

Susquehanna 2

4Q/2010 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Evaluate Periods of Elevated Risk for Necessary Risk Management Actions

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. 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. In neither of these cases was the protected equipment program implemented as a risk management action as required by station procedures. This NCV 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 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 then 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, 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 the violation occurring, they failed to take appropriate corrective actions to address the adverse trend in a timely manner, commensurate with safety significance and complexity.

Inspection Report# : [2010005](#) (*pdf*)

Significance:  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Control, Calibrate and Evaluate M&TE

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 issue was evaluated IAW IMC 0612 Appendix E examples and determined to be similar to 3J, 3K and 4A. Namely, that significant programmatic deficiencies were identified that could lead to worse errors if uncorrected (3J, 3K) and that there was a routine of failing 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 or 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. It also 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. 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.
Inspection Report# : [2010005](#) (pdf)

Significance: SL-IV Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Inaccurate report of MSPI data

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 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. 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.

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 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, 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 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 finding was identified and no cross-cutting aspect was assigned. (Section 40A1
Inspection Report# : [2010005](#) (pdf)

Significance:  Oct 08, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Test Control of Safety-Related DC Circuit Breakers

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criteria XI, "Test Control," in that PPL did not ensure that test results were documented and evaluated to verify that test requirements were satisfied. Specifically, PPL did not adequately evaluate the over-current trip setting test results for 125 Vdc circuit breaker 1D652-12 to ensure the results were within the established acceptance limits. PPL subsequently placed the breaker in-service with an as-left trip setting outside of the approved acceptance band. In response, PPL entered this issue into the CAP and determined there was sufficient margin to ensure breaker operability.

The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the operability, availability, and reliability of systems that respond to initiating events to prevent undesirable consequences. The team performed a Phase 1 SDP screening, in accordance with NRC IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined the finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the area of Human Performance, Resources Component, because PPL did not ensure that complete, accurate, and up-to-date procedures and work packages were available and adequate to assure nuclear safety. Specifically, the procedure for DC breaker testing did not have adequate administrative controls to ensure that as-left test values were within the established acceptance criteria. (IMC 0310, aspect H.2(c)) (1R21.2.1.2)

Inspection Report# : [2010007](#) (pdf)

Significance:  Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Accurately Model the Simulator for RCIC System Operation at Reduced Flow Rates in Automatic

An NRC-identified, Green NCV of 10 CFR 55.46(c)(1), "Plant Referenced Simulators," was identified because the Susquehanna simulator did not accurately model RCIC system response when operated in automatic flow control at less than design basis full flow. While the licensee has not yet completed simulator modifications to routinely model RCIC control system instabilities when operating the system in automatic flow control at less than design basis full flow, the simulator does model instabilities resulting from a control system malfunction. The inspectors verified that licensed operators have trained on and responded to RCIC control system malfunctions during examinations. This issue was entered in PPL's corrective action process as CRs 1285503, 1287462, and 1286803.

The performance deficiency is more than minor because it is associated with the Human Performance attribute of Mitigating Systems and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the modeling of the Susquehanna simulator introduced negative operator training that could affect the ability of the operators to take the appropriate actions during an actual event. The finding was determined to be of very low safety significance because it is not related to operator performance during requalification, it is related to simulator fidelity, and it could have a negative impact on operator actions.

This issue was determined to not have a cross-cutting aspect. This was based on the age of the EPRI guidance (issued in 2002) applicable to the RCIC system flow instabilities and the lack of opportunities over the past three years to revisit this guidance. Therefore, this issue was not reflective of current performance.

Inspection Report# : [2010004](#) (pdf)

Significance:  Jun 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Conduct Online Risk Assessment for a Change in Plant Configuration

A self-revealing, Green NCV of 10 CFR 50.65(a)(4), occurred when PPL failed to conduct an adequate risk assessment of online maintenance activities on April 22, 2010. A maintenance activity that caused the 11 B bus tie supply feeder breaker from the startup transformer (Breaker 1A10204) to be inoperable was not modeled in the equipment out-of-service (EOOS) risk model despite work being commenced. A reactor scram occurred that day during unrelated testing and was complicated by the resulting equipment configuration that included the loss of the 11 B Bus and its associated "B" reactor recirculation pump and "B" condensate pump. Additionally, the "B" and "C" reactor feed pump turbines (RFPTs) tripped due to low suction pressure caused by the loss of the "B" condensate pump. When the maintenance activity was properly modeled, plant risk was reclassified from Green to Yellow. PPL entered the issue in their CAP and is conducting an evaluation of their work planning process.

This NCV affected 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 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." In this case, plant risk went from Green to Yellow when the maintenance was properly modeled; 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 Human Performance, Work Control in that PPL failed to appropriately plan work activities by not incorporating risk insights associated with breaker maintenance.

(H.3 (a)) (Section 1R13)

Inspection Report# : [2010003](#) (pdf)

Significance: **G** Jun 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct Condition Adverse to Quality

The inspectors identified a Green NCV of 10 CFR 50 Appendix 9, Criterion XVI, "Corrective Action," in that PPL failed to identify and properly correct a condition adverse to quality (CAO). Specifically, PPL failed to recognize the "B" control structure chiller (CSC) trip from May 12, 2010, as a CAO and did not replace the refrigerant low temperature cutout switch (RL TCS) despite previous operating experience (OE) demonstrating that the RL TCS experienced setpoint drift following calibration. As an immediate corrective action, PPL entered this NCV into their CAP in addition to replacement of the switch.

This finding is more than minor because it affects the equipment performance attribute of the Mitigating System cornerstone and the associated cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding in accordance with IMC 0609 Attachment 04, Phase 1 - "Initial Screening and Characterization of Findings," Table 4a. This finding was of very low safety significance because it did not represent an actual loss of safety function. The inspector determined that this violation has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, in that PPL failed to properly evaluate the problem and its significance and failed to properly classify and prioritize a CAO (P.1 (c)). Specifically, PPL did not classify the initial failure as a CAO because it occurred during post-maintenance testing PPL failed to recognize the potential for the RL TCS to affect the operability of a safety-related component despite prior operating experience with the RTLCS and current PM guidance. As a result, the RL TCS was not replaced leading to a subsequent "B" CSC trip on June 28, 2010. (Section 1R19)

Inspection Report# : [2010003](#) (pdf)

Significance: **G** Jan 29, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate PM Implementation Procedure Leading to Programmatic Deficiencies in the PM Program

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for PPL's failure to provide an adequate procedure to address and prevent multiple critical component preventive maintenance (PM) items from expiring without timely engineering justification. The inspectors determined this procedural inadequacy was a performance deficiency that was within PPL's ability to foresee and correct, and has contributed to programmatic deficiencies associated with the PM program. PPL entered this issue into the CAP for resolution as CR 1229194.

This finding is more than minor because it is similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," examples 3.j and 3.k in that significant programmatic deficiencies were identified that could lead to a more significant safety concern if left uncorrected. Additionally, the inspectors determined that this issue was more than minor because it affected the procedure quality attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined this finding was not a design qualification deficiency resulting in a loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding, or severe weather initiating event. Therefore, the finding is considered to be of very low safety significance.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL failed to identify the issues associated with the PM implementation procedure completely, accurately, and in a timely manner.

Inspection Report# : [2010006](#) (pdf)

Significance:  Jan 29, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct Non-conservative Maximum Safe Water Levels

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to correct a condition adverse to quality associated with non conservative maximum safe water levels in Table 10 of Emergency Operating Procedure EO-000-104, "Secondary Containment Control." Although some of the values in Table 10 were recognized as non-conservative, PPL determined that a change to the procedure was not necessary. PPL entered this issue into the CAP as CR 1229012 and revised the procedure on February 11, 2010.

The finding was determined to be more than minor because it was similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 4.d because PPL failed to take prompt corrective action for a condition adverse to quality and the condition could contribute to safety-related equipment unavailability. The inspectors assessed the finding to be of very low safety significance because it did not involve the loss or degradation of equipment or function specifically designed to mitigate a flooding initiating event and did not involve the total loss of any safety function that contributes to external event initiated core damage accident sequences.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the problem was not thoroughly evaluated such that the resolution addressed the cause and extent of condition [P.1.(c)]. Specifically, although the values of Table 10 were recognized as non-conservative, PPL determined that a change to EO-000-104 was not necessary.

Inspection Report# : [2010006](#) (*pdf*)

Significance:  Jan 29, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Condition Report Process for Overdue Actions

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for PPL's recurring failure to implement corrective action program procedural requirements. Specifically, Procedure NDAP QA 0702, "Action Request and Condition Report Process," Revision 25, states, in part, that all condition report (CR) action items shall be completed by the due date specified in the CR evaluation and action plan. If an action item cannot be completed by the specified due date, the action item due date may be revised by following a specified extension process. Contrary to these procedural requirements, PPL has consistently failed to implement the procedural requirements as demonstrated by sampling audits performed between January 2009 and May 2009, and by observed examples during the inspection. PPL entered this issue into the CAP as CR 1224714.

This finding is more than minor because it was similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 3.j in that it represents a significant programmatic deficiency that could lead to worse errors if uncorrected. If left uncorrected this issue would have the potential to lead to a more significant safety concern because not following an established process for extending due dates (including assessment of the impact on equipment and the identification of necessary compensatory actions) may lead to inoperable, nonfunctional, or degraded equipment. This finding was determined to be of very low safety significance because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent a loss of safety function of a single train for greater than its TS allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not implement appropriate corrective actions, in a timely manner, to address repetitive non-compliance with procedural requirements

Inspection Report# : [2010006](#) (*pdf*)

Significance:  Jan 29, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Test Reactor Vessel Safety Relief Valves in Accordance with ASME Code

The inspectors identified a Green NCV of 10 CFR 50 Appendix B Criterion XI, "Test Control," for PPL's failure to appropriately implement American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) Interpretation 01-18. In 2005, PPL changed their in-service test (IST) program for testing Class I Safety Relief Valves (SRVs) to adopt the "Installation" to "Test" methodology when calculating test periodicity. ASME OM Code Interpretation 01-18, identified that the Code requires the owner to use the "Test" to "Test" methodology. As a result of the incorrect methodology being used, a total of 12 SRVs exceeded the six year test periodicity. Of these 12 valves, four are currently installed in Unit 1. Additionally, two of the valves, when removed and tested in March 2009, failed to meet the ASME and Technical Specification limits. PPL has entered this issue into their CAP, has initiated action to revise their IST program to make it consistent with the ASME OM Code, and has submitted or prepared Relief Requests for all currently installed valves which have or will exceed the 6 year test interval before the next refueling outage.

The fact that PPL's IST testing program for Class I SRVs was not consistent with the underlying ASME OM code requirements is a performance deficiency which was reasonable within PPL's ability to foresee and prevent. The finding affects the equipment performance attribute of the Mitigating Systems cornerstone and the corresponding cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is also similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 1.c in that a missed surveillance is more than minor if, when tested, the equipment fails its test acceptance criteria as two SRVs did in this case. This finding was determined to be of very low safety significance because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent a loss of safety function of a single train for greater than the TS allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding has a cross cutting aspect in the area of OE because PPL failed to collect, evaluate, and communicate OE in a timely manner [P.2(a)]. Specifically, PPL failed to identify that ASME OM Code Interpretation 01-18 had been issued in 2003 and failed to evaluate relevant OE.

Inspection Report# : [2010006](#) (pdf)

Significance:  Dec 31, 2009

Identified By: NRC

Item Type: FIN Finding

Scenarios for NRC Annual Operating Examinations Did Not Meet Quantitative Standards for Total Malfunctions

The inspectors identified greater finding in that 20% of the NRC annual operating exam simulator scenarios reviewed did not meet the quantitative standard for total malfunctions, 4 to 8 for a single scenario, and 10 to 14 for a scenario set established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Form ES-604-1, "Simulator Scenario Review Checklist." In addition, the licensee's procedures NTP-QA-31.11, "Operator Requalification Exam Preparation and Implementation" and NTP-QA-31.7, "Simulator Scenario Writers Guides," recommend these same quantitative standards. The quantitative guidelines for malfunctions is an important metric because it establishes an objective standard used throughout the nuclear industry to ensure that the simulator portion of the NRC-required annual operating exams are written at an appropriate level of difficulty. As an immediate corrective action, the licensee entered this finding into their corrective action process (CR 1187760).

This finding was more than minor because it was associated with the Human Performance attribute of the Mitigation Systems cornerstone and affected the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the finding affected the level of difficulty of simulator operating exams which potentially impacted PPL's ability to appropriately evaluate licensed operators. A review of the possible cross-cutting aspects was performed and no cross-cutting aspect was identified that would be considered a contributor to the cause of the finding.

Inspection Report# : [2009005](#) (pdf)

Barrier Integrity

Emergency Preparedness

Significance: G Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Equipment to Measure Freon Concentration and Assess Threshold for an EAL Declaration

A Green self-revealing NCV associated with emergency planning standard 10 CFR 50.47(b)(4) was identified regarding inadequate indications for operators to determine if a threshold for an Alert Emergency Action Level (EAL) (OA7) declaration based on toxic gas concentrations immediately dangerous to life and health (IDLH) within a vital area had been met. Specifically, there were no meters (permanently installed or portable) available on site to measure Freon concentration, a toxic gas in high concentrations. This impacted the operator's ability to make an EAL declaration and operators had to rely on other indications such as personal ill effects from exposure. PPL entered this issue into its CAP as AR 1294109 and is evaluating the development of permanent corrective actions.

This performance deficiency is more than minor because it was associated with the Emergency Preparedness (EP) cornerstone attribute of Facilities and Equipment, and affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. This finding was similar to an example of a green finding evaluated using IMC 0609, Appendix B, "Emergency Preparedness SDP," Sheet 1, "Failure to Comply." This finding is associated with a failure to meet or implement a regulatory requirement. The deficiency is not greater than Green because it did not result in the Risk-Significant Planning Standard Function being lost or degraded and was similar to an example of a green finding in that "the EAL classification process would not declare any Alert or Notification of Unusual Event that should be declared." Since the declaration of Alert OA7 based on toxic gas levels for Freon concentrations IDLH (defined as greater than 2000 ppm Freon) within a vital area could have been missed or delayed, this finding was considered consistent with the example provided and was determined to be of very low safety significance (Green). This finding is related to the cross-cutting area of Human Performance, Resources, because PPL did not ensure that equipment and other resources were available and adequate to assure safety. Specifically, PPL did not appropriately evaluate equipment necessary to effect a change to the emergency plan for an EAL classification related to toxic gasses in a vital area. PPL lacked adequate equipment to make an accurate EAL classification and had to rely on secondary means (personnel ill effects) for appropriately classifying a Freon leak in the Unit 1 RB that occurred on August 10, 2010. This was determined to be the most significant contributing factor to this issue.

Inspection Report# : [2010004](#) (*pdf*)

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Last modified : March 03, 2011