

# Susquehanna 2

## 2Q/2007 Plant Inspection Findings

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### Initiating Events

**Significance:**  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Institute Effective Measures to Assure Special Processes (Welding) are Controlled and Accomplished**

The inspectors identified a non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," for the failure to provide sufficiently detailed instructions for performing a reactor coolant system (RCS) pressure boundary weld on March 19, 2007, during the Unit 2 refueling outage. Lack of instructions resulted in a leak in the RCS pressure boundary. PPL entered this issue into the condition reporting system, made changes to the affected work instructions, and repaired the leak.

This finding is more than minor because it affected the Human Performance attribute of the Initiating Events cornerstone. The finding is of very low safety significance because the leak was small with sufficient mitigating equipment available in accordance with IMC 0609, Appendix G, Attachment 1, "Boiling Water Reactor (BWR) Refueling Operations Significance Determination Process." A contributing cause of this finding was related to the Resources aspect of the Human Performance cross-cutting area in that PPL did not provide complete, accurate and up-to-date documentation, procedures and work packages, which contributed to a welder breaching the RCS boundary. (Section 1R08)

Inspection Report# : [2007002](#) (*pdf*)

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### Mitigating Systems

**Significance:**  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Take Timely Corrective Actions for an "E" Emergency Diesel Generator Jacket Water Leak**

The inspectors identified a non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix B, Criterion XVI, "Corrective Action," when PPL did not correct a condition adverse to quality, associated with a jacket water supply header leak on the "E" emergency diesel generator (EDG) 3R (right) engine cylinder. Inspectors identified that PPL had several opportunities to correct this leak before the condition impacted safety

system reliability and availability. PPL identified the jacket water leak during a diesel generator surveillance test on December 2, 2005 and entered this condition into the corrective action system. Although, the leak was small and did not originally impact system operability or reliability, PPL rescheduled, delayed, and deferred the repair work for this gasket connection until the condition resulted in a leak of approximately 12 gallons per hour during a March 28, 2007 surveillance test. Due to the rate of jacket water coolant inventory loss, PPL shutdown the engine and declared the "E" emergency diesel inoperable. PPL repaired the leak and entered the issue into the corrective action program.

This finding is greater than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and negatively affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is related to the Problem Identification and Resolution cross-cutting area (Corrective Action) because PPL did not take actions to correct the jacket water leak in a timely manner, commensurate with the issue's safety significance. (P.1(d)) (Section 1R19)

Inspection Report# : [2007003](#) (*pdf*)

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**Significance:**  Jun 29, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inoperable Pumphouse Ventilation lineup Corrective Actions**

The inspectors identified a non cited violation (NCV) of 10CFR 50 Appendix B, Criterion III Design Control because PPL failed to ensure that the design basis for the Residual Heat Removal System (RHR) was correctly translated into specifications and procedures. In 1990 PPL identified a single point vulnerability that could result in a complete loss of RHR to one of the units during a design basis event. PPL corrected this vulnerability by establishing alternate ventilation by opening a door. In 2002 PPL sealed the door disabling this strategy and reintroducing the same single point vulnerability. In November 2005, PPL identified that the modification had made the ventilation procedure unusable. PPL's assessment of the condition report incorrectly concluded that the ventilation procedure was not part of the design basis and immediate corrective actions were not performed. Following the team's identification of the issue PPL took immediate corrective actions to establish a new ventilation path. The issue had a crosscutting aspect in the area of problem identification and resolution related to corrective actions.

The finding was more than minor because it is associated with the design control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team conducted a Phase 3 SDP and determined the finding to be of very low safety significance.

Inspection Report# : [2007007](#) (*pdf*)



**Significance:** Jun 29, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **E EDG Procedure Violation Human Performance**

The inspectors identified a non cited violation of Susquehanna Steam Electric Station (SSES) Technical Specification 5.4.1, Administrative Controls, Procedures, for failure to use procedures required by Regulatory Guide 1.33. PPL operators did not follow the procedure adherence requirements when aligning the E emergency diesel generator (EDG) for standby operation prior to removing the C EDG from service for planned maintenance. The field supervisor concurred that not following procedure adherence requirements was an acceptable practice in this instance. Both the station procedure review and management expectations confirmed that the administrative procedure required strict procedure adherence during this evolution. SSES entered this issue into the corrective action program for resolution. The finding is more than minor because it affected the human performance attribute of the mitigating systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance (Green) because it did not result in a loss of system safety function. This finding has a cross cutting aspect in the area of human performance because SSES did not effectively communicate expectations regarding procedural compliance and because personnel did not follow procedures.

Inspection Report# : [2007007](#) (*pdf*)



**Significance:** Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate work instructions for the disassembly and inspection of IST check valves**

The inspectors identified a non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because PPL did not provide adequate work instructions for the disassembly and inspection activities, required by Technical Specification 5.5.6, Inservice Testing (IST), for emergency service water (ESW) check valve 011514. Consequently, undetected degradation of the valve internals, led to the valve's failure in the full open position and the diversion of approximately 1000 gallons per minute of ESW system flow from the operating loop into the idle ESW Loop. PPL has entered the finding into the corrective action program (CR 824522) and plans to revise its maintenance instructions.

The finding is more than minor because it is associated with the Procedure Quality attribute of the Mitigating System Cornerstone and it adversely affected the cornerstone's objective to ensure the availability, reliability, and capability of systems (e.g. ESW) that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance in the Phase 1 screening conducted per Appendix A of the SDP. This finding has a cross-cutting aspect in the area of human performance because the work package was not sufficiently complete to define and implement the required disassembly and inspection of check valves (1R12).

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Corrective Actions for EPA Breaker Failures**

Inspectors identified a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because PPL failed to correct a long standing condition adverse to quality with regard to RPSP EPA circuit breaker problems. The failures were attributed, in part, to PPL's inadequate prior evaluations with respect to not following recommended preventive maintenance replacement activities. PPL entered the finding into its corrective program (CR 710737) and plans to modify its preventive maintenance practices for the EPA breakers and to continue to work with the vendor to establish a permanent resolution.

The finding is more than minor because it is associated with the equipment performance attribute and affected the objective of the Mitigating Systems Cornerstone to ensure the availability, reliability and capability of equipment (e.g. the reactor protection system) that respond to initiating events to prevent undesirable consequences. The finding was determined to have very low safety significance (Green) in Phase 1 of Appendix A to the SDP because it was not a design or qualification deficiency, did not result in the loss of system safety function, did not represent the actual loss of safety function of a single train of equipment for greater than its technical specification allowed outage time, did not result in the loss of safety function of a train of risk significant non-technical specification equipment for greater than 24 hours, nor is it potentially risk significant due to seismic, flood, or severe weather initiating events. This finding has a cross-cutting aspect in the area of problem identification and resolution because PPL did not thoroughly evaluate similar breaker failures and take into account vendor information such that the extent of condition was considered and the problem resolved (4OA2).

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Risk Assessment**

The inspectors identified a non-cited violation (NCV) of 10 CFR 50.65 (a)(4), for an inadequate risk assessment. PPL did not correctly assess the risk associated with planned maintenance activities on the "A" emergency service water pump and the diesel fire pump on August 25, 2006. PPL entered this deficiency into their corrective action program and revised the risk assessment to correctly assess plant risk.

The finding is greater than minor because it was similar to Example 7.e in IMC 0612, Appendix E, "Examples of Minor Issues," and because PPL underestimated the cumulative increase in core damage probability for ongoing planned maintenance which when correctly assessed placed Unit 2 into a higher risk category. The finding was determined to be of very low safety significance (Green) using Appendix K of Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Management Significance Determination Process, " using Flowchart 1, because the incremental core damage probability deficit was determined to be less than 1.0 E-6 and the incremental large early release probability deficit was determined to be less than 1.0 E-7. The finding has a cross-cutting aspect in the area of human performance because PPL's planned work activities did not effectively incorporate risk insights. (Section 1R13)

Inspection Report# : [2006004](#) (*pdf*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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# Occupational Radiation Safety

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**Significance:** Jun 30, 2007

Identified By: NRC

Item Type: FIN Finding

## **Failure to Maintain Occupational Radiation Exposure As Low As reasonably Achievable During Reactor Water Cleanup Pipe Replacement Activities**

A self-revealing finding having very low safety significance was identified due to a deficiency in the area of maintaining occupational radiation exposures as low as is reasonably achievable (ALARA). For the Unit 2 refueling outage (2RIO13), the replacement of the reactor water clean-up (RWCU) piping was planned, and the estimated collective exposure for this work was 2.070 person-rem. Actual collective exposure for the job was 7.742 person-rem, more than 50 percent above the dose goal.

The performance deficiency that resulted in the exposure overrun was due to significantly increased hours to perform the work (budgeted for 308 person-hours, actual was 1081 person-hours when the work was suspended). The root cause of the overrun was determined to be poor initial welding on the piping, which required extensive rework.

Susquehanna's three-year rolling average is 101 person-rem, which is below the SDP criteria of 240 person-rem for boiling water reactors (BWRs), therefore, overall ALARA performance has been effective and this finding is of very low safety significance (Green). A contributing cause of this finding was related to the Work Practice Oversight aspect of the Human Performance cross-cutting area because the contracted vendor utilized inexperienced workers without providing additional supervisory oversight and PPL did not ensure adequate supervisory and management oversight of the work activities. H.4.c (Section 2OS2.1)

Inspection Report# : [2007003](#) (*pdf*)

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**Significance:** Jun 30, 2007

Identified By: NRC

Item Type: FIN Finding

## **Failure to Maintain Occupational Radiation Exposure ALARA During Outage Inservice Inspection of Reactor Pressure Vessel**

A self-revealing finding having very low safety significance was identified due to a deficiency in the area of maintaining occupational radiation exposures ALARA. For the Unit 2 refueling outage (2RIO13), the inservice inspection of the reactor pressure vessel and nozzles was planned, and the estimated collective exposure for this work was 6.536 person-rem. Actual collective exposure for the job was 10.684 person-rem, more than 50 percent above the dose goal.

The performance deficiency that resulted in the exposure overrun was due to significantly increased hours to perform the work (budgeted for 654 person-hours, actual was 1517 person-hours). The root cause of the overrun was determined to be an inexperienced work force.

Susquehanna's three-year rolling average is 101 person-rem, which is below the SDP criteria of 240 person-rem for BWRs, therefore, overall ALARA performance has been effective and this finding is of very low safety significance (Green). A contributing cause of this finding was related to the Work Practice Oversight aspect of the Human Performance cross-cutting area because the contracted vendor utilized inexperienced workers without providing additional supervisory oversight and PPL did not ensure adequate supervisory and management oversight of the work activities. (H.4.c) (Section 2OS2.2)

Inspection Report# : [2007003](#) (*pdf*)

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# Public Radiation Safety

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**Significance:** Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

## **Violation of 10 CFR 71.5 for Inadequately Secured Transport of Condensate Pump Motors (Class 7 Material)**

An NRC-identified finding having very low safety significance was identified due to a deficiency in the radioactive material control program. On March 20, 2007, Susquehanna shipped two condensate pump motors in a sealand container as Class 7 material, surface contaminated objects, to a vendor, in Memphis, TN. Upon receipt at the vendor

on March 22, 2007, it was identified that there had been a breach of the package during transit, in that several holes were in the side wall of the container due to inadequate blocking and bracing of the load. Code of Federal Regulations 10 CFR 71.5 requires that each licensee who transports licensed material shall comply with the applicable requirements of the Department of Transportation (DOT) regulations in 49 CFR Parts 171 through 180. 49 CFR 173.448 requires that each shipment of Class 7 materials must be secured to prevent shifting during normal transportation conditions. 49 CFR 173.410 requires that each package used for the shipment of Class 7 materials be designed so that the package will be capable of withstanding the effects of any acceleration, vibration or vibration resonance that may arise under normal conditions of transport without any deterioration in the integrity of the package. Contrary to these requirements, PPL failed to properly block and brace the contents of a sealand container, resulting in the loss of package integrity. This finding has a cross-cutting aspect in the area of human performance (work practices) because the contracted vendor did not have established instructions for proper loading and bracing of the shipment and PPL did not ensure adequate supervisory and management oversight of the work activities. (H.4.c) (Section 2PS2.1)  
Inspection Report# : [2007003](#) (*pdf*)

**Significance:**  Jun 30, 2007  
Identified By: NRC  
Item Type: NCV NonCited Violation

### **Violation of 10 CFR 71.5 for Inadequately Accounting for Activity in a Shipment of Irradiated Fuel Channels**

A self-revealing finding having very low safety significance was identified due to a deficiency in the radioactive material control program. On June 22, 2007, while preparing to load fuel channels in a disposal liner, Susquehanna identified that a liner of irradiated fuel channels previously shipped to the Barnwell Disposal facility in South Carolina contained an incorrect fuel channel for that shipment.

Code of Federal Regulations 10 CFR 71.5 requires that each licensee who transports licensed material shall comply with the applicable requirements of the DOT regulations in 49 CFR Parts 171 through 180. 49 CFR 172.203(d)(3) requires that the shipping papers for Class 7 materials include the activity contained in the shipment. Contrary to these requirements, PPL failed to properly account for the activity contained in a shipment due to the inclusion of the wrong item in the shipment. This finding has a cross-cutting aspect in the area of human performance (work practices) because the contracted vendor did not follow established instructions for proper loading of the shipment and the licensee did not ensure adequate supervisory and management oversight of the work activities. (H.4.c) (Section 2PS2.2)

Inspection Report# : [2007003](#) (*pdf*)

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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**

Last modified : August 24, 2007