UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 13, 2012

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

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION - NRC INTEGRATED INSPECTION REPORT 05000387/2012004 AND 05000388/2012004 AND NRC OFFICE OF INVESTIGATIONS REPORT 1-2012-017

Dear Mr. Rausch:

On September 30, 2012, 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 (IR) presents the inspection results, which were discussed on October 16, 2012, with you and other members of your staff.

This 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 two NRC-identified findings and one self-revealing finding of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. Additionally, one 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 correction action program (CAP), the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC's 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, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspectors at SSES. In addition, if you disagree with the cross-cutting aspect of any finding 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 Inspectors at SSES.

This inspection also reviewed actions regarding the failure of the 'C' emergency diesel generator (EDG) identified by NRC inspectors in December 2011. In response, the Region I Field Office, NRC Office of Investigations (OI), initiated an investigation on January 2, 2012, to

determine whether maintenance technicians and a Quality Control (QC) inspector, employed by PPL, deliberately failed to properly assemble delivery valves on 15 fuel pumps. Based on testimonial and documentary evidence gathered during the investigation, the investigators concluded that while a violation of Technical Specification (TS) requirements had occurred, improper planning and implementation of work instructions was identified as the cause and that the technicians and QC inspector did not deliberately fail to perform the maintenance. The safety significance of this violation was previously evaluated by the NRC and documented in NRC Inspection Report 05000387;388/2011005 as a Green finding. The enforcement aspects of the Green finding were held open pending the completion of the NRC OI Investigation. The NRC is dispositioning this violation of NRC requirements as an NCV in accordance with the Enforcement Policy since it was of very low safety significance, PPL has entered this issue into their CAP, it was not repetitive or willful, and compliance was restored in a reasonable period of time. The finding and associated violation will be counted as one input into the plant assessment process.

Please note that final NRC documents, such as the OI report described above, may be made available to the public under the Freedom of Information Act (FOIA) subject to redaction of information appropriate under FOIA. Requests under FOIA should be made in accordance with 10 CFR 9.23, “Request for Records.”

In accordance with 10 CFR 2.390 of the NRC’s "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 Public Document Room or from the Publicly Available Records (PARS) component of the NRC’s Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

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Sincerely,
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Reactor Projects Branch 4
Division of Reactor Projects

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

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U.S NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-387, 50-388
License No:	NPF-14, NPF-22
Report No:	05000387/2012004 and 05000388/2012004
Licensee:	PPL Susquehanna, LLC (PPL)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	July 1, 2012 through September 30, 2012
Inspectors:	P. Finney, Senior Resident Inspector J. Greives, Resident Inspector R. Edwards, Acting Resident Inspector F. Arner, Senior Reactor Inspector S. Ibarrola, Acting Resident Inspector P. Kaufman, Senior Reactor Inspector J. Caruso, Senior Operations Engineer R. Rolph, Health Physicist S. Hammann, Senior Health Physicist
Approved By:	Paul G. Krohn, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2012004, 05000388/2012004; 07/01/2012 – 09/30/2012; Susquehanna Steam Electric Station, Units 1 and 2; Adverse Weather Protection, Maintenance Effectiveness, Maintenance Risk Assessments and Emergent Work Control

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified two non-cited violations (NCVs) and one self-revealing finding of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," (ROP) Revision 4, dated December 2006.

Cornerstone: Initiating Events

- Green. The inspectors identified a Green NCV of TS 5.4.1, "Procedures," when PPL did not maintain adequate procedures to respond proactively to acts of nature. Specifically, PPL's adverse weather procedure did not ensure timely risk management activities for imminent adverse weather were completed despite a National Weather Service (NWS) declaration of a high wind watch, high wind advisory, and a tornado watch. PPL entered this item in their Corrective Action Program (CAP) as condition report (CR) 1628452.

  The issue was evaluated in accordance with IMC 0612 and determined to be more than minor since it affected the procedure quality 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 power operations. Specifically, the inadequate procedure prevented PPL from taking proactive steps to limit the likelihood of high wind or tornado-related missile hazards upsetting plant electrical power systems.

  The finding screened to Green in accordance with IMC 0609, Attachment 4, and Appendix A, Exhibit 1, since it did not cause a reactor trip, involve the complete or partial loss of mitigation or support equipment, or impact the frequency of a fire or internal flooding event. The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution - CAP because PPL did not identify issues completely, accurately, and in a timely manner commensurate with their safety significance. Specifically, PPL did not identify that the Off Normal procedure was inadequate both during the 2011 periodic procedural review and during documentation of inspector observations in May 2012 as part of CR 1579977. [P.1(a)] (Section 1R01)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) when PPL did not implement risk management actions (RMAs) during maintenance as required by station procedures. The inspectors identified multiple examples of PPL non-compliance with 10 CFR 50.65(a)(4); PPL's implementing procedures NDAP-QA-0340, "Protected Equipment Program;" and NDAP-QA-1902, "Integrated Risk Management." PPL entered the issue in their CAP as CRs 1611044, 1604007, 1601929, 1602495, and 1611876.

The finding was more than minor because it was similar to IMC 0612, Appendix E, examples 7.e and 7.f. Specifically, elevated plant risk required RMAs or additional RMAs that were not implemented as required by plant procedures. The finding also affected the equipment performance attribute of the Mitigating Systems Cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609, Attachment 4, the issues were determined to involve PPL's assessment and management of risk associated with performing maintenance activities and was further assessed under IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management SDP." The issue was evaluated by a Senior Reactor Analyst utilizing flowchart 2, and the finding was determined to be of very low safety significance (Green) since it did not result in an increase to either the incremental core damage probability (ICDP) or to the incremental large early release probability (ILERP). The finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Control, in that PPL did not plan work activities, consistent with nuclear safety, by incorporating risk insights. Specifically, PPL did not incorporate RMAs into its work activities despite recognition of increased risk. [H.3(a)] (Section 1R13)

Cornerstone: Barrier Integrity

- Green. A self-revealing Green finding against PPL procedure NDAP-QA-0510, "Troubleshooting Plant Equipment," was identified when inadequate troubleshooting caused repeated inoperability of secondary containment, an associated unplanned Unit 2 entry into a 4-hour limiting condition for operation (LCO) action statement, and a loss of the '1C' fuel pool cooling (FPC) pump during equipment restoration. The FPC pump had been designated as protected equipment as a risk management action. The failure to perform adequate troubleshooting activities to identify and correct equipment problems prior to restoration was a performance deficiency that was within PPL's ability to foresee and prevent. PPL entered this issue into their CAP as CR 1628250.

  The inspectors determined that the finding was more than minor because it was associated with the configuration control attribute of the Barrier Integrity cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the event resulted in the inoperability of secondary containment and loss of a FPC pump. The finding was evaluated in accordance with IMC 0609, Attachment 4, and Appendix A - Exhibit 3, and was determined to be of very low safety significance (Green) because the finding did not only represent a degradation of the radiological barrier function provided for the standby gas treatment system and it did not: a) cause the spent fuel pool to exceed a maximum temperature limit; b) cause mechanical fuel damage and detectable release of radio-nuclides; c) result in the loss of spent fuel pool water inventory; or d) affect spent fuel shutdown margin. This finding is related to the cross-cutting area of Human Performance – Decision-Making because PPL did not make safety-significant or risk-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, PPL failed to restore equipment in a systematic manner, given the intermittent nature of heater faults, to preclude a repeated loss of protected equipment and secondary containment. [H.1(a)] (Section 1R12)

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 numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period in Mode 2 starting up from a forced outage. The unit reached 100 percent rated thermal power (RTP) on July 6. On July 7, the unit was reduced to 68 percent over 32 hours for a control rod pattern adjustment. On July 17, the unit was reduced to 83 percent power over 17 hours for indications of a main generator oil exciter leak. On August 18, the unit was reduced to 65 percent power over 33 hours for a control rod sequence exchange. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at or near 100 percent power. On July 28, the unit was reduced to 83 percent power over 18 hours for a condenser waterbox planned isolation activity. On August 3, the unit was reduced to 59 percent power over 66 hours for condenser waterbox cleaning. On August 24, Unit 2 was reduced to 66 percent power over 34 hours for a control rod sequence exchange. 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 – 2 samples)

Readiness for Imminent Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PPL's preparations in advance of and during warnings and advisories issued by the National Weather Service. The inspectors performed walkdowns of areas that could be potentially impacted by the weather conditions, such as the emergency and station black out diesel generators, station transformers, and switchyards, and verified that station personnel secured loose materials staged for outside work prior to the forecasted weather. The inspectors verified that PPL monitored the approach of adverse weather according to applicable procedures and took appropriate actions as required. Documents reviewed for each section of this inspection report are listed in the Attachment.

- Common, hot weather alert for July 5 - 7, 2012
- Common, high wind watch for afternoon of September 18, 2012

b. Findings

Introduction. The inspectors identified a Green NCV of TS 5.4.1, "Procedures," when PPL did not maintain adequate procedures to respond proactively to acts of nature. Specifically, PPL's adverse weather procedure did not ensure timely risk management activities for imminent adverse weather were completed despite a National Weather Service (NWS) declaration of a high wind watch, high wind advisory, and a tornado watch.

Description. On May 25, 2012, inspectors informed Operations staff of a concern regarding debris in the vicinity of the supplemental decay heat removal piping that could become a missile hazard based on the amount of debris in the area if high winds were encountered. The items noted included hoses, buckets, stanchions, and loose piping. The inspectors based this concern, in part, on forecasted inclement weather. PPL entered this observation in their CAP as CR 1579977, closed the CR without action, and documented that "should inclement weather occur prior to clean up, the appropriate off normal procedure would be entered and the area secured." Regulatory Guide (RG) 1.33 identifies Acts of Nature as one type of procedure for combating emergencies and other significant events that is part of the list of safety-related activities that should be covered by written procedures.

On September 17, 2012, the NWS issued a High Wind Watch for Luzerne County in effect from the morning through the evening of September 18. The NWS issues a High Wind Watch when there is a potential for high wind speeds developing that may pose a hazard or is life threatening. At 4:04 a.m. on September 19, the NWS issued a High Wind Advisory to be in effect from 11:00 a.m. to 6:00 p.m. expecting sustained winds of 20 to 30 miles per hour (mph) with gusts of 40 to 50 mph and localized gusts of 50 mph or greater possible. Downed trees and power lines were anticipated. Based on the High Wind Watch and Advisory, the resident inspectors selected an Imminent Weather inspection sample and completed walkdowns of the 500KV and 230KV offsite power switchyards, the primary and backup meteorological towers, offsite power transformers T10 and T20, Unit 1 and 2 main transformers, the station blackout EDG, and the Engineered Safeguards System transformers. The inspectors noted a number of items that could be potential missile hazards that included loose pieces of wood, loose wood blocks, wooden pallets, a wooden cable spool, stanchions, piping, piping flanges, a metal-frame door, and pieces of sheet metal. Some of the loose wood, pallets, and cable spool were located inside the 500KV switchyard. The remaining items were located in the vicinity of the ESS transformers and station blackout (SBO) EDG.

The inspectors reviewed the station procedures concerning adverse weather. At approximately 12:00 p.m., one of the inspectors went to the control room and asked the Shift Manager what procedure(s) had been entered for the High Wind Advisory. During the conversation, the control room received a phone call informing the site that the NWS had declared a Tornado Watch for Luzerne County. The NWS issues a Tornado Watch when conditions are favorable for the development of tornadoes in and close to the watch area. The Shift Manager updated station leadership on the new information and a log entry was made that: a) onsite work groups were notified of weather conditions; b) outside work was prepared for high winds; and c) a walkdown of site areas for missile hazards was commenced. The subsequent PPL walkdown identified items in the vicinity of the main transformers and ESS transformers to include a gas cylinder, tools, ladders, tarps, and pipe flanges. The inspectors observed that not all of the items the inspectors had observed were noted by PPL nor were they all removed during the PPL walkdown. An Independent Spent Fuel Storage Installation (ISFSI) campaign was also in progress that day and the inspectors noted that a loaded dry fuel cask had been moved from the spent fuel pool to the reactor vessel head washdown area at 11:15 am, despite the High Wind Advisory in effect at that time.

The inspectors reviewed ON-000-002, "Natural Phenomena," Revision 28, to determine whether the site met entry conditions for that off-normal procedure. Procedural entry condition 1.1 is a "receipt of warning of impending hurricane or tornado with probable impact on station confirmed from Transmission Control Center or Generation Power Dispatcher." The NWS issues a Tornado Warning when a tornado is indicated by radar

or sighted by spotters. Step 3.3.3 states, “If hurricane/tornado approaching, perform section 3.4.” Section 3.4 states, “If impending hurricane or tornado impact probable and wind velocity < 50 mph 10 meters above ground, perform following: Call in appropriate personnel to support imminent emergency efforts as required; initiate a walk down of outside areas for loose material/debris such as wood planks, plywood, sheet metal, scaffold planks or material in dumpsters that can be potential missiles; contact PPL Electric Utilities and request a walk down of the 500KV and 230KV switchyards for potential missiles; and notify maintenance to install locking pins on the Unit 1 and Unit 2 Reactor Building Cranes.” PPL did not enter this ON procedure during the forecast period of inclement weather when the NWS warnings and advisories were in effect.

The inspectors concluded that, procedurally, PPL would not take anticipatory actions until there is a confirmed tornado and that tornado has probable impact on the station. This approach was determined to be inadequate given that the touchdown of a tornado with probable impact on the station did not allot sufficient time to take preventive measures or mitigating actions and that a proactive approach to acts of nature was warranted. Additionally, proactive entry into this procedure would have enabled PPL to consider the increased risk of relocating a dry fuel cask from the spent fuel pool to the refueling floor under these conditions since ON-000-002 directs the installation and engagement of locking pins on the reactor building cranes. Finally, the inspectors determined that the procedure had received its periodic review in 2011 and that PPL had missed an opportunity to identify the inadequacy at that time. Specifically, PPL did not identify that the Off Normal procedure was inadequate either during the 2011 periodic procedural review or during documentation of inspector observations in May 2012 as part of 1579977. PPL entered this item in their CAP as CR 1628452.

Analysis. An inadequate procedure for addressing acts of nature was a performance deficiency within PPL’s ability to foresee and correct. The issue was evaluated in accordance with IMC 0612 and determined to be more than minor since it affected the procedure quality 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 power operations. Specifically, the inadequate procedure prevented PPL from taking proactive steps to limit the likelihood of high wind or tornado-related missile hazards upsetting plant electrical power systems. The finding screened to Green in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 1, since it did not cause a reactor trip, involve the complete or partial loss of mitigation or support equipment, or impact the frequency of a fire or internal flooding event.

The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution – CAP because PPL did not identify issues completely, accurately, and in a timely manner commensurate with their safety significance. Specifically, PPL did not identify that the Off Normal procedure was inadequate either during the 2011 periodic procedural review or during documentation of inspector observations in May 2012. [P.1(a)]

Enforcement. TS 5.4.1.a, “Procedures,” requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in RG 1.33, Revision 2, Appendix A. RG 1.33, Appendix A lists safety-related activities that should be covered by written procedures. Section 6 identifies procedures for combating emergencies and other significant events among which is 6.w “Acts of Nature (e.g. tornado, flood, dam failure, earthquakes).” Contrary to the above,

prior to September 2012, PPL did not maintain an adequate procedure to respond proactively to acts of nature, specifically high winds and tornadoes. Since this issue was entered into PPL's CAP as CR 1628452, it is being treated as an NCV in accordance with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000387;388/2012004-01, Inadequate Procedure for Acts of Nature)**

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, 125 VDC batteries during 'B' emergency service water (ESW) pump unavailability
- Common, 'E' EDG aligned for 'B' EDG during overhaul
- Common, 'A' control structure (CS) chiller during 'B' CS chiller maintenance

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), 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 CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S - 1 sample)

a. Inspection Scope

On July 18 and 19, 2012, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 reactor core isolation cooling (RCIC) system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication, equipment cooling, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify

that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure PPL appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q - 5 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 out-of-service (OOS), degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, remote shutdown panel room (I-109), Fire Zone 1-2D
- Unit 2, residual heat removal (RHR) pump room 'A' (II-14), Fire Zone 2-1F
- Unit 2, high pressure coolant injection (HPCI) Fire Zone 2-1C
- Common, emergency safeguards service water (ESSW) pump house loops A and B, Fire Zones 0-51 and 0-52
- Common, heating and ventilation equipment rooms (Fire Zones 0-29A through 0-29D),

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including electrical vaults VA011 and VA006, and manhole MH032 containing power cables, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

Heat Sink Annual Review (71111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed documents associated with maintenance for the Unit 1, 'A' HPCI room cooler to determine its readiness and availability to perform its safety functions. This review was performed to ensure the performance capability for the HPCI room cooler was consistent with design assumptions. The inspectors verified that PPL initiated appropriate corrective actions for identified deficiencies. Additionally, the inspectors reviewed the WOs associated with the latest as-found maintenance inspection for the HPCI room cooler to evaluate whether maintenance procedures were adequate to ensure the minimum assumed design heat removal capability.

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 August 14 and 21, 2012, which included a loss of startup bus 20, loss of the '1D' Engineering Safeguard System (ESS) bus, and an auxiliary bus undervoltage load shed. 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 (EOPs). 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 TS 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

The inspectors observed control room operators during a substitution of the 'B' EDG for the 'E' EDG that placed both units in Orange risk on September 15, 2012, a period of heightened activity and risk. The inspectors observed the crew during the evolution to

verify that procedure use, crew communications, and coordination of activities in the control room met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSCs) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, 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.

- Common, breaker failure during 'E' EDG swap for 'B' EDG
- Common, ground fault causes loss of reactor Load Centers 1B270/280

b. Findings

Introduction. A self-revealing Green finding against PPL procedure NDAP-QA-0510, "Troubleshooting Plant Equipment," was identified when inadequate troubleshooting caused repeated inoperability of secondary containment, an associated unplanned Unit 2 entry into a 4-hour limiting condition for operation (LCO) action statement, and a loss of the '1C' FPC pump during equipment restoration. The FPC pump had been designated as protected equipment by station procedures as a risk management action.

Description. On April 13, 2012, Load Center (LC) feeder breaker 1B27012 tripped twice on a ground fault while LCs 1B270 and 1B280 were cross-tied. The 480VAC LCs were cross-tied to support plant modifications during Unit 1's refueling outage. The first trip occurred approximately 12 hours after the LCs were cross-tied and the second trip occurred approximately 20 minutes after attempts to re-energize the LCs.

The loss of both LCs impacted secondary containment in that both reactor building (RB) heating, ventilation, and air conditioning (HVAC) Zone I equipment compartment exhaust fans tripped due to the loss of power. This in turn caused the supply and exhaust fans for Zone I to trip and Zone I secondary containment differential pressure to drop below the required negative differential pressure of 0.25" water. This rendered Unit 2 secondary containment inoperable and necessitated entry into Unit 2 TS 3.6.4.1 since Zone I was not isolated from the recirculation plenum. Additionally, the power loss impacted Unit 1 Zone III supply fans and unfiltered exhaust fans which caused Zone III differential pressure to drop below its own 0.25" water requirement. Unit 1 was in Mode 5, not performing core alterations, nor any operations with a potential for draining the

reactor vessel (OPDRV). Therefore, TS 3.6.4.1 was not applicable for Unit 1. Finally, the loss of the LCs also caused the '1C' FPC to trip.

Operators responded by aligning Unit 2 Zone III ventilation to carry the zone for both units, shutting down Unit 1 Zone III filtered exhaust fans, and isolating Zone I from the recirculation plenum since Unit 1 secondary containment was not required for the given plant conditions.

Engineering developed a troubleshooting plan in accordance with procedure NDAP-QA-0510, "Troubleshooting Plant Equipment," Revision 6. Electrical maintenance inspected the LC feeder breaker, the Zone III '1A' supply fan breaker, and the 1C277 A through D heaters. Electrical maintenance completed their troubleshooting activities on April 15, 2012. Faulty Unit 1 Zone III ventilation heaters were identified and electrically isolated by pulling their respective fuses.

On April 23, 2012, operators attempted to restore non-faulted Zone III ventilation heaters due to concerns that Zone III air temperatures were approaching the lower limits. Restoration of the load center was conducted outside of the troubleshooting plan with the load centers cross-tied. During the restoration, breaker 1B27012 tripped again on ground fault and the loss of the LC caused Unit 1 and Unit 2 Zone III differential pressure to drop below the required 0.25" water requirement. Unit 2 secondary containment was again declared inoperable and TS 3.6.4.1 was entered, placing Unit 2 in a 4-hour shutdown LCO due to loss of LC-fed HVAC loads. The loss of the LCs also caused a repeat trip of the '1C' FPC pump except that the pump had now been designated as protected equipment as a risk management action since the spent fuel pool (SFP) time to 200 degrees Fahrenheit was less than 72 hours. Given the previous two trips on April 13th and the troubleshooting conclusion that this was an intermittent fault, it was reasonable to expect that PPL staff take actions to place ventilation and spent fuel pool cooling in an alternate line up to protect that equipment in case the bus was lost again. However, the operators did not consider this and it resulted in an additional loss of secondary containment ventilation, '1C' FPC pump, and another unplanned LCO entry.

The inspectors reviewed two apparent cause evaluations (ACEs) that were completed for the April 15 and April 23 trips. The second ACE determined that the troubleshooting plan was limited in scope due to the desire to limit interruption to refueling floor work and pose minimal risk to the operating unit's Zone III HVAC. The troubleshooting plan did not identify the individual LC supply breakers as a possible cause and only their downstream loads were suspected. NDAP-QA-0510, "Troubleshooting Plant Equipment," Revision 6, Section 2 states, in part, that "troubleshooting is a structured process to systematically identify equipment and system problems, their causes, and the necessary actions to resolve the problem." NDAP-QA-0510, Attachment A states, in part, that "recurring faults may be either complete, partial, or intermittent." While the troubleshooting plan classified the heater fault as intermittent in nature, the troubleshooting did not identify all of the faulted heaters and PPL did not account for this by ensuring that system configuration at the time of the equipment's restoration would not result in the subsequent loss of secondary containment or protected equipment. Additionally, the inspectors identified that the second ACE did not identify and consider the impact of the FPC pump's protected status during the assessment of the event's actual consequences. PPL entered this issue into their CAP as condition report CR 1628250.

Analysis. The failure to perform adequate troubleshooting activities per NDAP-QA-0510 to identify and correct equipment problems prior to restoration was a performance deficiency that was within PPL's ability to foresee and prevent. The inspectors

determined that the finding was more than minor because it was associated with the configuration control attribute of the Barrier Integrity cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the events resulted in the inoperability of secondary containment and the loss of a FPC pump. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A - Exhibit 3, and was determined to be of very low safety significance (Green) because the finding did not only represent a degradation of the radiological barrier function provided for the standby gas treatment system and it did not: a) cause the spent fuel pool to exceed a maximum temperature limit; b) cause mechanical fuel damage and detectable release of radionuclides; c) result in the loss of spent fuel pool water inventory; or d) affect spent fuel shutdown margin.

This finding is related to the cross-cutting area of Human Performance – Decision-Making because PPL did not make safety-significant or risk-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, PPL failed to restore equipment in a systematic manner, given the intermittent nature of heater faults, to preclude a repeated loss of protected equipment and secondary containment. [H.1(a)]

Enforcement. This finding does not involve enforcement action because no violation of regulatory requirements was identified. Because this finding does not involve a violation and is of very low safety significance, it is identified as a FIN. **(FIN 05000387;388/2011004-02, Inadequate Troubleshooting Results in Loss of Secondary Containment and Protected Equipment)**

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 TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Common, swap 'E' EDG for 'D' EDG and failure of breaker to close
- Common, yellow risk during Division I ESW pump testing
- Common, orange risk during swap of 'E' EDG for 'B' EDG
- Common, Division II ESW OOS with 'E' EDG unavailable for substitution

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) when PPL did not implement risk management actions (RMAs) during maintenance as required by

station procedures. The inspectors identified multiple examples of PPL non-compliance with 10 CFR 50.65(a)(4) and PPL's implementing procedures NDAP-QA-0340, "Protected Equipment Program," Revision 17, and NDAP-QA-1902, "Integrated Risk Management," Revision 9.

Description. First, on July 24, 2012, PPL performed TP-054-065, "Pump Curve for Division I ESW Pumps," Revision 12. PPL's equipment out-of-service (EOOS) risk assessment of the procedure yielded Yellow risk on both Units. However, because the duration was less than 12 hours, no equipment was required to be protected per NDAP-QA-0340, step 6.2.1 as a RMA. When inspectors requested to review the NDAP-QA-1902, Integrated Risk Assessment for this work activity, PPL could not provide it since it had not been performed. When PPL subsequently performed that assessment, the risk was determined to be Medium Operational risk. Where assessed risk is Medium or High, NDAP-QA-1902, step 6.4.1 requires the staff to consider those RMAs listed in Appendix D, Section 1; determine the RMAs to be used; and document the RMAs selected on Attachment E. The inspectors additionally identified that NDAP-QA-0340, Attachment G, step 5, requires protection of the available ESW loop when the other ESW loop is unavailable. This requirement is active when the calculated heatup rate associated with the SFP reaching 200 degrees F is less than 72 hours. The inspectors inquired as to whether the other ESW loop had been protected during completion of TP-054-065 and PPL confirmed that it had not. PPL entered these issues in their CAP as CRs 1601929, 1602495, and 1611876. PPL's short term corrective actions included protecting an ESW loop during the same test on the opposite division of ESW during procedure TP-054-066, on August 25.

Second, on August 13, 2012, the Unit 2 Division I RHR loop was taken OOS for maintenance. That maintenance included work on the breaker associated with the loop's minimum flow valve. The inspectors noted that NDAP-QA-0340, Attachment G, step 4, requires that when the SFPs are cross-tied, their time to reach 200 degrees F is less than 72 hours, and the 'A' loop of RHR on either unit is unavailable, then the other unit's 'A' loop of RHR must be protected. Under that condition, the procedure also requires that the supporting residual heat removal service water (RHRSW) and ESW loops be protected. The inspectors inquired as to whether those systems had been protected in accordance with the procedure and PPL confirmed that they had not. PPL entered this issue into their CAP as CR 1611044.

Finally, on July 30, 2012, five vent monitoring system particulate, iodine, and noble gas (SPING) sample pumps were being taken OOS sequentially for maintenance. The vent monitoring systems are used to identify unplanned or uncontrolled releases to the environment. At the time of the schedule review, the standby gas treatment system (SGTS) SPING had already been taken OOS. On the schedule, only the Unit 1 RB SPING was annotated as an Emergency Preparedness (EP) risk item. The inspectors inquired as to why only one SPING met this criterion. A subsequent review by PPL determined that the other four SPING WOs had been improperly reviewed for risk in accordance with NDAP-QA-1902, Attachment C. PPL re-performed the risk screenings for all five SPINGS, determined them all to be Medium EP risk and implemented RMAs from NDAP-QA-1902, Attachment D that included consulting the EP manager to determine additional actions to manage risk, evaluating redundant components required to support the activity, providing field supervisory monitoring of the activity, and verifying pre-planned alternate measures are available. PPL entered this issue into their CAP as CR 1604007.

Analysis. Not performing RMAs for maintenance activities in accordance with station procedures was a performance deficiency within PPL's ability to foresee and correct.

The finding was more than minor since it was similar to IMC 0612, Appendix E examples 7.e and 7.f. Specifically, elevated plant risk required RMAs or additional RMAs that were not implemented as required by plant procedures. The finding also affected the equipment performance attribute of the Mitigating Systems Cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609, Attachment 4, the issue was determined to involve PPL's assessment and management of risk associated with performing maintenance activities and was further assessed under IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management SDP." The issue was evaluated by a Senior Reactor Analyst utilizing flowchart 2, and the finding was determined to be of very low safety significance (Green) because it did not result in an increase to either the ICDP or to the ILERP.

The finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Control, in that PPL did not plan work activities, consistent with nuclear safety, by incorporating risk insights. Specifically, PPL did not incorporate RMAs into its work activities despite recognition of increased risk. [H.3(a)]

Enforcement. 10 CFR 50.65(a)(4) states, in part, that "before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." PPL procedures NDAP-QA-1902, "Maintenance Rule Risk Assessment and Management Program," Revision 2, and NDAP-QA-0340, "Protected Equipment Program," Revision 8, implement the requirements of 10 CFR 50.65(a)(4) at the station. Contrary to the above, during the months of July and August 2012, there were multiple instances of inadequate implementation of RMAs while maintenance was conducted. Because of the very low safety significance of this finding and because the finding was entered into PPL's CAP as CRs 1611044, 1604007, 1601929, 1602495, and 1611876, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387;388/2012004-03, Failure to Implement Risk Management Actions)**

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

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

- Unit 1, anomalies of 'A' steam pressure regulator and 1, 2, and 3 bypass valves
- Unit 2, reactor recirculation loop decontamination connections
- Unit 2, HPCI water hammer during comprehensive flow verification
- Common, passive fire barrier qualification
- Common, settlement monitoring of the ESSW pump house

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

No findings were identified.

1R18 Plant Modifications

.1 Permanent Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors evaluated a modification to the Zone III exhaust system on Units 1 and 2 implemented by engineering change 1495468, "Close and Block Dampers HD17534C and HD27534C." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change. The inspectors also reviewed revisions to station documents and interviewed engineering personnel.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests (PMTs) 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.

- Unit 1, B control rod drive (CRD) pump motor after modification to breaker controls
- Unit 2, RHR 'B' loop Division II after pressure safety valve (PSV) replacement and electrical maintenance
- Unit 2, RHR 'D' loop after socket weld leak on suction piping
- Common, motor-driven fire pump after discharge check valve maintenance
- Common, 'E' EDG intercooler PSV01126E replacement
- Common, 'B' EDG 5 year inspection and overhaul
- Common, 'B' CS chiller following piping and valve work
- Common, 'A' control room emergency outside air supply system (CREOAS) following hydramotor replacement (HDM07811A)

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 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 TS, 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 1, SO-151-A02, quarterly core spray Division II flow verification
- Unit 1, SO-100-010, monthly Zone I integrity verification
- Unit 2, SO-249-B02, RHR Division II quarterly flow verification
- Common, SO-024-014, monthly EDG 'E' operability test
- Common, SO-070-001, monthly standby gas treatment

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This area was inspected to: (1) review and assess PPL's performance in assessing the radiological hazards in the workplace associated with licensed activities and the implementation of appropriate radiation monitoring (RM) and exposure control measures for both individual and collective exposures, (2) verify PPL is properly identifying and reporting Occupational Radiation Safety cornerstone performance indicators (PIs), and (3) identify those performance deficiencies that were reportable as a PI and which may have represented a substantial potential for overexposure of the worker.

During August 20 to 24, 2012, the inspectors interviewed the radiation protection manager (RPM), performed walkdowns of various portions of the plant, and reviewed PPL documents. The inspectors used the requirements in 10 CFR Part 20 and guidance in RG 8.38 Control of Access to High and Very High Radiation Areas (VHRAs) for Nuclear Plants, the TSs, and PPL's procedures required by TSs as criteria for determining compliance.

a. Inspection Scope

Instructions to Workers

The inspectors selected five containers containing non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers. The inspectors

assessed whether the containers were labeled and controlled in accordance with 10 CFR Part 20 requirements.

Contamination and Radioactive Material Control

The inspectors reviewed PPL's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters.

Risk-Significant High Radiation Area (HRA) and Very High Radiation Area Controls

The inspectors evaluated PPL controls for VHRAs and areas with the potential to become a VHRA to ensure that an individual was not able to gain unauthorized access to these areas.

Problem Identification and Resolution

The inspectors reviewed CRs associated with RM and exposure control and verified SSES's problems were identified at an appropriate threshold and were properly addressed for resolution. The inspectors specifically evaluated the investigation and resolution for the contaminated transfer trailer issue and the associated CR 1606682.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.02)

This area was inspected August 20 to 24, 2012, to ensure occupational dose is appropriately monitored and assessed. The inspectors used the requirements in 10 CFR Part 20, the guidance in RG 8.13 - Instructions Concerning Prenatal Radiation Exposures, RG 8.36 - Radiation Dose to Embryo Fetus, RG 8.40 - Methods for Measuring Effective Dose Equivalent from External Exposure, TSs, and PPL's procedures required by TSs as criteria for determining compliance.

a. Inspection Scope

Inspection Planning

The inspectors reviewed the results of SSES radiation protection program audits related to internal and external dosimetry. The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report on PPL and PPL's vendor's most recent results to determine the status of the accreditation.

A review was conducted of PPL's procedures associated with dosimetry operations, including issuance/use of external dosimetry, assessment of internal dose, and evaluation of dose assessments for radiological incidents.

The inspectors evaluated whether PPL had established procedural requirements for determining when external dosimetry and internal dose assessments are required.

External Dosimetry

The inspectors evaluated whether PPL and PPL's dosimetry vendor is NVLAP accredited and if the approved irradiation test categories for each type of personnel

dosimeter used are consistent with the types and energies of the radiation present and the way the dosimeter is being used.

The inspectors evaluated the onsite storage of dosimeters before issuance, during use, and before processing/reading. The inspectors also reviewed the guidance provided to radiation workers with respect to care and storage of dosimeters.

PPL does not use non-NVLAP accredited passive dosimeters.

The inspectors assessed the use of electronic personal dosimeters to determine if PPL uses a “correction factor” to address the response of the electronic personal dosimeter as compared to the dosimeter of legal record for situations when the electronic personal dosimeter is used to assign dose and whether the correction factor is based on sound technical principles.

The inspectors reviewed four dosimetry occurrence reports or CAP documents for adverse trends related to electronic personal dosimeters. The inspectors assessed whether PPL had identified any adverse trends and implemented appropriate corrective actions.

Internal Dosimetry

Routine Bioassay (In Vivo)

The inspectors reviewed procedures used to assess the dose from internally deposited radionuclides using whole body counting equipment. The inspectors evaluated whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, determining the route of intake and the assignment of dose.

The inspectors reviewed the whole body count (WBC) process to determine if the frequency of measurements was consistent with the biological half-life of the radionuclides available for intake.

The inspectors reviewed PPL's evaluation for use of its portal radiation monitors as a passive monitoring system. The inspectors assessed if instrument minimum detectable activities were adequate to determine the potential for internally deposited radionuclides sufficient to prompt an investigation.

The inspectors selected three WBCs and evaluated whether the counting system used had sufficient counting time/low background to ensure appropriate sensitivity for the potential radionuclides of interest. The inspectors reviewed the radionuclide library used for the count system to determine if it included the gamma-emitting radionuclides that exist at the site. The inspectors evaluated how PPL accounts for hard-to-detect radionuclides in their internal dose assessments, if applicable.

Special Bioassay (In Vitro)

The inspectors selected two internal dose assessments obtained using whole body counting. The inspectors reviewed and assessed the adequacy of PPL’s program for urinalysis of radionuclides including collection and storage of samples.

The inspectors reviewed the vendor laboratory quality assurance program and assessed whether the laboratory participated in an industry recognized cross-check program

including whether out-of-tolerance results were reviewed, evaluated, and resolved appropriately.

Internal Dose Assessment – Airborne Monitoring

PPL had not performed any internal dose assessments using airborne/derived air concentration monitoring during the period reviewed.

Internal Dose Assessment – Whole Body Count Analyses

The inspectors reviewed several dose assessments performed by PPL using the results of WBC analyses. The inspectors determined whether affected personnel were properly monitored with calibrated equipment and that internal exposures were assessed consistent with PPL's procedures.

Special Dosimetric Situations

Declared Pregnant Workers

The inspectors assessed whether PPL informs radiation workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors reviewed the records for two individuals who had declared pregnancy during the current assessment period and evaluated whether PPL's radiological monitoring program (internal and external) for declared pregnant workers is technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed exposure results and monitoring controls that were implemented.

Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

The inspectors reviewed PPL's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated PPL's criteria for determining when alternate monitoring, such as use of multi-badging, is to be implemented.

The inspectors reviewed selected dose assessments performed using multi-badging to evaluate whether the assessment was performed consistent with PPL procedures and dosimetric standards.

Shallow Dose Equivalent

The inspectors reviewed two dose assessments of shallow dose equivalent for adequacy. The inspectors evaluated PPL's method (e.g., VARSKIN or similar code) for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

Assigning Dose of Record

For the special dosimetric situations reviewed in this section, the inspectors assessed how PPL assigns dose of record for total effective dose equivalent (TEDE), shallow dose equivalent, and lens dose equivalent (LDE). This included an assessment of external

and internal monitoring results, supplementary information on individual exposures, and radiation surveys when dose assignment was based on these techniques.

Problem Identification and Resolution

The inspectors assessed whether problems associated with occupational dose assessment are being identified by PPL at an appropriate threshold and are properly addressed for resolution in PPL's CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by PPL involving occupational dose assessment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 7 samples)

.1 Safety System Functional Failure (2 samples)

a. Inspection Scope

The inspectors sampled PPL's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of January 2011 through June 2012. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed PPL's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, condition reports, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (MSPI) (2 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittal of the MSPI for the following systems for the period of October 2011 through May 2012:

- Units 1 and 2, Heat Removal System

To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment PI Guideline," Revision 6. The inspectors also reviewed PPL's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.3 Reactor Coolant System (RCS) Specific Activity (2 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittal for the RCS specific activity performance indicator for both Unit 1 and Unit 2 for the period of April 2011 through March 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6.

b. Findings

No findings were identified.

.4 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed implementation of PPL's Occupational Exposure Control Effectiveness PI Program. Specifically, the inspectors reviewed recent condition reports, and associated documents, for occurrences involving locked HRAs, VHRAs, and unplanned exposures against the criteria specified in NEI 99-02, Regulatory Assessment PI Guideline, to verify that all occurrences that met the NEI criteria were identified and reported as PIs. This inspection activity represents the completion of one (1) sample relative to this inspection area; completing the annual inspection requirement.

b Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of PI&R Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "PI&R," 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 CR screening meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Review of the Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in PPL procedure OI-AD-096, "Operator Burdens," Revision 8.

The inspectors reviewed PPL's process to identify, prioritize, and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent PPL self assessments of the program. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that PPL entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153 – 1 sample)

.1 (Closed) Licensee Event Report (LER) 05000387/2011-004-00: 'C' Emergency Diesel Generator Inoperable

a. Inspection Scope

On December 6, 2011, PPL declared the 'C' EDG inoperable due to loss of firing from cylinder 8R during surveillance testing. TS 3.8.1 was entered until the 'E' EDG was substituted for the 'C' EDG. A review of past maintenance on the 'C' EDG determined that it was inoperable from the time maintenance was performed on September 21, 2011 until it was shutdown on December 6, 2011, because it could not have fulfilled its mission time. The cause of the loss of firing was incorrect installation of the delivery valve spring that resulted in interruption of the spray pattern in the fuel injection nozzle and partial blockage. As a consequence of the inoperability, a condition prohibited by TS 3.8.1 occurred. PPL identified the root causes of this event to be that: 1) the work package to install delivery valve springs was insufficient, 2) the work crew proceeded using an inadequate work package, and 3) QC activities were insufficient to prevent the incorrect reassembly of the fuel injector pump components. The inspectors reviewed this LER, and the root cause analysis (RCA) and corrective actions associated with this event. This LER is closed.

b. Findings

An NRC-identified Green FIN (FIN 05000387;388/2011005-01; Failure to Properly Implement Work Instructions Results in 'C' EDG Inoperability) associated with this LER was documented in IR 05000387;388/2011-005. Section 4OA5 of this report provides additional information on the status of that finding and subsequent enforcement.

4OA5 Other Activities

.1 NRC Office of Investigations Report 1-2012-017

In December 2011, NRC inspectors identified a failure to meet TS requirements for properly planning and implementing work instructions on the 'C' EDG and the potential existed that this may have been a deliberate act. In response, the Region I Field Office, NRC Office of Investigations (OI), initiated an investigation on January 6, 2012, to determine whether maintenance technicians and a Quality Control (QC) inspector, employed by PPL at Susquehanna, deliberately failed to implement those work instructions during the assembly of delivery valves on 15 fuel pumps. Based on testimonial and documentary evidence gathered during the investigation the investigators concluded that while violations of TS requirements had occurred, improper planning and implementation of work instructions was identified as the cause and that the technicians and QC inspector did not deliberately fail to perform the maintenance.

The safety significance of the violation was previously evaluated by the NRC and documented in NRC Inspection Report 05000387;388/2011005 as a Green finding (FIN 05000387;388/2011005-01; Failure to Properly Implement Work Instructions Results in 'C' EDG Inoperability). The enforcement aspects of that finding were held open pending the completion of the NRC OI Investigation. While this finding involved a violation of NRC requirements, the NRC has determined that this issue is an NCV in accordance with the Enforcement Policy since it was of very low safety significance, PPL has entered this issue into their CAP, it was not repetitive or willful, and compliance was restored in a reasonable period of time. The finding and associated violation, although dispositioned separately, only count as one input into the plant assessment process. The enforcement section of the original finding is amended as follows.

Enforcement. Susquehanna Units 1 and 2 TS Section 5.4.1, requires, in part, that procedures be established, implemented, and maintained for those recommended in Regulatory Guide 1.33. RG 1.33, Appendix A, section 9, states, in part, "Maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to the above, on September 21, 2011, PPL did not properly plan and implement work instructions and QC hold point inspections on the 'C' EDG. This also resulted in violations of 10 CFR 50, Appendix B, Criterion X, "Inspection" and TS 3.8.1, "AC Sources – Operating," since the 'C' EDG exceeded the TS allowed outage time. Because of the very low safety significance of this finding and because the finding was entered into PPL's CAP (ARs: 1226969, 1226202, 1299543, 1299476, 1302720, and 1303308), it is being treated as an NCV in accordance with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000387;388/2011005-01; 05000278/2011005-02; Failure to Properly Implement Work Instructions Results in 'C' EDG Inoperability)**

.2 Temporary Instruction 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 – Flooding Walkdowns

On August 6, 2012, inspectors commenced activities to independently verify that PPL conducted external flood protection walkdown activities using an NRC-endorsed walkdown methodology. These flooding walkdowns are being performed at all sites in response to Enclosure 4 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). The results of this temporary instruction will be documented in a future inspection report.

.3 Temporary Instruction 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns

On July 19, 2012, inspectors commenced activities to independently verify that PPL conducted seismic walkdown activities using an NRC-endorsed seismic walkdown methodology. These seismic walkdowns are being performed at all sites in response to Enclosure 3 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). When complete, the results of this temporary instruction will be documented in a future inspection report.

.4 Operation of an ISFSI at Operating Plants (IP 60855 and 60855.1)

a. Inspection Scope

The inspectors observed and evaluated the licensee's loading of the third canister associated with PPL's current ISFSI dry cask campaign. The inspectors verified compliance with the Certificate of Compliance (CoC), TS, regulations, and licensee procedures. The inspectors also reviewed PPL's activities related to long-term operation and monitoring of the ISFSI.

The inspectors observed the heavy load movement of the transfer cask and loaded dry shielded canister (DSC) from the spent fuel pool to the cask washdown area next to the spent fuel pool. The inspectors also observed DSC processing operations including: decontamination and surveying, welding, non-destructive weld examinations, DSC draining, and vacuum drying. During performance of the activities, the inspectors evaluated PPL's familiarity with procedures, supervisory oversight, and communication and coordination between the personnel involved. The inspectors also reviewed loading and monitoring procedures and evaluated PPL's adherence to these procedures.

The inspectors performed a walk-down of the heavy haul path and toured the ISFSI pad to assess the material condition of the pad and the loaded horizontal storage modules. The inspectors also reviewed the as low as is reasonably achievable (ALARA) goal for the loading of the cask to determine the adequacy of PPL's radiological controls and to ensure that radiation worker doses were ALARA and that project dose goals could be achieved.

The inspectors attended PPL briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors.

The inspectors reviewed PPL's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages and the video recording of the canister to verify that PPL was loading fuel in accordance with the CoC and TS. PPL did not plan to load any damaged fuel assemblies during this campaign.

The inspectors reviewed corrective action reports and the associated follow-up actions that were generated since the last ISFSI inspection to ensure that issues were entered into the corrective action program, prioritized, and evaluated commensurate with their safety significance. The inspectors also reviewed PPL's 10 CFR 72.48 screenings.

b Findings

No findings were identified.

4OA6 Meetings, Including Exit

On August 24, 2012, the inspectors presented the inspection results to Mr. J. Helsel, Plant Manager and Acting Site Vice President, and other members of the staff.

On September 21, 2012, the inspectors presented the inspection results to Mr. J. Helsel, Plant Manager and Acting Site Vice President, and other members of the staff.

On October 16, 2012, the inspectors presented the inspection results to Mr. T. Rausch, Chief Nuclear Officer (CNO) and other members of the PPL staff. PPL acknowledged the findings. No proprietary information is contained 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.

- On September 27, 2011, PPL declared the 10-meter wind direction instrument on the primary meteorological tower inoperable when indications showed, as confirmed by the vendor; the wind direction data was inconsistent with known weather responses. EP-TP-007, "Equipment Important for Emergency Plan Implementation," states compensatory measures for an out of service Meteorological Tower include notifying the control room of potential Emergency Notification System (ENS) notifications, ensuring the availability of the backup and/or Nescopeck towers, using onsite observations by personnel and obtaining external meteorological information. The control room verified and notified the Nuclear Emergency Response Organization (NERO) Duty Planner that the compensatory measures identified in EP-TP-007 were available. However, the NERO was not notified of the meteorological tower 10-meter wind direction indication being inoperable. In addition, the wind direction indication on the plant computer system continued to display a yellow status color indicating valid data was available for use. Because the NERO was unaware the 10-meter wind direction indication on the primary meteorological tower was erroneous, the inaccurate meteorological information on the plant computer system could have been used by the NERO to make emergency classifications, perform dose projections, and

make protective action recommendations (PAR). Although the data from the backup meteorological tower would have been available there were no stimuli that would have caused the NERO to use that data instead. PPL's RCA determined the cause of not notifying the NERO was due to the lack of specific procedural guidance defining the conditions for which the duty NERO personnel should be notified when equipment important to EP was out of service or inoperable.

This issue was determined to be a violation of 10 CFR 50.54(q)(2), which requires licensees follow and maintain the effectiveness of an emergency plan that meets the planning standards in 50.47(b). 10 CFR 50.47(b)(9) requires the use of adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition. Contrary to the above, from September 27 through September 30, 2011, PPL did not maintain an adequate method for accurately calculating dose projections and issuing PARS to offsite agencies. In accordance with IMC 0609, Appendix B, Attachment 2, and the examples contained in Table 5.9-1, the inspectors determined the finding was Green since the meteorological tower was not functional for longer than 24 hours from the time of discovery without adequate compensatory measures. The finding was not greater than Green since the capability for immediate dose projection existed via alternate meteorological towers. The issue was entered in PPL's CAP as CR 1541932.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Boika, Nuclear Operations
M. Christopher , Nuclear Operations Support
S. DiPalma, Nuclear Field Services
L. Fuller, Design Engineer
C. Goff, Nuclear Training Director
J. Goodbred Jr., Nuclear Operations Manager
K. Griffith- Nuclear Training
M. Hanover, Senior Engineer
J. Helsel, Plant General Manager and Acting Site Vice President
J. Hirt, Supervisor, Reactor Engineering
T. Hess, Journeyman Electrician
F. Hickey, Chemistry Support Senior Health Physicist
D. Karchner, Refuel Floor Manager
A. Klopp, Senior Engineer
J. Knorr, Maintenance Foreman
J. Lada, System Engineer
J. Lear, Nuclear Field Services
D. Lock, Manager, Nuclear Maintenance
T. Magrone, Chemistry
C. Manchester, Electrical Maintenance Supervisor
D. Marinos, Nuclear Operations
G. Merenich, Radiation Protection Instrument Foreman
J. Mirilovich, Reactor Engineering
S. Muntzenberger, Supervising Engineer
B. O'Rourke, Senior Engineer, Licensing
E. Ortuba, Health Physicist
S. Peterkin, Radiation Protection Manager
R. Rodriguez-Gillroy, Radiation Operations Supervisor
D. Smethers, Nuclear Field Services
W. Snyder, Electrician Leader
R. Takacs, Chemistry
D. Wright, Dry Fuel Storage Project Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened/Closed

05000387;388/2012004-01	NCV	Inadequate Procedure for Acts of Nature (Section 1R01)
05000387;388/2012004-02	FIN	Inadequate Troubleshooting Results in Loss of Secondary Containment and Protected Equipment (Section 1R12)
05000387;388/2012004-03	NCV	Failure to Implement Risk Management Actions (Section 1R13)

Closed

05000387;388/2011005-01	NCV	Failure to Properly Implement Work Instructions Results in 'C' EDG Inoperability (Section 4OA5)
05000387/2011-004-00	LER	'C' Emergency Diesel Generator Inoperable (Section 4OA3.1)

LIST OF DOCUMENTS REVIEWED

(Not Referenced in the Report)

Section 1R01: Adverse Weather Protection

Procedures:
OI-AD-029, Emergency Load Control, Revision 15
NDAP-00-0030, Severe Weather Preparations (Winter Storm, Hurricane)
GO-1(2)00-010, Hot Weather Operation, Revision 6(3)
ON-000-002, Natural Phenomenon, Revision 28
EP-TP-001, Emergency Classification Levels Manual, Revision 6
NDAP-QA-1902, Integrated Risk Management, Revision 9

Condition Reports:
1457059, 1598613

Miscellaneous:
Final Safety Analysis Report (FSAR) 3.3, 3.5

Section 1R04: Equipment Alignment

Procedures:
OP-024-004, Transfer and Test Mode Operations of DG E, Revision 31
LA-0521-002, DG B 0C521B, Revision 16
CL-030-0023, Common Control Structure Heating and Ventilation, Revision 5
CL-030-0011, Control Structure Chilled Water System A, Revision 7
CL-030-0021, Common Control Room Floor Cooling, Revision 3
CL-030-0012, Control Structure Chilled Water System A, Revision 13

CL-030-0022, Common Computer Room Floor Cooling, Revision 4
CL-030-0015, Control Structure Chilled Water System, Revision 5

Condition Reports (* NRC identified):
1610577*, 1610610, 1549568, 1617975,

Drawing:
M-149, Unit 1, RCIC, Revision 47

Section 1R05: Fire Protection

Procedures:
FP-013-200, ESW Pump House LOOP A Pump Room, Fire Zone 0-51, Revision 4
FP-013-201, ESSW Pump House LOOP B Pump Room Fire Zone 0-52, Revision 4
FP-013-086, H&V Equipment Rooms (C-700 through C-706) Fire Zones 0-29A through 0-29D, Elevation .783'-0", Revision 6
ON-013-001, Response to Fire, Revision 31
FP-213-241, RHR Pump Room 'A' (II-14), Fire Zone 2-1F, Elevation 645'-0", Revision 6
NDAP-QA-0443, Firewatch Procedure, Revision 10
FP-113-109, Remote Shutdown Panel Room (I-109), Fire Zone 1-2D, Elevation 670'-0", Revision 5
FP-213-238, HPCI Pump Room (II-11), Fire Zone 2-1C, Elevation 645'-0", Revision 5
SO-213-023, 18 Month Functional Test and Visual Inspect-DS-215and 216

Condition Reports (*NRC identified):
1606649, 1606652, 1606656, 1595016

Work Orders:
1376682, 1436253

Miscellaneous:
ESW Pump House LOOP A and B Pump Rooms, Fire Zones 0-51 and 0-52, Revision 685'6"
FPRR, Section 4.5, Deluge Systems, Revision 11
TRS 3.7.3.2 and TRSB 3.7.3.2
Compensatory Actions Firewatch Log, August 17, 2012, August 18, 2012, and August 19, 2012

Section 1R06: Flood Protection Measures

Condition Reports (* NRC identified):
1601756, 1601764, 1601780, 1618248*

Drawings:
E-413, Sheet 1, Manholes and Duct Banks, Revision 36
E-52, Sheet 54, Manhole Schedule Notes and Details, Revision 9
E-52, Sheet 55, Manhole Schedule Notes and Details, Revision 10

Section 1R07: Heat Sink Performance:

Procedure:
NDAP-QA-0504, Heat Exchanger (HX) Program, Revision 4

Condition Reports:
1443053, 1603636*, 1604543

Work Orders:
1324446, 1538214, 1538996, 1364291, 1596094, 1538992, 1521415

Drawings:
M-1557, HX Gasket Materials, Revision 1
M-111, Sheet 2, ESW 'A' Loop, Revision 52

Miscellaneous:
H-1004, TS for HX/Condenser Inspection and Condition Assessment
Generic Letter (GL) 89-13
MT-GM-025, HX Cleaning and Inspection, Revision 4
EPRI NP-7552, HX Performance Monitoring Guidelines, December, 1992

Section 1R11: Licensed Operator Requalification Program

Procedures:
ON-100-101, Scram, Scram imminent, Revision 27
OP-142-001, Circulating Water (CW) System and Cooling Tower Operation, Revision 53
ON-004-002, Energizing Dead 4kV ESS Bus, Revision 22
ON-104-204, Loss of 4kV ESS Bus 1D (1A204), Revision 12
ON-003-002, Loss of Startup Bus 20, Revision 26
AR-106-001, Main Turbine Generator, Computer HVAC, Instrument AC 2 4VDC, 125VDC, 250 VBC, Panel 1C651, Revision 52
OP-AD-001, Operations Standards for System and Equipment Operation, Revision 48
OP-AD-004, Operations Standards for Error and Event Prevention, Revision 24
OP-024-004, Transfer and Test Mode Operations of DG E, Revision 31
OP-AD-002, Standards for Shift Operations, Revision 39
NDAP-QA-0300, Conduct of Operations, Revision 32
NDAP-QA-0302, System Status and Equipment Control, Revision 25

Condition Reports (* NRC identified):
1594232, 1597808, 1349898, 1413175, 1494142, 1610926*, 1611014*, 1620382

Miscellaneous:
OP002-12-05-02, Loss of Sub 20, Loss of 1D ESS Bus, Re-Energize 1D ESS Bus, Auxiliary Bus UV Load Shed, Revision 0
10 CFR 55.59, 10 CFR 55.53

Section 1R12: Maintenance Effectiveness

Procedures:
NDAP-00-0752, Cause Analysis, Revision 16
NDAP-QA-0510, Troubleshooting Plant Equipment, Revision 6
NDAP-QA-0413, Maintenance Rule Program, Revision 10

Condition Reports:
1600373, 1619873*, 1619286*, 1619356*, 1557253, 1563533, 1562913, 1562381, 1557360, 1561813

Calculation:
EC-SOPC-0516, Relay Setting for Coordination of 1E LCs and Motor Control Centers, Revision 0

Work Orders:
160420, 1601472, 1601477, 890695, 880117, 890762

Drawing:
E-8, Common Single Line Meter and Relay Diagram 480V LCs 1B270, 1B280, 1B810, 1B820, Revision 30

Miscellaneous:
Maintenance Rule Basis Document – System 24
IOM 779, Class 1E 4.16kV Switchgear DGs 0A501 A (B-D) for DG 'E'
EPRI TR 1000013, Guidance on Overhaul of ABB K-Line Circuit Breakers
EPRI TR 109001-1, ABB Breaker Lubrication Testing Report, Revision 0
EPRI TR 1003087, Evaluation and Testing of ABB Breakers with Mobil Grease 28
EPRI Technical Evaluation 100 0014, Circuit Breaker maintenance Programmatic Considerations
Unit 1 Operations Logs for July 19 and 26, 2012
Anderol Product Data Sheet
EC-RISK-1054, Performance Criteria for Maintenance Rule, Revision 5
IN 95-22, Hardened or Contaminated Lubricants Cause Metal- Clad Circuit Breaker Failures
IR 05000354/2007006
IR 05000285/2009007
ML11238A234, ML11238A242, and ML11238A241
EPRI NP-7410-V1P1
Routine Preventive Maintenance Guidance for ABB K-Line Circuit Breakers
ABB MV 1E Circuit Breaker Refurbishment, dated July 30, 2007
Maintenance Rule Basis Document – System 05, 480V LCs
Unit 2 Operations Log For April 13 and 23, 2012

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures:
OP-024-004, Transfer and Test Mode Operations of DG E EOOS Risk Profile for August 17, 2012, Units 1 and 2 Protected Equipment Tracking form Dated August 15, 2012 for System 024, Revision 30
OP-024-001, DGs, Revision 63
NDAP-QA-1902, Integrated Risk Management, Revision 9
PSP-26, Online and Shutdown Nuclear Risk Assessment Program, Revision 11

Condition Reports:
1616224, 1616220, 1616211, 1616738*

Action Request:
1600373

Miscellaneous:
EOOS for Units 1 and 2 for Thursday, July 19, 2012

Section 1R15: Operability Evaluations

Procedures:
TM-OP-193L-ST, Electrohydraulic Control (EHC) Pressure Control and Logic, Revision 7
ON-200-005, Excess Drywell Leakage Identification, Revision 15
GO-200-012, Power Maneuvers, Revision 40
GO-200-009, Single Recirculation Loop Operation, Revision 25
NDAP-QA-0703, Operability Assessments and Requests for Enforcement Discretion, Revision 20
TP-000-015 Settlement Monitoring of the ESSW Pump House, Completed September 11, 2012, Revision 1
ON-000-002, Natural Phenomena, Revision 28
SO-252-006, HPCI Comprehensive Flow Verification, Revision 11

Condition Reports (* NRC-identified):
1594228, 1594473, 1594323, 1594346, 1593886, 1597021*, 1590555, 1590704, 1588212, 1591543, 1612302, 1612304, 1611225, 1612311, 1612330, 1526133, 1612342, 1613346*, 1616228, 1616050, 1620168, 1616723

Action Requests:
1602927, 1618916

Calculations:
EC-058-1001, Turbine Valve Closure SCRAM Bypass Setpoint, Revision 4
EC-058-1016, Turbine First Stage Pressure versus Reactor Power For Siemens Turbine, Revision 8
EC-STRU-2031, Structural Monitoring Inspection Calculation, Revision 1
EC-PUPC-2070, Extended Power Uprate (EPU) Flow Inducted Vibration Testing and Walkdown Criteria, Revision 1

Work Orders:
1594244, 1602927

Drawing:
M-2155, Sheet 1, Unit 2 P&ID HPCI, Revision 43

Miscellaneous:
Operations Logs Unit 1, July 2, 2012 – July 3, 2012
TS and TSB for 3.7.6, 3.7.8, 3.3.4.1, and 3.3.1.1
Hot Box 12-31
Audit Number 1343693, Fire Protection Quality Assurance Internal Audit Report
Specification C 1026, TS for Settlement Monitoring of ESSW Pump House, Revision C
FSAR Section 2.5.4.10.2 and 2.5.4.13.2
EPRI TR-106438, May 1996, Water Hammer Handbook for Nuclear Plant Engineers and Operators
TRS 3.7.8.5

Section 1R18: Permanent Plant Modifications

Condition Reports (* NRC identified):
1495489, 1334937, 1356828, 1239036, 1239037, 1234032, 1234060

Work Orders:
1503115, 1503108, 1501186, 1501190

Drawings:
M-175, Unit 1 P&ID RB, Air Flow Diagram Zone III, Revision 32
M-2175, Unit 1 P&ID RB, Air Flow Diagram Zone III, Revision 19

Miscellaneous:
EC 1495468, Close and Block Dampers HD17534C and HD27534C, Revision 0
50.59 SD 01164

Section 1R19: Post-Maintenance Testing

Procedures:
MT-GM-003, Valve Disassembly, Reassembly, and Rework, Revision 22
SO-013-001, Monthly Diesel and Motor Driven Fire Pump Run, Revision 6
TP-013-035, Annual motor Driven Fire Pump OP512 Performance Test, Revision 6
SO-024-014, Monthly EDG E Operability Test, Revision 33
MT-GM-005, Safety Relief Valve (SRV) Setting, Revision 24
NDAP-QA-0480, ASME XI System and Component Pressure Testing, Revision 7
NDAP-QA-0482, Post-Maintenance Testing, Revision 6
PSP-29, Post-Maintenance Test Matrix, Revision 12
NDE-LP-001, Color Contrast Liquid Penetrant Examination, Revision 4
SO-249-B02, Quarterly RHR System Flow Verification, Division II, Revision 17
OP-155-001, CRD Hydraulic System, Revision 50
TP-155-019, CRD Pump B Test of EC1305834 4kV Breaker, Revision 0
SM-024-002, 24 Month ED Engine Inspection, Revision 15
SO-024-013, Offsite Power Source and Onsite Class 1E Operability Test, Revision 17
SO-024-001B, Monthly DG 'B' Operability Test, Revision 10
SO-030-B03, Quarterly Control Structure Chilled Water Flow Verification Loop B, Revision 21
SE-030-202, CSCW System Emergency Condenser Pump Check Valve Exercising, Revision 1
SE-130-102, 24 Month Division II Control Structure Chiller DC Control Automatic Transfer Logic, Revision 4
MT-GE-051, Initial Inspection Testing and Installation of NLI 480 VAC MCC Cubicles, Revision 13

Condition Reports (*NRC-identified):
1421627, 1421795, 1480537, 1596673, 1595302, 1595297, 1477405, 1529893, 1527414, 1600956*, 1607435*, 1607434*, 1607913, 1607636, 1606802, 1607636*, 1609371*, 1609213*, 1606271, 1604956, 1610519, 1610875, 1610747, 1610427, 1612545, 1612544, 1612769, 1614134, 1615498, 1617575, 1619755, 1620648, 471256, 1615959, 1623141, 1548540, 1537511, 1625096, 1621437

Work Orders:
1585115, 1339086, 892555, 1606843, 1481648, 1475404, 1509420, 1601815, 1596948, 1067855, 1239107, 1115159, 1301270, 1499158, 1499957, 1263262, 1447131, 1304896, 1616019, 1091530, 1613920

Drawings:
M-122, Sheet 1, Fire Pump House North and South, Revision 52
FF110230, Sheet 301, Outline Drawing and Bill of Material 2" to 14" Cast Iron Swing Check Valve
ISIM-100-1, Sheet 1, Legends and Symbols Inservice Inspection (ISI) Classification Boundary Drawing, Revision 7
M-2151, Sheet 3, RHR, Revision 24
D107318, Susquehanna Unit 1, Schematic Diagram CRD Pump 1P132B, Revision 24

Miscellaneous:
TS 3.5.3, TRO 3.6.4
'B' CS Chiller Maintenance

Section 1R22: Surveillance Testing

Procedures:
SO-000-010, Monthly Zone III Integrity, Revision 31
SO-151-A02, Quarterly Core Spray Flow Verification Division II, Revision 14
SO-024-014, Monthly DG 'E' Operability Test
OP-024-001, Diesel Generator, Revision 63
SO-070-001, Monthly Standby Gas Treatment, Revision 17
SO-249-B02, Quarterly RHR System Flow Verification, Division II, Revision 17

Calculations:
EC-037-1006, Determination of Minimum Pressure Requirement to Assure Emergency Core Cooling System (ECCS) and RCIC Pump Discharge Lines Filled with Water, Revision 2
EC-051-0004, Core Spray TS Test Pressure, Revision 7

Drawings:
M-152, Unit 1 P&ID Core Spray, Revision 39
M-134, Sheet 5, E Diesel Auxiliaries (Starting Air and Jacket Water System), Revision 17
M-134, Sheet 7, E Diesel Auxiliaries, (Fuel Oil System, Lube Oil System, and Air Intake and Exhaust System), Revision 18
M-175, Unit 1 P&ID RB Air Flow Diagram – Zone III, Revision 8

Miscellaneous:
Operability Assessment Form, Corrective Action Document 548841, System 070, Year 2004, Revision 0
EC-037-1006, Determination of Minimum Pressure Requirement to Assume ECCS and RCIC Pump Discharge Lines are Filled with Water, Revision 2
EC-051-0004, Core Spray TS Test Pressure, Revision 7

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedure:
HP-TP-310, Barricading, Posting, and Labeling, Revision 40

Condition Reports:
1428275, 1459847, 1493300, 1500283, 1601902

Miscellaneous:
QA Internal Audit 1340786, March 2011 Radiation Protection/Solid Radwaste

Section 2RS4: Occupational Dose Assessment

Procedures:
HP-TP-201, Operation of the Whole Body Counting System using APEX-INVIVO Software, Revision 2
HP-TP-205, Dosimeter Handling and Control, Revision 16
HP-TP-208, Performance Verification and Calibration of the Whole Body Counting System, Revision 13
HP-TP-209, Dose Tracking and the Dose Extension Process, Revision 13
HP-TP-215, Issuance and Replacement of the Permanent Whole Body Thermoluminescence Dosimeter (TLD), Revision 28
HP-TP-220, Indirect Bioassay, Revision 10
HP-TP-221, External Dose Investigations & Evaluations, Revision 23
HP-TP-222, Special Dosimetry Issuance and Criteria, Revision 19
HP-TP-223, Internal Dose Investigations and Evaluations, Revision 13
NDAP-QA-0625, Personnel Radiation Exposure Monitoring Program, Revision 11

Condition Reports:
1430729, 1454093, 1473474, 1510774, 1558759, 1606258, 1609774

Exposure Evaluations

PCE #	CR#	Date
1391012	158010	4/20/2011
1574834		5/16/2012
	1387290	4/18/2011
1574854		4/16/2012
1384690		4/10/2011

Internal Dose Evaluations
RH-7150-1, April 23, 2011
SH-1733, May 4, 2012

Miscellaneous
2011 Teledyne Brown Engineering Environmental Services Quality Assurance Report
2011 PPL NVLAP Proficiency Testing Report
Landauer NVLAP Accreditation Report for 2012
HP009, Prenatal Radiation Exposure Briefing, Revision 3
Health Physics (HP) Technical Basis #00-022 “Use of the Eberline PM-7 Monitors as Passive Internal Exposure Monitors”

Section 4OA1: Performance Indicator Verification

Procedures:
SC-176-102, Unit 1 Primary Coolant Specific Activity Equivalent I-131, Revision 12
SO-000-010, Monthly Zone III Integrity, Revision 30

Condition Reports (* NRC identified):
1527190, 1357370, 1574550, 1566734

Work Order:
1574595

Miscellaneous:
PI Summary Report, Susquehanna Unit 1 and 2, RCS Activity, April, 2011 – March, 2012
Performance Analysis Form Units 1 & 2, April, 2011 – March, 2012
Operability Assessment Form, Corrective Action Document No. 548841, System 070, Year 2004, Revision 0
MSPI Derivation Reports for Susquehanna Unit 1 and Unit 2 for Heat Removal System Unavailability and Unreliability Index
MS05, Maintenance Rule Database, August 16, 2012
Consolidated Data Entry 4.0 MSPI Derivation Report, July 17, 2012
NDAP-QA-0737, ROP PIs, Revision 9
PL-NF-06-002, SSES Mitigating System Performance Index Basis Document, Revision 7
SSES Mitigating System Performance Basis Document, Revision 6
NEI-99-02, Regulatory Assessment PI Guideline, Revision 6

Section 4OA2: Identification and Resolution of Problems

Procedures:
OI-AD-096, Operator Burdens, Revision 8
OI-AD-034, Annunciator Deficiency Tracking, Revision 11

Condition Reports (* NRC identified):
1595576*, 1596902*, 1596912*, 1602765*, 1602931*, 1600927*, 1602505*, 1601935*, 1601934*, 1606239*, 1602933, 1606933*, 1607320*, 1607617*, 1609459*, 1070595, 1033487, 148491, 1333186, 1516027, 1600773, 1370249, 1451345, 1583544, 1264068, 1328315, 1365728, 1401848, 1572905, 1605167, 1589035, 1350759, 1263813, 1461789, 1489410, 1580548, 1571254, 1297085, 1575433, 1160117, 1519268, 1345589, 1436313, 1609417, 1609405, 1609402, 1609395, 1609387, 1609377, 1609375, 1612969*, 1613395*, 1617148, 1614352*, 1617148, 1618337, 1618341

Work Orders:
1487388, 1334219, 1517210, 1386973, 829233, 1252589, 1574231, 1515988, 1527235, 1614352*

Miscellaneous:
SL5 – Unit 1/GWE (General Work Environment) 27 – U1 for July, 2012
SL5 – Unit 2/GWE 27 – U2 for July, 2012
SL6 – for July, 2012
SL7 – for July, 2012

Section 4OA3: Event Followup

Procedures:
NS-SSP-003, Tests, Checks, and Inspections of Security Systems and Equipment, Revision 22
HP-TP-320, Radiological Work Permits, Revision 24
MI-PS-001, Work Package Standard, Revision 35

Condition Reports:
156105, 1532037, 1532038, 1532042, 1532049, 1532050, 1532052, 1532057, 1532059, 1538240, 1616131

Section 4OA5: Other Activities

Procedures:
ME-ORF-023, "Dry Fuel Storage-61BT DSC," Revision 20
ME-ORF-152, "Dry Fuel Storage – Response to Crane/Rigging/Transfer Equipment Malfunction and CoC TS Requirements," Revision 3
ME-ORF-179, "Dry Fuel Storage Equipment List and Reference Information," Revision 10
MT-EO-045, "Guidance and Use of Nutech Horizontal Modular Storage Automated Welding System for Welding Operation," Revision 2
MT-EO-058, "E1000 Series Vacuum Drying System Operation," Revision 20
MT-199-001, "Reactor Building Crane Operating Procedure", Revision 22
NDAP-QA-0507, "Conduct of Refuel Floor," Revision 21
RE-081-043, "Selection and Monitoring of Fuel for Dry Storage," Revision 7

Condition Reports:
1611028*, 1611254*, 1613395*, 1611312*, 1616212*, 1618248*, 1619745, 1624965*, 1625702*, 1623008*, 1623018*, 1623022*, 1625645, 1297621, 1327056, 1602791, 1317006, 1498388, 1612923

Work Orders:
M8663-01 OS559, "Assist Vendor with E1000 Vacuum Drying System (DFS) Mechanical Preparations"
M8663-01, 1480449, "Preventative Maintenance on the Vacuum Drying Skid"

Miscellaneous:
2012 Dry Fuel Storage Program Implementation Readiness Check
72.48 Screen, 72.48 SD 00046, "ISFSI Temperature Monitoring And Lightning Protection System Row D & E"
72.48 Screen, 72.48 SD 00059, "Dry Fuel Storage Horizontal Modules Installation at ISFSI"
"Annual Preventative Maintenance Plan for Unit 1 Reactor Building Crane," Rev. 2, 2011
Form RE-081-042-4, "Components/Storage Locations with Special Requirements," Revision 5
NFE-1-17-014, "Appendix E, Bundle DH Storage for Dry Fuel Storage," Revision 1
QA Audit 1225786, "Fuel Management Audit Report," March 10, 2011
Receipt Inspection Report No. 179523, "Dry Shielded Canister S/N SSE61B-044-A"
RWP 2012-0200, "Dry Fuel Storage Activities on The Refuel Floor," Revision 000
RWP 2012-0201, "Dry Fuel Storage Activities in 101 Truck Bay and ISFSI," Revision 002
RWP 2012-0202, "Setup and Demobilization of Dry Fuel Storage Equipment," Revision 000
"SSES, Spent Fuel Storage Project, 10CFR72.212 Evaluation," Revision 4
Training Material Number HP272, "Dry Fuel Storage Refresher for HP," Revision 1
Training Material Number MM132, "Dry Fuel Storage – Maintenance Workers"
Weld Record, Weld Document No. 090410, "Work Order WPQT350"

LIST OF ACRONYMS

AC	Alternating Current
ACE	Apparent Cause Evaluation
ADAMS	Agencywide Document and Access Management System
ALARA	As Low As Is Reasonably Achievable
ANS	Alert and Notification System
AR	Action Report
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
CoC	Certificate of Compliance
CR	Condition Report
CRD	Control Rod Drive
CREOAS	Control Room Emergency Outside Air Supply
CS	Control Structure
CW	Circulating Water
DG	Diesel Generator
DP	Differential Pressure
DSC	Dry Shielded Canister
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EHC	Electrohydraulic Control
ENS	Emergency Notification System
EOOS	Equipment Out-of-Service
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPU	Extended Power Uprate
ERO	Emergency Response Organization
ESS	Engineering Safeguard System
ESSW	Emergency Safeguards Service Water
ESW	Emergency Service Water
FEMA	Federal Emergency Management Agency
FIN	Finding
FOIA	Freedom of Information Act
FPC	Fuel Pool Cooling
FSAR	[SSES] Final Safety Analysis Report
GE	General Electric
GL	Generic Letter
GWE	General Work Environment
HP	Health Physics
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
HVAC	Heating, Ventilation and Air-Conditioning
HX	Heat Exchanger
IMC	Inspection Manual Chapter
ICDP	Incremental Core Damage Probability
ILERP	Incremental Large Early Release Probability
IP	Inspection Procedure

IR	NRC Inspection Report
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
kV	Kilovolts
LC	Load Center
LCO	Limiting Condition for Operation
LDE	Lens Dose Equivalent
LER	Licensee Event Report
LOOP	Loss of Offsite Power
mph	Mile Per Hour
MT	Magnetic Particle Testing
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NEI	Nuclear Energy Institute
NERO	Nuclear Emergency Response Organization
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
NWS	National Weather Service
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
OI	NRC Office of Investigations
OOS	Out-of-Service
PAR	Protective Action Recommendation
PARS	Publicly Available Records
PCE	Potential Chilling Effect
PI	[NRC] Performance Indicator
PI&R	Problem Identification and Resolution
PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
PS	Planning Standard
PSV	Pressure Safety Valve
QA	Quality Assurance
QC	Quality Control
RB	Reactor Building
RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual heat Removal Service Water
RMA	Risk Management Actions
RM	Radiation Monitoring
ROP	Reactor Oversight Process
RPM	Radiation Protection Manager
RTP	Rated Thermal Power
SBO	Station Blackout
SDP	Significance Determination Process
SE	Safety Evaluation
SFP	Spent Fuel Pool
SFPC	Spent Fuel Pool Cooling

SGTS	Standby Gas Treatment System
SPING	System Particulate Iodine and Noble Gas
SRV	Safety Relief Valve
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescence Dosimeter
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Areas
WBC	Whole Body Count
WO	Work Order