UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

May 14, 2015

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC INTEGRATED INSPECTION REPORT 05000387/2015001 AND 05000388/2015001

Dear Mr. Rausch:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station (SSES) Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 8, 2015 with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one self-revealing and three NRC-identified findings of very low safety significance (Green). Three of these findings were determined to involve violations of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at SSES. In addition, if you disagree with the cross-cutting aspect assigned to any finding or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at SSES.

In accordance with 10 CFR 2.390 of the NRCs “Rules of Practice,” a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC’s Public Document Room or from the Publicly Available Records component of the NRC’s Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.htmL (the Public Electronic Reading Room).

Sincerely,

/RA/

Fred L. Bower, III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-387, 50-388
License Nos. NPF-14, NPF-22

Enclosure:
Inspection Report 05000387/2015001 and 05000388/2015001
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-387, 50-388
License Nos.:	NPF-14, NPF-22
Report No.:	05000387/2015001 and 05000388/2015001
Licensee:	PPL Susquehanna, LLC (PPL)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	January 1, 2015 through March 31, 2015
Inspectors:	J. Greives, Senior Resident Inspector T. Daun, Resident Inspector N. Graneto, Operations Engineer T. O'Hara, Reactor Inspector A. Turilin, Reactor Inspector
Approved By:	Fred L. Bower, III, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

IR 05000387/2015001, 05000388/2015001; 01/01/2015 - 03/31/2015; Susquehanna Steam Electric Station, Units 1 and 2; Adverse Weather Protection, Fire Protection, Operability Determinations and Functionality Assessments and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified four findings of very low safety significance (Green), three of which were NCVs. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Initiating Events

Green. 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]. (Section 1R05)

Cornerstone: Mitigating Systems

Green. 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]. (Section 1R15)

Green. 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]. (Section 1R01)

Cornerstone: Barrier Integrity

Green. 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]. (Section 4OA2)

Other Findings

A violation of very low safety significance that was identified by PPL was reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into PPL's CAP. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On January 11, 2015, operators reduced power to approximately 82 percent to perform emergent repairs to a moisture separator level control valve. Following repairs, operators returned the unit to 100 percent on January 12, 2015. On January 23, 2015, operators reduced power to 73 percent to perform a planned rod sequence exchange and power was restored to 100 percent the next day. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power and operated at full power until January 16, 2015, when operators reduced power to 73 percent to perform a planned rod sequence exchange. On January 17, 2015, operators returned the unit to 100 percent power. On February 6, 2015, operators reduced power to 60 percent to perform a planned rod sequence exchange and control rod scram time testing. Operators restored power to 100 percent on February 8, 2015. On March 6, 2015, operators reduced power to 82 percent to perform a planned rod patter adjustment and restored power to 100 percent on March 7, 2015. On March 20, 2015, operators reduced power to 70 percent to perform a planned rod sequence exchange and restored power to 100 percent on March 21, 2015. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PPL's preparations for a winter weather advisory and extreme cold temperatures on February 20, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency and station black out diesel generators, station transformers, and exterior buildings to ensure system availability. The inspectors verified that operator actions defined PPL's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

Introduction: 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 portable diesel generator (Blue Max) was rendered non-functional when ambient air temperatures fell below the cloud point temperature of the diesel fuel oil.

Description: On February 18, 2015, inspectors questioned the station on the acceptability of the diesel fuel oil cloud point in relation to the Blue Max after reviewing NRC information notice 94-19, “Emergency Diesel Generator Vulnerability to Failure from Cold Fuel Oil.” NDAP-QA-0633 states, in part, “the cloud point generally relates to the temperature at which wax crystals begin to precipitate from the fuel during use, at or below which the fuel may clog filter systems and restrict flow.” On February 19, PPL performed a functionality assessment for the Blue Max and determined that the diesel maintained functionality based on a measured fuel temperature of 15.7 F with ambient temperature of 14 F. PPL determined that the last diesel fuel oil tanker delivery had a cloud point of 10 F and no compensatory or interim actions were taken to ensure Blue Max maintained functionality.

The inspectors reviewed the station’s functionality assessment documented under CR-2015-04800, the station’s diesel fuel oil purchase specification (H1015), the station’s diesel fuel oil testing program (NDAP-QA-0633) and the vendor manual for the station blackout (SBO) diesel (IOM 829). NDAP-QA-0633 is applicable to new and stored diesel fuel oil for use in the station’s diesel generators. NDAP-QA-0633 follows the guidelines of ASTM D975-10c which states, in part, “Cloud point may be used as an estimate of operating temperature limits for diesel fuel oils. Appropriate low temperature operability properties should be agreed upon between the fuel supplier and purchaser for the intended use and expected ambient temperature.” Specification H1015 identified a cloud point of -6F utilizing ASTM D975 based on expected ambient temperatures. NDAP-QA-0633 specified a cloud point temperature of 23F for fuel oil based on temperature limits determined by the underground storage tanks for the station’s five stationary EDGs. NDAP-QA-0633 did not consider expected ambient conditions of the other diesel engines covered by the program which includes the Blue Max, station’s diesel fire pump (0P511), backup diesel fire pump (0P592), and security control center diesel (0G502). The fuel oil storage tank for the Blue Max is stored in an enclosure with the Blue Max and other support systems which are subject to ambient temperature conditions.

NDAP-QA-0633 recognizes that cold temperatures may impact fuel oil and states that heating or warming may be required to offload fuel from unheated tankers during cold weather as a result of the formation of wax deposits when temperatures are below the cloud point of the diesel fuel oil. Additionally, the vendor manual, IOM829, “Station Portable Diesel Generator – Blue Max,” contains a section on fuel problems in cold weather operation. IOM829 states, in part, “the fuel cloud point must be below the temperature of the surrounding (ambient) air to prevent filter waxing and power loss.” IOM829 also recommends “the use of starting aids, engine oil pan heaters, engine coolant heaters, fuel heaters and fuel line insulation to provide a means of minimizing starting and fuel problems in cold weather when No. 2 diesel fuel is used.”

On February 20, inspectors again questioned the station on the functionality Blue Max based on a significant drop in ambient air temperature. PPL obtained a diesel fuel temperature of 3.5 F and declared Blue Max non-functional. The fuel oil storage tanks for the station’s diesel fire pump, backup diesel fire pump, and security control center diesel are maintained in permanent heated structures with their associated diesels and no non-functionality was identified. The station’s five stationary emergency diesel generators have underground fuel oil storage tanks which ensure the fuel oil is maintained greater than the cloud point temperature and no operability concerns were identified.

The inspectors determined that the functionality assessment performed on February 19 was inadequate because it did not consider the implications of cold weather on the diesel fuel oil for Blue Max. PPL entered this into CAP as CR-2015-05067. PPL implemented compensatory actions to monitor diesel fuel oil temperatures for Blue Max every shift and erected a temporary heated structure to restore and maintain functionality. PPL entered this into their CAP and permanent corrective actions are being evaluated under CR-2015-04800 and CR-2015-07058.

Analysis: Not establishing diesel fuel oil specifications in accordance with ASTM D975 to ensure diesel-driven equipment important to safety will function during expected ambient temperatures was a performance deficiency. Based on guidance provided in NDAP-QA-0633 and in the Blue Max vendor manual, inspectors determine this performance deficiency was within PPL's ability to foresee and correct and should have been prevented.

This performance deficiency was determined to be 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," dated June 19, 2012, 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," dated June 19, 2012, 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 inspectors made the following assumptions to estimate a conservative upper bound to the risk consequence of the EPS Blue Max Diesel Generator:

- Basic event EPS-DGN-BLUE, "Emergency Power (EPS) Blue Max Diesel Generator," was set to 1.0. In consultation with the regional SRA, inspectors determined this was appropriate since there is no common mode failure concern for the emergency diesel generators (EDGs) as a result of this performance deficiency;
- The exposure time was capped at 372 hours based upon the amount of time that ambient temperature, as indicated by the station's 10m meteorological tower, was below the cloud point temperature of the fuel as determined by review of the past 12 months of fuel receipts.

Based upon the above assumptions, 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 and Appendix H, "Containment Integrity Significance Determination Process," dated May 2004, 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 remained functional. [P.2]

Enforcement: This finding does not involve any enforcement action since no regulatory requirement violation was identified. Specifically, since the Blue Max is non-safety-related and is not credited for the first four hours of a station black-out, its functionality is not required per 10CFR50.63. Therefore, NDAP-QA-0633, "Diesel Fuel Oil Testing Program," is not required to be implemented for the Blue Max as part of Susquehanna's 10 CFR 50, Appendix B, Quality Assurance Program. Because the finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN. **(FIN 05000387;388/2015001-01, SBO Diesel Fuel Oil Cloud Point)**

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2, 'A' core spray (CS) during 'B' CS system outage window (SOW) on January 13, 2015
- Common, 'B' EDG fuel oil system on February 5, 2015
- Common, Back-up diesel driven fire pump (DDFP) with motor driven fire pump and DDFP out of service (OOS) on February 26, 2015
- Unit 2, 'A' loop of emergency service water while 'B' loop is out of service for planned maintenance on March 16, 2015

The inspectors selected these systems based on their risk-significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and

support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PPL staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PPL controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Common, 'E' EDG (fire zone 0-41E) on February 5, 2015
- Common, control structure elevation 806' (fire zone 0-30A) on February 12, 2015
- Common, 'A' EDG (fire zone 0-41A) on March 17, 2015
- Unit 1, 'A' CS pump room (fire zone 1-1A) on March 17, 2015
- Unit 1, Sump pump room (fire zone 1-1G) on March 17, 2015
- Unit 2, 'A' CS pump room (fire zone 2-1B) on March 17, 2015

b. Findings

Introduction: The inspectors identified a Green NCV of the PPL Unit 1 and Unit 2 facility operating license condition 2.C.(6), "Fire Protection Program," for PPL not adequately controlling the storage of transient combustibles in accordance with program requirements. Specifically, combustible materials in excess of the maximum allowable transient combustible loading were stored without being evaluated by the SFPE or having compensatory actions identified.

Description: During a walkdown by inspectors of the control structure 806' elevation (fire zone 0-30A) on February 12, inspectors observed 45 cardboard 55 gallon barrels containing replacement charcoal, 200 feet of 1.5-inch rubber hose, 100 feet of polycarbonate vacuum hose and approximately 20 pounds of miscellaneous combustible materials. A large quantity of this combustible material was stored within 3 feet of energized electrical equipment and power cables. The combustible material was staged in the area for upcoming work to replace charcoal in the 'B' standby gas treatment

(SBGT) filter train. Fire zone 0-30A contains both trains of the control structure HVAC, both control structure chillers, and both SBGT trains. Inspectors were unable to locate a transient combustible permit in the area to verify it was appropriate for the amount of material staged. Inspectors went to the work control center and discovered that the work order, and associated compensatory hourly fire watch, associated with charcoal change-outs was closed-out after the 'A' train of SBGT and the 'A' and 'B' trains of CREOASS were completed and the old charcoal was removed from the fire zone. A new work order had been generated for the replacement of charcoal on the 'B' train of SBGT which did not identify a compensatory fire watch through the work planning process. New charcoal was staged in preparation of this work with the erroneous assumption by the work group involved that the previously approved transient combustible permit and compensatory fire watch were still in effect.

This issue was raised by the inspectors and PPL immediately instituted a fire watch for the area and contacted the SFPE to evaluate the combustibles present. The SFPE evaluated the area and determined that the transient combustibles exceeded the maximum allowable transient combustible loading as determined by the fire protection program.

NDAP-QA-0440, "Control of Transient Combustible/Hazardous Materials," Revision 17, section 5.2.8 states that, "transient combustibles or hazardous materials shall not be left unattended without an approved permit that covers the location where material is to be left." Section 4.2.6 states, "Only Site Fire Protection personnel can authorize the permitting of combustible storage in the plant in excess of the allowable combustible limits. The combustible storage must be for limited duration and additional compensatory actions as prescribed by the SFPE must be established." Section 5.2.20.e states, "transient combustible materials shall be adequately separated or protected from potential ignition sources (minimum of 3 feet)." If material cannot be adequately separated and the material will be left beyond the work shift, an hourly fire watch will be provided by the work group."

Subsequently, a continuous fire watch was instituted in the area until all materials were moved outside 3 feet to potential ignition sources. Once all combustible materials were removed from the 3 foot zone around potential ignition sources, the SFPE authorized compensatory actions to be relaxed to an hourly fire watch.

Analysis: The storage of transient combustibles on the control structure 806' elevation in excess of the allowable transient combustible limits [without compensatory actions established by the SFPE and within 3 feet of potential ignition sources] was a performance deficiency.

Inspectors determined the performance deficiency was more than minor because the condition affected 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," dated August 11, 2009, in that transient combustibles were not within the fire hazard analysis limits and a credible fire scenario existed involving the transient combustibles that could impact equipment important to safety, specifically both trains of the control structure HVAC, both control structure chillers, and both trains of SBGT.

In accordance with IMC 0609.04, “Initial Characterization of Findings,” dated June 19, 2012, and Attachment 1 of IMC 0609, Appendix F, “Fire Protection SDP Phase 1 Worksheet,” dated September 20, 2013, 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).

Enforcement: PPL’s Unit 1 and Unit 2 operating license condition 2.C.(6), requires, in part, that “PPL shall implement and maintain in effect all provisions of the approved fire protection program as described in the fire protection review report for the facility. NDAP-QA-0449, “Fire Protection Program” is PPL’s implementing procedure. NDAP-QA-0449, section 4.22.1.e states, in part, “All personnel are responsible for assuring transient combustibles are limited and controlled per NDAP-QA-0440.” NDAP-QA-0440, section 4.2.6 states that “only Site Fire Protection personnel can authorize the permitting of combustible storage in the plant in excess of the allowable combustible limits. The combustible storage must be for limited duration and additional compensatory actions as prescribed by the SFPE must be established.” Section 5.2.20.e of NDAP-QA-0440 requires that “transient combustible materials shall be adequately separated or protected from potential ignition sources (minimum of 3 feet).”

Contrary to the above, from February 11 through February 12, 2015, PPL stored combustible materials in excess of the maximum allowable transient combustible loading within 3 feet of potential ignition sources without evaluation by the SFPE and without compensatory actions being prescribed. PPL instituted a continuous fire watch the area until all materials were moved outside 3 feet to potential ignition sources. Once all combustible materials were removed from the 3 foot zone, the SFPE authorized compensatory actions to be relaxed to an hourly fire watch. Because of the very low safety significance of this finding and because the finding was entered into PPL’s CAP as CR-2015-04348, CR-2015-04357 and CR-2015-05614, this violation was treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV05000387; 388/2015001-02, Control of Transient Combustible Materials)**

1R07 Heat Sink Performance

.1 Annual Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the ‘B’ DG intercooler heat exchanger (HX) on January 26, 2015 to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified PPL’s commitments to NRC Generic Letter 89-13. The inspectors observed actual performance tests for the HXs and reviewed the results of previous inspections of the ‘B’ DG intercooler and similar HXs. The inspectors discussed the results of the most recent inspection with

engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that PPL initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the HX did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

.2 Triennial Heat Sink Performance (71111.07T - 3 samples)

a. Inspection Scope

Based on plant specific risk rankings, previous inspection results, recent operational experience, and resident inspector input, the inspectors selected and completed the following heat sink and heat exchanger samples:

Ultimate Heat Sink Sample (1): Unit 2 Intake, Unit 2 Cooling Tower, and Common Spray Pond

The inspectors conducted a walkdown of the Unit 2 river water intake structure, observed repairs being conducted on the travelling screens and strainers and noted the general condition of the enclosed equipment and structure. The inspectors verified the condition of accessible internal and some external masonry walls and concrete structures. The inspectors also reviewed the results of structural monitoring inspections recently completed in the intake structure. The inspectors observed that pump and component mounts were in a serviceable condition and performed as expected. The inspectors determined PPL measured and trended service water pump bay silt accumulation and conducted periodic cleaning to keep the silt at acceptable levels. The inspectors determined Susquehanna Unit 1 and Unit 2 are susceptible to frazzle ice conditions at the river intake structure. The inspectors determined the emergency service water (ESW) system has the capability to recirculate warmer system water back to the intake to thaw forming ice.

The inspectors reviewed the UFSAR sections describing the design features of the Unit 2 Cooling Tower. The inspectors interviewed the Cooling Tower system engineer and discussed the methodologies used to verify the heat removal capacity of the Unit 2 Cooling Tower. The inspectors also reviewed the results of periodic structural monitoring inspections of the Unit 2 Cooling Tower and water systems.

The inspectors reviewed the Common Spray Pond design drawings and results of a recent structural monitoring inspection and silt survey mapping inspection of the Common Spray Pond structure and associated equipment. The spray pond serves as the ultimate heat sink for both Unit 1 and Unit 2. The inspectors reviewed structural inspection reports of the condition of the embankments of the spray pond and the Emergency Service Water pump house. The inspectors also reviewed the calculations which determined the minimum spray pond level needed to support simultaneous shutdown of both Unit 1 and Unit 2. The inspectors also, reviewed the plant procedures for monitoring of the common spray pond water level. The inspectors reviewed design basis analyses which verified that adjacent non-seismic or non-safety-related structures would not block safety-related flowpaths, during a severe weather or seismic event.

The inspectors reviewed the results of structural inspections performed by PPL engineers outside and inside the spray pond pump house and the associated piping and pumps of the ESW system and the Residual Heat Removal Service Water System (RHRSW). The inspector reviewed past tests of the spray pond nozzles, and reviewed the licensee's calculation which verified that the spray pond has sufficient heat removal capacity to carry out the safety-related functions described in the Unit 1 and Unit 2, UFSAR.

The inspectors reviewed the construction drawings for the spray pond and reviewed the PPL's structural inspections of the pond overflow path and the embankments of the pond. The inspectors reviewed the surveillance procedures performed to verify the required chemical treatment of the spray pond and associated water systems to prevent fouling and degradation of spray pond structures and water systems.

The inspectors verified that PPL staff conducted examinations of buried piping associated with the Common Spray Pond and associated systems. The inspectors reviewed the operation and maintenance records for the cathodic protection system which is intended to prevent degradation of buried safety-related piping. Also, the inspectors reviewed the results of the American Society of Mechanical Engineers (ASME), Section XI, Subsection IWA 5244 testing completed on buried piping from the ESW system and the RHRSW system which serve the Spray Pond. The inspectors further reviewed recent Common Spray Pond system health reports.

Unit 1 Heat Exchanger 1E205A Sample (1)

The inspectors performed a walkdown of the accessible areas of the residual heat removal (RHR) heat exchanger 1E205A. The inspectors reviewed surveillance test records which verified the ability of the heat exchanger to remove sufficient heat to support plant operation and carry out the heat exchanger's design function. The inspectors reviewed eddy current testing results of RHR heat exchangers 1E205A and 1E205B. Additionally, the inspectors reviewed engineering calculations which were performed to support an increase in the heat exchanger plugging criteria from 40% through wall to 50% through wall, and subsequently to the present plugging limit of 60% through wall.

The inspectors reviewed the licensee's calculations showing that the heat exchanger was not susceptible to water hammer damage or to flow induced vibration damage if operated within the correct fluid flow velocity ranges,(i.e. less than 9,500gpm). The inspectors also verified that the licensee conducted periodic tests to ensure that heat exchanger flow remained within this design limit.

The inspectors reviewed the heat exchanger cleaning procedures, the results of eddy current testing of the heat exchangers and the numbers of plugged tubes in each of the Unit 1 RHR heat exchangers.

The inspectors reviewed the periodic chemistry surveillance results which monitor the chemical environment intended to prevent corrosion of the system piping, valves, and heat exchangers, and to minimize the amount of under deposit pitting corrosion, which is the dominant degradation mechanism of corrosion in the RHR heat exchangers.

The inspectors reviewed the programs and procedures for maintaining the safety functions of the Unit 1 RHR heat exchanger (1E205A) which is directly cooled by service water. The inspectors reviewed the results of the most recent cleaning and reviewed eddy current testing results to verify tube integrity, and reviewed trending of tube plugging in the 1A and 1B heat exchangers. The inspectors reviewed the results of these inspection activities and testing of tube integrity and reviewed engineering calculations verifying that tube plugging limits maintain the minimum required design flow.

The inspectors reviewed the condition of the system components, including piping, pumps, and valves with PPL staff personnel and verified the general conditions during walkdown of both heat exchangers. The inspectors also reviewed the previous performance test of the 1A heat exchanger which verified that the heat exchanger met its acceptance criteria for design-basis heat removal (Calculation LM-0638). The inspectors verified that the flow margin was found to be acceptable and met the design basis.

Unit 1 Heat Exchanger 1E205B Sample (1)

The inspectors conducted a walkdown of accessible equipment and structures of the RHR heat exchanger 1E205B and piping.

The inspectors conducted a walkdown of the RHR safety-related heat exchangers and pumps and the associated structural supports. The inspectors also interviewed the responsible system engineer regarding system operation, piping leaks and planned piping repairs and upgrades. The inspectors reviewed RHR system health reports and system heat removal capacity testing reports.

The inspectors verified, through review of design records, that the safety-related RHR heat exchangers for Unit 1 and Unit 2 were designed to minimize the potential for water hammer and that operational flow values were identified to minimize the potential for flow induced vibration damage from occurring in the heat exchangers served by the system.

The inspector determined that PPL staff conducted eddy current examinations of the RHR heat exchangers every 2 years. The inspectors reviewed the most recent eddy current examination results of heat exchanger 1E205B and noted that 12 tubes are plugged. The maximum allowable number of plugged tubes is 32. The inspectors reviewed the evaluation of thermal performance data and verified that the required design heat removal capacity was achieved.

The inspectors reviewed PPL's test and inspection, maintenance, chemical control, and performance monitoring methods for the RHR system, to determine whether potential deficiencies could mask degraded performance, and to assess the capability of the systems to perform their design functions. In addition, the inspectors evaluated whether any potential common cause heat sink performance problems could affect multiple heat exchangers or heat removal paths in mitigating systems or could result in an initiating event.

Review of Corrective Action Reports

The inspectors selected and reviewed a sample of corrective action program reports related to the Common Spray Pond, the Unit 1 RHR heat exchangers, the Unit 1 ESW system and leaks in above ground and buried piping systems. The review verified that PPL was appropriately identifying, characterizing, and correcting problems related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate. The reports reviewed are listed in Attachment 1.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on January 9, 2015, which included a manual reactor scram inserted in response to abnormal containment radiation levels complicated by an isolable steam leak from the high pressure coolant injection (HPCI) system. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

On March 20, 2015, inspectors observed the control room operators perform a down power and rod pattern adjustment on Unit 2. The inspectors observed reactivity control briefings to verify that the briefings met the criteria specified in OP-AD-004, “Standards for Shift Operations,” Revision 38, and OP-AD-338, “Reactivity Manipulations Standards and Communication Requirements,” Revision 27. The inspectors observed the crew during the evolution to verify that procedure use, crew communications, control board component manipulations, and coordination of activities in the control room met established standards.

- Down power and rod pattern adjustment on March 20, 2015

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on significant structures, systems and components (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that PPL was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by PPL staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that PPL staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Unit 1, reactor manual control system
- Unit 1 and 2, containment instrument gas system

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that PPL performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that PPL personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PPL performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 2, fire risk during 'B' CS SOW on January 12, 2015
- Common, elevated risk to support 'C' and 'E' EDG maintenance on March 12, 2015

- Common, yellow integrated and elevated fire risk during ‘B’ loop ESW SOW on March 17, 2015
- Unit 2, yellow risk due to emergent failure of ‘A’ RHR HX inlet valve, HV21210A, to stroke closed on March 23, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Unit 1, 1V222A emergency load center and switchgear room cooler elevated fan vibrations on January 16, 2015
- Unit 1, failure of the reactor core isolation cooling (RCIC) exhaust line vacuum breaker inboard containment isolation valve to open on January 29, 2015
- Common, ‘B’ DG fuel oil flowing vent line pipe fretting on February 5, 2015
- Unit 2, division I residual heat removal (RHR) pressure perturbation during injection valve stroking on February 10, 2015
- Unit 2, leak from CS closed system boundary on February 11, 2015
- Unit 1, ‘A’ engineered safeguard system (ESS) bus with normal off-site power supply synch check relay inoperable on February 26, 2015

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to PPL’s evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PPL. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction: 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.

Description: On January 31, 2015, a through wall leak of 12 drops per minute (dpm) was identified on a flowing vent line from the fuel injection pumps on the 'B' EDG during post maintenance testing. Field observation determined the leakage was due to vibration induced fretting on the 3/4" line. CR-2015-3053 was generated to assess the condition and assess the potential impact of the condition on the operability of the EDG. In their prompt operability determination (POD), PPL assessed, in part, the potential for the leak to initiate a fire and determined it did not represent a degraded condition because it would equate to less than 2 gallons of fuel over the mission time of the EDG and stated it could be easily cleaned up over the seven day period. Based on this determination, a work order was generated for the piping to be replaced in August 2015.

On February 4, 2015, inspectors questioned the conclusion of the POD with regards to the potential fire risk of the fuel oil leakage. Specifically, the POD assumed that leakage would remain constant at 12 dpm for the entire 7 day mission time of the engine. CR-2015-03593 was generated to address inspectors' concerns and the POD was revised. Though the revision of the POD provided a more extensive discussion of the potential for leakage increasing, it assumed that the line was gravity drained and therefore could not become pressurized to the point where spray would occur. Inspectors' walkdown of the system determined this was an incorrect assumption based on the design and configuration of the system. Ultimately, PPL determined that no compensatory actions were required and that the scheduling of the work orders was appropriate. Additionally, PPL did not take any actions to implement temporary repairs or actions to mitigate the condition adverse to quality.

On March 2, 2015, during the next scheduled surveillance run of the 'B' EDG, the leakage was identified as having increased to a spray and the engine was promptly shutdown. Operations declared the 'B' EDG inoperable and instituted a compensatory action to initiate a fire watch if the 'B' EDG was started to ensure that the fuel oil leakage could be managed such that a fire would not occur. Because the other EDGs exhibited vibration induced fretting at the same location, PPL assessed whether the other EDGs were inoperable because of the same cause. PPL documented in their common cause assessment that the other EDGs were not susceptible to the potential failure because a through wall leak did not currently exist on the other EDGs and PPL believed that the line on the 'B' EDG had been in service for a considerably longer period of time than the other EDGs. Inspectors reviewed the maintenance history of the other EDGs and determined that the line on the 'B' EDG was replaced at the same time as the lines for the other EDGs in 2001 due to exhibited vibration induced fretting being identified at that time. Additionally, inspectors assessed the run history of the 'B' EDG and determined that the EDG was run for a very short period of time between identification of the 12 dpm leak and the leak degrading to a spray. Based on these factors, inspectors determined that PPL's common cause assessment was inadequate and did not provide reasonable assurance that a fire would not occur on the EDGs if a leak were to develop. In response to the inspector's questions, 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 scheduled prompt replacements of all the piping that was exhibiting signs of fretting. Replacement of the fuel oil pump flowing vent piping was completed on March 3, March 12, March 19 and March 27 for the 'B', 'C', 'D', and 'A' EDGs, respectively. Inspectors determined that these actions provided reasonable assurance that all the EDGs would be capable of performing their safety function for the duration of their required mission time.

Overall, the inspectors determined that PPL had identified a condition adverse to quality on January 31, 2015, associated with vibration induced fretting of the 'B' EDG fuel oil flowing vent line. However, no corrective actions were taken to correct or compensate for the condition prior to it degrading to a point that required shutdown of the EDG. Consequently, the 'B' EDG was inoperable from January 31 through March 3, 2015, a condition prohibited by Unit 1 and 2 TSs 3.8.1. Additionally, PPL's actions to address the potential common cause inoperability were inadequate to ensure continued operability of the other EDGs.

Analysis: Inspectors determined that failing to implement timely corrective actions to address a condition adverse to quality was a performance deficiency that was within PPL's ability to foresee and correct and should have been prevented. Specifically, despite identifying a condition adverse to quality on January 31, 2015, associated with vibration induced fretting of the 'B' EDG fuel oil flowing vent line, implementation of 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. 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," dated June 19, 2012, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, 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 the 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]

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, from January 31, 2015 through March 3, 2015, implementation of PPL's CAP did not assure that a condition adverse to quality associated with a through wall leak on a fuel oil flowing vent line caused by vibration induced fretting was promptly corrected. Specifically, despite identifying a condition adverse to quality on January 31, 2015, implementation of the 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. Consequently, the 'B' EDG was determined to be inoperable from January 31 through March 3, 2015, causing PPL to be in violation of Unit 1 and 2 TSs 3.8.1.

To maintain operability of the other EDGs, which exhibited the same vibration induced fretting, 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 of the piping that was exhibiting signs of fretting. Because this violation was of very low safety significance (Green), and PPL has entered this performance deficiency into the CAP as CR-2015-08469, the NRC is treating this as an NCV in accordance with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387;388/2015001-03; Failure to Promptly Correct a Condition Adverse to Quality on the 'B' EDG)**

1R18 Plant Modifications (71111.18 – 1 sample)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- T-10 switchyard upgrade from February 27, 2015 through March 27, 2015

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Common, 'A' CREOASS following SOW on January 8, 2015
- Common, 'A' SBGT following charcoal absorber bed replacement on January 21, 2015
- Common, 'B' EDG following mid-cycle overhaul on January 30, 2015

- Common, concrete repair to Unit 1 secondary containment railroad bay door on February 13, 2015
- Unit 2, RCIC following SOW and control system calibration on March 11, 2015
- Unit 2, repair of RHR HX service water inlet valve on March 24, 2015

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and PPL procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Unit 2, 'A' CS comprehensive flow surveillance on January 7, 2015 (IST)
- Unit 2, RCIC logic system functional test on January 27, 2015
- Unit 2, RCIC comprehensive flow surveillance on January 28, 2015 (IST)
- Unit 2, pressure isolation valve testing of RCS to low pressure system boundary valves on February 12, 2015 (RCS)
- Common, 'A' DG integrated surveillance test (SE-024-A01) on February 24, 2015
- Unit 1, HPCI quarterly flow surveillance on March 4, 2015

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a full-scale emergency drill on February 17, 2015, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified

by PPL staff in order to evaluate PPL's critique and to verify whether PPL staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

Introduction: An unresolved item (URI) was identified because inspectors could not obtain enough information from PPL to determine whether two issues identified by PPL, related to the ability to declare emergencies RG1 and RS1 under the Abnormal Radiation Levels/Radiological Effluents emergency action level (EAL), constituted a violation of regulatory requirement. During a full-scale emergency preparedness (EP) drill, PPL identified during their drill critique that various dose assessment methods are only procedurally directed to be performed by the emergency operations facility (EOF) dose assessment staff. Specifically, procedures for the technical support center (TSC) dose assessment staff would not allow assessment of offsite consequences from an unfiltered and unmonitored release unless field monitoring was available. Additionally, PPL's Nuclear Oversight (NOS) documented that the remote monitoring system (RMS), which consists of 16 fixed radiation monitors at the site boundary that are activated and monitored by TSC/EOF staff, was in a condition that could impact the ability to assess the EAL thresholds.

Description: The Abnormal Radiation Level EAL, as presented in EP-RM-004, "EAL Classification Bases," Revision 3, includes five dose threshold values for each of the initiating conditions (ICs) RG1 and RS1. One such threshold requires a valid dose assessment using actual meteorology in excess of the limit specified in the EALs. During a full-scale drill on February 17, 2015, PPL identified during their post-drill critique that the TSC and on-shift dose assessors were unable to perform a valid dose assessment for an unmonitored and unfiltered release. In the drill scenario, an airborne release occurred from a blowout panel due to an unisolable leak in the HPCI system. This leak, in conjunction with approximately 1% cladding damage that had occurred due to the initiating event, resulted in dose projections in excess of the RG1 threshold. The TSC staff was not able to perform a valid blowout panel calculation because their procedures and training do not direct them to perform this action. In accordance with EP-PS-105, "TSC Dose Calculator," Revision 23, TSC dose assessors are only procedurally directed to perform forward calculations using release data from the vent stack monitors and back calculations using field monitoring data. PPL entered the issue into the CAP as CR-2015-04701. Inspectors questioned whether any compensatory measures would be implemented to address the potential issue. PPL's initial response determined that the current revision to the emergency plan indicates that only forward and back calculations are required for all emergency facilities. Though PPL acknowledges that the EOF has the ability to perform several other types of calculations (i.e. Default Accident, Event Tree NUREG-1228, Blowout Panel, and Isotopic Entry Calculations), PPL indicated that these types of calculations would require additional information that requires EOF staffing to perform. PPL staff indicated that this conclusion would be formally documented in an evaluation.

Inspectors reviewed the issue and questioned the adequacy of PPL's response. PPL's Emergency Plan describes that data from vent effluent monitors serve as inputs for the off-site dose calculation methods and that field team surveys are used to update projected dose. Section 7.1.1.3 of the plan describes PPL's dose calculation model,

MIDAS, which complies with the U. S. Environmental Protection Agency Protective Action Guide Manual (EPA-400). This program provides multiple methods to perform valid dose assessments including those described above. Inspectors reviewed what additional information would be required from EOF staff to perform, in particular, the blowout panel calculation method. EP-RM-004, "MIDAS-NU User's Manual," Revision 1, is the procedure for performing dose assessment using PPL's dose assessment model. Section H provides directions for performing a blowout panel calculation and lists the required inputs. All inputs would be available to TSC personnel. The only engineering information needed would be the estimated percent fuel cladding failure which is determined by the Fuels Lead Engineer in the EOF or the Core Thermal Hydraulics Engineer in the TSC in accordance with EP-PS-324, "Fuels Lead Engineer/Core Thermal Hydraulics Engineer," Revision 17. Of these two positions, the Fuels Lead Engineer is not designated as minimum staffing in accordance with PPL's emergency plan and therefore the primary responsibility for core damage assessment lies with the TSC staff. Overall, the inspectors' issue of concern regarded whether the effectiveness of PPL's emergency plan to meet the planning standards in 10 CFR 50.47 had been maintained by limiting procedural direction and training for forward and back calculations to TSC dose assessment staff or whether the TSC staff should have been capable of performing all MIDAS calculations.

A second dose threshold value listed in the Abnormal Radiation Level EAL requires assessment of the RMS. RMS readings can serve as an alternate input to dose assessment in lieu of field monitoring data. Inspectors reviewed CR-2015-06706 in which NOS identified a programmatic deficiency associated with the system. Specifically, the CR documented that PPL did not maintain the Emergency Plan consistent with the approved EALs. The RMS perimeter radiation monitoring system was initially added to the Emergency Plan in Revision 28 and was considered an enhancement. In revision 56 of the Emergency Plan, the RMS perimeter radiation monitoring system was added as an initiating condition for EALs RG1 and RS1. Despite this, the equipment is still described in the emergency plan as not being required. Additionally, the CR documented that the RMS is not maintained as required by EP-115, "Equipment Important to Emergency Response," Revision 2. Specifically, NOS documented that 4 of the 16 fixed radiation monitors in the RMS had been out of service since 2013 and the software that displays the RMS does not consistently run in computers in the EOF and TSC. Finally, the CR documented that PPL's CAP has failed to take adequate corrective actions with regards the RMS system. Specifically, CR-2013-04635, written by PPL in November 2013, identified stated that the RMS system is unreliable and cannot be maintained due to a number of hardware and software issues. Despite this, no action had been taken to correct the identified equipment issues. Overall, PPL's NOS concluded that the systematic breakdown in maintaining the Emergency Plan and associated equipment has led to the RMS perimeter radiation monitoring system not being maintained in a functional state to support RG1 and RS1 classification under IC-3. At the end of this inspection, PPL was performing a level 2 apparent cause evaluation for the NOS identified issue. The inspectors' issue of concern regarded whether the emergency planning standard in 10 CFR 50.47 had been maintained with the identified RMS equipment deficiencies.

10 CFR 50.54(q)(2) requires that a licensee follow and maintain the effectiveness of an emergency plan that meets the requirements of appendix E to this part and the planning standards of 10 CFR 50.47(b). 10 CFR 50.47(b)(4), "Emergency Classification System," requires a standard emergency classification and action level scheme, the bases of

which include facility system and effluent parameters, to be in use by the nuclear facility licensee. Appendix E, Section IV.C.2 requires that licensees establish and maintain the capability to assess, classify and declare an emergency condition within 15-minutes after the availability of indications to plant operators that an emergency action level has been exceeded. Additionally, 10 CFR 50.47(b)(9), "Emergency Assessment Capabilities," requires that adequate methods, systems and equipment for assessing and monitoring offsite consequences of a radiological emergency to be in use. 10 CFR 50.47(b)(2) states, in part, that on-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified. Section 2 of NUREG-0696, "Functional Criteria for Emergency Response Facilities," states, in part, that the on-site TSC will perform the EOF functions for the Alert Emergency classification and for the Site Area and General Emergency classifications until the EOF is functional.

At the completion of the inspection, inspectors did not have enough information to determine whether either of the two issues resulted in PPL failing to maintain the effectiveness of their emergency plan and therefore could not determine whether a violation of regulatory requirements existed. PPL's evaluations under CR-2015-04701 and CR-2015-04635 should document PPL's determination of whether each constituted a violation of regulatory requirements, to include: 1) whether the effectiveness of the emergency plan was maintained with the identified issues of concern and 2) whether corrective actions to address the identified issues of concern were adequate to maintain the effectiveness of the emergency plan pending future actions and 3) the timeline of events regarding the reliability of the RMS system. This issue will be tracked as an unresolved item (URI) pending further NRC review of PPL's evaluation of the two issues documented under CR-2015-04701 and CR-2015-04635, to include consultation with regional EP specialists and the Office of Nuclear Security and Incident Response (NSIR). **(URI 05000387;388/2015001-04, Effectiveness of Declaration Capability of Abnormal Radiation Level EAL)**

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams, Unplanned Power Changes, and Unplanned Scrams with Complications (6 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittals for the following Initiating Events Cornerstone performance indicators (PIs) for the period of January 1, 2014 through December 21, 2014.

- Units 1 and 2, Unplanned scrams (IE01)
- Units 1 and 2, Unplanned power changes (IE02)
- Units 1 and 2, Unplanned scrams with complications (IE04)

To determine the accuracy of the PI data reported during those periods, inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02,

"Regulatory Assessment PI Guideline," Revision 7. The inspectors reviewed PPL's operator narrative logs, maintenance planning schedules, condition reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 sample)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure (IP) 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PPL entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended management review committee meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Corrective Actions to Address Adverse Trends in Human Performance Related Events

a. Inspection Scope

The inspectors performed an in-depth review of PPL's evaluation and corrective actions associated with condition reports CR-2014-38533 and CR-2015-00878, which were both written to address potential declining performance in procedure use and adherence. Additionally, inspectors performed in-depth reviews of PPL's evaluation and corrective actions associated with licensee event reports (LERs) 387;388/2014-008, 387;388/2014-009, and 388;387/2014-001, which all documented losses of safety function caused by human performance errors.

The inspectors assessed PPL's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of PPL's corrective actions to determine whether PPL was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of PPL's corrective action program and 10 CFR 50, Appendix B.

b. Findings and Observations

Inspectors reviewed PPL's evaluation to assess a potential declining trend in procedure use and adherence at the station and determined that it appropriately identified the previous adverse trend of performance in this area. Corrective actions documented in the trend CRs were limited to a station-wide communication reinforcing the importance to adhering to procedures. To fully assess actions taken by the station to address this area, inspectors interviewed functional unit managers in the Operations, Maintenance and Engineering departments. During discussions, PPL indicated that adherence to nuclear standards, including procedure use and adherence, is being reinforced more frequently during department meetings and tailboards. Operations department has instituted external observers in the control room and simulator to monitor for application of nuclear standards. Additionally, NDAP-00-0036, "Management of Observations," Revision 7, includes requirements for all supervisors to perform in-field observations. Section 5.5 of the procedure describes the "Procedure-In-Hand" program which is designed to reinforce procedure use and adherence with information use procedures. Finally, inspectors noted the increased application of the site's accountability model when gaps in application of nuclear standards are identified. This was based on a review of recent prompt human performance evaluations. Inspectors determined that the corrective actions identified by PPL were reasonable and would likely improve the identified adverse trend in human performance and procedure use and adherence if they continue to be applied rigorously. Inspectors also recognized that the apparent increase in CR generation for human performance, and specifically procedure use and adherence related events is likely being driven, in part, by the increased management attention in that area and increased station-wide communications identifying it as an area of focus for the station.

Notwithstanding this, inspectors noted that significant human performance related events are still occurring at the station and performed an in-depth review of three reportable events that were caused by human performance errors. Inspectors reviewed the evaluation of these events, documented in CR-2014-19672, CR-2014-19699, and CR-2014-34399 and determined that PPL's evaluations were adequate. The inspectors also determined that the corrective actions were reasonable for the three events and would address the specific human performance errors that occurred.

However, inspectors noted that CR-2014-19672 and CR-2014-19699, which evaluated the conditions reports in LERs 387;388/2014-008 and 387;388/2014-009, respectively, were screened differently than past related events. Specifically, CRs 2014-19672 and 2014-19699, which documented two separate losses of safety function associated with TS 3.7.3, "CREOASS and TS 3.7.4, "Control Room Floor Cooling," were classified as conditions adverse to quality. However, CR-1572658, which evaluated a similar loss of safety function that was documented in LER 387;388/2012-010, was classified in accordance with the station's CAP as a significant condition adverse to quality (SCAQ) and a level 1 root cause evaluation was performed. Additionally, inspectors noted that the cause of the SCAQ documented in CR-1572658 was similar to the cause identified in CR-2014-19699 and that corrective actions to preclude recurrence (CAPRs) were related to and potentially could have prevented the more recent event. Inspectors noted that the evaluation of the recent event, CR-2014-19699, did not review the previous corrective actions or assess whether the previous root cause evaluation was adequate. PPL entered these concerns into the CAP as CR-2015-10768. Though inspectors noted the relation between the two events, they determined that the evaluation appropriately

documented the apparent cause of the event documented in CR-2014-19699 as human performance related. As such, inspectors did not identify a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for this event. In review of the three reportable events, inspectors identified a self-revealing finding and associated violation of regulatory requirements.

NCV 05000387;388/2015001-05: Human Performance Errors Result in Losses of Safety Function

Introduction: A self-revealing finding of very low safety significance (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.

Description: Technical Specification (TS) 5.4.1, "Procedures," requires that written procedures be implemented for activities recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Appendix A, Revision 2. RG 1.33 requires implementing procedures for each technical specification surveillance, general procedures for the control of maintenance, including a method for obtaining permission and clearance for work, and procedures for operation of secondary containment. From June through November, 2015, PPL reported three separate losses of safety function that were the result of human performance errors in implementing maintenance or operations procedures.

Event 1 - During restoration from SO-030-B03, "Quarterly Control Structure Chilled Water Flow Verification – Loop 'B'," revision 23, on June 12, 2014, operators placed the control switch for the 'A' chilled water pump in the stop position. The procedure step being performed, step 5.1.43, required placing the control switch for the 'B' chilled water pump in the stop position. When this step was incorrectly performed, the running 'A' chiller tripped and was rendered inoperable. Since the 'B' chiller had previously been rendered inoperable during the test, this resulted in a condition where both control structure chillers were inoperable and unable to perform their required safety function as required by TS 3.7.3, "Control Room Emergency Outside Air Supply System," and TS 3.7.4, "Control Room Floor Cooling System." PPL entered TS 3.0.3 for the condition and subsequently placed the switch for the 'A' chilled water pump to the start position, restoring the 'A' chiller to operable. Both chillers were inoperable for a total of two minutes. This event was reported to the NRC as required by 10 CFR 50.73(a)(2)(v) in LER 387(388)/2014-008. PPL's investigation determined the apparent cause of the event was less than adequate use of human performance error prevention tools because the operator did not use self-check or flagging and didn't require a peer-check of the manipulation by the other control room operator. Corrective actions included updating conduct of operations procedures to clearly articulate the expectations for use of peer checks and concurrent verifications.

Event 2 - During clearance order application on June 13, 2014, both control structure chillers were rendered inoperable when breakers for the condenser circulating water pumps for both the 'A' and 'B' chillers were opened. PPL's review of the event identified that the impact of breaker operation on the control logic for both chillers was not recognized during work order processing. By opening both breakers, the logic for both chillers was de-energized, resulting in the inoperability of both control structure chillers

inability to perform their required safety function as required by TS 3.7.3 and TS 3.7.4. PPL entered TS 3.0.3 for the loss of safety function and restored the clearance. Both chillers were rendered inoperable for a total of 11 minutes. This event was reported to the NRC as required by 10 CFR 50.73(a)(2)(v) in LER 387(388)/2014-009. PPL's investigation determined that personnel did not ensure the impacts and effects of work were understood contrary to NDAP-QA-0502, "Work Order Process." During the clearance order development process, engineering personnel were engaged to help identify appropriate blocking. The technical evaluation recommended isolating the flow path by closing the service water throttling valves. The clearance order writer prescribed opening the breakers for equipment protection, since the pumps would not have a discharge flow path, but did not re-engage engineering personnel to ensure this was prudent given the complicated logic scheme. Overall, PPL determined that the apparent cause of the event was that human error prevention tools were not applied appropriately when a peer check of the final blocking scheme was not performed.

Event 3 - On November 5, 2014, an operator accessed an airlock without obeying the posted requirement contrary to Step 4.3.1 of NDAP-QA-0321, "Secondary Containment Integrity Control." Step 4.3.1 of NDAP-QA-0321 states that personnel accessing secondary containment are responsible for obeying posted requirements for proper operation of airlocks. The posted sign at each airlock states that personnel shall not access the airlock if the red light is lit, indicating the second door is being accessed. When the operator opened the airlock door, the redundant door was already opened for personnel egress, resulting in the inoperability of secondary containment. PPL entered TS 3.6.4.1, "Secondary Containment," and immediately restored the doors to their closed condition. Because secondary containment represents a single train, PPL reported this event to the NRC as required by 10 CFR 50.73(a)(2)(v) in 388(387)/2014-001. PPL's investigation determined the apparent cause of the event was less than adequate use of human performance error prevention tools because the operator did not use self-check prior to opening the door. Corrective actions included distribution of a station communication reinforcing the significance of maintaining secondary containment and how to appropriately access various secondary containment doors.

Analysis: Inspectors reviewed three examples where PPL did not implement procedures or work instructions as required and determined that these examples constituted a performance deficiency that was within PPL's ability to foresee and correct and should have been prevented. 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, "Quarterly Control Structure Chilled Water Flow Verification – Loop 'B'." Additionally, contrary to NDAP-QA-0502, "Work Order Process," personnel did not ensure the impacts and effects of work were understood when applying a clearance order on June 13, 2014. Finally, on November 5, 2014, an operator accessed an airlock without obeying the posted requirement contrary to Step 4.3.1 of NDAP-QA-0321, "Secondary Containment Integrity Control."

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 CREOASS and control room floor cooling systems. 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," dated June 19, 2012, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, 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]

Enforcement: TS 5.4.1, "Procedures," requires that written procedures be implemented for activities recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Appendix A, Revision 2. RG 1.33 requires, in part, implementing procedures for each technical specification surveillance, general procedures for the control of maintenance, including a method for obtaining permission and clearance for work, and procedures for operation of secondary containment. SO-030-B03, "Quarterly Control Structure Chilled Water Flow Verification – Loop 'B'," Revision 3, is the surveillance implementing procedure for component testing as required by TS 5.5.6, "Inservice Testing Program," NDAP-QA-0502, "Work Control Process," Revision 37, provides the instructions for the control of work activities and NDAP-QA 0321, "Secondary Containment Control," Revision 13, in part, provides the administrative controls for operation of secondary containment airlocks.

Contrary to the above, one three separate occasions PPL did not implement procedures as required. 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. 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. Finally, On November 5, 2014, an operator accessed an airlock without obeying the posted requirement not to access the airlock if the red light is lit contrary to Step 4.3.1 of NDAP-QA-0321. 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. Because this violation was of very low safety significance (Green), and PPL has entered this performance deficiency into the CAP as CR-2015-08431, the NRC is treating this as an NCV in accordance with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387;388/2015001-05; Human Performance Errors Result in Losses of Safety Function)**

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 4 samples)

.1 (Closed) LER 05000387;388/2014-008-00: Loss of Both Trains of Control Structure Chilled Water due to Personnel Error

On June 12, 2014, while restoring from a quarterly surveillance test, an operator manipulated a control switch for the 'A' control structure chilled water pump to the off position, which rendered the 'A' subsystem of CREOASS and CR floor cooling inoperable by TSs 3.7.3 and 3.7.4, respectively. The 'B' subsystem was previously rendered inoperable to perform the surveillance test. Upon rendering both trains inoperable, operators entered TS limiting condition for operation (LCO) 3.0.3. Upon recognizing the incorrect switch had been manipulated, operators placed the switch for the control structure chilled water pump to start position, restoring the division to an operable condition. Because both divisions of CREOASS and CR floor cooling were rendered inoperable simultaneously, PPL reported the event or condition that, at the time of discovery, could have prevented the fulfillment of a safety function as event notification 50198 in accordance with 10 CFR 50.72(b)(3)(v)(D). PPL determined the apparent cause of the event was less than adequate use of human performance error prevention tools in that the operator did not appropriately apply a self-check nor did he require a peer-check of the switch manipulation from another operator.

The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The enforcement aspects of this issue are discussed in Section 4OA2.2 of this report. This LER is closed.

.2 (Closed) LER 05000387;388/2014-009-00: Loss of Both Trains of Control Structure Chilled Water during Application of Clearance Order

On June 13, 2014, while applying a clearance order to repair an instrument air valve, operators opened the circuit breaker supplying power to the 'A' control structure chiller condenser circulating pump, tripping division 1 of control structure chilled water and rendering the 'A' subsystem of CREOASS and CR floor cooling inoperable per TSs 3.7.3 and 3.7.4, respectively. Since the breaker supplying power to 'B' control structure chiller condenser circulating pump was already open, both CREOASS and CR floor cooling subsystems were rendered inoperable simultaneously and operators entered TS LCO 3.0.3. Upon recognizing the condition, operators closed the breaker for the 'A' pump and returned the 'A' subsystem to service. Because both divisions of CREOASS and CR floor cooling were rendered inoperable simultaneously, PPL reported the event or condition that, at the time of discovery, could have prevented the fulfillment of a safety function as event notification 50200 in accordance with 10 CFR 50.72(b)(3)(v)(D). The event was entered into the CAP as CR-2014-19699. PPL determined the apparent cause was that the clearance order writer did not understand the impacts and effects of the clearance and did not engage engineering for a peer check of the impacts and effects prior to application.

The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The enforcement aspects of this issue are discussed in Section 4OA2.2 of this report. This LER is closed.

.3 (Closed) LER 05000388;387/2014-001-00: Both Doors of a Secondary Containment Personnel Airlock Momentarily Open due to a Personnel Error Resulting in Entry into Secondary Containment Technical Specification Limiting Condition for Operation.

On November 5, 2014, secondary containment zone 3 was unintentionally cross tied to zone 2 during passage of personnel through a personnel airlock. LCO 3.6.4.1 was entered based on the prohibited crosstie of the two secondary containment zones. Specifically, operability of secondary containment per TS 3.6.4.1 requires that at least one door remain closed for airlocks where two doors are provided when an access opening between Secondary Containment Zones is being used for exit and entry. Recognizing that conditions were not met, the operator closed the door, restoring secondary containment operability. Because secondary containment is considered a single train system, PPL reported the event or condition that, at the time of discovery, could have prevented the fulfillment of a safety function as event notification 50595 in accordance with 10 CFR 50.72(b)(3)(v)(D). PPL entered the event into the CAP as CR-2014-34399. PPL determined that, while performing equipment checks in the Unit 2 reactor building, an operator opened an airlock door prior to verifying the airlock was clear and that conditions were met for opening the door. PPL determined that the operator did not apply human error prevention tools when accessing the door by not self-checking their action prior to performance.

The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The enforcement aspects of this issue are discussed in Section 4OA2.2 of this report. This LER is closed.

.4 (Closed) LER 05000387;388/2014-001-00: Operation of the Reactor Pressure Vessel at Less than 0 psig Resulting in a Violation of Technical Specification 3.4.10, Reactor Coolant System Pressure and Temperature Limits.

On February 6, 2014, PPL identified that the reactor pressure vessel (RPV) had been operated in a condition prohibited by TS LCO 3.4.10, "Reactor Coolant System Pressure and Temperature Limits." Specifically, PPL identified twenty-seven occasions during the past 3 years that the RPV was operated below 0 psig during reactor startups and shutdowns. The apparent cause was that the startup and shutdown general operating procedures allowed operation with the main steam isolation valves (MISVs) open without the RPV being pressurized. This allowed the RPV to communicate directly with the main condenser and a slight vacuum to be drawn. Operating with the RPV below 0 psig was not recognized as a condition prohibited by TSs until the receipt and evaluation of operating experience from a plant of similar design.

PPL entered the issue into the CAP as CR-2014-06949. The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The enforcement aspects of this issue are discussed in Section 4OA7. This LER is closed.

4OA6 Meetings, Including Exit

On April 8, 2015, the inspectors presented the inspection results to Mr. Timothy Rausch, Senior Vice President and Chief Nuclear Officer, and other members of the PPL staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by PPL and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

- 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires activities affecting quality be prescribed by documented procedures which include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. On February 6, 2014, PPL identified that the startup and shutdown procedures for both Units 1 and 2 were inadequate such that they allowed operation of the RPV at a vacuum. This resulted in twenty-seven separate violations of TS 3.4.10, "Reactor Coolant System Pressure and Temperature Limits," which requires RPV pressure to be maintained within limits at all times. The limits specified by TS 3.4.10 do not permit operating the RPV at a vacuum. Contrary to these requirements, on multiple occasions during startup and shutdowns over the past 3 years, PPL operated the RPV at a vacuum.

  PPL entered this issue into the corrective action program as CR-2014-06949. The inspectors determined that the finding was more than minor because it was associated with the procedure quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors determined through a review of IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, that the finding required a detailed risk evaluation since it was associated with the reactor coolant system boundary (e.g., pressurized thermal shock). Inspectors determined the finding to be of very low safety significance (Green) based on a qualitative assessment that there was no appreciable effect on the reactor pressure vessel as a barrier. Specifically, this conclusion was based on review of PPL's evaluation of acceptability of the RCS for continued operation, which determined that the stresses on a postulated crack, when the RPV is under vacuum conditions, would be less than the stresses when the RPV is under positive pressure conditions.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Allen, Station Engineering
B. Bishop, General Manger - Maintenance
B. Bridge, Effluents Manager
T. Case, Senior Engineer
R. Centanero, Design Engineering
K. Cimorelli, General Manager- Operations
T. Creasy, Assistant Operation Manager- Shift
S. Davis, Manager, Susquehanna Emergency Preparedness
D. Deretz, Manager- Programs Engineering
D. Filchner, Supervisor Nuclear Regulatory Affairs
J. Franke, Site Vice President
B. Franssen, Plant Manager
J. Grisewood, Nuclear Regulatory Affairs Manager
D. Jones, Operations Manager
A. Klop, Programs Engineering
A. Kuklis, Station Engineering
C. Manges, Senior Licensing Engineer
R. Murphy, Station Engineering
L. Owen, Radiation Protection Foreman
S. Peterkin, Radiation Protection Manager
B. Reppa, General Manager Engineering
B. Rigatti, Station Engineering
P. Scanlan, Manager- Station Engineering
M. Smartwood, Heat Exchanger Program Engineer
R. Whitenight, Station Engineering

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000387;388/2015001-01	FIN	SBO Diesel Fuel Oil Cloud Point (Section 1R01)
05000387;388/2015001-02	NCV	Control of Transient Combustible Materials (Section 1R05)
05000387;388/2015001-03	NCV	Failure to Promptly Correct a Condition Adverse to Quality on the ‘B’ EDG (Section 1R15)
05000387;388/2015001-05	NCV	Human Performance Errors Result in Losses of Safety Function (Section 4OA2)

Opened

05000387;388/2015001-04	URI	Effectiveness of Declaration Capability of Abnormal Radiation Level EAL (Section 1EP6)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
SC-023-002, New Diesel Fuel Oil Receipt Analyses, Revision 17
NDAP-QA-0633, Diesel Fuel Oil Testing Program, Revision 5
NDAP-00-1913, Seasonal Readiness, Revision 2

Condition Reports (*NRC identified)
CR-2015-04800*

Maintenance Orders/Work Orders
1817377

Miscellaneous
IOM 829, Station Portable Diesel Generator Blue Max
ASTM D975-10c, Standard Specification for Diesel Fuel Oils
H-1015, Procurement of Diesel Fuel Oil for Emergency Diesel Generators, Revision 4

Section 1R04: Equipment Alignment

Procedures
OP-054-001, Emergency System Water System, Revision 38

Condition Reports
CR-2015-05486

Drawings
M-134, P&ID A-D Diesel Auxiliaries Fuel Oil, Lube Oil, Air Intake & Exhaust and Jacket Water Cooling Systems, Sheet 1, Revision 50
M-134, P&ID A-D Diesel Auxiliaries Fuel Oil, Lube Oil, Air Intake & Exhaust and Jacket Water Cooling Systems, Sheet 7, Revision 21
M-122, P&ID Backup Fire Protection System, Sheet 6, Revision 22
M-122, P&ID Fire Protection Reactor Bldg. Standby D.G., River Intake Struct., Service & Admin. Bldg. & Circ. Water Pumphouse, Sheet 3, Revision 65
M-122, P&ID Fire Protection Turbine Bldg., Control Structure and Radwaste Building, Sheet 2, Revision 61
M-122, P&ID Fire Protection Fire Pumphouse North & South Gatehouse & Security Control Center Building, Sheet 1, Revision 54
M-111, Common P&ID Emergency Service Water System, Sheet 1, Revision 50
M-111, Unit 1 P&ID Emergency Service Water System “A” Loop, Sheet 2, Revision 53
M-111, Common P&ID Emergency Service Water System, Sheet 4, Revision 4

Miscellaneous
TM-OP-024-ST, Emergency Diesel Generators A-D, Revision 13
TP-013-036, Annual Backup Diesel Fire Pump (OP592) Performance Test, Revision 7, performed on October 10, 2014 12:31

Section 1R05: Fire Protection

Procedures
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NDAP-QA-0443, Firewatch Procedure, Revision 11
NDAP-QA-0442, Control of Ignition Sources, Cutting, Welding, and Hot Work Permits, Revision 10

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Drawings
C-1929, Common Summary of Fire Zones Combustible Limitations, Sheet 7, Revision 3
C-1756, Units 1 and 2 Control Structure Fire Zone Plan Elevation 806'-0", Sheet 1, Revision 7
C-1756, Units 1 and 2 Control Structure Fire Doors and Fire Dampers Elevation 806'-0", Sheet 2, Revision 7
C-1756, Units 1 and 2 Control Structure Fire Protection Plan Elevation 806'-0", Sheet 3, Revision 5
C-1756, Units 1 and 2 Control Structure Fire Zone Plan of Protected Conduit Raceway Elevation 806'-0", Sheet 6, Revision 4
C-1720, Unit 1 Reactor Building Fire Zone Plan Elevation 645'-0", Sheet 1, Revision 7
C-1720, Unit 1 Reactor Building Fire Protection Plan Elevation 645'-0", Sheet 3, Revision 4
C-1720, Unit 1 Reactor Building Fire Detection Location Plan Elevation 645'-0" to 670'-0", Sheet 4, Revision 5
C-1761, Common Diesel Generator Building Fire Zone Plan Elevation 660'-0", Sheet 1, Revision 3
C-1761, Unit 1 & 2 Diesel Generator Building Fire Detection Location Plan Elevation 660'-0" to 677'-0", Sheet 4, Revision 3
C-1762, Common Diesel Generator Building Fire Zone plan Elevation 677'-0", Sheet 1, Revision 4
C-1762, Common Diesel generator Building Fire protection Plan Elevation 677'-0", Sheet 3, Revision 3
C-1762, Unit 1 & 2 Diesel Generator Building Fire Detection Location Plan Elevation 677'-0" to 710'-0", Sheet 4, Revision 4
C-1763, Common Diesel Generator Building Fire Zone Plan Elevation 710-9", Sheet 1, Revision 3
C-1763, Common Diesel Generator Building Fire Protection Plan Elevation 710'-9", Sheet 3, Revision 2
C-1728, Unit 2 Reactor Building Fire Zone Plan Elevation 645'-0", Sheet 1, Revision 8

C-1728, Unit 2 Reactor Building Fire Protection Plan Elevation 645'-0", Sheet 3, Revision 7
C-1728, Unit 2 Reactor Building Fire Detection Location Plan Elevation 645'-0" to 670'-0", Sheet 4, Revision 4
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Section 1R07: Heat Sink Performance

Procedures
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MT-GM-025, Heat Exchanger-Cleaning and Inspection, Revision 21
NDAP-QA-0504, Heat Exchanger Program, Revision 7
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OP-009-001, River Water Makeup System, Revision 33
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CH-SY-016, ESSW Treatment Program, Revision 10
CH-SY-010, Circulating Water/Service Water Treatment Program, Revision 16
CH-SY-015, Circ./Serv. Water Biocide Treatment, Revision 11
OP-041-004, Common Cooling Tower Biocide Injection System, Revision 27
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OP-241-001, Unit 2 Cooling Tower Sulfuric Acid Injection System, Revision 12,
LS-120, Issue Identification and Screening Process, Revision 3
LS-125, Corrective Action Program, Revision 2
MT-GM-025, Plugging Verification Sheet, Revision 21
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M-57-1, River Intake Structure Area 57, Revision 4
E-105161, Units 1 and 2, Site & Yard Development Spray – Pond Earthwork Plan, Revision 7
E-105188, Units 1 and 2, Spray – Pond Plan and Details of Liner In Spray – Bank Area, Revision 1
E-105186, Spray - Pond Earthwork Sections, Sheet 1, Revision 4
E-105186, Site and Yard Development Finish Grades & Yard Piping Spray Pond Area, Sheet 2, Revision 15
E-105187, Spray - Pond Sections & Details, Sheet 1, Revision 10
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E106216, Unit 1 P&ID Emergency Service Water System “A” Loop, Sheet 2, Revision 52
E106216, Unit 1 P&ID Emergency Service Water System “B” Loop, Sheet 3, Revision 23
E106216, Common P&ID Emergency Service Water System, Sheet 4, Revision 3
E106217, Unit 1 P&ID RHR Service Water System, Sheet 1, Revision 50
E106217, Common P&ID RHR Service Water System, Sheet 2, Revision 18
E106255, Unit 1 P&ID RCIC Turbine – Pump, Sheet 1, Revision 33
E106255, Unit 1 P&ID RCIC Turbine Lube Oil, Sheet 2, Revision 2
E106256, Unit 1 P&ID Residual Heat Removal, Sheet 1, Revision 65
E106256, Unit 1 P&ID Residual Heat Removal, Sheet 2, Revision 53
E106256, Unit 1 P&ID Residual Heat Removal, Sheet 3, Revision 27
E106256, Unit 1 P&ID Residual Heat Removal, Sheet 4, Revision 19
E106256, Unit 1 P&ID Residual Heat Removal, Sheet 5, Revision 2
E106261, Unit 1 H.P.C.I. Lubricating and Control Oil P&ID, Sheet 2, Revision 9
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UFSAR Section 2.5.4.5.3. Spray Pond Excavation, Slope Protection and Liner Construction
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Procedures
GO-100-012, Power Maneuvers, Revision 49
OP-AD-338, Reactivity Manipulations Standards and Communications Requirements, Revision 27
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Section 1R12: Maintenance Effectiveness

Procedures
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NDAP-QA-0413, Implementation of the Maintenance Rule, Revision 12

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Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
NDAP-QA-0340, Protected Equipment Program, Revision 25
OI-013-002, Fire Risk Management, Revision 1
NDAP-QA-0302, System Status and Equipment Control, Revision 31
Ol-AD-085, Operations Switching Orders, Revision 4
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M-153, Unit 1 P&ID Fuel Pool Cooling and Clean-up, Sheet 1, Revision 42
M-186, Common P&ID Control Structure Chilled Water System "B", Sheet 2, Revision 15
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M-111, Unit 1 P&ID Emergency Service Water System "B" Loop, Sheet 3, Revision 24
M-125, Common P&ID Instrument Air Control Structure and Turbine Building, Sheet 7, Revision 9

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Procedures
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PSP-29, Post Maintenance Testing Matrix, Revision 19
SO-249-014, RHR Cold Shutdown Valve Exercising, Revision 19
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C-2009, Emergency Diesel Generator "C" Fuel Injection Pump Flowing Vents, Sheet 1, Revision 1

C-2009, Emergency Diesel Generator “C” Fuel Injection Pump Flowing Vents, Sheet 2, Revision 1
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M-2151, P&ID Residual Heat Removal, Sheet 2, Revision 45
M-2151, P&ID Residual Heat Removal, Sheet 1, Revision 60
E-31, Units 1 & 2, Logic Diagram-Electrical System 4.16kv BUS Incoming FDR. BKR., Sheet 5, Revision 13
E-103, Unit 1 Schematic Diagram 4.16kv BUS 1A Incoming Feeder Breaker from ESS Trans 101, Sheet 1, Revision 31
E-23, Unit 1 Schematic Meter & Relay Diagram 4.16kv system Engineered Safeguard, Sheet 1, Revision 28
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E-1, Unit 1 & 2 Single Line Diagram 13.8kv through 480v Station Auxiliary BUS Arrangement, Sheet 2, Revision 21
E-1, Unit 1 & 2 Single Line Diagram Station, Sheet 1A, Revision 7
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Miscellaneous
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Section 1R19: Post-Maintenance Testing

Procedures

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SO-030-015A, Two Year CSCW RPI A Loop, Revision 0
MFP-QA-5250, Control Structure PLRT and Reactor Building NLRT Boundary Breaches and Penetration Seals, Revision 13
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C-135, Reactor Building Unit 1 Floor Plan Elevation 670'-0" Area 29, Revision 18
C-150, Reactor Buildings Units 1 and 2 Sections and Details El. 670'-0" to El. 683'-0", Revision 13

Miscellaneous
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EC-016-1011, MOV Data Calculation for HV21210A, Revision 7
M-1100, Motor Operated Valve Program Summary and Drawing Index, Sheet 1, Revision 32
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Section 1R22: Surveillance Testing

Procedures
SO-151-A02, Quarterly Core Spray Flow Verification Division I, Revision 24
SE-250-002, Unit 2 RCIC Logic System Functional Test (On-line Version), Revision 7
SO-250-006, RCIC Comprehensive Flow Verification, performed on February 1, 2013
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M1-E51-90, RCIC System, Sheet 205, Revision 5
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M-2149, Unit 2 P&ID Reactor Core Isolation Cooling, Sheet 1, Revision 32
M-2150, Unit 2 P&ID RCIC Turbine Pump, Sheet 1, Revision 31
M-2151, Unit 2 P&ID Residual Heat Removal, Sheet 1, Revision 60
M-2151, Unit 2 P&ID Residual Heat Removal, Sheet 3, Revision 25
C-1977, Common A Diesel OG-501A Fuel Oil Piping and Tubing Supports, Sheet 2, Revision 0
C-1977, Common A Diesel OG 501A Fuel Oil Piping and Tubing, Sheet 1, Revision 0
M-134, Common P&ID A-D Diesel Auxilaries Fuel Oil, Lube Oil, Air Intake & Exhaust and Jacket Water Cooling Systems, Sheet 1, Revision 50
M-155, Unit 1 P&ID HPCI, Sheet 1, Revision 58
M-156, Unit 1 P&ID HPCI Turbine- Pump, Sheet 1, Revision 38
M-156, Unit 1 HPCI Lubricating and Control Oil P&ID, Sheet 2, Revision 10

Miscellaneous
EC-730624, Safety Assessment, Unit 2- Ensure Positive Seating of RHR Injection Check Valves HV251F050A & B

Section 1EP6: Drill Evaluation

Procedures
EP-RM-005, SSES Midas-NU User Manual, Revision 1

Condition Reports

CR-2015-03695	CR-2015-06706	CR-2015-06680	CR-2015-06684
CR-2015-06675	CR-2015-06738	CR-2015-06733	CR-2015-06772
CR-2015-06747	CR-2015-06732	CR-2015-04701	CR-2015-03232
CR-2015-03257	CR-2015-05440	CR-2015-05435	CR-2015-05545
CR-2015-05544	CR-2015-05542	CR-2015-05539	CR-2015-05538
CR-2015-05537	CR-2015-05536	CR-2015-05316	CR-2015-04704
CR-2015-04832	CR-2015-04861	CR-2015-04884	CR-2015-04887
CR-2015-04889	CR-2015-04895	CR-2015-04897	CR-2015-04901
CR-2015-04903	CR-2015-04914	CR-2015-04919	CR-2015-04953
CR-2015-04956	CR-2015-04968	CR-2015-04972	CR-2015-04974
CR-2015-04975	CR-2015-04978	CR-2015-04981	CR-2015-04982
CR-2015-04983	CR-2015-04986		

Miscellaneous
Emergency Plan, Revision 56

Section 4OA1: Performance Indicator Verification

Procedures
NDAP-QA-0737, Reactor Oversight Process (ROP) Performance Indicators, Revision 14

Action Requests
DI-2014-12881

Section 4OA2: Problem Identification and Resolution

Condition Reports

CR-2014-34399	CR-2014-19699	CR-2014-19672	CR-2015-00878
CR-2014-38533	CR-2014-36081	CR-1572658	

Procedures

LS-120, Issue Identification and Screening Process, Revision 0
LS-125, Corrective Action Program, Revision 2

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Condition Reports

CR-2014-06949	CR-2014-11714

Action Requests

AR-2014-07467	AR-2014-06819	AR-2014-06846	AR-2014-07495
AR-2014-07709			

Miscellaneous

PLA-7181, Susquehanna Steam Electric Station Proposed Amendment No.318 to Unit 1 Facility Operating License NPF-14 and Proposed Amendment to No.290 to Unit 2 Facility Operating License NPF-22: Revise Technical Specification 3.4.10 “RCS Pressure and Temperature (P/T) Limits”

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CDF	core damage frequency
CR	condition report
CS	core spray
CREOASS	control room emergency outside air supply system
DDFP	diesel driven fire pump
dpm	drops per minute
EAL	emergency action level
EDG	emergency diesel generator
EOF	emergency operations facility
EP	emergency preparedness
ESS	engineered safeguard system
ESW	emergency service water
FPP	Fire Protection Program
HPCI	high pressure coolant injection
HVAC	heating, ventilation and air conditioning
HX	heat exchanger
IMC	Inspection Manual Chapter
LCO	limiting condition for operation
LER	licensee event report
NOS	Nuclear Oversight
NRC	Nuclear Regulatory Commission
IP	inspection procedure
NCV	non-cited violation
OOS	out of service
P&ID	piping and instrument diagram
PI	performance indicator
POD	prompt operability determination
RCIC	reactor core isolation cooling
RCS	reactor coolant system
RHR	residual heat removal
RHRSW	residual heat removal service water
RMS	remote monitoring system
RPV	reactor pressure vessel
SBGT	standby gas treatment
SBO	station blackout
SCAQ	significant condition adverse to quality
SDP	Significance Determination Process
SFPE	site fire protection engineer
SOW	system outage window
SSC	structure, system, or component
SSES	Susquehanna Steam Electric Station
TS	Technical Specification
TSC	technical support center
UFSAR	Updated Final Safety Analysis Report
URI	unresolved item
WO	work order