

Susquehanna 2

4Q/2008 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Dec 31, 2008

Identified By: NRC

Item Type: FIN Finding

Ineffective Evaluation and Incorporation of Operating Experience into the Corrective Action Program

Green. A self-revealing finding was identified for failing to properly implement PPL procedure NDAP-QA-0725 regarding the incorporation and evaluation of operating experience (OE) into the corrective action program and control of field work. Specifically, in December 2007 an industry operating experience report regarding the control of field work for nitrogen freeze seals in plant vital areas was entered into Susquehanna's corrective action program. However, the inspectors identified that PPL's review and evaluation of this OE resulted in no corrective actions taken or planned and that the relevant information was not communicated to the affected station groups as required by NDAP-QA-0725, Appendix D. Inspectors determined that the lack of corrective actions and inadequate communication of industry OE were primary contributors to the Susquehanna Unit 2 Alert declaration on October 27, 2008. This emergency declaration was required when the oxygen level in the 2B residual heat removal (RHR) pump room, which is a plant vital area, dropped below the minimum allowable threshold of 19.5 percent, which is the Immediately-Dangerous-to-Life-and- Health (IDLH) limit.

This finding was more than minor because the failure to properly implement NDAP-QA-0725, Appendix D, to evaluate external industry OE, implement corrective actions, and communicate the OE information to those who performed the relevant tasks at Susquehanna resulted in prohibiting access to safety-related equipment in the RHR room, resulted in the declaration of an emergency event (Alert), and increased the Technical Specification (TS) out of service (OOS) time for the 2B RHR pump. This finding affected the equipment performance attribute of the Mitigating Systems cornerstone and was of very low safety significance (Green) because it was not a design or qualification deficiency, there was no loss of safety function, and it was not potentially risk significant due to external events. The finding was not a violation of regulatory requirements but represented a failure to properly implement NDAP-QA-0725, Appendix D, in that external OE was not correctly evaluated and as a result, relevant information was not communicated to the affected work groups. PPL entered this issue into their corrective action program (CR # 1086125) and implemented corrective actions that included procedure revisions, reinforcement of procedure adherence, and training and qualification revisions. The inspectors determined that this finding has a cross-cutting aspect in the area of Problem Identification and Resolution (operating experience component) because PPL did not systematically or effectively evaluate and communicate industry OE to affected internal stakeholders in a timely manner. [IMC 0305 aspect: P.2(a)]. (Section 4OA3)

Inspection Report# : [2008005](#) (*pdf*)

Significance:  Nov 07, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish Adequate Procedures for Operation of the Plant Following Evacuation of the Control Room due to a Fire

• Green. The team identified a Green non-cited violation of Units 1 and 2 Technical Specification 5.4.1, "Procedures" for PPL's failure to establish appropriate procedure directions for operation of the plant from the remote shutdown panel following a control room evacuation due to a fire. PPL's guidance for control room evacuation is provided in

Unit 1 (Unit 2) procedure ON-100(200)-009, Control Room Evacuation, Revision 15. However, the team found that these procedures did not contain directions for establishing alternate shutdown cooling from the Remote Shutdown Panel using the train of equipment that had been analyzed to remain free from fire damage in the event of a control room fire. The licensee initiated a condition report and implemented procedure changes to add a section for operation of Residual Heat Removal(RHR)/Low Pressure Coolant Injection(LPCI) in the alternate shutdown cooling mode from the remote shutdown panel.

This finding is more than minor because it is associated with the procedural quality attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent core damage. Specifically, this issue would have required the plant operators to implement emergency operating procedures for maintaining reactor coolant inventory and cooling without the benefit of appropriate procedure guidance. This finding is related to the cross-cutting area of Problem Identification and Resolution (Corrective Action Program) because PPL did not take appropriate corrective actions to address a safety issue in a timely manner, commensurate with its safety significance and complexity. (P.1(d)), (Section 1R05.01)

Inspection Report# : [2008009](#) (*pdf*)

Significance: SL-IV Jul 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Provide Complete and Accurate NRC License Application

Severity Level IV: The NRC identified a Level IV non-cited violation of 10 CFR 50.9, "Completeness and Accuracy of Information" because PPL submitted a license application for a reactor operator to take an initial NRC license examination that incorrectly stated that the applicant was medically qualified with restrictions. The performance was reviewed for any cross cutting aspects and none were identified.

This finding was more than minor because it impacted the NRC's ability to perform its regulatory function and was therefore evaluated using the traditional enforcement process. Specifically, PPL submitted a license application for a reactor operator to take an NRC license examination that incorrectly stated that the applicant was medically qualified with restrictions. This information could have resulted in an operator being licensed that was not medically qualified. The finding is of very low significance because it did not result in the NRC making an incorrect licensing decision and PPL took adequate corrective actions and on July 14, 2008 requested withdrawal of this reactor operator license application. (Section 4OA5)

THIS NCV WAS ACTUALLY CLOSED IN IR 2008-005

Inspection Report# : [2008302](#) (*pdf*)

Significance:  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inappropriate Corrective Actions in Response to Repeated ESW Pump Timer Failures

The inspectors identified a non-cited violation (NCV) of Title 10 of the Code of Federal Regulation (CFR), Part 50, Appendix B, Criterion XVI, "Corrective Action" because PPL did not implement timely corrective actions for a degraded condition associated with the "A" and "C" emergency service water (ESW) pump emergency diesel generator (EDG) load sequence timers. Inspectors identified that PPL had multiple opportunities to correct this condition adverse to quality. The inability of ESW pump initiation timers to function as designed over the entire surveillance interval was identified by PPL following failed surveillance tests in 2002, 2004, and 2006. On April 9, 2008, during the performance of Unit 1 Division I diesel generator LOCA/LOOP testing, the "A" and "C" ESW pump start sequencing timers failed their acceptance criteria with times that were longer than specified. In response to the timer failures, and to ensure the operability of the associated diesel generators, the operators deactivated the "A" and "C" ESW pumps by opening the DC knife switches in accordance with procedure. This resulted in elevated online risk for Unit 2 because one Division of ESW was inoperable and unavailable for automatic or manual start. PPL initiated actions to restore the function of the timers and has entered the issue into the corrective action program. The ESW pumps were returned to an operable status on April 10, 2008.

This finding is greater than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone; and it negatively impacted the cornerstone objective of ensuring the availability, reliability, and

capability of systems that respond to initiating events to prevent undesirable consequences.

This finding is related to the Problem and Identification Resolution cross-cutting area (Corrective Action) because PPL did not take appropriate corrective actions to address a safety issue and adverse trend in a timely manner commensurate with its safety significance. (P.1(d)),

Inspection Report# : [2008003](#) (*pdf*)

Significance:  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Application of Work Instructions Resulted in Unavailable and Inoperable Engineering Safeguards Electrical Bus

A self-revealing, Green NCV was identified for failure to accomplish work in accordance with the appropriate instructions as required by 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings." Specifically, PPL did not complete the required actions that would properly protect the Unit 1 transformer 1X210 windings from moisture intrusion when heat was not applied to the transformer as specified by the work instructions and original equipment vendor manual. This resulted in high initial Doble test results, an investigation into cause, a drying out period, and additional Doble testing which caused an approximate 24-hour delay in the restoration of the safety-related 1A 4 KV ES bus. This electrical bus provides power to common safety-related loads which increased the online risk for Unit 2, the operating unit during the Unit 1 refueling outage. PPL applied concentrated heat and energized the primary windings to remove moisture from the windings prior to returning the transformer to service. This finding is greater than minor because it adversely impacted the equipment performance attribute of the Mitigating Systems cornerstone and affected the objective to ensure the availability, reliability and the capability of systems that respond to initiating events to prevent undesirable consequences. This finding was considered to have very low safety significance (Green), using phase one of the significance determination process for Unit 2. A contributing cause of this finding is related to the Human Performance cross cutting area, work control planning attribute H.3.(a). Specifically, PPL did not appropriately plan and coordinate the work activities by incorporating job site conditions, including environmental conditions.

Inspection Report# : [2008002](#) (*pdf*)

Significance:  Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Evaluate a Deviation from BWROG EPG/SAG Resulted in an Inadequate EOP

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because, in the 1990s, Susquehanna failed to adequately evaluate a deviation from the Boiling Water Reactor Owner's Group Emergency Procedure Guidelines / Severe Accident Guidelines (BWROG EPG/SAG), which resulted in one of the emergency operating procedures (EOPs) being inadequate. Specifically, Caution #1 in the BWROG EPG/SAG warned the operators that reactor pressure vessel (RPV) level instrumentation may be unreliable if the drywell temperatures exceeded RPV saturation temperature. The purpose of the Caution was to give the operators a chance to evaluate the validity of the RPV level instrumentation to avoid premature entry into the RPV flooding contingency procedure. Susquehanna did not adequately evaluate the deviation, and the Susquehanna EOPs did not use a Caution statement; but instead, changed the caution to a procedural step, which directed the operators to transition directly to the RPV flooding procedure.

The performance deficiency is more than minor because it is associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and affects the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the EOP could have directed entry into the RPV flooding procedure unnecessarily which would have restricted the use of suppression pool cooling and required other actions that would have complicated the operators' response to the event. The finding was determined to be of very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events. (Section 4OA2.a.3 (a))

Inspection Report# : [2008006](#) (pdf)

Significance:  Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

failure to Identify and Correct Inconsistencies in the Licensing Basis and the EOPs

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to identify that an inconsistency between the procedures and the design basis for suppression pool (SP) cooling was a condition adverse to quality (CAQ), which resulted in corrective actions not being taken in a timely manner. Specifically, in January 2006, a Condition Report (CR) identified an inconsistency between an assumption in the Final Safety Analysis Report (FSAR) for the design basis accident and the emergency operating procedures (EOPs) regarding the timing for the implementation of SP cooling. At the time of the inspection, the inconsistency had not been resolved because Susquehanna did not recognize that it impacted current plant operations. This performance deficiency has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Susquehanna did not identify that the inconsistency documented in the CR should have been categorized as a CAQ, commensurate with its safety significance. [P.1(a)]

The performance deficiency is more than minor because it is associated with the Design Control 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 EOPs provided direction that, under some accident conditions, would affect the availability and/or capability of the SP cooling system to perform its safety function. The finding screened out as having very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events.

Inspection Report# : [2008006](#) (pdf)

Significance:  Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Accurately Model the Simulator for RPV Water Level Instrumentation

The NRC identified a Non-Cited Violation of 10 CFR 55.46(c)(1), "Plant Referenced Simulators," because the Susquehanna simulator did not accurately model reactor pressure vessel (RPV) level instrumentation following a design basis accident loss of coolant accident (DBA LOCA). Specifically, an analysis performed in 1994 to determine if the observed simulator response during a large break LOCA was consistent with the expected plant response, was based on an overly conservative assumption that the drywell would experience superheated conditions, which would cause RPV water level instrumentation reference leg flashing and a subsequent loss of all RPV level indication. The expected plant response, as stated in the analysis, was incorrect; in that a LOCA would not always cause a loss of all RPV level instruments. As a result, the simulator modeling was incorrect.

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 (a mitigating system) 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.

Inspection Report# : [2008006](#) (pdf)

Significance:  Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to identify and Correct a Setpoint Error in the RHR and CS Operating Procedures

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the

failure to identify that a setpoint error in the operating procedures for safety-related systems was a condition adverse to quality (CAQ), resulting in the procedures not being corrected in a timely manner. The setpoint for the low pressure injection permissive interlock in the RHR and CS systems had been changed in 1999 as part of a modification. However, the setpoint was not changed in the system operating procedures and operator aids. When this issue was identified by Susquehanna staff in 2006, the setpoint error in the procedure was not screened as a CAQ, which resulted in the procedures not being revised for 17 months after the issue was identified in an Action Report. This performance deficiency has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Susquehanna did not identify that a setpoint error in operating procedures for safety-related systems was a CAQ, commensurate with its safety significance. [P.1(a)]

The performance deficiency is more than minor because it is associated with the Procedure Quality 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 incorrect setpoint reference in the procedure impacted the reliability of operator response to the event in that it could delay operator actions or result in misoperation of equipment. The finding screened out as having very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events.

Inspection Report# : [2008006](#) (pdf)

Barrier Integrity

Emergency Preparedness

Significance:  Sep 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Equipment to Assess Threshold for Emergency Action Level

The inspectors identified a NCV associated with emergency planning standard 10 CFR 50.47(b)(4). The inspectors determined that a performance deficiency existed in that inadequate indications were available for operators to determine if a threshold for emergency action levels (EALs) based on sustained wind speed in the protected area, had been met. On the afternoon of July 17, 2008, a severe thunderstorm with winds in excess of 50 miles per hour (mph) passed though the plant site. The storm caused damage to non-vital structures and resulted in the loss of two, 13.2 kilovolts (kV) power lines which interrupted power to several non-power block buildings on site. Inspectors observed operators responding to the event and identified that the wind speed indicator in the control room had indicated the maximum value for several minutes. This recorder only displayed wind speeds up to a maximum of 50 mph. Inspectors also observed that the backup wind speed indication, located 6 miles from the site and which reads from 0-100 mph, was inoperable during the storm. Inspectors identified that the Unit Supervisor had mistakenly read the wind direction trace on the recorder and had determined a 65 mph wind speed in error. Based upon direct observations during this adverse weather event, the inspectors determined that the operators did not have adequate indications available to determine if the threshold, sustained winds of greater than 80 mph, for EALs OA5 or OU5, had been met. This finding is greater 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 is of very low safety significance (Green) because it did not result in the Risk-Significant Planning Standard Function being lost or degraded. This finding is related to the cross-cutting area of Problem Identification and Resolution Corrective Action Program because PPL did not take appropriate corrective actions to address a safety issue in a timely manner, commensurate with its safety significance and complexity. Specifically, the NRC had previously identified this potential vulnerability over two years prior to the event and the licensee had entered the concern into their CAP; however, corrective actions were not implemented. [P.1(d)] (Section 1R01)

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 : April 07, 2009