

Susquehanna 2

2Q/2005 Plant Inspection Findings

Initiating Events

G**Significance:** Jun 30, 2005

Identified By: NRC

Item Type: FIN Finding

Inadequate Corrective Actions to Address Loss of Main Transformer Cooling and Potential for Reactor Scram

The loss of all cooling to the "B" main transformer and the resulting manual reactor scram on April 28, 2005 uncovered a self-revealing finding of failure to follow the corrective action program procedure. Following transformer replacement modifications, and a review of industry operating experience in 2002, PPL identified that the automatic transfer scheme of the power supplies to the Unit 2 main transformer cooling system contained single-point failure vulnerabilities. A previous loss of all cooling to the Unit 2 "A" main transformer occurred on March 27, 2003 and identified that total loss of transformer cooling could result in a reactor scram. The PPL Corrective Action procedure NDAP-QA-702, requires the implementation of interim corrective actions to prevent recurrence, minimize the problem or mitigate its effects. Contrary to this procedure, PPL initiated no actions to prevent recurrence or mitigate its effects until the identified design vulnerability caused another loss of main transformer cooling which resulted in a reactor scram on April 28, 2005. After the April 28th scram, PPL revised procedures to improve operator response to a total loss of transformer cooling and initiated a high priority modification to remove the design vulnerability.

This finding is greater than minor because it is associated with the design control and procedure adequacy performance attributes of the Initiating Events cornerstone and the finding negatively affected the cornerstone objective to limit the likelihood of those events that upset plant stability. An SDP Phase 1 risk assessment determined the finding was determined to be of very low significance (Green) since as a transient initiator it did not contribute to the likelihood of mitigation equipment or functions not being available.

This finding is related to the corrective action category of the Problem Identification and Resolution cross-cutting area because PPL did not take action on identified problems in accordance with corrective action and work process procedures to implement actions that could prevent recurrence, minimize the problem or mitigate its effects.

Inspection Report# : [2005003\(pdf\)](#)**G****Significance:** Sep 30, 2004

Identified By: NRC

Item Type: FIN Finding

PPL Did Not Retest and Evaluate Transformer 2X270

The inspectors identified a finding because PPL did not complete an evaluation of the condition of Unit 2 transformer 2X270 as required by a station procedure before energizing the transformer. Not completing the evaluation allowed a degraded transformer to be returned to service. The transformer faulted shortly after being placed in service which resulted in a loss of main condenser vacuum.

This finding is greater than minor because it adversely impacts the equipment performance attribute of the Initiating Events cornerstone and the finding adversely affected the cornerstone objective, in that, it is associated with an event that upset plant stability. This finding was considered to have very low safety significance (Green), using phase 1 of the significance determination process. The failure of transformer 2X270 did not increase the likelihood of an LOCA initiator, and did not increase the likelihood of a reactor trip and the likelihood that mitigation functions would be lost. In addition, the finding did not increase the likelihood of a fire or flood event.

A contributing cause of this finding is related to the Human Performance cross-cutting area because PPL did not complete the required retest and engineering evaluation of transformer 2X270 prior to energizing the transformer. (Section 1R19)

Inspection Report# : [2004004\(pdf\)](#)**G****Significance:** Jun 30, 2004

Identified By: NRC

Item Type: FIN Finding

Loss of One Offsite Power Source to Unit 2 (Operating Unit)

A self-revealing finding was identified because PPL did not ensure that the contract workers cleaning the Unit 1 cooling tower maintained the required minimum distance from an energized electrical line. PPL's Safety Operations Safety Rule Book requires a minimum distance of 15 feet 8 inches from an energized 230 KV offsite electrical power line. Subsequently, the worker in a bucket lift contacted the 230 KV line which resulted in the loss of one of two offsite electrical power sources for Unit 2. This resulted in the loss of one of two station startup transformers, T-10. In addition, the loss of T-10 resulted in a loss of condensate transfer keepfill water supply for the Unit 2 "A" and "C" residual heat removal pumps. The pumps were rendered inoperable when the system keepfill pressure dropped below 50 pounds per square inch gauge, the minimum value for pump operability, as required by PPL procedure.

This finding is more than minor because the deficiency affects the Initiating Events and Mitigating Systems cornerstone attributes related to equipment performance which reduced availability for the T-10 offsite power source and the "A" and "C" residual heat removal pumps. The error adversely affected the objective of the Initiating Events cornerstone to limit the likelihood of those events that upset plant stability such as loss of offsite power. The finding is of very low safety significance because Transformer T-10 was out-of-service for a short period of time (30

hours) and "B" and "D" residual heat removal pumps, as well as remaining containment venting and power conversion systems, were unaffected. Also, the error adversely affected the objective of the Mitigating Systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent reactor core damage. (Section 1R14.1)

Inspection Report# : [2004003\(pdf\)](#)

Mitigating Systems

Significance:  Jun 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Maintenance Performance Contributed to a Failure of 125 Volt DC Battery Charger 2D633

The inspectors identified a self-revealing non-cited violation of Technical Specifications Section 5.4.1 "Administrative Controls - Procedures," for not correctly pre-planning and implementing a surveillance on the 2D633 battery charger. This resulted in not identifying and correcting a degraded condition which contributed to the failure of the battery charger and subsequent Unit 2 shutdown on April 10, 2005. Following the shutdown, PPL initiated actions to improve the battery charger inspection work plans and preventive maintenance procedures as well as provide improvements in training.

This finding is greater than minor because the loss of 125 Volt DC battery charger 2D633 affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The SDP Phase 1 screening determined that a Phase 2 evaluation was required, because the finding represented an actual loss of a safety function of a single train, for greater than its Technical Specification Allowed Outage Time. A Phase 3 evaluation was performed instead of a Phase 2 evaluation because the Phase 3 evaluation was able to more accurately characterize the risk of this subsystem failure. A Phase 3 Risk Assessment determined this finding to be of very low safety significance (Green).

The inspectors identified that a contributing cause of this finding is related to the organizational performance category of the Human Performance cross-cutting area because the lack of adequate pre-planned work instructions resulted in maintenance individuals not inspecting all wires in battery charger 2D633 as required by the work instructions. Therefore, the degraded wires were not identified and repaired in March 2005, and as a result the battery charger failed on April 10, 2005.

Inspection Report# : [2005003\(pdf\)](#)

Significance:  Jun 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Evaluation for a Degraded Emergency Service Water Ventilation Damper

The NRC identified a non-cited violation for not implementing the Temporary Change procedure, in accordance with Technical Specification 5.4.1.a, "Administrative Controls - Procedures." The temporary change performed in the field resulted in a loss of seismic qualification of the "D" emergency service water (ESW) ventilation subsystem. When this was discovered the "D" ventilation subsystem and the "D" ESW pump were declared inoperable in accordance with the Technical Requirements Manual, Section 3.7.6.E. The inspectors determined that failure to implement the temporary change procedure as required by Technical Specifications caused the loss of the seismic qualification of the "D" ESW ventilation subsystem, which provides cooling for the ESW pumps. PPL declared the "D" ESW ventilation subsystem and the "D" ESW pump inoperable, performed an engineering evaluation (EWR 681288) and approved the use of a special tool to secure and maintain the seismic qualification of the damper. PPL installed this tool and declared the damper operable on June 7, 2005.

This finding is more than minor because the loss of seismic qualification affected the "Protection Against External Factors" Attribute of the Mitigating Systems cornerstone and the objective of ensuring capability of a system (ESW) that responds to initiating events to prevent undesirable consequences. This finding is of very low safety significance because the qualification deficiency did not result in the loss of function.

The inspectors identified that a contributing cause of this finding was related to the organizational performance category of the Human Performance cross-cutting area because operations and maintenance did not recognize the need to have engineering evaluate the method that was used to secure the damper in accordance with NDAP-QA-1218, "Plant Changes."

Inspection Report# : [2005003\(pdf\)](#)

Significance:  Sep 30, 2004

Identified By: NRC

Item Type: FIN Finding

Diesel Driven Fire Pump Lack of Engine Cooling

A finding of low safety significance was identified because PPL did not adequately evaluate and correct a degraded condition associated with the high engine operating temperatures and repetitive overheating of the diesel driven fire pump (DFP) which occurred following engine shutdown.

This issue is greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance, based on a Phase 1 significance determination process evaluation, because the finding did not result in the loss of a function of equipment designed as risk significant for greater than 24 hours and the finding does not increase the potential or risk of a seismic event, flood or severe

weather event.

A contributing cause of this finding is related to the Problem Identification and Resolution (PI&R) cross-cutting area. PPL did not sufficiently evaluate the condition to identify and correct the reduced cooling water flow to the DFP engine. This resulted in ineffective corrective actions because the DFP was removed from service several times without taking action to correct the DFP high engine coolant temperature issue.

(Section 4OA2.3)

Inspection Report# : [2004004\(pdf\)](#)

Barrier Integrity

Significance:  Mar 31, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Equipment Status for a Degraded Control Room Radiological Barrier Door

A self-revealing non-cited violation (NCV) was identified because PPL did not correctly implement the equipment status control procedure, in accordance with Technical Specification 5.4.1.a, which resulted in degrading the radiological barrier function for the control room. This finding is greater than minor because the loss of equipment status control resulted in an actual degradation of barrier performance which is an attribute of the Barrier Integrity cornerstone. This finding is of very low safety significance because only the radiological barrier function provided for the control room was affected. The inspectors identified that a contributing cause of this finding is related to the organizational performance category of the Human Performance cross-cutting area, in that PPL did not initially recognize the radiological barrier function of the control structure boundary door because the references utilized by PPL to determine the functions of the degraded door did not contain complete design information (Section 1R15).

Inspection Report# : [2005002\(pdf\)](#)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Jun 30, 2005

Identified By: NRC

Item Type: FIN Finding

Additional Collective Radiation Exposure Due to Inadequate Preparation for RHR Valve Work

The inspectors identified a self-revealing finding having very low safety significance due to a deficiency in ALARA performance. During the Susquehanna Unit 2 refueling outage (2RI012), rework on the residual heat removal (RHR) F050A and F050B valves resulted in a collective exposure of 17.006 person-rem, against a goal of 6.830 person-rem. This additional collective exposure was principally the result of problems associated with the seat lapping tool and an inability to effectively hydrolaze the work area.

The performance deficiency was due to an inability to effectively lap the valve seat on the RHR F050A and F050B valves. Susquehanna's three-year rolling average (2001-2003) is below the significance determination process (SDP) criteria of 240 person-rem for boiling water reactors; therefore, overall ALARA performance has been effective and this finding is of very low safety significance.

The inspectors identified that a contributing cause of this finding was related to the organizational performance category of the Human Performance cross-cutting area because health physics and maintenance personnel did not adequately prepare for the work to be performed, and did not review the documentation and lessons learned of similar work performed in earlier outages.

Inspection Report# : [2005003\(pdf\)](#)

Public Radiation Safety

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

Last modified : August 24, 2005