CFR 50.65(a)(4) occurred when PPL failed to conduct an adequate risk assessment of online maintenance activities during the week of October 24, 2010. In one period of elevated risk on October 27, 2010, the entire duration in which valve functionality was affected was not appropriately accounted for in the risk assessment for work on the Residual Heat Removal Service Water (RHRSW) system. Though the maintenance window was calculated as Yellow risk, when the entire period of functionality was considered the duration of Yellow risk was extended from 9.5 to 12.5 hours. Additionally, on October 26, 2010, online risk was calculated as Yellow for a period of 13.5 hours due to work on the Residual Heat Removal (RHR) system. In neither of these cases was the protected equipment program implemented as a risk management action as required by station procedures. PPL entered these issues into their CAP as condition reports (CRs) 1318550 and 1318602.

This finding affected the Human Performance attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is more than minor because it is similar to example 7.e. in IMC 0612 Appendix E, "Examples of Minor Issues," in that failure to perform an adequate risk assessment when required by 10 CFR 50.65 (a)(4) is not minor if the overall elevated plant risk would put the plant into a higher licensee established risk category or would require, under plant procedures, risk management actions (RMAs) or additional RMAs. In one case, plant risk was reclassified from Green to Yellow when the maintenance was properly modeled and in both cases the maintenance duration was in excess of the PPL established threshold requiring protected equipment as an RMA; therefore, the violation is more than minor. The inspectors evaluated the finding using IMC 0612, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." Since the incremental core damage probability deficit was less than 1 E-6 and the incremental large early release probability deficit was less than 1 E-7, this finding is determined to be of very low safety significance (Green). This finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution,

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Corrective Action Program. Specifically, though PPL had recognized a negative trend, as well as the underlying weaknesses in the assessment of on-line risk; prior to this violation occurring they failed to take appropriate corrective actions to address the adverse trend in a timely manner, commensurate with the safety significance and complexity. (P.1 (d)) (Section 1R13)

SL-IV: An NRC-identified NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information," occurred when PPL failed to update the Mitigating Systems Performance Index (MSPIs) to reflect a change in PPL's MSPI basis document. The change to the basis document affected all five MSPIs on each unit and resulted in inaccurate values for three consecutive quarters during 2010. PPL evaluated the MSPIs for needed changes and updated over 100 values used in calculating the PIs and entered the issues in their CAP as CRs 1328561 and 1328563. No performance indicator crossed the Green/White threshold once the values were updated.

Because violations of 10 CFR 50.9 are considered to potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process. The inspectors concluded that PPL had reasonable opportunity to foresee and correct the inaccurate information prior to the information being submitted to the NRC. This violation is characterized as a SLIV violation because it is similar to example 6.9.d.1 of the NRC Enforcement Policy, and is consistent with Section 2.2.1.c in that the violation impacted the regulatory process. Because this finding was of very low safety significance, was not repetitive or willful, and was entered into PPL's CAP, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. The significance of the associated performance deficiency was screened against the ROP per the guidance of Manual Chapter 0612, Appendix B and the inspectors determined it to be minor because it did not result in any of the PIs exceeding the Green-White threshold. As such, no ROP finding was identified and no cross-cutting aspect was assigned. (Section 4OA1)

Green: An NRC-identified NCV of 10 CFR 50, Appendix B, Criterion XII, "Control of Measuring and Test Equipment," occurred when PPL failed to control and calibrate measuring and test equipment (M&TE) at specified periods and document evaluations of missing M&TE. The inspectors added significant value in identifying, that since at least 2008, when M&TE was missing for long periods of time after being due for calibrations, it was not being captured and evaluated in CRs in a timely manner once retired and declared lost. PPL entered this issue into their CAP as CR 1339535.

The issue was evaluated in accordance with IMC 0612 Appendix E, "Examples of Minor Issues," and determined to be similar to examples 3J, 3K and 4A. Namely, a finding was more than minor if significant programmatic deficiencies were identified that could lead to worse errors if uncorrected (3J, 3K) and the licensee routinely failed to perform evaluations (4A). Specifically, overdue or missing M&TE were not being evaluated for their associated impact on the validity of past work in the CAP program since at least 2008 and that evaluations when performed did not meet the requirements of NDAP-QA-0515, "Control and Calibration of Plant Measuring and Test Equipment", Revisions 3 and 4. The finding affected the equipment performance attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the control, calibration, and adjustment of M&TE on a periodic basis ensures that work results achieved on safety-related equipment are within specifications

and standards. The finding was evaluated using IMC 0609, Attachment 4, "Phase I - Initial Screening and Characterization of Findings." The finding screened to Green since it was not a design or qualification deficiency, not a loss of system safety function, or risk significant due to external events. The NCV was determined to have a cross-cutting aspect in Problem Identification and Resolution, CAP - Evaluation of Identified Problems area. Namely, problems are thoroughly evaluated such that resolutions address causes and extent of conditions and evaluate CAQs for operability. Specifically, PPL did not thoroughly evaluate problems to include the individual missing M&TE, the overall programmatic recurrence, and the potential effects on operability of safety related equipment. (P.1(c)) (Section 4OA2)

Green: A self-revealing finding of very low safety significance (Green) was identified against PPL's CAP procedure NDAP-QA-0702, "Action Request and CR Process." A non-conforming condition with system design requirements was identified with the 'A' Reactor Building (RB) chiller filter line. Specifically, the line was vibrating excessively and a support for the line was missing when compared to other identical chillers. Action Request (AR) 888836 was written to document this condition in July 2007. However, the nonconformance with system design was not evaluated and corrective actions were not developed. Subsequently, in September 2008 an elbow in the line failed. The elbow was repaired; however, the missing support was not evaluated and replaced. As a result on August 10, 2010, the same elbow failed again resulting in the evacuation of the Unit 1 RB and the declaration of an ALERT due to toxic gas levels within the vital area of the plant. PPL entered the issue into their CAP (1291181), conducted repairs to the 'A' RB chiller, and conducted a root cause analysis (RCA).

This finding is more than minor as it affected the protection against external events (toxic gas) attribute of the corresponding Mitigating Systems cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the August 10, 2010, Freon leak and Unit 1 RB evacuation impacted the plant operator's ability to access and operate safety-related equipment located within the Unit 1 RB which are required to be operated in accordance with Emergency and Abnormal Operating Procedures during plant transients and events. The finding was evaluated for significance using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Since the finding was not a design or qualification deficiency, did not result in a loss of safety function or loss of a train for greater than its Technical Specification (TS) allowed outage time, and was not potentially risk significant due to external event initiators, the finding was determined to be of very low safety significance (Green). This finding was assigned a cross-cutting aspect in the area of PI&R -Operating Experience (OE)- Implementation of OE, because PPL failed to implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs. Specifically, PPL did not incorporate American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) codes, Dupont Refrigerant Piping Handbook, and the Carrier Piping Manual in the modification, evaluation, and troubleshooting of site refrigeration systems. (P.2.(b)) (Section 4OA2)

B. Other Findings

Two violations of very low safety significance, identified by PPL, were reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into PPL's CAP. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 began the inspection period at 100 percent of its licensed reactor thermal power (RTP). On October 8, the unit was reduced to 67 percent RTP over 24 hours for a control rod sequence exchange and rod pattern adjustment. On October 15, the unit was reduced to 60 percent RTP over 44 hours following a service water (SW) leak on the 1A RB chiller which resulted in the trip of the 1B RB chiller. On November 12, the unit was reduced to 85 percent RTP over 37 hours for condenser waterbox cleaning. On December 17, the unit was reduced to 71 percent RTP over 19 hours for control rod hydraulic control unit maintenance, scram time testing and a control rod sequence exchange. Unit 1 remained at full RTP for the remainder of the quarter.

Unit 2 began the inspection period at the authorized power level of 94.4 percent RTP. On November 12, the unit was reduced to 68 percent RTP over 14 hours for a control rod pattern adjustment. On November 19, the unit was reduced to 74 percent RTP over 14 hours for scram time testing, a control rod sequence exchange and rod pattern adjustment, and accumulator maintenance. On December 25, the unit was reduced to 82 percent RTP over 12 hours for a control rod pattern adjustment. Unit 2 remained at full RTP for the remainder of the quarter.

Note: The licensed RTP for both units is 3952 megawatts thermal. The Extended Power Uprate (EPU) License Amendment for SSES was approved on January 30, 2008, and was implemented for both units in accordance with the issued license conditions. For the purposes of this report and the remainder of the current operating cycle, the authorized power level for Unit 1 is 100 percent of the EPU licensed power limit. For the current operating cycle, the authorized power level for Unit 2 is 94.4 percent of the EPU licensed power limit.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

Readiness for Impending Weather Conditions (71111.01 - 2 Imminent samples)

a. Inspection Scope

The inspectors reviewed system operations and readiness for extreme cold weather conditions on November 5 and an impending snow storm on December 10. Plant walkdowns for the condensate tank supply line, cooling tower heat trace and ultimate heat sink (UHS) systems were performed to determine the adequacy of PPL's weather protection features. Inspectors reviewed operator actions to address failures of equipment due to freezing and compensatory actions during the adverse cold weather conditions. The inspectors also reviewed and evaluated considerations in PPL's Maintenance Rule station risk assessment. Documents reviewed are listed in the Attachment.

- Common, readiness for extreme cold on November 5; and
- Common, impending snow storm on December 10.

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b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns to verify system and component alignment and to identify any discrepancies that would impact system operability. The inspectors verified that selected portions of redundant or backup systems or trains were available while certain system components were out-of-service (OOS). The inspectors reviewed selected valve positions, electrical power availability, and the general condition of major system components. Documents reviewed are listed in the Attachment. The walkdowns included the following systems:

- Unit 1, standby liquid control;
- Common, “B” emergency diesel generator (EDG); and
- Common, standby gas treatment (SGTS) system.

b. Findings

No findings were identified.

.2 Complete Walkdown (71111.04S - 1 sample)

a. Inspection Scope

The inspectors performed a detailed review of the alignment and condition of the instrument air (IA) system. The inspectors reviewed operating procedures, checkoff lists, and system piping and instrumentation drawings. Walkdowns of accessible portions of the systems were performed to verify components were in their correct positions and to assess the material condition of systems and components. The inspectors evaluated ongoing maintenance and outstanding CRs associated with the IA system to determine the effect on system health and reliability. The inspectors verified proper system alignment and looked at system operating parameters. The walkdown included the following system:

- Unit 2, instrument air.

b. Findings

No findings were identified.

1R05 Fire ProtectionFire Protection – Tours (71111.05Q - 4 samples)a. Inspection Scope

The inspectors reviewed PPL's fire protection program to evaluate the specified fire protection design features, fire area boundaries, and combustible loading requirements for selected areas. The inspectors walked down these areas to assess PPL's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. Documents reviewed are listed in the Attachment. The inspected areas included:

- Unit 1, Division I and II residual heat removal (RHR), Fire Zones 1-1E and 1-1F;
- Unit 1, remote shutdown panel room and access areas, Fire Zones 1-102, 1-105, 1-109;
- Unit 2, circulating space, standby liquid control, chiller and load center, Fire Zones 2-5 A-N, 2-5 A-S, 2-5 A-W, 2-5 H, 2-5 F, 2-5 G; and
- Unit 2, upper and lower relay rooms and cable spreading rooms, Fire Zones O-24, O-25A, O-27A, O-27B.

b. Findings

No findings were identified.

1R06 Flood Protection MeasuresUnderground Cables (71111.06 - 1 sample)a. Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and entered four manholes to evaluate conditions of risk-significant cables. The inspection focus included direct observation for cable integrity and potential submergence. Additionally, the material condition of support structures and credited components such as watertight plugs, floor drains, flood detection equipment, and alarms were also assessed to determine whether the components were capable of performing their intended function. Documents reviewed are listed in the Attachment. The following risk significant areas were reviewed:

- Common, EDG manhole inspections MH016, MH017, MH018, and MH019.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification ProgramResident Inspector Quarterly Review (71111.11Q – 1 sample)a. Inspection Scope

The inspectors observed a simulator-based licensed operator evaluation, during requalification training, to assess licensed operator performance and the evaluator's post-scenario critique. The inspectors evaluated crew performance in the areas of:

- Clarity and formality of communications;
- Ability to take timely actions;
- Prioritization, interpretation, and verification of alarms;
- Procedure usage;
- Timely control board manipulations with a focus on high-risk operator actions;
- Shift supervisor command and control, including identification and implementation of TSs, event classification, and emergency response actions; and
- Group dynamics involved in crew performance.

The inspectors verified that any crew performance issues and weaknesses were discussed in the post-scenario critique. The inspectors also verified simulator physical fidelity, to ensure that the simulator arrangement closely paralleled the main control room. These activities constituted one quarterly licensed operator requalification training program inspection sample. Documents reviewed during the inspection are listed in the Attachment. The following training was observed:

- Common, licensed operator performance during October 5, 2010, Emergency Preparedness Drill.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)a. Inspection Scope

The inspectors evaluated PPL's work practices and followup corrective actions for selected structures, systems, and component (SSCs) issues to assess the effectiveness of PPL's maintenance activities. The inspectors reviewed the performance history of those SSCs and assessed PPL's extent of condition (EOC) determinations for those issues with potential common cause or generic implications to evaluate the adequacy of PPL's corrective actions. The inspectors reviewed PPL's problem identification and resolution (PI&R) actions for these issues to evaluate whether PPL had appropriately monitored, evaluated, and dispositioned the issues in accordance with PPL procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals, and PPL's corrective actions that were taken or planned, to verify whether the actions were reasonable and appropriate. Documents reviewed are listed in the Attachment. The following system was reviewed:

- Common, diesel-driven fire pump.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to evaluate the effectiveness of PPL's risk management for planned and emergent work. The inspectors compared the risk assessments and risk management actions to the requirements of 10 CFR Part 50.65(a)(4) and the recommendations of NUMARC 93-01, Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine whether risk assessments were performed when specified and appropriate risk management actions were identified.

The inspectors reviewed scheduled and emergent work activities with licensed operators and work-coordination personnel to evaluate whether risk management action threshold levels were correctly identified. In addition, the inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the emergent work activities. The inspectors performed control room and field walkdowns to evaluate whether the compensatory measures identified by the risk assessments were appropriately performed. Documents reviewed are listed in the Attachment. The selected maintenance activities included:

- Unit 1, loss of continuity for standby liquid control (SBLC) squib valve;
- Unit 1, Yellow Risk during Unit 1 RHR maintenance;
- Unit 1, leak seal of "B" feedwater (FW) flow element south flange;
- Units 1 and 2, Yellow Risk during Unit 1 and Unit 2 Division II RHR system outage windows (SOW); and
- Common, Yellow Risk during T-10 outage.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) when PPL failed to conduct an adequate risk assessment of online maintenance activities during the week of October 24, 2010. Two instances of inadequate risk assessments were identified that when properly modeled in the equipment out-of-service (EOOS) system and/or evaluated against PPL-established thresholds required additional RMAs to be identified and implemented.

Description: During the week of October 24, 2010, the inspectors identified two instances of inadequate risk assessment and failure to identify and implement use of RMAs as required.

The first example was on October 26, 2010. PPL had identified a period of increased risk (Yellow) due to work on the RHR system. This increased risk was identified in the

work week schedule. Specifically, the period of Yellow risk was scheduled for the time period from 2:00 AM to 3:30 PM, a duration of 13.5 hours. In accordance with PPL's procedure, Yellow risk conditions greater than 12 hours in length require RMAs, however PPL failed to identify that the condition required RMAs and none were implemented.

The second example was on October 27, 2010. Plant risk was incorrectly calculated for work on HV212F073B, the Unit 2 residual heat removal SW (RHRSW) /RHR loop 'B' cross-tie motor-operated valve (MOV). Specifically, the risk was associated with the following work windows that impacted the valve's functionality:

- Open Breaker (0500-0600);
- Install new NLI breaker (0700-1530); and
- Mod closure (1530-1630).

The calculated risk profile for the maintenance showed a 1-hour period of Yellow risk, a 1-hour period of Green risk, followed by a 9.5 hour period of Yellow risk. However, the schedule failed to identify two additional periods during the maintenance that affected the valve's functionality. One occurred during the 1-hour period between opening of the breaker and commencing the maintenance in which calculated risk dropped from Yellow to Green. In the second period, the schedule failed to identify the window to remove the clearance order and shut the breaker (time 1530-1730) as an impact on valve functionality. In both cases, the valve's functionality was impacted but not accounted for in the risk assessment. When risk was appropriately calculated, it resulted in a continuous period of Yellow risk of 12.5 hours. Therefore, in addition to not identifying plant risk during the work window, the revised duration of Yellow risk was longer than 12 hours and RMAs would have been required by plant procedures.

NDAP-QA-1902, Revision 2, "Maintenance Rule Risk Assessment and Management Program," defines a risk management action threshold as a level of risk which triggers compensatory measures of increased awareness, controlling activity duration, or other actions to control the impact of a higher risk evolution. Additionally, it provides a list of RMAs that can be used to manage the impact of increased risk. One of the RMAs that is described is implementation of the protected equipment program as described in NDAP-QA-0340.

NDAP-QA-0340, Revision 8, "Protected Equipment Program" states, in part, that in addition to calculated periods of ORANGE or RED risk, the program "shall also be implemented when the calculated risk status is YELLOW for greater than 12 hours." Because PPL failed to adequately assess the risk associated with the RHR system outage window on October 26 and 27 against PPL-established thresholds, required RMAs were not identified and implemented prior to entry into the periods of elevated risk. Specifically, the protected equipment program was not implemented for either of the two windows of Yellow risk in excess of 12 hours previously described.

PPL has had repetitive issues in the area of risk assessment. A self-revealing Green NCV of the 10 CFR 50.65(a)(4) was noted in the 2nd quarter resident inspection report (05000387;388 2010-003) and a licensee-identified Green NCV of the regulation was noted in the 3rd quarter resident inspection report (05000387;388 2010-004). PPL had recognized the underlying weaknesses in the assessment of on-line risk prior to this violation occurring, but had not implemented corrective actions in a timely fashion (see Section 4OA2.2.c of this report for additional details). Although previous indications of a

weaknesses in the risk assessment process were related to the use of EOOS and not evaluation of EOOS results against established RMA thresholds, corrective actions specified in the CAP would likely have provided the necessary oversight and peer-checking to prevent this deficiency from occurring. PPL entered these issues into their CAP as CRs 1318550 and 1318602.

Analysis: Failing to ensure plant maintenance activities were properly modeled and evaluated for online plant risk is a performance deficiency, was reasonably within PPL's ability to foresee and correct, and is a violation of 10 CFR 50.65 (a)(4). This finding affected the Human Performance attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The item is similar to example 7.e. in NRC IMC 0612, Appendix E, "Examples of Minor Issues." This example states, in part, that failure to perform an adequate risk assessment when required by 10 CFR 50.65 (a)(4) is not minor if the overall elevated plant risk would put the plant into a higher licensee-established risk category or would require, under plant procedures, RMAs or additional RMAs. In one case, plant risk was reclassified from Green to Yellow when the maintenance was properly modeled and in both cases, the maintenance duration was in excess of the PPL-established threshold requiring protected equipment as an RMA; therefore, the issue is more than minor. The inspectors evaluated the finding using IMC 0612 Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." Since the incremental core damage probability deficit was less than 1 E-6 and the incremental large early release probability deficit was less than 1 E-7, this finding is determined to be of very low safety significance (Green).

This finding was determined to have a cross-cutting aspect in the PI&R, CAP –Timely and Effective Corrective Actions area. Namely, the licensee takes appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity. Specifically, though PPL had recognized a negative trend, as well as the underlying weaknesses in the assessment of on-line risk, prior to this violation occurring they failed to take appropriate corrective actions to address the adverse trend in a timely manner, commensurate with safety significance and complexity. (P.1 (d))

Enforcement: 10 CFR 50.65 (a)(4) states, in part, that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activity. PPL procedures NDAP-QA-1902, Revision 2, "Maintenance Rule Risk Assessment and Management Program," and NDAP-QA-0340, Revision 8, "Protected Equipment Program," implement the requirements of 10 CFR 50.65(a)(4) at the station. Contrary to the above, during the week of October 24, 2010, two instances of an inadequate risk assessment were identified that, when properly modeled in EOOS and evaluated against PPL established thresholds, required identification and implementation of RMAs and PPL did not identify all periods of elevated plant risk while maintenance was conducted. Because of the very low safety significance of this finding and because the finding was entered into PPL's CAP as CRs 1318550 and 1318602, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000388/2010005-01, Failure to Adequately Evaluate Periods of Elevated Risk for Necessary Risk Management Actions)**

1R15 Operability Evaluations (71111.15 – 3 samples)a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights to assess the adequacy of the evaluations, the use and control of compensatory measures, and compliance with TSs. In addition, the inspectors reviewed the selected operability determinations to evaluate whether the determinations were performed in accordance with NDAP-QA-0703, "Operability Assessments." The inspectors used the TSs, Technical Requirements Manual (TRM), Final Safety Analysis Report (FSAR), and associated Design Basis Documents as references during these reviews. Documents reviewed are listed in the Attachment. The issues reviewed included:

- Unit 1, high pressure coolant injection (HPCI) – use of undersized o-rings in lubricating oil filters;
- Common, 'C' EDG failure of a cylinder Kiene indicator valve; and
- Common, 'E' EDG battery charger relies on emergency lights.

b. Findings

A violation of very low safety significance, identified by PPL, was reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into their CAP. This violation and corrective action tracking numbers are listed in section 4OA7 of this report.

1R18 Plant ModificationsTemporary Plant Modifications (71111.18 – 1 sample)a. Inspection Scope

The inspectors reviewed a temporary plant modification to determine whether the changes adversely affected system or support system availability, or adversely affected a function important to plant safety. The inspectors reviewed the associated system design bases, including the FSAR, TSs, and assessed the adequacy of the safety determination screening and evaluation. The inspectors also assessed configuration control of the changes by reviewing selected drawings and procedures to verify that appropriate updates had been made. The inspectors compared the actual installation to the modification documents to determine whether the implemented change was consistent with the approved documents. The inspectors reviewed selected post-installation or removal test results as appropriate to evaluate whether the actual impact of the change or removal had been adequately demonstrated by the test. The following modification and document was included in the review:

- Unit 1, implement compensatory reactor recirculation LOOP flow limits.

b. Findings

No findings were identified.

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

The inspectors observed portions of post-maintenance test (PMT) activities in the field to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated acceptance criteria to determine whether the test demonstrated that components satisfied the applicable design and licensing bases and TS requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied.

- Unit 1, RHRSW inlet isolation to RHR heat exchanger valve position indication;
- Unit 1, local leak rate test (LLRT) of feedwater 10A check valve after soft seat replacement;
- Unit 2, reactor core isolation cooling (RCIC) system outage window (SOW);
- Unit 2, HPCI SOW;
- Common, T-10 outage restoration;
- Common, 'B' control structure (CS) chiller SOW; and
- Common, 'C' EDG following various PMs.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 Samples; 4 Routine samples and 1 RCS Leak Detection sample)a. Inspection Scope

The inspectors observed portions of selected surveillance test activities in the control room and in the field and reviewed test data results. The inspectors compared the test results to the established acceptance criteria and the applicable TS or TRM operability and surveillance requirements to evaluate whether the systems were capable of performing their intended safety functions. The observed or reviewed surveillance tests included:

- Unit 1, quarterly calibration of reactor vessel pressure channels;
- Unit 1, 24 month RHR Division II Logic System Functional Test (LSFT);
- Unit 1, remote shutdown panel surveillance – RHR Division II/RHRSW/CIG (containment instrument gas);
- Unit 2, monthly functional test of 2A (B) containment radiation detection system (RCS Leak Detection); and
- Units 1 and 2, quarterly calibration of drywell high pressure channels.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety, Public Radiation Safety

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

a. Inspection Scope

Inspection Planning

The inspectors reviewed the solid radioactive waste system description in the FSAR, the Process Control Program (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 any quality assurance (QA) audits in this area since the last inspection to gain insights into PPL's performance and inform the "smart sampling" inspection planning.

Radioactive Material Storage

The inspectors selected areas where containers of radioactive waste were stored, and verify that the containers are 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 20 CFR 1802, "Control of Material Not in Storage," as appropriate.

The inspectors verified that PPL has 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 selected containers of stored radioactive materials, and verified that there were no signs of swelling, leakage, and deformation.

Radioactive Waste System Walkdown

The inspectors selected liquid and solid radioactive waste processing systems, and walked down accessible portions of 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 selected 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 will 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 has 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 is described in the FSAR were reviewed and documented in accordance with 10 CFR 50.59, as appropriate.

The inspectors selected 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 provides sufficient mixing.

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

Waste Characterization and Classification

The inspectors selected 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 selected 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) verify that waste shipments continue 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 and 10 CFR 61.56, "Waste Characteristics."

Shipment Preparation

The inspectors observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and PPL 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 observed radiation workers during the conduct of radioactive waste processing and radioactive material shipment preparation and receipt activities. 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," dated August 10, 1979, 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.

Shipping Records

The inspectors selected 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 UN number. The inspectors verified that the shipment placarding was consistent with the information in the shipping documentation.

Identification and Resolution of Problems

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 involved radioactive waste processing, handling, storage, and transportation.

The inspectors reviewed the results of selected audits performed since the last inspection of this program and evaluated the adequacy of the PPL's corrective actions for issues identified during those audits.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems (71151 - 4 samples)

a. Inspection Scope

The inspectors reviewed PPL's PI data for the period of November 2009 through September 2010 to determine whether the PI data was accurate and complete. The inspectors examined selected samples of PI data, PI data summary reports, and plant records. The inspectors compared the PI data against the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline, Revision 6." The following performance indicators were included in this review:

- Units 1 and 2, Heat Removal Systems, MS08; and
- Units 1 and 2, RHR systems, MS09.

b. Findings

Introduction: The inspectors identified a SL-IV NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information," when PPL failed to update the Mitigating Systems Performance Indicators (MSPIs) to reflect a change in PPL's MSPI basis document. The change to the basis document affected all five MSPIs on each unit and resulted in inaccurate values for three consecutive quarters during 2010. PPL evaluated the MSPIs for needed changes and updated over 100 values used in calculating the PIs and entered the issues in their CAP as CRs 1328561 and 1328563. No PIs crossed the Green/White threshold once the values were updated.

Description: In December 2007, PPL updated its probabilistic risk assessment (PRA) model to reflect upgrades included in the EPU project. This PRA model change was rolled out to the various PRA product lines in December 2009. The MSPI basis document was updated to reflect these changes in June 2010. Numerous changes were made to the MSPI basis document which affected both PRA coefficients and the baseline core damage frequency (CDF) for the following Unit 1 and Unit 2 PIs:

- MS06 – Emergency AC Power Systems;
- MS07 – High Pressure Injection Systems;
- MS08 – Heat Removal System;
- MS09 – Residual Heat Removal System; and
- MS10 – Cooling Water Systems.

PA-TI-200, Revision 1, "Plant Analysis Technical Instruction - On-line PRA Rollout Process" states, in part, that following the completion of the rollout calculation package, an AR should be generated, with actions assigned to each affected group, to communicate the generation of new risk information. Contrary to this, actions were not assigned to Nuclear Regulatory Affairs or Site Engineering to ensure that the Consolidated Data Entry (CDE) system, used to calculate and submit PI data to the NRC, was updated to reflect changes to the MSPI basis document. The inspectors noted that PA-TI-200 does not specify any requirements with regard to timeliness of the actions.

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline", Revision 6, provides the guidelines for collection and submittal of PI data for review by the NRC. Section 2.2 of the guideline states, in part, that updates to the MSPI coefficients developed from the plant specific PRA will be made as soon as practical following an update to the plant specific PRA. It requires that the quarterly data submittal include a comment that provides a summary of any changes to the MSPI coefficients. More specific guidance on updates to PRA coefficients is provided in an example:

"For example, if a plant's PRA model of record is approved on September 29 (3rd quarter), MSPI coefficients based on that model of record should be used for the 4th quarter. The calculation of the new coefficients should be completed (including a revision

of the MSPI basis document if required by the plant specific processes) and input to CDE prior to reporting the 4th quarter's data (i.e., completed by January 21)."

Based on the guidance contained in NEI 99-02, following the roll-out of the PRA information in fourth quarter of 2009, the MSPI basis document should have been updated and been reflected in data submitted to the NRC for review in first quarter of 2010, the quarter following update to the plant's PRA model. Despite this guidance, PPL failed to update the PRA coefficients and baseline CDF values in the CDE system. The issue has been entered into PPL's CAP as CRs 1328561 and 1328563. Additionally, CDE has been updated to reflect the changes to the MSPI basis document. PI data for both Unit 1 and Unit 2 for the first three quarters of 2010 will be corrected and resubmitted with the data submittal of fourth quarter PI data. Upon recalculation, PPL reported a slight reduction in margin that was experienced in all ten PIs, though none crossed the Green-White threshold.

IP 71151, "Performance Indicator Verification," dated June 28, 2007, provides guidance to verify performance indicator data submitted by licensees. With regards to MSPI verification, it states that inspectors should review train/system unavailability data as well as review any MSPI component risk coefficient that has changed by more than 25 percent of values since the last review. It states that NEI 99-02 requires licensees to report changes to these coefficients and to note the changes in the comment field with their quarterly PI data submittal. Lacking the report of a change in coefficients in the PI comment field, inspectors could have failed to identify that PRA coefficients had changed in excess of 25 percent, and thus missed their review as part of the baseline inspection.

Analysis: The performance deficiency involved PPL's failure to submit complete and accurate performance indicator data for all five MPSIs for both Unit 1 and Unit 2 for a period of 3 quarters during 2010. Because violations of 10 CFR 50.9 are considered to potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process. The inspectors concluded that PPL had reasonable opportunity to foresee and correct the inaccurate information prior to the information being submitted to the NRC. This violation is characterized as a SLIV violation because it is similar to example 6.9.d.1 of the NRC Enforcement Policy which states, "A licensee fails to make a required report which, had it been submitted, would have resulted in, for instance, increasing the inspection scope of the next regularly scheduled inspection," and is consistent with Section 2.2.1.c in that the violation impacted the regulatory process. Because this finding was of very low safety significance, was not repetitive or willful, and was entered into PPL's CAP, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

The significance of the associated performance deficiency was also screened against the ROP per the guidance of IMC 0612, Appendix B, "Issue Screening," and the inspectors determined it to be minor because it did not result in any of the PIs exceeding the Green-White threshold. As such, no associated finding was identified and no cross-cutting aspect was assigned.

Enforcement: 10 CFR 50.9(a) requires, in part, that information provided to the NRC by a licensee be complete and accurate in all material respects. NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, provides guidance to the industry for submittal of PI data to the NRC. PPL procedure PA-TI-200, Revision 1,

“Plant Analysis Technical Instruction - On-line PRA Rollout Process,” addresses PRA changes and actions to take with respect to ensure MSPI basis changes are addressed. Contrary to the above, during the first three quarters of 2010 PPL failed to provide complete and accurate information when MSPI data was submitted for review without reflecting numerous changes to the MSPI basis document. This violation is characterized as a SL-IV NCV consistent with Sections 2.2.1.c and 6.9 of the NRC Enforcement Policy. Because this finding was of very low safety significance, was not repetitive or willful, and was entered into PPL’s CAP as CRs 1328561 and 1328563, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000387; 05000388/2010005-06, Inaccurate MSPI Data Submittal)**

.2 Public Radiation Safety Cornerstone (1 sample)

a. Inspection Scope

The inspectors reviewed a listing of PPL’s action reports for the period January 1, 2010 through December 3, 2010, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/quarter (qtr) whole body or 5 mrem/qtr organ dose for liquid effluents; or 5 mrads/qtr gamma air dose, 10 mrads/qtr beta air dose; or 7.5 mrems/qtr organ doses from I-131, I-133, H-3, and particulates for gaseous effluents.

- Common, RETS/ODCM Radiological Effluent Occurrence, PR01.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152 – 4 Samples)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As specified by IP 71152, “Identification and Resolution of Problems,” and in order to help identify risk significant, repetitive, long-term or latent equipment failures, cross-cutting components or adverse performance trends for followup, the inspectors performed screening of all items entered into PPL’s CAP. This was accomplished by reviewing the description of each new CR, attending management committee meetings, and viewing computerized CAP entries. Minor issues entered into the CAP as a result of inspector observations are included in the attached list of documents reviewed.

b. Findings

No findings were identified.

.2 Semi-Annual Review to Identify Trends (1 Sample)

a. Inspection Scope

As required by IP 71152, "Identification and Resolution of Problems," the inspectors performed a review of PPL's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues but also considered the results of daily inspector CAP item screenings discussed in Section 4OA2.1. The review also included issues documented outside the normal CAP in corrective maintenance work orders (WOs), component status reports, site monthly meeting reports and maintenance rule assessments. The inspectors' review concentrated on the six month period of July 2010 through December 2010, although some examples expanded beyond those dates when the scope of the trend warranted. Corrective actions associated with a sample of the issues identified in PPL's trend reports were reviewed for adequacy. Specific documents reviewed are listed in the Attachment.

As part of this sample and in support of verifying the effectiveness and sustainability of corrective actions from the Potential Chilling Effect (PCE) letter issued to PPL in January 2009, the inspectors examined issues related to the general work environment (GWE) at Susquehanna. With the support of the agency allegation advisor (AAA), inspectors performed quarterly conference calls with PPL to review the results of PPL's safety conscious work environment (SCWE) metrics. Specifically, metrics from June to October 2010 were reviewed for trends and evaluated to assess the effectiveness of PPL's actions to ensure a healthy SCWE at the site. In addition, CAP effectiveness regarding work environment corrective actions was reviewed to evaluate timeliness and backlog trends.

b. Findings

Introduction: Inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XII, "Control of Measuring and Test Equipment," when PPL failed to control and calibrate measuring and test equipment (M&TE) at specified periods and document evaluations of missing M&TE.

Description: In October 2010, the inspectors identified an increasing trend in the number of CRs related to missing M&TE issues through their daily CR screenings. The inspectors brought their observation to the attention of PPL senior management during a biweekly briefing on October 29, where PPL acknowledged the same observation. The inspectors discovered that in 2008, a Quality Assurance (QA) audit (960725) of the maintenance department identified that M&TE were not being returned as required by NDAP-QA-0515, Control and Calibration of Plant Measuring and Test Equipment (M&TE), Revision 3. At the time of the audit, 13 pieces of M&TE were overdue for calibration. In a related action, an inventory was performed and identified 12 additional M&TE that could not be located. Of the total, 17 pieces were not recovered and corrective actions included retiring the missing equipment from the M&TE program. This CR was identified as a condition adverse to quality (CAQ) and two corrective actions were developed for a procedural revision to limit the time that M&TE may be issued and to implement another phase of an M&TE tracking program to address issue and usage documentation shortcomings.

The inspectors identified that PPL's evaluation of the missing equipment lacked a documented evaluation of prior work performed using the M&TE and the potential impact on operability for safety related equipment on which the M&TE was used. In 2010,

another QA audit (1237524) of the maintenance department identified that M&TE were still not being returned as required by NDAP-QA-0515. At the time of this audit, 23 pieces of M&TE were identified as overdue for calibration. No reactive inventory was conducted in response to this issue, as performed in 2008, in order to identify other missing M&TE as an extent of condition search. This CR was identified as a condition not adverse to quality (NAQ) despite the repeat of the previous issue and ineffective corrective actions, contrary to the guidance of NDAP-QA-0702, "Action Request and CR Process."

Further, QA recommended that the CR be assigned as an apparent cause evaluation but it was re-screened two months later and downgraded to an evaluation. The corrective actions from this CR were to perform an analysis for separating custody control and usage and to revise NDAP-QA-0515 to generate a CR after M&TE goes overdue for calibration by two weeks. However, the requirement to generate a CR for lost M&TE and evaluate the validity of previous work had existed since 2003 and during the time of the QA audits. Therefore, the requirement for a CR within 14 days was not a corrective condition but an enhancement. The procedure was revised in September 2010 and CRs began to be generated in October 2010 for missing M&TE.

Subsequently, the NRC inspectors identified that 16 of the missing M&TE during the 2010 QA audit were not evaluated for prior work performed using the M&TE and the potential impact on operability at safety-related equipment.

There were 33 CRs generated in the fourth quarter 2010 on missing M&TE, at least seven of which were for M&TE that was overdue for calibration in 2009. The inspectors reviewed a portion of the CRs that had been closed and noted the following items that were not in accordance with the NDAP procedure:

- 1310775 – Closed without evaluation and included the statement of opinion as the basis for the closure;
- 1310857, 1311092, 1311096 – Closed to CR 1310775. Used on such items as 'A' EDG hoses, control structure ventilation fan, reactor vessel head vent valve motor actuator, alternate decay heat removal piping, control rod hydraulic control units, electrical raceways, and fire protection. No evaluation of the missing M&TE or affected work orders appeared in CR 1310775;
- 1312287 – Used on a HPCI Logic System Functional Test, an RHR Appendix R logic modification, in support of operational surveillances during 2009. Closed without an evaluation of the affected work orders performed;
- 1312279 – Working status but with comments "Completed eval. No actions required";
- 1312890 – Closed without an evaluation;
- 1318087 – Closed by stating that a different torque wrench (CDS-747A) was used on drywell vacuum relief valves. Inspectors could not locate CDS-747A in the cited work order and the M&TE was not located in PPL's database. The evaluation did not state whether CDS-747A was in calibration or overdue as well. The work order listed another M&TE, CDS-747D;
- 1322434 – Closed to CR 1327158 to retorque RHR power supply bolts. The associated work order was due in May 2011. The operability determination on 1327158 stated there was no reason to question operability. However, the generation of the retorque CR suggests that the torque was in doubt. CR

1338835 was generated for the NRC question of operability. That CR's operability determination stated that the inability to obtain final cal data does not result in impairment or degradation. Despite 10 CFR 50, Appendix B, Criterion XII; ANSI standard ANSI N18.7-1976; and the NDAP procedure;

- 1322455 – Closed without an evaluation of usage or affected work order on Control Structure wiring;
- 1336457 – Working status but was annotated that the dial indicator was used despite not being signed out revealing ineffective control of usage.

Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, endorses ANSI N18.7-1976 QA program requirements as acceptable as an adequate basis for complying with the requirements of 10 CFR 50, Appendix B.

ANSI N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," section 5.2.16, states that M&TE "shall be controlled, calibrated and adjusted and maintained at specified intervals" and that when M&TE "are found to be out of calibration, an evaluation shall be made and documented concerning the validity of previous tests and the acceptability of devices previously tested from the time of the previous calibration." PPL OPS-1, "Operational Quality Assurance Program," Revision 15, commits to ANSI N18.7-1976. Operational Quality Assurance Manual, OPS-16, "Instrument Calibration and Control," Revision 8, references ANSI N18.7-1976 and describes the method of documenting calibration data, in particular, "the action taken when an M&TE device is found out of calibration. The action shall include determining what instrumentation had been calibrated, equipment inspected, or tests performed, utilizing the M&TE device. A documented evaluation shall be conducted to determine the validity of the results of those activities." Since lost M&TE cannot be confirmed to be in calibration, it is treated as being out of calibration and evaluated in the same manner. NDAP-QA-0515 requires that "M&TE found to be out of calibration or lost shall be documented...using a CR" and that "measures taken, or immediate actions to determine the validity of previous work performed using the M&TE since its last valid calibration, shall be documented in the CR as action taken."

The inspectors added significant value in identifying that since at least 2008, when M&TE was missing for long periods of time after being due for calibration, it was not being captured and evaluated in CRs in a timely manner when retired due to being declared lost. In addition, the inspectors identified that several evaluations were not being performed to verify safety-related equipment on which missing or out of calibration M&TE was used, did not result in that piece of equipment testing satisfactorily and being declared operable when it was actually inoperable due to M&TE issues. The inspectors also added value by identifying that the 2010 QA audit was inappropriately classified as a NAQ thus impacting the timeliness and prioritization of proposed corrective actions. Therefore, in accordance with IMC 0612, due to the value added by the inspectors, this issue is being considered an NRC identified finding.

The inspectors determined that this issue did not meet the requirements of 10 CFR 50 Appendix B, Criterion XII, "Control of Measuring and Test Equipment," and the associated programs and procedures in place for criterion compliance and concluded that this was a performance deficiency.

Analysis: The inspectors determined that not returning M&TE when due for calibrations and subsequently not performing the evaluations when missing was a performance

deficiency. The issue was evaluated IAW IMC 0612, Appendix E, "Examples of Minor Issues," and it was determined to be similar to examples 3J, 3K and 4A. Namely, the issue is more than minor if significant programmatic deficiencies were identified that could lead to worse errors if uncorrected (3J, 3K) and the licensee routinely failed to perform evaluations (4A). Specifically, overdue or missing M&TE were not being evaluated for their associated impact on the validity of past work in the CAP program since at least 2008 and that evaluations when performed did not meet the requirements of NDAP-QA-0515, "Control and Calibration of Plant Measuring and Test Equipment," Revisions 3 and 4. The repeat QA audit findings in 2008 and 2010 and the large number of inadequate evaluations identified by the inspectors are also a basis for determining this issue is programmatic in nature. This finding affected the equipment performance attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the control, calibration, and adjustment of M&TE on a periodic basis ensures that work results achieved on safety-related equipment are within specifications and standards. The finding was evaluated for significance using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." The finding screened to very low safety significance (Green) since it was not a design or qualification deficiency, not a loss of system safety function, or risk significant due to external events.

The NCV was determined to have a cross-cutting aspect in Problem Identification and Resolution, CAP. Namely, problems are thoroughly evaluated such that resolutions address causes and extent of conditions and evaluate CAQs for operability. Specifically, PPL did not thoroughly evaluate problems to include the individual missing M&TE, the overall programmatic recurrence, and the potential effects on operability of safety-related equipment. In addition, the inspectors identified that PPL failed to consider M&TE issues as CAQs on several occasions which also contributed to the conduct of inadequate evaluations. (P.1(c))

Enforcement: 10 CFR 50, Appendix B, Criterion XII, "Control of Measuring and Test Equipment," states that "Measures shall be established to assure that tools, gauges, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits." Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, endorses the ANSI N18.7-1976 QA program requirements as acceptable as an adequate basis for complying with the requirements of 10 CFR 50, Appendix B. OPS-1, "Operational Quality Assurance Program," Revision 15, commits to ANSI N18.7-1976. Operational Quality Assurance Manual, OPS-16, "Instrument Calibration and Control," Revision 8, references ANSI N18.7-1976 and describes the method of documenting calibration data, in particular, the action taken when an M&TE device is found out of calibration, and NDAP-QA-0515 requires that "M&TE found to be out of calibration or lost shall be documented...using a CR" and that "measures taken, or immediate actions to determine the validity of previous work performed using the M&TE since its last valid calibration, shall be documented in the CR as action taken." Contrary to the above, between 2008 and 2010 PPL did not control and calibrate M&TE at the specified periods and did not document evaluations of missing M&TE for its impact on the validity of past work. Because the finding was of very low safety significance and because it was entered into PPL's CAP (1339535), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC

Enforcement Policy. **(NCV 05000387; 388/2010005-03, Failure to Control, Calibrate and Evaluate M&TE)**

c. Observations

NRC Performance Indicators

The inspectors identified a trend of issues in PPL's NRC PI program. During the review of MSPI data for MS08 and MS09 (Section 4OA1), the inspectors identified that PRA revisions in December 2009 for MSPI were not updated in calculations of the MSPI since the first quarter 2010 as required by NEI 99-02, Revision 6, "Regulatory Assessment Performance Indicator Guideline." Additionally, it was noted that PPL's MSPI basis document had not been updated in the quarter following MPSI PRA data revision as directed by NEI 99-02. This resulted in a Green NCV finding discussed in Section 4OA1 of this report.

In a separate review of PPL's reported PIs for the third quarter, the inspectors noted that the Unit 1 condenser bay flooding-related scram on July 16, 2010, had not been counted toward the Unplanned Scrams with Complications (USwC) PI. When the residents requested the data PPL had considered in analyzing the scram, no source documentation to support PPL's conclusion had been retained contrary to of site procedure NDAP-QA-0737," Reactor Oversight Process (ROP) Performance Indicators," Revision 5. A search for the extent of the condition identified other departments responsible for PIs had also not retained source documentation as required. PPL entered this issue into their CAP (1327416) but the inspectors noted a CR (935044) in December 2007 that made this a repeat issue. After PPL created source documentation on the July scram for review, the inspectors disagreed with the assessment that the scram was not complicated. The inspectors engaged Nuclear Reactor Regulation (NRR) via the ROP feedback process and received affirmation that the scram should be considered complicated. After discussion with NEI, PPL entered the issue in their CAP (1336449) and the fourth quarter 2010 PI data submission reported the July 16th event as a Scram with Complications. The inspectors evaluated this issue for significance using IMC 0612 Appendix B, "Issue Screening," and the NRC Enforcement Policy and determined that the inaccurate PI did not cause PPL to exceed a PI threshold value, the NRC was aware of the issue, no regulatory decisions had been made using the inaccurate PI data, and the error did not result in additional scope for a regularly scheduled inspection activity. Therefore this issue was considered to be of minor risk significance and is not subject to the NRC Enforcement Policy. PPL has entered the issue in their CAP (1336449) and has subsequently updated the publically available PI data.

10 CFR 50.65a(4)

The inspectors identified a negative trend in PPL's conduct of risk assessments based on three consecutive-quarter violations of 10 CFR 50.65a(4). A self-revealing Green NCV of the regulation was noted in the 2nd quarter resident inspection report (05000387; 388/2010-003) and a licensee-identified Green NCV of the regulation was noted in the 3rd quarter resident inspection report (05000387; 388/2010-004). This report also contains an additional NRC-identified Green NCV of the regulation (Section 1R13).

In addition to the NCV documented in this report, additional examples of inadequate risk assessment or risk management were identified during this inspection period. Specifically, on October 26, 2010, an emergency service water (ESW) flow balance test procedure, TP-054-076, case 5B-E, was conducted which secured flow from the 'B' ESW LOOP to the 'B' EDG. Although this does not affect the operability of the EDG per TSs, it impacted station risk because it removed the redundant source of cooling to the EDG. In the associated risk assessment, PPL failed to identify the test procedure as having an impact on risk. During PPL's evaluation of the extent of condition for this deficiency, another instance was identified on September 28, 2010, in which an ESW flow balance test case was not included in the plant's risk calculation. In both cases, when risk was re-calculated to include performance of the test procedures, risk remained Green. This example was considered to be a minor violation and is not subject to the NRC's Enforcement Policy since overall plant risk did not increase to a higher licensee established category.

Lastly, on October 26, 2010, operations made the decision to protect the 2'A' RB chiller during maintenance on the 2'B' chiller due to its effects on generation risk as allowed by NDAP-QA-0340. NDAP-QA-0340 requires that if the program is implemented then the protected equipment should be communicated to station personnel in addition to posting signs in the vicinity of the protected equipment. Contrary to this, operations failed to communicate the status of protected equipment to station personnel as required. Although the decision to protect the non-safety related chiller was not taken as an RMA required by 10 CFR 50.65(a)(4), in conjunction with the other examples discussed earlier, it is indicative of an emerging trend in the risk assessment and risk management areas.

PPL had recognized this trend, as well as the underlying weaknesses in the assessment of on-line risk prior to the violations occurring, but had not implemented corrective actions in a timely fashion to prevent the most recent violation (see Section 1R13). Specifically, in October 2009, PPL identified weaknesses in the process for nuclear risk assessment (CR 1187989); however, because the CR was classified as not adverse to quality (NAQ), corrective actions were not required to be completed until September 2010. The process was determined to be prone to human performance errors since one individual decides whether the maintenance activity impacts the risk function of the component. At the T-6 work week, this is completed by the work week manager, and the current process does not require a review by a different position.

Additionally, in July 2010, PPL identified a potential adverse trend regarding on-line risk assessments, as evidenced by fourteen related CRs, and documented and analyzed the trend with an apparent cause evaluation (CR 1285293). Included in this trend and associated evaluation were the CRs associated with the first two NCVs described above. One of the apparent causes identified in the evaluation was that the risk assessment program was susceptible to human performance errors due to manual input and verification of information. Several corrective actions, previously identified by the October 2009 evaluation, were specified to correct the trend; however none were required to be implemented until January 2011. Despite the trend and duration of the vulnerability, no interim corrective actions were taken while changes to the process were implemented.

General Work Environment (GWE)

The inspectors reviewed usage of available programs for raising concerns over the last six months. Use of the employee concerns program (ECP) continued the increasing trend observed in the first half of the year. As of November 20, there were 42 more ECP entries than in 2009. However, the dominant source of the entries shifted away from supervision as seen in the first half of 2010. Use of the anonymous AR process experienced an increasing trend that started in June and peaked at 27 entries in October 2010. However, the numbers appear to be a recovery to the former average of 25 entries per month. The use of the anonymous hotline while historically infrequent, based on one call per month from February through April 2010, was non-existent from May through October 2010. Notwithstanding, the inspectors concluded that PPL's staff continues to use the various resources available to them to raise concerns. When the ECP is used, it is almost exclusively in person or self-identifying, suggesting that when staff desire to raise an issue, those employees generally feel comfortable pursuing their concern openly.

SCWE Metrics

Susquehanna continues to maintain generally effective SCWE metrics to monitor the work environment at the site. On a broad level workers continue to demonstrate a willingness to raise issues through the normal corrective action program, the Employees Concern Program, and the anonymous AR process. No specific SCWE issues were identified.

Notwithstanding, there continue to be specific departments and work groups (Security, Maintenance, and Clerical) which have general work environment concerns and require additional attention and resources to ensure a SCWE issue does not develop. In addition, although the spring 2010 security department work environment self-assessment was self-critical and well-designed (NRC review was documented in IR 05000387;388/2010-003), PPL missed opportunities to engage on the issues in a prompt manner resulting in additional concerns being raised by the security staff at the site.

The inspectors also noted opportunities to improve analyses of broad CAP program metrics such as CR initiation rates and corrective action backlogs. For instance, analyses performed at the department level could provide the licensee with earlier indications of negative trends. Metrics are currently analyzed at the site level.

Finally, the inspectors noted a negative trend over the last five months regarding the age of general work environment corrective actions and the backlog of corrective actions associated with conditions adverse to quality (CAQ). Specifically, the proportion of general work environment corrective actions opened for greater than one year is on a slowly increasing trend. Also, the backlog of CAQ corrective actions items has increased by approximately 20 percent over the last five months. The inspectors observed that PPL generated CR 1294575 associated with the increasing CAQ backlog trend.

Occurrences of Operational Staffing Below Administrative Limits

While not a violation of regulatory requirements, the inspectors noted an increase in the number of times that operations staff went below administrative staffing limits. During the first half of 2010, there were five instances where operations staffing fell below administrative limits. During the latter half of the year, there were eleven instances with more than half occurring in a single month. At no time did operations staffing fall below regulatory levels. PPL is aware of this issue and has included corrective actions in their site Excellence Plan.

Station Trending

IP 71152 recommends the review of licensee trend and system health reports to identify trends that might indicate the existence of a more significant safety issue. The inspectors noted that the site-wide, quarterly trend reports for 2nd and 3rd quarter 2010 were not completed in the time expected. The trend reviews were changed in December 2009 from a semi-annual to a quarterly periodicity and became effective in the first quarter of 2010. Step 7.1.4 of NDAP-QA-0710, "Station Trending Program," Revision 5, requires that departmental trend analysis be completed within 30 days of the end of the calendar quarter. Step 7.5.1 states that station level trending will be completed on a quarterly frequency, approximately every three months. Contrary to this, the 2nd quarter trend report was completed on November 8 and the 3rd quarter trend report was still in progress as of December 2. While the content and insight of the reports has improved, delays in analysis prolong the time that trends may exist and unmonitored trends could lead to a more significant concern. The inspectors noted that a similar observation on timely completion of trending was identified in inspection report 05000387;388/2009-003. Not completing trend reports within procedure guidelines was considered to be a minor violation not subject to the NRC's Enforcement Policy since there were no actual consequences from the last report.

.3 Review of Corrective Actions for CAP Programmatic Weaknesses (1 Annual sample)

a. Inspection Scope

The NRC Biennial Problem Identification and Resolution Team Inspection, IR 05000387; 388/2010006, issued March 15, 2010, documented a number of programmatic weaknesses in PPL's CAP. The inspectors noted there were programmatic weaknesses associated with the implementation of certain aspects of PPL's CAP. Specifically, weaknesses were observed in the effectiveness of corrective actions for identified deficiencies; the timeliness of corrective actions; the station's actions to resolve PPL's Quality Assurance-identified findings; and the effectiveness of PPL's trending program. Also of concern were PPL's actions to resolve certain NRC findings, NRC regulatory requirement violations, and risk significant equipment problems.

This inspection reviewed the corrective actions developed by PPL to address the weaknesses noted during the PI&R inspection and by other third party evaluations of PPL's CAP. The inspection consisted of a review of the RCAs conducted by PPL and associated corrective actions developed in response to those RCAs. The inspectors also reviewed a sample of CAP documents, evaluations, and root cause evaluations, reviewed self assessments and QA program audits, attended CAP training and observed Station Ownership Committee (SOC) CAP screening meetings and Management Review Committee (MRC) meetings, and conducted interviews with several individuals and managers in order to assess the level of progress PPL had made in addressing the identified weaknesses.

b. Findings

Introduction: A self-revealing finding of very low safety significance (Green) was identified against PPL's CAP Procedure NDAP-QA-702, "Action Request and CR Process." Specifically, a nonconforming condition with system design requirements was identified with the "A" RB chiller filter line, in that the line was vibrating excessively and a support for the line was missing when compared to other identified chillers. AR 888836 was written to document this condition in July 2007. However, the nonconformance with system design was not evaluated and corrective actions were not developed. Subsequently, in September 2008 an elbow in the line failed. The elbow was repaired; however, the missing support was not evaluated and replaced despite the July 2007 AR still being open. As a result on August 10, 2010, the same elbow failed a second time resulting in the evacuation of the Unit 1 RB and the declaration of an ALERT due to toxic gas levels within the vital area of the plant.

Description: On the morning of August 10, 2010, Susquehanna operators discovered a Freon leak from the Unit 1 RB chiller. The area was evacuated and approximately 30 minutes later, operators, maintenance technicians, and site safety personnel went back into the space to evaluate the leak, identify the source, and isolate the leak, if possible. The leak was identified to be coming from the elbow of a 1" copper line to a filter and appeared to be unisolable. The lead maintenance technician, a qualified refrigerant handler, instructed all personnel to evacuate the area after he felt ill from the effects of Freon exposure. Personnel exited the space and reported the condition to the control room. The shift manager evaluated the entry criteria for OU7, "Release of Toxic or Flammable Gases Deemed Detrimental to NORMAL PLANT OPERATIONS," and OA7, "Release of Toxic or Flammable Gases within or Contiguous to a Plant VITAL AREA which Jeopardizes Operation of Safety Systems Required to Establish or Maintain Safe Shutdown." Alert OA7 was declared at 9:22 a.m. due to toxic gas concentrations in a vital area (Unit 1 RB) in concentrations greater than Immediately Dangerous to Life and Health (IDLH) based upon the indication of personal ill effects from exposure. The shift manager declared the Alert and ordered the entire Unit 1 RB to be evacuated. Inspectors evaluated operator performance during this event and determined that an appropriate and timely declaration was made based upon the information available at the time.

Following the August 2010 ALERT, PPL conducted a RCA (CR 1291181). The root cause of the event was determined to be that PPL had not maintained the equipment in accordance with design specifications as originally installed. The direct cause of the leak was most likely determined to be stress corrosion cracking of the copper elbow.

The chillers at Susquehanna are skid mounted Freon cooled chiller units which were installed in 1982. There are two RB chillers per unit located on the 749' elevation of the RB. The RCA identified two major stress concentrators which contributed to the failures in 2008 and 2010. First, when the unit was installed, PPL elected to use a short-radius elbow for the filter line application. This was contrary to the vendor guidance to use a long-radius configuration to minimize stress concentration.

The second factor was that the 'A' RB chiller filter line was missing a support leaving the line unsupported. In July 2007, PPL operators identified that the 'A' RB chiller filter line was vibrating excessively and documented this as AR 888836. The AR also noted that operators noticed that the filter line on the other chillers had a support for this line. It is

believed that this support on the 'A' RB chiller was removed in either January 2004 (PCWO 537710) or in October 2005 (PCWO 612505) to allow access for maintenance and was not reinstalled. On September 5, 2007, a small Freon leak was detected on the elbow of the filter line (AR 900603). This leak was repaired under WO 900609 and 900718, however, the missing support was not addressed despite the fact that AR 888836 had been held open until October 2008. The close out for AR 888836 indicated the filter line had been monitored since the repairs and was no longer vibrating excessively. The missing support was not evaluated by the AR or addressed in the close out.

There was sufficient industry operating experience (OE) available to PPL in 2007 and 2008 which would have helped identify that this design nonconformance impacted equipment reliability. A search of the industry OE database revealed 300 similar events, and failures at North Anna Unit 2 and Hope Creek were similar to PPL's configuration and failure mode. In addition, the piping configuration guidance supplied by the vendor (Carrier Piping Manual), which did not allow an unsupported line of that length, was not referenced. PPL also did not use ASHRAE standards or other industry standards such as the Dupont Refrigerant Piping Handbook, which also advises against having such a long run of unsupported piping.

Other contributing factors included inadequate drawings which did not show the designed piping supports, and work order documentation which did not identify the supports having to be removed and reinstalled.

The failure of the chiller elbow resulted in approximately 1900 pounds of refrigerant R-12 being released into the Unit 1 RB, creating atmospheres in the vicinity of the chiller in excess of IDLH. As a result, the Unit 1 RB was evacuated and an ALERT was subsequently declared. Therefore, access to safety-related equipment by plant operators inside the Unit 1 RB was challenged and their ability to carry out time critical operator actions in EOPs was also impacted. A Freon leak from a RB chiller is an analyzed event and site Emergency Action Levels (EALs) account for the possibility and potential consequences of such an event. PPL CAP procedure NDAP-QA-702 defines a Level 2 event as, "Loss of configuration control that could affect plant safety or reliability or a deficiency in material, documentation, or procedure, which could affect safe reliable plant operation, place personnel at risk, or requires management level coordination to resolve." Level 2 events require a level 2 apparent cause or evaluation. Due to the AR written identifying the condition (July 2007), the line failure (September 2007), and the known potential impact a Freon leak could have on plant safety and personnel health and safety, this issue was considered to be a performance deficiency within PPL's ability to foresee and prevent.

Assessment: Failing to properly evaluate and correct a nonconforming condition associated with the Unit 1 'A' RB chiller filter line is a performance deficiency which was reasonably within PPL's ability to foresee and prevent. The finding was not subject to traditional enforcement because there were no actual consequences, it was not willful, and did not impact the NRC's ability to regulate. This issue is more than minor as it affected the protection against external events (toxic hazard) attribute of the corresponding Mitigating Systems cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the August 10, 2010, Freon leak and Unit 1 RB evacuation, impacted the plant operators ability to access and operate safety-

related equipment located within the Unit 1 RB which are required to be operated in accordance with EOPs and Abnormal Operating Procedures during plant transients and events. The finding was evaluated for significance using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Since the finding did not result in a loss of safety function or the loss of a train for greater than its TS allowed outage time, and was not potentially risk significant due to external event initiators (because it did not impact seismic, flooding, or severe weather risk factors), the finding was determined to be of very low safety significance (Green).

This finding was assigned a cross-cutting aspect in the area of PI&R -Operating Experience Implementation of OE, because PPL failed to implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs. Specifically, PPL did not incorporate ASHRAE codes, Dupont Refrigerant Piping Handbook, and the Carrier Piping Manual in the modification, evaluation, and troubleshooting of site refrigeration systems. [P.2.(b)].

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. Specifically, the RB chillers are not safety-related components. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as **FIN 05000387/2010005-05, Failure to Evaluate a Non-Conforming Condition Resulted in an Alert.**

c. Observations

The inspectors determined that PPL has made progress in addressing some of the programmatic weaknesses identified by the NRC in IR 50-387 & 50- 388 2010006. Specifically, PPL conducted two RCAs (IR 1194033 and IR 1194026) and developed corrective actions to address weaknesses in the CAP program structure, weaknesses in the training and oversight of personnel conducting root cause evaluations, and weaknesses in the CAP screening process. These actions included hiring additional resources and establishing full time Corrective Action Program Coordination Officers (CAPCOs) and Performance Improvement Coordinators (PICs) for each department, cause analysis (RCA) team leader training, establishment of CAP Performance Indicators, revising station CAP procedures, and increased management focus and communication of CAP expectations and standards. Based upon a review of the Level 1 RCAs conducted in 2010, the inspectors determined that the quality of the evaluations has improved. The evaluations have been successful in identifying complex causes of issues, developing meaningful corrective actions, and the level of management and QA review has raised the standards such that the final products are of a higher quality.

However, some areas of weakness have not shown significant improvement as corrective actions have not been fully implemented or corrective actions have not yet proven to be effective. For instance, the station's trending program and departmental self assessments continue to provide limited value, and corrective actions have not been fully implemented. This was identified by PPL during their QA Program CAP audit completed on November 5, 2010. In addition, the station remains slow in responding to findings and observations identified by the QA Organization. A number of issues identified by QA such as programmatic weaknesses in the M&TE program were not adequately addressed by the station and resulted in violations of regulatory requirements.

The inspectors identified a negative trend in the number of repetitive equipment failures and violations of regulatory requirements as a result of not conducting an appropriate level of evaluation. In many cases, issues were classified as not-a-condition adverse to quality (NCAQ) vice CAQs due to inadequate condition report screening guidance and procedure definitions. As a result, effective corrective actions were not developed and the conditions were not corrected resulting in failures of risk significant equipment, plant transients, and violations. These examples are evenly spread over four quarters in 2010 and across several departments at Susquehanna.

In addition, since 2009, PPL has had two Greater-than-Green findings with a cross-cutting aspect of P.1(c) and has had two or more findings in the same aspect during each subsequent assessment period. Furthermore, the number of findings with PI&R cross-cutting aspects has continued to trend upwards (3 in the 2008 End of Cycle Assessment, 6 in the 2009 Mid-Cycle Assessment, 7 in 2009 End-of-Cycle Assessment, and 10 in both the 2010 Mid-Cycle and End-of-Cycle Assessments). Despite this history, the trend in lower tier evaluation weaknesses was not identified by PPL until the completion of a common cause evaluation during the 4th quarter of 2010 (CR 1287298, Revision 1). Specific examples of evaluation weaknesses include:

- Green Finding 4th Quarter 2010: In July 2007, plant operators identified an abnormal condition related to the 'A' RB chiller filter line. It was recognized that the line was vibrating excessively and appeared to be missing a support which the other chillers had. The missing support was never evaluated and the elbow failed due to a through-wall crack in September 2007 and again on August 10, 2010, which resulted in an ALERT declaration. The July 2007 condition report was classified as a NCAQ and was held open until October 2008, but the missing support was never evaluated.
- Green NCV 4th Quarter 2010: An adverse trend relating to control of M&TE used to monitor safety system operability was identified by QA during 2008 and 2010. Despite 10 CFR 50 Appendix B, Criterion XII; ASME; and ANSI codes and standards for M&TE, PPL's CAP did not consider some of the issues raised to be CAQs and the evaluations which were done lacked the rigor and detail to demonstrate operability. One of these insufficient evaluations was subsequently used as a basis for closing a number of related CRs. As a result, the operability of safety related equipment questioned.
- White Finding 3rd Quarter 2010: Three evaluation failures preceded the Unit 1 July 2010 internal flooding event. Specifically:
 - Inadequate evaluations of two condenser flooding events in April 2007 and March 2008 involving waterbox gaskets extrusions occurred. PPL did not review the adequacy of the maintenance procedure and did not recognize that loss of the normal heat sink at power was a risk significant event. As a result, no higher level evaluations were performed and no corrective actions were developed to address issues with maintenance procedures and practices. Subsequently, on July 16, 2010, two gaskets in the Unit 1 waterbox were extruded resulting in an unisolable Circulating Water (CW) system leak. Operators manually scrammed the reactor and secured the normal heat sink to isolate the leak.

- An inaccurate chemistry off-normal procedure was identified which mislabeled the configuration of the condenser waterboxes (November 2009). However, the inaccuracy was improperly evaluated for impact on plant operations and the issue was designated a NCAQ. As a result, the corrective actions to fix the procedure were cancelled. During the July 16, 2010, flooding event, the operators used this procedure in an attempt to identify the source and isolate the CW leak. Operator response to the event was complicated and delayed by the inadequate off normal procedure.
- Green NCV 2nd Quarter 2010: In June 2010, inspectors identified a Green, 10 CFR 50, Appendix B, Criterion XVI, NCV in that PPL failed to identify and properly correct a CAQ. Specifically, PPL failed to accurately classify the “B” control structure chiller (CSC) trip on May 12, 2010 as a CAQ as required by procedure and did not replace the refrigerant low temperature control switch (RLTCS). The chiller tripped again on June 28, 2010 resulting in unplanned unavailability of safety-related equipment.
- Green NCV 1st Quarter 2010 PI&R Team Inspection: Issues related to values in an EOP associated with Maximum Safe Water Levels for rooms containing safety-related equipment were identified and entered into the CAP in September 2009. The issue was evaluated and the corrective actions developed did not correct the EOP. The evaluation did not consider that having an EOP with non-conservative values which initiates time critical operator actions to be a CAQ. As a result the procedure was not corrected until this issue was identified by the PI&R team in January 2010.

Also supporting the negative trend, were other examples over the course of 2010 where the inspectors noted evaluation weaknesses as a contributing cause to the event, but another cross-cutting aspect was determined to be a more significant contributor. These include Green NCV's related to:

- Failure to test reactor SRVs in accordance with ASME Code requirements (1st quarter);
- Untimely corrective actions for ESW timers (2nd quarter);
- IRM failures during the April 16, 2010, startup (2nd quarter);
- The May 14, 2010, Unit 1 Scram and simulator fidelity issues during Unit 1 integrated control system (ICS) implementation (3rd quarter); and
- Repeat failures to conduct on-line risk assessments (4th quarter).

.4 Missed TS Surveillances (1 Annual Sample)

a. Inspection Scope

The inspectors reviewed PPL's actions to investigate and identify the cause of the number of missed surveillance requirements (SRs) over the last two years. The inspectors reviewed PPL's action towards identification and completion of corrective actions. The inspectors reviewed PPL procedures, notifications, orders, corrective actions, and root cause evaluations to understand the analysis to address roles and responsibilities for surveillance completion, and tools for proactively monitoring surveillances, as well as the identification, evaluation, and corrective actions associated

with the analysis. Surveillance coordinator and other PPL staff were interviewed to gain additional insights on the corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors found that PPL appropriately identified the cause of the number of missed SRs over the last two years. PPL's root cause investigation determined the cause of failure to be inadequate performance monitoring, and tools for proactively monitoring surveillances were less than adequate. Inspectors determined that the evaluations of degraded conditions were thorough and included considerations for extent of condition. The inspectors reviewed PPL's corrective actions and determined that they were generally appropriate to address identified deficiencies.

However, the inspectors noted that site QA identified and elevated an effectiveness review for the RCA that had not been completed in a timely manner. It was during that review that another surveillance requirement was missed. As a result, the effectiveness review included interim compensatory actions and targeted corrective actions towards monitoring and tracking early completion of SRs, a contributor of the most recent missed surveillance. The inspectors noted that NDAP-QA-0702, "Action Request and CR Process," Revision 29, Attachment H, states that if additional corrective actions are found to be warranted during an effectiveness review, the review should be evaluated as ineffective. Nonetheless, the inspectors noted that the effectiveness review for missed SRs was evaluated as effective despite site QA identifying that the effectiveness review had not been completed in a timely manner. This was considered to be a minor violation not subject to the NRC's Enforcement Policy since there were no actual consequences associated with the issue.

.5 Emergency Operating Procedures (1 Annual Sample)

a. Inspection Scope

The inspectors performed an in depth review of Emergency Operating Procedures (EOPs) and Off Normal Procedures (ONs). The inspectors observed a crew of licensed operators execute various EOP procedures during simulator scenarios.

The inspectors reviewed PPL's actions related to recent changes to EOPs. The inspectors reviewed PPL's procedures, notifications, engineering analysis, corrective actions, and root cause evaluations to ensure that the changes implemented were effective and reasonable. The inspectors reviewed the reportability and operability issues that were identified as part of the EOP changes.

b. Findings

No findings were identified.

The inspectors found that PPL appropriately identified and resolved issues with EOPs. The inspectors determined that the evaluations of degraded conditions were thorough, and included considerations for extent of condition. The inspectors reviewed PPL's

corrective actions (CR 1349966) and determined that they were appropriate to adequately address the identified deficiencies.

4OA3 Event Followup (71153 – 1 sample)

.1 (Closed) License Event Report (LER) 05000387/2010-003-00, Unit 1 Manual Reactor Scram due to Leakage from the Unit 1 Circulating Water System and Subsequent Flooding of the Unit 1 Condenser Bay

On July 16, 2010, Unit 1 received a condenser bay flood alarm. Plant operators verified that flooding was occurring into the 656' elevation of the condenser bay. Reactor power was reduced to 40 percent RTP via control rod insertions and a recirculation runback. Operator attempts to isolate condenser waterboxes remotely were unsuccessful. Unit 1 was subsequently manually scrammed, main steam isolation valves (MSIVs) were shut, and the main condenser was isolated so that the CW system could be shutdown. Concurrently, plant operators manually closed waterbox isolation valves and isolated the leak. The NRC issued a White Finding related to the flooding event and inadequate procedures. This finding is documented in IR 50-387;388/2010004 (preliminary White) and 50-387;388/2010008 (Final White).

Plant response following the manual reactor scram was not as expected. The integrated control system (ICS) feedwater level control system (FWLC) is designed to switch to single element (1E) control on low main steam flow. Due to steam condensation and flashing on the flow instrument, measured main steam flow remained above the transition point and ICS FWLC remained in three element (3E) control. The effect of this was that while the 'B' and 'C' feedwater pumps automatically switched to the idle mode and level setpoint-setdown occurred as expected, the 'A' feedwater pump underwent demand oscillations prior to its transition to discharge pressure mode. Inventory continued to be added to the reactor vessel until level reached the high level turbine trip setpoint and peaked at 55". Exceeding the setpoint resulted in a trip of all feedwater pump turbines, the HPCI turbine, the RCIC turbine and the main turbine. It took approximately 14 minutes for reactor vessel water level to steam down less than the trip setpoint. Once level was restored below the setpoint, the MSIVs were shut and HPCI and RCIC were manually initiated for pressure and level control respectively.

The inspectors reviewed this LER and the PPL CRs associated with this issue including all associated corrective actions. While reviewing this LER the inspectors observed that the LER did not contain a discussion about the unexpected ICS response following the manual scram of Unit 1. This omission did not change the NRC's or PPL's safety-evaluation of the event, the NRC was aware of the transient, and the LER was not relied upon by the NRC for any regulatory decisions. Thus it was determined to be a minor violation of 10 CFR 50.73(c), Licensee Event Reporting System". Minor violations are required to be corrected but are not subject to the NRC Enforcement Policy. PPL entered this observation into their CAP (CR 1334323) and committed to revising the LER. When issued, the revised LER will be reviewed under a separate sample. This LER is closed.

4OA5 Other Activities

.1 Followup Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period (IP 92723 – 1 sample)

a. Inspection Scope

On January 28, 2010, the NRC issued a Notice of Violation (NOV) (ML 100280714) to PPL related to two instances of failures by PPL Susquehanna, LLC (PPL) to obtain NRC approval for two senior reactor operators (SROs) to continue to conduct NRC-licensed activities after each SRO did not meet a specific medical prerequisite for performing the duties of a licensed operator, as required by 10 CFR 55.3. The apparent violation was described in detail in the subject NRC inspection report dated November 13, 2009 (Inspection Report Nos. 50-387;388/2009004). One case was determined to be a Severity Level III NOV and the other a Severity Level IV NCV.

In the 2nd quarter 2009 resident inspection report (IR 50-387;388/2009003), the NRC documented a non-cited violation of 10 CFR 50.73(a)(2)(vii), because PPL did not submit an LER for the common cause failure and consequent inoperability of two or more safety relief valves (SRVs) in 2005, 2008, and 2009. The inspectors determined that the SRV failures of set pressure testing per the 1998 ASME O&M Code were attributed to setpoint drift resulting in two or more independent channels (two or more SRVs) becoming inoperable.

Therefore, during the 12-month period from the 2nd quarter 2009 to 2nd quarter 2010, there were three traditional enforcement findings of SL IV significance or greater which impacted the regulatory process. Thus, the region elected to conduct an IP 92723 inspection and formally informed PPL of the NRC's intent to conduct this inspection via the NRC Mid Cycle Assessment letter dated September 1, 2010 (ML 102440462).

The inspectors reviewed PPL's apparent cause evaluations and common cause evaluation and associated CRs for the Operator Medical Examination issue and the LER issue to provide assurance that the causes of multiple traditional enforcement violations are understood by the licensee, provide assurance that the extent of condition and extent of cause of multiple traditional enforcement violations are identified, and to provide assurance that licensee corrective actions to traditional enforcement violations are sufficient to address the causes.

The inspectors also reviewed the IP 92702 followup inspection for the Operator Medical Examination Violations documented in IR 50-387;388/2010002 and PPL's written response to the SL III apparent violation. (On December 10, 2009, PPL submitted a written response (ML100150702) describing the action taken to restore compliance and prevent recurrence and to provide items for consideration for the enforcement process in lue of a Predecisional Enforcement Conference.)

The inspectors reviewed a sample of CRs containing issues which had been evaluated for reportability and determined an LER was not required, and a sample of the LERs which were submitted to the NRC from 2007 - 2010. The inspectors also conducted interviews with plant personnel, CAP staff, and Regulatory Assurance staff.

b. Findings and Observations

The inspectors documented a licensee-identified violation of TS 3.6.4.2 which occurred in 2003 related to secondary containment isolation valves (SCIV). This violation is discussed further in section 4OA7. The inspectors determined that PPL had appropriately evaluated the issue when it was identified in 2008 and that PPL correctly

identified that an LER was not required for this event since the issue was greater than 3 years old at the time of discovery, and did not involve an actuation of the Reactor Protection System (RPS) while the reactor was critical.

Overall, the inspectors determined that PPL had appropriately evaluated each issue, developed appropriate corrective actions, and implemented those actions in a timely manner. Corrective actions included revising policies and procedures to better clarify the requirements and expectations, training personnel and management about these requirements and expectations, and coordinating with the site's medical provider to ensure they were using the latest procedures when conducting, recording, and reporting medical examinations.

The extent of condition review conducted by the inspectors did not find any additional issues related to Operator Medical Examination Issues, or the reportability issues where an LER was not submitted as required. The inspectors did observe that LER 2010-003-00, "Unit 1 Manual Reactor Scram due to Leakage from the Unit 1 Circulating Water System and Subsequent Flooding of the Unit 1 Condenser Bay" did not contain a discussion about the unexpected ICS system response following the manual scram of Unit 1. See section 4OA3 for additional details.

4OA6 Meetings, Including Exit

On December 6, 2010, the inspector presented inspection results to Mr. J. Helsel and other members of his staff via telephone call, at the licensee's request. PPL acknowledged the findings.

On December 20, 2010, the inspectors presented inspection results to R. Pagodin, Acting Site Vice President and other members of your staff. PPL acknowledged the findings presented. No proprietary information was retained by the inspectors.

On January 6, 2011, the resident inspectors presented inspection results to Mr. T. Rausch and other members of his staff. PPL acknowledged the findings. There is no proprietary material in this report.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by PPL and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy Section 2.3.2, for being dispositioned as non-cited violations:

- On September 21, 2010, during a planned weekly run of the Unit 2 HPCI auxiliary oil pump, a minor oil leak was discovered on the in-service lubricating oil filter and HPCI was declared inoperable (EN 46268) while the standby filter was placed in-service. A subsequent investigation determined that an undersized o-ring was installed in the filter which led to the degraded condition. This error is a violation of 10 CFR 50, Appendix B, Criterion VIII, "Identification and Control of Material, Parts, and Components," for failure to prevent an incorrect component from being installed. The finding is more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone and its objective of ensuring the availability and reliability of systems that respond to initiating events. It was also similar to example 5.c. in NRC IMC 0612 Appendix E, "Examples of Minor Issues," which states, in part, that the failure to establish controls to prevent the wrong part from being installed in a system is more than

minor if the wrong part is installed and the system is returned to service. The finding was evaluated for significance using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." Since the finding did not result in a loss of safety function or the loss of a train for greater than its TS allowed outage time, and was not potentially risk significant due to external event initiators, the finding was determined to be of very low safety significance (Green). The issue was entered in PPL's CAP as CR 1306404.

- PPL CRs 1072993 and 1091573 (September and November 2008) questioned the configuration and TS aspects of the Susquehanna secondary containment airlock dampers. Further evaluation was conducted in CR 1095433. CRs 1072993 and 1091573 questioned whether the airlock dampers were Zone III containment isolation valves (they are listed in Table B. 3.6.4.2-1 as secondary containment system automatic isolation dampers) and noted they were not consistent with the FSAR design description of two dampers in series powered from independent trains. Per the FSAR, the only safety-related function of the RB heating, ventilation, and air-conditioning (HVAC) system is the automatic isolation function on high drywell pressure, low reactor vessel level, and high radiation in the refuel floor exhaust duct or railroad access shaft. Thus, only the Zone III automatic isolation dampers in the HVAC system would be considered SCIVs.

The evaluation identified that for most airlocks, the series isolation valves separate the safety-related and nonsafety-related sides of the Zone III ventilation piping (HD 17502 A&B for Unit 1 and HD 27502 A&B for Unit 2). Thus, the airlock dampers do not perform the Zone III isolation function in these cases and the FSAR design basis does not apply. This is consistent with the guidance in NUREG 800, "NRC Standard Review Plan."

However for airlocks I-707 and II-707, the ducting from those airlocks is routed downstream of the HD 17502 or 27502 dampers (the nonsafety-related side) and therefore HD 17534 C for Unit 1 and HD 27534 C for Unit 2 in conjunction with the outer airlock door provide isolation of the safety-related and nonsafety-related side to the system. Thus, the damper/door pair perform the Zone III isolation function. Therefore, HD 17534 C and 27534 C are Zone III isolations valves and are SCIVs. This design is not consistent with the FSAR design basis and TS Limiting Condition for Operation (LCO) Action Statement for TS 3.6.4.2 should be entered when either the outer airlock door or damper for the I-707 and II-707 airlocks are inoperable for maintenance.

CR 1095433 conducted a past operability review and identified that door 715 of airlock I-707 was propped open between September 9, 2003 and September 10, 2003 and door 716 of airlock II-707 was propped open between January 21, 2003 and April 18, 2003. Both of these instances exceeded the TS 3.6.4.2 Action Statement LCO time limits and would have required the plant be shut down to Mode 4 until the secondary containment isolation damper/door pair could be restored to an operable status or failed in the closed position. Therefore, PPL had operated in a condition prohibited by TS on two occasions in 2003. CR 1095433 also conducted a review for reportability. PPL correctly determined that 10 CFR 50.73 only requires an LER to be submitted for events which occurred within three year of the date of discovery unless the event involved an actuation of the RPS while the reactor was critical. Thus, an LER was not required.

Operating in a condition prohibited by TS is a performance deficiency that was reasonably within PPL's ability to foresee and prevent. The issue is more than minor since it affects the configuration control attribute of the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system (RCS), and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency represented a non-secured penetration in secondary containment. The issue screens to very low safety-significance (Green) when evaluated using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," because the finding only impacts secondary containment, does not affect the integrity of primary containment, and did not represent an actual open pathway. This issue is documented in PPL CAP as CR 1334937.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Bishop, GM Work Management
C. Brooks, Performance Improvement Manager
F. Curry, Senior Technology Specialist
D. D'Angelo, Engineering Manager
V. D'Angelo, Procurement Manager
D. Filchner, Senior Engineer
A. Fitch, Site Training Manager
J. Goodbred, Jr., Operations Manager
F. Gruscavage, Supervising Engineer
J. Helsel, Plant Manager
C. Hoffman, Manager - Nuclear Fuels
T. Illiadis, General Manager Operations
R. Klinefelter, Assistant Operations Manager
A. Klopp, System Engineer
G. Machalick, Senior Engineer
C. Manges, Regulatory Affairs
P. McGlynn, Project Manager
S. Muntzenberger, Senior Engineer
J. Nachtwey, Manager Field Projects
R. Pagodin, GM Engineering
J. Petrilla, Supervisor Nuclear Regulatory Affairs
M. Rochester, Special Projects Coordinator
J. Rowe, Surveillance Coordinator
J. Scopelliti, Communications and Public Relations Manager
J. Scranton, Senior Technology Specialist
V. Schuman, Radiation Protection Manager
J. Seek, Quality Assurance Manager
T. Strong, Design Engineer
R. Vazquies, Ventilation Systems Engineer
D. Walsh, Assistant Operations Manager
B. Willie, Manager – Online Work Management

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened

None.

Opened/Closed

05000388/2010005-01	NCV	Failure to Adequately Evaluate Periods of Elevated Risk for Necessary Risk Management Actions (1R13)
05000387; 388/2010005-03	NCV	Failure to Control, Calibrate and Evaluate M&TE (4OA2)
05000387/2010005-05	FIN	Failure to Evaluate a Non Conforming Condition Resulted in an Alert. (4OA2)
05000387; 388/2010005-06	SL IV	Inaccurate MSPI Data Submittal (4OA1)

Closed

05000387/2010-003-00	LER	Unit 1 Manual Reactor Scram due to leakage from the Unit 1 Circulating Water System and Subsequent Flooding of the Unit 1 Condenser Bay. (4OA3)
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**LIST OF DOCUMENTS REVIEWED
(Not Referenced in the Report)**

Section 1R01: Adverse Weather ProtectionCondition Report:

1291725, 1307493, 1307007, 1304526, 1303786, 1291725, 1102875, 1103661, 1320739,
1321034, 1315636, 1315249, 1311076, 1307265, 1302643, 1301000, 1302644,
1301208, 1321453, 1323433, 1323416, 1324472, 1324979, 1332499, 1332543,
1332545, 1331702, 1325566, 1332257, 1332249, 1333734, 1332501, 1334445*

Procedures:

NDAP-00-0024, "Winter Operations Preparations," Revision 15
OP-185-001, "Freeze Protection System," Revision 14
SI-252-308, "Quarterly Calibration of Condensate Storage Tank (CST) Low Level Channels
LSLL-E41-2N002 and LSLL-E41-2N003

Other:

Maintenance Rule Basis Document, System 85, "Cathodic and Freeze Protection"
FF 170018, Sheet 165, "Nelex Heater Installation," Revision 2

Section 1R04: Equipment Alignment

Condition Reports (* NRC identified):

1222237, 1280575, 1324117, 1327301*, 1323115*, 1323112*, 1326943, 1326272, 1182064, 1018879

Procedures:

FSAR 6.5.11, "SGTS," Revision 54
OP-070-001, "SGTS," Revision 18
ES-273-003, Venting Suppression Chamber without Radiological Release Limitation, Revision 11
FSAR 9.3.1, Table 9.3-2,3
OP-218-001, Instrument Air System Normal Operations, Revision 31
OP-218-002, Instrument Air System Infrequent Operations, Revision 3
EP-DS-004, Primary Containment and Reactor Pressure Vessel (RPV) Venting, Revision 3
ON-218-001, Loss of Instrument Air, Revision 21
CL-153-0012, "Unit 1 Standby Liquid Control System – Mechanic," Revision 10
CL-153-0011, "Unit 1 Standby Liquid Control System – Electrical," Revision 7

Drawings:

M-2125, Instrument Air, Sheet 1, Revision 41, Sheet 2, Revision 27, Sheet 5, Revision 6, Sheet 6, Revision 10, Sheet 7, Revision 15, Sheet 8, Revision 19, Sheet 16, Revision 16
M-125, Compressed Air System, Sheet 2, revision 46

Other:

System Engineering Journal – System 70 SGTS
Susquehanna SDP Notebook, Revision 2.1a
TM-OP-070-ST, "Standby Gas Treatment System," Revision 54
TM-OP-018-ST, Instrument Air, Revision 7
TM-OP-053-ST, "Standby Liquid Control," Revision 9
50.59 SD 00583, "Disable SBLC Tank HI/LO Level Alarm Function from LISHL14812, Revision 0

Section 1R05: Fire Protection

Condition Reports (*NRC identified):

1324295*

Procedures:

FP-113-105, RHR Pump Room "B" (I-13) Fire Zone 1-1E Elevation 645'-0", Revision 3
FP-113-106, RHR Pump Room "A" (I-14) Fire Zone 1-1F Elevation 645'-0", Revision 5
FP-113-109, Remote Shutdown Panel Room (I-109) Access Area (I-102) Fire Zones 1-2B, 1-2D, Elevation 670', Revision 5
FP-113-108, Railroads Airlock (I-100) Access Area (I-105), Fire Zones 1-2A, 1-2C, Elevation 670', Revision 4

FP-213-258, Load Center Room (II-510) Load Center (II-507), Fire Zone 2-5F, 2-5G, Elevation 749'-1", Revision 5
FP-213-254, Circulation Space (II-500), Fuel Pool Heat Exchanger (II-514), Chiller Room (II-512), Standby Liquid Control System Area (II-513), RPS MG Set Room (II-511), Sample Station (II-508), Fire Zones 2-5A-N, 2-5A-S, 2-5A-W, 2-5H, Elevation 749'-1" and 762'-10
FP-013-146, "Pre-Fire Plan Unit 2 Lower Cable Spreading Room (C-301) FZ 0-25A, Elevation 714'0," Revision 5
FP-013-162, "Pre-Fire Plan Unit 2 Upper Cable Spreading Room (C-507) FZ 0-27B, Elevation 754'0," Revision 6
FP-013-161, "Pre-Fire Plan Unit 2 Upper Relay Room (C-502) FZ 0-27A, Elevation 754'0," Revision 7
FP-013-142, "Pre-Fire Plan Unit 2 Lower Relay Room (C-201) FZ 0-24G, Elevation 698'0," Revision 7

Drawings:

E-205988, "Control Structure Fire Zone Plan, Elevation 698'0," Revision 6
E-205989, "Control Structure Fire Zone Plan, Elevation 714'0," Revision 5
E-205992, "Control Structure Fire Zone Plan, Elevation 754'0," Revision 6

Section 1R06: Flood Protection Measures

Condition Reports (* NRC identified):

1316360

Work Orders:

1224759, 1234494, 1251225

Other:

NRC Generic Letter 2007-01, Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients (ML070360665
PLA-6206, SSES Response to NRC Generic Letter 2007-01, dated May 4, 2007

Section 1R11: Licensed Operator Requalification Program

Condition Reports (* NRC identified):

1311415, 1310629, 1315063*, 1310505, 1311915*, 1312274

Procedures:

EP-TP-001, "Emergency Action Levels," Revision 03
AR-016-001, "EDG D ESW River Water Makeup (RWMU) and Miscellaneous Load Center 0653," Revision 44
AR-015-001, "13.8/4 kV Switchgear Distribution and DGs A, B, C OC653, Revision 36
ON-179-001, "Increasing Offgas MSL Radiation Levels," Revision 8

Other:

Exercise Manual

Section 1R12: Maintenance Effectiveness

Condition Reports:

1333184, 1290235, 1327498, 1265973, 1127754

Procedures:

NDAP-QA-0413, "Maintenance Rule Program," Revision 9

Other:

Maintenance Rule Basis Document – System 13 – Fire Protection
EC-RISK-1054, "SSL Availability Performance Criteria for Maintenance Rule, Revision 5
EC-RISK-1060, "Accepted Number of Failures for Selected System in the Scope of the
Maintenance Rule," Revision 2

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Condition Report:

426082, 821243, 1314734, 1314773, 1318227*, 1318550*, 1318602*, 1318700*, 1322383*,
1328365, 1333908

Procedures:

MT-GM-033, On-Line Leak Repairs, Revision 12
NDAP-QA-0340, Protected Equipment Program, Revision 8
NDAP-QA-1902, "Maintenance Rule Risk Assessment and Management Program," Revision 2
TM- OP-053-ST, Standby Liquid Control, Revision 9

Work Order:

824681

Other:

Protected Equipment Program Electronic Tracking Forms, dated October 9, 2010
Protected Equipment Program Electronic Tracking Form, dated October 26, 2010
Protected Equipment Program Electronic Tracking Form, dated December 10, 2010
EOOS Risk Profiles for Unit 1 and Unit 2, Week of October 24, 2010
FSAR 9.3.5
T.S. 3.1.7
T-10 Outage Readiness Review Summary, dated October 6, 2010
EOOS Risk Profiles for Unit 1, Week of December 13, 2010

Engineering Work Requests:

824681, 825151, 1308351, 1330121*, 1330270

Section 1R15: Operability Evaluations

Condition Reports (* NRC-identified):

1326149, 1328704, 1305655, 1306404, 1305843, 1306548, 1306214, 1328479, 1128702,
1128736, 309098, 335258, 1334146*, 1334144*, 1334293*, 1334412*, 1261268,
1305146, 1266188, 1328109, 1318508, 1270396, 1165553, 1324640, 1330975,
1328109

Procedures:

EC-052-1023, "Establishment of HPCI Room EO Conditions under Loss of barometric
Condenser"

Drawings:

E-11, Sheet 11, One Line Diagram Diesel Generator "E", Revision 16

Work Orders:

1261517, 1305208, 1319990, 1328658

Other:

E105956, "Unit 2 HPCI Lubricating and Control Oil P&ID," Revision 9
IOM 13, HPCI Pump Drive High Pressure Coolant Inspection or Steam Unit 1, Revision 33
NL-96-006, "Installation of Kiene Valve Extensions and Encoder"
Letter from MPR Associates Engineers to PPL, dated May 24, 2001, "Evaluation of Power Loss
through Cracked Indicator Valve"

Section 1R18: Permanent Plant Modifications

Procedures:

TP-164-037, Reactor Recirculation RRP Speed Control System Tune Up for ICS, Revision 0

Calculation:

EC-064-1032, Susquehanna Unit 1 and Unit 2 Jet Pump

Work Order:

1170627

Other:

TDC 1251049, Implement Compensatory Unit 1 Reactor Recirculation LOOP Flow Limits, Revision 0

Section 1R19: Post-Maintenance Testing

Condition Reports (*NRC-identified):

1313659, 1313054, 1315180, 1315449, 1315595, 1315171*, 1314491, 1314859, 1315456, 1315649, 1315132, 1315764, 1325035, 1325965, 1259033, 1258887, 1247151, 1329970, 1329552, 1329560, 1329769, 1329922, 1329788, 1329596, 1329908, 1333306*, 1333416*, 1277890, 1333186, 1334977, 1316753, 1336287*, 1336288*, 1334862, 1328445, 1328786, 1336537*, 1336543, 1336443, 1334865

Action Request:

1313057, 1113437, 1176307, 1012179, 1012181, 1281017

Procedures:

OI-AD-006, "Station Electrical Breaker and Component Instruction," Revision 0
OP-003-002, "Startup Bus 10 (0A103)/T-10 Outage and Restoration, Revision 1
SO-250-002, "Quarterly RCIC Flow Verification, Revision 39
SO-250-004, "Quarterly RCIC Valve Exercising," Revision 27
SO-250-015, "Two Year RCIC RPI Checks," Revision 11
OP-030-002, "Control Structure HVAC," Revision 27
TM-OP-030-ST, "Control Structure HVAC," Revision 6
SO-030-B03, "Quarterly Control Structure Chilled Water Flow Verification LOOP "B", " Revision 4
SO-030-015, "Two Year CSCW RPI," Revision 5
SO-252-002, "Quarterly HPCI for Verification," Revision 45
SO-252-004, "Quarterly HPCI Valve Exercising," Revision 26
OP-252-001, "HPCI System," Revision 44
SO-116-A02, Quarterly RHRSW Valve Exercising Division I, Revision 5
SO-116-015, Two Year RHRSW System RPI Checks Unit 1 Reactor Building Valves, Revision 9
SE-159-026, LLRT of Feedwater Line A Penetration Number X-9A and Check Valve Operability Tests (SCBL), Revision 17

Drawings:

E-102, Sheet 7, "Common Schematic Diagram 13.8 kV Bus 10 Incoming Circuit Breaker Control," Revision 15
E-214, Sheet 19, "Common Schematic Diagram Control Structure HVAC Chilled Wtr Sys, Chilled Wtr Circ PPS," Revision 6
E-197, Sheet 13, "Schematic Diagram HVAC Control Structure Air Cooler Unit Fan OV103B," Revision 4
M-2151, Sheet 3, "P&ID RHR," Revision 23
M-2155, Sheet 1, "P&ID HPCI," Revision 42
M-2656, HPCI Lubricating and Control Oil P&ID," Revision 9

Work Orders:

1269857, 1269861, 1284370, 1283967, 1168836, 1222293, 975437, 1312987, 807711,
1278410, 1052079

Section 1R22: Surveillance Testing

Condition Reports (* NRC identified):

612782, 1318126

Procedures:

SI-180-301, Quarterly Calibration of Reactor Vessel Pressure Channels PIS-B21-INO21A, B, C, D and PS-B21-INO21E, G (Core Spray System and LPCI Permissive) Reactor Pressure Greater Than Setting (420 psig), Revision 23
SI-151-301, Quarterly Calibration of Drywell Pressure Channels PS-E11-INO11A, B, C, D (Core Spray, HPCI, LPCI Permissive), Revision 19
SI-251-301, Quarterly Calibration of Drywell Pressure Channels PS-E11-2N011A, B, C, D (Core Spray, HPCI, LPCI Permissive), Revision 17
SE-149-008, 24 Month RHR Logic System Functional Test (Division II) – Online (Partial), Revision 2
SC-273-102, Monthly Functional Test of the Unit 2A Containment Radiation Detection System, Revision 20
SC-273-105, Monthly Functional Test of the Unit 2B Containment Radiation Detection System, Revision 18

Calculations:

EC-080-1006, Setpoint B21 E21 Core Spray RHR LPCI Reactor Low Pressure Permissive Pressure Indicating Switches, Revision 1

Drawings:

E-184, Sheet 11, Schematic Diagram of Loss of Coolant Accident (LOCA) Isolation Signals

Other:

TS 3.4.4
TS 3.4.6
FSAR 5.2.5.4, 5.2.5.1.2

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

Condition Reports:

1293759; 1303390; 1304372; 1302390; 1307503; 1307535

Procedures:

MC-OI-103, Off-Load Facility Receiving and Inspection of Incoming Material, Revision 4
NDAP-QA-0648, Purchase, Receipt and Shipment of Radioactive Material, Revision 20

Other:

909123, Low - Level Radwaste Handling Facility Readiness Review, August 2010
1302390, Walk Up of LLRWHF RWCU liner Inspection, September 2010
1284515, Assessment of Water Management Plan, Decontamination Plan and
Radiological/Effluents Controls for Unit 1 July 2010 Forced Outage
Quality Assurance Audit 1093653, Radiation Protection/Solid Radwaste Audit Report,
March 25, 2009
Teledyne Engineering Report of Analysis (2009) for DAW, control rod drive (CRD), Bead Resin,
LRW Filter Media, CFS Backwash Media, Unit 1 Fuel Pool, Unit 2 Fuel Pool, RWCU
Training Material HP248, Use of Shipping Document Computer Programs, Revision 0
Shipment Records: 10-003; 10-040; 10-092; 10-106; 10-110
NUPIC Joint Audit of Energy Solutions, Audit Nos. 22572, 22698, 22603, 22601, 22600,
April 2010

Section 4OA1: Performance Indicator Verification

Condition Reports (* NRC identified):

1327416*, 1328563*, 1328561*, 817570

Other:

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6
MSPI Derivation Reports for RCIC and RHR for October 9 through September 10
PL-NF-06-002, "MSPI Basis Document," Revision 5
RCIC System Engineer Unavailability Tracking Spreadsheet
RHR System Engineer Unavailability Tracking Spreadsheet
Operator Logs from October 1, 2009 through September 30, 2010
EC-RISK-1146, "PRA Model Rollout: DEC07EPU," Revision 0
PL-NF-06-002, "MSPI Basis Document," Revision 4
PA-TI-200, "Plant Analysis Technical Instruction- On-line PRA Rollout Process," Revision 1
PA-TI-206, "Updating the Tables Required in the Mitigating Systems Performance Indicator
Basis Document," Revision 0

Section 4OA2: Identification and Resolution of Problems

Condition Reports (* NRC identified):

1303929, 1289012, 1286078, 1288262, 1292262, 1286712, 1287456, 1282063, 1276085,
1276036, 1275078, 1274218, 1274175, 1271897, 1293592, 1272965, 1325766,
1323973, 1326704, 1285099, 1269798, 1294575, 1322651, 1321674, 1322343,
1288905*, 1330217, 0916453, 1041999, 1176579, 1180553, 1180553, 1190631,
1198659, 1244928, 1251256, 1258710, 1266877, 1267919, 1330560*, 1330561*,
1334899, 1333597*, 1333644*, 1333653*, 1333306*, 1333597*, 1333644*, 1333653*,
1334079*, 1334073*, 1334070*, 1334445*, 1335959*, 1187989, 1257775, 1285293,

1293802, 1324867, 1294583, 1304975, 1334425*, 1335913*888836, 900603, 1194026, 1194033, 1224714, 1229194, 1241190, 1257775, 1257781, 1257781, 1258743, 1263306, 1266877, 1269994, 1278530, 1282128, 1284522, 1285569, 1286001, 1287298, 1288534, 1291181, 1291349, 1292802, 1293174, 1294287, 1300782, 1308036, 1308372, 1309013, 1314127, 1315294, 1318800, 1323908, 1331314, 1332137, 1332384, 1334937*

Procedures:

NDAP-QA-0710, Station Trending Program, Revision 5
 EP-TP-001, "Emergency Plan"
 NDAP-00-0483, "Engineering Work Management Process." Revision 0
 NDAP-00-0745, "Self Assessments, Benchmarking, and Performance Indicators." Revision 7
 NDAP-00-0752, "Cause Analysis" Revision 6
 NDAP-00-0753, "Common Issue Analysis," Revision 0
 NDAP-QA-0008, "Procedure Writer's Guide"
 NDAP-QA-0300, Conduct of Operations, Revision 26
 NDAP-QA-0502, "Work Order Process" Revision 20
 NDAP-QA-0710, "Station Trending Program" Revision 3
 NDAP-QA-0720, "Station Report matrix and Reportability Evaluation Guidance" Revision 15
 NDAP-QA-0725, "Operating Experience Review Program" Revision 13
 NDAP-QA-702, "Action Request and CR Process" Revisions 25, 27, and 29
 ON-131-003, "ICS Component Failure(s)", Revision 0
 ON-142-001, "Circulating Water System Leak" Revision 17
 ON-145-001, "RPV Level Control System Malfunction", Revision 27
 ON-245-001, "RPV Level Control System Malfunction", Revision 27
 OP-AD-055, "Operations Procedure Program", Revision 12
 SO-193-001, "Quarterly Turbine Valve Cycling" Revision 29

Work Orders:

1110756, 900609, 612505, 900718, 537710

Other:

System Health Report, May 1 – August 31, 2010
 Station Trending Report, First Quarter, Second Quarter, 2010
 PPL Susquehanna 2010/2011 Excellence Plan, September 27, 2010, Revision 2
 Station PIs from October 2009 to October 2010
 List of Unit 1 and Unit 2 RCAs for January 1, 2010 to December 2, 2010
 ANSI/ANS 3.5-1985, "Nuclear Power Plant Simulators for use in Operator Training"
 Completed surveillance form for SO-193-001 performed on November 6, 2010
 Susquehanna QA Station Status Update November 20, 2010
 Control Room Deficiencies List as of December 1, 2010 and Operator Challenges List
 Operator Logs for May 14, 2010
 PLA-6652, "Response to NRC Request for Additional Information on proposed Revision 1 to Relief Request RR-02"
 PLA-6657, "10 CFR 50.59 Summary Report and Changes to Regulatory Commitments."
 Post Event Review Report for April 22, 2010 Unit 1 Reactor Scram
 Post Event Review Report for July 16, 2010 Unit 1 Reactor Scram
 Post Event Review Report for May, 14, 2010 Unit 1 Reactor Scram

PPL Performance Indicators for November 2010
Susquehanna QA Audit 1225783 Post Audit Conference Summary
Susquehanna QA Review of CR 1282128
Susquehanna Station Quarterly Trends Report for 3rd Quarter 2010 (DRAFT), 2nd Quarter 2010
and 1st Quarter 2010
Trend Code Search Results for OWAs from June 30, 2010 – December 13, 2010

Section 4OA3: Event Followup

Condition Reports:

1284522 and 1257781

Procedure:

NDAP-QA-0720, "Station Report Matrix and Reportability Evaluation Guidance" Rev 15

Other:

LER 05000387 2010-002-00
LER 05000387 2010-002-01
LER 05000387 2010-003-01
EN 45688
EN 45930
EN 46103
Post Event Review Report for July 16, 2010 Unit 1 Reactor Scram
Post Event Review Report for May, 14, 2010 Unit 1 Reactor Scram
Post Event Review Report for April 22, 2010 Unit 1 Reactor Scram
NUREG 1022, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73"

Section 4OA5: Other Activities

Condition Reports:

1091573, 1097571, 1095433, 704692, 1072993, 1334323, 1332275, 1332276, 1314127

Procedures:

NDAP-QA-0409, "Door, Floor Plug, and Hatch Control," Revision 7
NDAP-00-0752, "Cause Analysis," Revision 6
NDAP-00-0753, "Common Issue Analysis," Revision 0
NDAP-QA-0502, "Work Order Process," Revision 20
NDAP-QA-702, "Action Request and CR Process," Revisions 25, 27, and 29
NDAP-QA-0720, "Station Report Matrix and Reportability Evaluation Guidance," Revision 15

Other:

Susquehanna TS Sections 3.6.4.1, 3.6.4.2, and 3.6.4.3
Susquehanna TS Basis for Sections 3.6.4.1, 3.6.4.2, and 3.6.4.3
Table B 3.6.4.2-1 "Secondary Containment Ventilation System-Automatic Isolation Dampers,"
Revision 1

Table B 3.6.4.2-2 "Secondary Containment Ventilation System-Passive Valves or Devices,"
Revision 2

PPL Drawing E106280, "Unit 1 P&ID RB Air Flow Diagram-Zone II," Revision 32

PPL Drawing E106680, "Unit 1 P&ID HVAC Control Diagram Reactor Building Zone III,"
Revision 22

LER 05000387 2010-001-00

LER 05000387 2010-002-00

LER 05000387 2010-002-01

LER 05000387 2010-003-00

LER 05000387 2009-001-00

LER 05000387 2008-001-00

LER 05000387 2008-001-01

LER 05000387 2007-001-00

LER 05000387 2007-002-00

LER 05000388 2009-001-00

LER 05000388 2009-002-00

LER 05000388 2007-001-00

PPL Licensing Document Change Notice 393, "TSTF-18, TS 3.6.4.1.3 Secondary Containment
Access Doors"

PLA-5726, Susquehanna Licensee Amendment Numbers 261(Unit 1) and 226 (Unit 2)
Secondary Containment Access Doors Surveillance Requirement 3.6.4.1.3.

NRC SER and Licensee Amendment 224 (Unit1) and 201 (Unit 2)

Susquehanna FSAR Section 6.5.3, 9.4.1, and 9.4.2

NUREG 1433,"Standard Technical Specifications - General Electric Plants (BWR/4)"

LIST OF ACRONYMS

AAA	Agency Allegation Advisor
ADAMS	Agencywide Document and Access Management System
ANS	Alert and Notification System
AR	Action Request
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CAPCO	Corrective Action Program Coordination Officers
CAQ	Condition Adverse to Quality
CDE	Consolidated Data Entry
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CIG	Containment Instrument Gas
CR	Condition Report
CRD	Control Rod Drive
CS	Control Structure
CSC	Control Structure Chiller
CST	Condensate Storage Tank
CW	Circulating Water
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ECF	Employee Concerns Program
EDG	Emergency Diesel Generator
EOC	Extent of Condition
EOOS	Equipment Out-of-Service
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPU	Extended Power Uprate
ER	Engineering Request
ESW	Emergency Service Water
EWR	Engineering Work Request
FEMA	Federal Emergency Management Agency
FIN	Finding
FSAR	[SSES] Final Safety Analysis Report
FW	Feedwater
FWLC	Feedwater Level Control System
GE	General Electric
GL	Generic Letter
GWE	General Work Environment
HPCI	High Pressure Coolant Injection
HV	High Voltage
HVAC	Heating, Ventilation and Air-Conditioning
IA	Instrument Air
ICS	Integrated Control System
IDLH	Immediately Dangerous to Life and Health
IEEE	Institute of Electrical and Electronics Engineers
IN	Information Notice
IMC	Inspection Manual Chapter
IP	Inspection Procedure

IR	NRC Inspection Report
kV	Kilovolts
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LERF	Large Early Relief Frequency
LLRT	Local leak Rate Test
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LSFT	Logic System Functional Test
M&TE	Measuring and Test Equipment
MOV	Motor-Operated Valve
MRC	Management Review Committee
MSIV	Main Steam Isolation Valves
MSPI	Mitigating Systems Performance Indicators
MT	Magnetic Particle Testing
NAQ	Not Adverse to Quality
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NEI	Nuclear Energy Institute
NERO	Nuclear Emergency Response Organization
NOV	Notice of Violation
NRA	Nuclear Regulatory Affairs
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
OE	Operating Experience
OFR	Operability Followup Request
O&M	Operation and Maintenance
OOS	Out-of-Service
PARS	Publicly Available Records
PCE	Potential Chilling Effect
PCP	Process Control Program
PEMA	Pennsylvania Emergency Management Agency
PI	[NRC] Performance Indicator
PIC	Performance Improvement Coordinators
PI&R	Problem Identification and Resolution
PIM	Plant Issues Matrix
PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
PRA	Probabilistic Risk Assessment
QA	Quality Assurance
RB	Reactor Building
RCA	Radiologically Controlled Area
RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RETS	Radiological Effluents Technical Specifications
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual heat Removal Service Water

RLTCS	Refrigerant Low Temperature Control Switch
RMA	Risk Management Actions
ROP	Reactor Oversight Process
RPM	Radiation Protection Manager
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RTP	Rated Thermal Power
RWMU	River Water Make-Up
SBLC	Standby Liquid Control
SCWE	Safety Conscious Work Environment
SDP	Significance Determination Process
SE	Safety Evaluation
SOC	Statements of Consideration
SOW	System Outage Window
SR	Surveillance Requirements
SRO	Senior Reactor Operators
SRV	Safety Relief Valve
SCIV	Secondary Containment Isolation Valve
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
SW	Service Water
TRM	Technical Requirements Manual
TS	Technical Specifications
UHS	Ultimate Heat Sink
USwC	Unplanned Scrams with Complications
WO	Work Order