

# Susquehanna 1

## 2Q/2010 Plant Inspection Findings

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### Initiating Events

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### Mitigating Systems

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Correct IRM Condition Adverse to Quality**

A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions", occurred when PPL failed to correct a condition adverse to quality associated with the 1D Intermediate Range Monitor (IRM) prior to a second reactor startup resulting in its failure and the aggregate of two IRMs inoperable in the same trip system. PPL inserted all control rods and went to Mode 3 to conduct IRM repairs and the issue was placed in PPL's corrective action program (CAP).

The finding was more than minor since it was associated with the equipment performance attribute of the Mitigating systems cornerstone and affected its objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the reliability and capability of the IRM system was impacted by the 1D failure. In accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations", the finding was determined to be of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of a system/train safety function and did not screen as potentially risk significant due to external events. This finding had a cross-cutting aspect in the area of Human Performance, Decision Making, in that PPL did not use conservative assumptions in decision making [H.1(b)]. Specifically, PPL did not consider other failure mechanisms as possible causes for the 1D IRM's degraded condition and adopted a troubleshooting approach of proving an expectation vice disproving other possible causes. (1R12)

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

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Correct Condition With ESW LOOP/LOCA Timer**

The inspectors identified a Green NCV of 10 CFR 50, Appendix 9, Criterion XVI, "Corrective Action," in that PPL failed to correct a condition adverse to quality in a timely manner. Specifically, PPL failed to replace the emergency service water (ESW) pump electropneumatic time delay relays with a design that would comply with design analysis and Technical Specification (TS) criteria. PPL entered the issue into their corrective action program CAP.

This finding is more than minor because it affected 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 4, 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 finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not take appropriate corrective actions to address an adverse trend in a timely manner (P.1 (d)).

Specifically, PPL had a history of sequence timer failures without corrective actions to ensure TS criteria and design analysis compliance for a full testing interval.

Inspection Report# : [2010003](#) (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:**  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:**  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: NCV NonCited Violation

### **Insufficient Fire Drill Oversight to Ensure Fire Brigade Performance Deficiencies are Identified**

The inspectors identified a Green Non-Cited Violation for the failure of fire brigade performance deficiencies to be identified and corrected during an unannounced fire drill, as required by programs set forth in Licensee Condition 2.C.3. Specifically, on November 16, 2009, the inspectors observed multiple deficiencies during an unannounced fire brigade drill that should have resulted in drill failure. However, the licensee determined the drill was completed satisfactorily.

The finding was more than minor because unaddressed fire brigade deficiencies may result in degraded performance during a real fire event in the vicinity of safe shutdown equipment. Additionally, the finding adversely affected the mitigating systems cornerstone objective. The inspectors assessed the finding in accordance with IMC 0609, Appendix M,"" and determined the finding to be a very low safety significance because the other elements of the defense in depth concept for fire events remained effective. This finding was determined to have a cross cutting aspect in the area of Problem Identification and Resolution, Self Assessments, because PPL did not communicate the results of assessments to affected personnel, and take corrective actions to address issues commensurate with their significance [P.3(c)]. Specifically, the single evaluator did not identify all of the drill deficiencies that occurred during the drill.

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

**Significance:** SL-III Sep 30, 2009

Identified By: NRC

Item Type: VIO Violation

### **Senior Reactor Operators Medical Qualification Issue- Vision Test**

In August 2009 two violations were identified involving PPL Susquehanna, LLC (PPL) failing to ensure that individual license holders, on shift in the capacity of senior reactor operators (SROs), met the medical prerequisites required for holding a license prior to performing the duties of a licensed operator as required by 10 CFR 55.3. In one occasion in August 2009, an SRO failed a medical examination which identified a disqualifying condition, in that, the examination identified that the SRO's vision did not meet the health requirements stated in ANSI/ANS 3.4-1983, Section 5.4.5, "Eyes." However, he performed the function of an SRO during three watches with a license that was not appropriately conditioned to require that corrective lenses be worn. Since this error invalidated the licensee basis for the operator, in that the operator stood duty as an SRO with an actual disqualifying condition. This was determined to be a SLIII Violation . Upon discovery, PPL removed both individuals from watchstanding duties pending follow-up medical evaluations and, in the case involving the SRO whose failed medical examination resulted in a disqualifying condition, PPL requested a conditional NRC license to address the disqualifying medical condition. Both issues have been entered into PPL's corrective action program.

Each example was evaluated independently using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, medical certification and conditional licensing are used by the NRC to ensure health conditions will not adversely affect operator duties or performance. The SL III violation was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because PPL did not systematically collect, evaluate, and communicate relevant external operating experience [P.2(a)]. Specifically, PPL failed to evaluate NRC Information Notice 2004-20 for medical examination issue applicability in accordance with their operating experience review program as evidenced by the 2008 SL-IV NCV (NRC IR 50-387 & 50-388 2008302-01), for an initial licensed operator application submitted to the NRC with a disqualifying medical condition, as well as these two events in July and August of 2009. (Section 1R11.2) This IN specifically mentions the responsibilities of licensee's (including licensee operators) to report changes which could impact physical qualification such as changes in vision.

Inspection Report# : [2009004](#) (pdf)

**Significance:**  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Corrective Actions Result in a Repeat Failure of Unit 1 HPCI Turbine Stop Valve**

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," in that PPL did not implement timely corrective actions to preclude repetition of a significant condition adverse to quality. Specifically, actions taken to address causes of the Unit 1 high pressure coolant injection (HPCI) stop valve failure to close in 2006 did not prevent the same HPCI stop valve from failing to close on August 18, 2009. In both cases, the stop valve failure to close rendered this single train HPCI system inoperable as it was unable to meet the 30 second injection response time as described in the design basis. Corrective maintenance was performed on the valve and the issue was entered into PPL's CAP.

The finding is more than minor because it adversely affected the performance attribute of the Mitigating Systems cornerstone objective, to ensure the availability, reliability, and capability of equipment that respond to initiating events to prevent undesirable consequences. Specifically, a full closed stop valve indication resets the HPCI ramp generator via a lower limit switch. Without this reset, the governor is unprepared to restart the turbine from an idle state during a designed basis event. The inspectors assessed this finding in accordance with IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings" and determined the finding to be of very low safety significance because it did not result in an actual loss of safety function for greater than the Technical Specification allowed outage time. The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not take appropriate corrective actions to address safety issues in a timely manner, commensurate with their safety significance and complexity [P.1(d)]. Specifically, PPL did not appropriately implement corrective actions following the 2006 failure of the HPCI stop valve. (Section 1R12)

Inspection Report# : [2009004](#) (pdf)

**Significance:** SL-IV Sep 30, 2009

Identified By: NRC

Item Type: VIO Violation

### **Operator Medical Qualifications Issue - Missed Physical Examination**

In August 2009 two violations were identified involving PPL Susquehanna, LLC (PPL) failing to ensure that individual license holders, on shift in the capacity of senior reactor operators (SROs), met the medical prerequisites required for holding a license prior to performing the duties of a licensed operator as required by 10 CFR 55.3. In the second occasion, an SRO performed licensed operator duties 52 times between April 1, 2009, and July 22, 2009, after the deadline for his biennial medical examination had passed. The medical examination may have identified an issue with the SRO's medical condition and general health that would have disqualified him from being authorized by a license. Since no actual disqualifying condition was identified, the basis for the operators licensee was still valid therefore this violation was determined to be a SL IV violation. Upon discovery, PPL removed both individuals from watchstanding duties pending follow-up medical evaluations. Both issues have been entered into PPL's corrective action program.

Each example was evaluated independently using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, medical certification and conditional licensing are used by the NRC to ensure health conditions will not adversely affect operator duties or performance.

The SL IV violation was not determined to have a cross cutting issue based on that none of the examples cited in IN 2004-20, "Recent Issues Associated with NRC Medical Requirements for Licensed Operators," would have led to actions that would have precluded the missed physical examination.

Inspection Report# : [2009004](#) (pdf)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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## **Public Radiation Safety**

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## **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.

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# Miscellaneous

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