

Susquehanna 2

2Q/2015 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Control of Transient Combustible Materials

The inspectors identified a Green NCV of the PPL Unit 1 and Unit 2 Facility Operating License Condition 2.C.(6), “Fire Protection Program” (FPP), for PPL not adequately controlling the storage of transient combustibles in accordance with their fire protection program requirements. Specifically, combustible materials in excess of the maximum allowable transient combustible loading were stored without being evaluated by the site fire protection engineer (SFPE) or having compensatory actions identified. PPL immediately instituted a fire watch for the area. The SFPE subsequently evaluated the area and determined that the transient combustibles exceeded the maximum allowable transient combustible loading as determined by the fire protection plan.

Inspectors determined the performance deficiency was more than minor based on affecting the protection against external factors attribute of the initiating events cornerstone and its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations.

Additionally, it was similar to example 4.k in IMC 0612 Appendix E, “Examples of Minor Issues,” in that transient combustibles were not within the fire hazard analysis limits and there was a credible fire scenario that existed involving the transient combustibles that would impact equipment important to safety, specifically both trains of the control structure heating, ventilation and air conditioning (HVAC), control structure chillers and standby gas treatment.

In accordance with IMC 0609.04, “Initial Characterization of Findings,” and Attachment 1 of IMC 0609, Appendix F, “Fire Protection SDP Phase 1 Worksheet,” the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not impact the ability to reach and maintain safe shutdown conditions. Specifically, a postulated fire in the fire zone did not present the possibility of impacting more than one train of safe shutdown equipment. This finding had a cross cutting aspect of Work Management in the Human Performance area because multiple groups were responsible for bringing the transient combustibles into the area and the individuals failed to effectively communicate and coordinate their activities to ensure that transient combustible control processes were appropriately implemented [H.5].

Inspection Report# : [2015001](#) (*pdf*)

Mitigating Systems

Significance: G Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Promptly Correct a Condition Adverse to Quality on the ‘B’ EDG

The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to correct a condition adverse to quality. Specifically, despite identifying a condition adverse to quality on January 31, 2015 associated with vibration induced fretting of the 'B' emergency diesel generator (EDG) fuel oil flowing vent line, implementation of the corrective action program (CAP) did not assure that the condition adverse to quality was promptly corrected, and subsequently during the next monthly surveillance run the EDG was declared inoperable when the through wall leak worsened. To maintain operability of the other EDGs, which exhibited the same vibration induced fretting that rendered the 'B' EDG inoperable, PPL instituted a compensatory action to initiate a fire watch if any of the EDGs were started to ensure that leakage could be promptly identified and mitigated without causing a fire. Additionally, PPL replaced the piping that exhibited signs of fretting.

Inspectors determined that the finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correct the fuel oil tube leak on the 'B' EDG resulted in an unplanned shutdown of the diesel and declaration of inoperability when the leak worsened during subsequent surveillance testing. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent the actual loss of a 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 had a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because PPL did not thoroughly evaluate the issue of vibration induced fretting of the 'B' EDG fuel oil flowing vent line to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, PPL's assessment of the condition with regard to operability and the potential impact on the other EDGs was inadequate, which prevented PPL from taking adequate corrective actions to maintain operability [P.2].

Inspection Report# : [2015001](#) (*pdf*)

Significance:  Mar 31, 2015

Identified By: NRC

Item Type: FIN Finding

SBO Diesel Fuel Oil Cloud Point

The inspectors identified a finding of very low safety significance (Green) for not establishing diesel fuel oil specifications to ensure diesel-driven equipment important to safety will function during expected low ambient temperatures. Specifically, PPL did not establish appropriate measures for diesel fuel oil cloud point and the station blackout diesel generator (Blue Max) was potentially rendered non-functional when ambient air temperatures fell below the cloud point temperature of the diesel fuel oil. PPL implemented compensatory actions to monitor diesel fuel oil temperatures in the Blue Max every shift and erected a temporary heated structure to restore and maintain functionality.

Inspectors determined the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the mitigating systems cornerstone to ensure the availability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, by not ensuring the cloud point of the diesel fuel oil was below the temperature of the surrounding ambient environment, the Blue Max was potentially non-functional during expected low temperature conditions. In accordance with NRC IMC 0609, Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," the issue was determined to affect the Mitigating Systems Cornerstone. Per IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions," the inspectors conservatively answered YES to question A.4, "Does the finding represent an

actual loss of function of one or more non-Tech Spec Trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for > 24 hours?" and determined that a detailed risk evaluation was needed to assess the safety significance of this finding. The inspectors used Systems Analysis Programs for Hands-On Evaluation (SAPHIRE) Revision 8.1.2, and the Standardized Plant Analysis Risk (SPAR) Model for Susquehanna Unit 1 and 2, Versions 8.23 and 8.21, respectively, to conduct an evaluation of the safety significance of this finding. In consultation with a regional Senior Reactor Analyst (SRA), a bounding analysis was conducted using conservative assumptions to approximate the worst case increased risk associated with the degraded condition of the Emergency Power Supply (EPS) Blue Max Diesel Generator. The calculated delta core damage frequency (CDF) for this condition was low E-8, or very low safety significance (Green). Inspectors noted that the most dominant core damage sequence was a loss of offsite power with coincident failure of all installed EDGs. In accordance with IMC 0609 Appendix A, since the change in core damage frequency was less than 1E-7, no further evaluation of external events or LERF was required. This finding was determined to be Green.

The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, in that, PPL did not thoroughly evaluate the effects of cold weather on the diesel fuel oil systems for diesel driven equipment to ensure that resolutions address the extent of conditions commensurate with their safety significance. Specifically, PPL did not thoroughly evaluate the effects of cold temperatures on the diesel fuel oil system when performing the functionality assessment for the Blue Max to ensure it maintained availability [P.2].
Inspection Report# : [2015001](#) (*pdf*)

Significance: G Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

Risk Management Actions Not Implemented

The inspectors identified a Green NCV of Title 10 Code of Federal Regulations (CFR) 50.65(a)(4) due to multiple examples of not assessing and managing the increase in risk from online maintenance activities. Specifically, on November 12, 2014, a risk assessment did not identify a Yellow online risk condition during a residual heat removal system (RHR) outage. Additionally, the inspectors identified multiple examples where PPL did not implement the procedural requirements of OI-013-002, "Fire Risk Management," NDAP-QA-1902, "Integrated Risk Management," and NDAP-QA-0340, "Protected Equipment Program" such that adequate risk mitigation actions were performed. Immediate corrective actions were taken and PPL documented the issues in condition report (CR) 2014-35235 and 2014-35270.

The inspectors determined the performance deficiency (PD) was more than minor because it adversely impacted the protection against external factors attribute of the Mitigating Systems cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the finding using IMC 0612 Appendix K, "Maintenance Risk Assessment and Risk Management SDP."

The inspectors and the Region I Senior Risk Analyst (SRA) used Appendix K, Flowchart 2, "Assessment of Risk Management Actions (RMAs)," and determined that not implementing the appropriate RMAs was of very low safety significance (Green). The basis for this determination was that the short duration of the actual planned maintenance activities (62 hours and 40.5 hours) associated with the RHR Train 'B' unavailability results in a mid E-9 calculated incremental core damage probability (ICDP), using the Susquehanna Unit 2 standardized plant analysis risk (SPAR) Model, Revision 8.21, and Systems Analysis Programs for Hands-on Integrated Reliability Evaluations (SAPHIRE) 8. In accordance with Appendix K guidance, doubling the estimated ICDP value to reflect not implementing RMAs is a reasonable approximation of the increased risk. The resultant low E-8 ICDP deficit remains below the ICDP E-6 deficit Green-White threshold and screens this PD to Green.

The finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Management, in that, PPL did not control and execute activities, consistent with nuclear safety, by managing risk commensurate to the

work and the need for coordination with different groups or job activities. Specifically, PPL did not recognize an elevated risk category and incorporate all RMAs into its work activities [H.5]. (Section 1R13)

Inspection Report# : [2014005](#) (pdf)

Significance: G Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

EPA Breaker Underfrequency Setpoint Drift

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," for PPL not establishing design control measures that provide for verifying or checking the adequacy of design and translating the design basis requirements into allowable values and trip set points. Specifically, PPL did not establish measures to assure the under frequency trip set point on the electrical protection assemblies (EPA) for the reactor protection system (RPS) were correctly translated into design specifications. PPL took immediate corrective actions to perform calibration of all EPA under frequency setpoints and document the condition under CR 2014-28492 and 2014-37665.

The PD was determined to be greater than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the capability of the system that respond to initiating events to prevent undesirable consequences (i.e., core damage). The item is similar to example 3.j in NRC IMC 0612, Appendix E, "Examples of Minor Issues." This example states, in part, that it is not minor if the engineering calculation error results in a condition where there is now reasonable doubt on the operability of a system or component. The inspectors evaluated the finding in accordance with NRC IMC 0609, Attachment 4, "Initial Characterization of Findings," Table 2, "Cornerstones Affected by Degraded Condition or Programmatic Weakness," and determined it affected the Reactivity Control Systems Degraded subsection of the Mitigating Systems cornerstone. Per IMC 0609, Appendix A, "SDP for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions," sub-paragraph C, the inspectors and a Region 1 SRA determined that a detailed risk evaluation was needed to assess the safety significance of this finding. Based upon the detailed risk evaluation, this finding was determined to be Green.

The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, in that PPL did not thoroughly evaluate issues to ensure resolutions address causes commensurate with their safety significance. Specifically, PPL did not thoroughly investigate and evaluate the causes of EPA under frequency set point drift outside the technical specification (TS) allowable values after three EPAs under frequency trip set points drifted below the TS allowable value in 2013 [P.2]. (Section 40A3)

Inspection Report# : [2014005](#) (pdf)

Significance: N/A Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Submit an LER

Inspectors identified a Severity Level IV NCV of 10 CFR 50.73 (a)(2)(v) for PPL staff not submitting an Licensee Event Report (LER) within 60 days of discovery of a condition that could have prevented the fulfilment of the safety function of the RPS Electrical Power Monitoring System. PPL submitted an LER for the subject condition and entered the issue into their CAP under CR-2014-17112.

The finding was evaluated using the traditional enforcement process because not accurately reporting events has the potential to impact or impede the regulatory process. The finding was determined to be a Severity Level IV violation of 10 CFR 50.73 (a)(2)(v) based on example 6.9.d.9 of the NRC Enforcement Policy. This example states that a licensee failing to make a report required by 10 CFR 50.73 is an example of a Severity Level IV violation.

Because this violation involves the traditional enforcement process and does not have an underlying technical

violation that would be considered more-than-minor, inspectors did not assign a cross-cutting aspect to this violation in accordance with IMC 0612, Appendix B. (Section 40A3.3)

Inspection Report# : [2014005](#) (*pdf*)

Barrier Integrity

Significance:  Mar 31, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Human Performance Errors Result in Losses of Safety Function

A self-revealing finding of very low safety significant (Green) and associated NCV of TS 5.4.1, “Procedures,” was identified for three separate examples of failing to implement work instructions or procedures that resulted in equipment inoperability and associated losses of safety function. Specifically, on June 12, 2014, operators placed the control switch for the ‘A’ chilled water pump in the stop position contrary to step 5.1.43 of SO-030-B03, an action which rendered both control structure ventilation subsystems inoperable. Additionally, contrary to NDAP-QA-0502 personnel did not ensure the impacts and effects of work were understood when applying a clearance order on June 13, 2014, which rendered both control structure ventilation subsystems inoperable when the clearance was applied. Finally, On November 5, 2014, an operator accessed an airlock without obeying the posted requirement to not access the airlock with the red light was lit contrary to Step 4.3.1 of NDAP-QA-0321 which rendered secondary containment inoperable when both airlock doors were opened simultaneously. PPL entered each of the issues into the CAP as CR-2014-19672, CR-2014-19699 and CR-2014-34399, respectively, and took action to restore the associated systems to an operable configuration.

Inspectors determined that the finding was more than minor because it was associated with the Human Performance attribute (Routine OPS/Maintenance Performance) of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers (Control Room Environment and Secondary Containment) protect the public from radionuclide releases caused by accidents or events. For the first two examples, the failure to adequately implement procedures for operation and maintenance of the control structure chillers resulted in the simultaneous inoperability of both chillers and associated loss of safety function of control room emergency outside air supply system (CREOASS) and control room floor cooling. For the third example, opening two reactor building airlock doors simultaneously did not maintain reasonable assurance that the secondary containment would be capable of performing its safety function in the event of a reactor accident. In accordance with IMC 0609.04, “Initial Characterization of Findings,” and Exhibit 2 of IMC 0609, Appendix A, “The SDP for Findings At-Power,” the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency only impacted the radiological barrier function of the control room and secondary containment.

This finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency because PPL did not implement appropriate error reduction tools. Specifically, on three separate occasions, personnel did not implement appropriate human error prevention tools (e.g. self-check, peer-check) in accordance with station processes [H.12].

Inspection Report# : [2015001](#) (*pdf*)

Emergency Preparedness

Significance: **W** Mar 18, 2015

Identified By: NRC

Item Type: VIO Violation

Failure to Maintain a Standard EAL Scheme

White: The inspectors identified an apparent violation of Title 10 of the Code of Federal Regulations (10 CFR) 50.54 (q)(2), which has been determined to be of low to moderate safety significance (White). Specifically, 10 CFR 50.54(q)(2) requires a licensee to follow and maintain an emergency plan which meets the requirements of 10 CFR 50.47(b), and 10 CFR Part 50, Appendix E. Contrary to this requirement, as of June 20, 2012, PPL Susquehanna (PPL) failed to establish an effective Susquehanna Steam Electric Station (Susquehanna) Emergency Plan to ensure that a timely event declaration would be made for an unisolable primary system leak outside of primary containment. Specifically, PPL's interpretation of the 15-minute assessment and classification period degraded their ability to make timely Alert or Site Area Emergency declarations in certain cases. This potential delay in declaration of an Alert or Site Area Emergency could have impacted the ability of off-site response organizations to implement timely actions to protect the public during a radiological emergency.

The inspectors determined the incorrect interpretation of the 15-minute assessment and declaration period was a performance deficiency that was within PPL's ability to foresee and correct and should have been prevented. Using IMC 0612, Appendix B, "Issue Screening," the performance deficiency was determined to be more than minor because it was associated with the ERO performance attribute of the emergency preparedness (EP) Cornerstone and affected the cornerstone objective to ensure that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the finding could impact the declaration timeliness of an emergency associated with a degraded fission product barrier. The inspectors utilized IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," to determine the significance of the finding. The finding is associated with the emergency classification planning standard and is considered a risk significant planning standard (RSPS) function. This finding impacts the following required RSPS function: 10 CFR 50.47(b)(4), "Emergency Classification System." The inspectors utilized the SDP to compare the finding with the examples in Section 5.4, "10 CFR 50.47(b)(4), Emergency Classification System," to evaluate the significance of this finding. Using Table 5.4-1, "Significance Examples §50.47(b)(4)," the inspectors determined that the finding matched an example of a degraded RSPS function, which would be assessed as White. Specifically, the example states that the finding would be assessed as White if the emergency action level (EAL) classification process is not capable of classifying a general emergency or a Site Area Emergency within 15-minutes or declaring the emergency promptly once the appropriate classification level is determined. The inspectors determined that the cross-cutting aspect that contributed most to the root cause is P.5, "Operating Experience: The organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner." Specifically, PPL did not perform a thorough review of operating experience during and after implementing the new EP rule to ensure all Susquehanna EAL thresholds were being evaluated in accordance with the NRC's emergency declaration timeliness requirement in the regulation. (Section 40A2)

Inspection Report# : [2015503](#) (pdf)

Inspection Report# : [2015504](#) (pdf)

Significance: **G** Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

Emergency Preparedness Drill Critique Did Not Identify a Risk-Significant Planning Standard Weakness

The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50.54(q)(2) for failing to follow and maintain an emergency plan that meets the requirements of appendix E and the planning standards of 10 CFR 50.47(b). Specifically, PPL did not identify and critique a weakness related to a risk significant planning standard during their

critique following the July 24, 2014, emergency preparedness drill, as required by 10 CFR 50.47(b)(14) and Appendix E, Section IV(F)(2)(g).

The inspectors determined that PPL did not identify and critique an emergency preparedness drill performance weakness in the formal critique was a performance deficiency that was within PPL's ability to foresee and correct and should have been prevented. Specifically, PPL did not identify that a periodic update notification provided to the offsite response organizations (OROs) was inaccurate in that it stated an airborne radiological release was in progress when one was not occurring. The inspectors determined the performance deficiency was more than minor because it was associated with the emergency response organization performance attribute of the Emergency Preparedness cornerstone and affected the cornerstone objective (Training, Drills, Exercises) to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, PPL's did not effectively identify and critique an emergency preparedness drill performance weakness caused a missed opportunity to identify and correct a drill-related performance deficiency. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued June 19, 2012. The attachment instructs the inspectors to utilize IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued September 26, 2014, when the finding is in the licensee's Emergency Preparedness cornerstone. The inspectors determined this finding was a critique finding, the drill scope was full scale, the planning standard was a risk-significant planning standard, and the performance indicator opportunity was a success because periodic update notifications to the OROs are not credited as performance indicator (PI) opportunities using the guidance provided in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. Therefore, using Figure 5.14-1, "Significance Determination for Critique Findings," the inspectors determined the finding was of very low safety significance (Green).

The cause of the finding has a cross-cutting aspect in the area of Human Performance, Consistent Process, because PPL did not use a consistent, systematic approach when making decisions. Specifically, PPL personnel did not use a consistent approach when evaluating and critiquing the accuracy of all notifications provided to the OROs [H.13]. (Section 1EP6)

Inspection Report# : [2014005](#) (*pdf*)

Significance:  Jun 21, 2014

Identified By: NRC

Item Type: VIO Violation

Failure to take Action to Restore Degraded Emergency Action Level Scheme

The inspectors identified a Green cited violation of 10 CFR 50.54(q)(2) for PPL's failure to follow and maintain an emergency plan that meets the requirements of the planning standards in 10 CFR 50.47(b), in that, since October 2003, PPL did not follow and maintain a standard emergency classification and action level scheme. Specifically, PPL did not take timely corrective actions to provide an adequate means to measure temperature in nine out of 21 areas, where reactor building temperatures are considered for the fission product barrier degradation emergency action levels (EALs). As a result, this deficiency adversely affected PPL's ability to classify an emergency such that a Site Area Emergency would be declared in a degraded manner. The violation is being cited because PPL has failed to restore compliance or demonstrate objective evidence of plans to restore compliance at the first opportunity in a reasonable period of time following discussion in a formal exit meeting on January 24, 2014 and documented in NRC Inspection Report 05000387;388/2013005 on February 14, 2014.

The finding is more than minor because it is associated with the Facilities and Equipment attribute of the emergency preparedness cornerstone, and adversely 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. Specifically, the continuing lack of installed temperature instrumentation or any other compensatory measures and the reliance on personnel dispatched to take temperature readings were insufficient to ensure a timely and accurate EAL classification could be made. Using IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process", section 5.4, the finding is of very low safety significance (Green) because the

finding was determined to be an example of an ineffective EAL initiating condition, such that a Site Area Emergency would be declared in a degraded manner.

The inspectors determined that this finding had a problem identification and resolution cross-cutting aspect related to Resolution because PPL did not take corrective actions in a timely manner nor did they take appropriate interim corrective actions to mitigate the issues while more fundamental causes are being assessed. Specifically, PPL had no corrective actions planned or taken to address the degraded EALs until NRC approval of their new EAL scheme, currently scheduled to be implemented no earlier than December 2015.

Inspection Report# : [2014009](#) (*pdf*)

Occupational Radiation Safety

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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