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

August 10, 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 05000387/2012003 AND 05000388/2012003

Dear Mr. Rausch:

On June 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 July 18, 2012, with yourself 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 four NRC-identified findings and one self-revealing finding, each of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective 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 NCV 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, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station. 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 the SSES.

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 document 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

Enclosures: Inspection Report 05000387/2012003 and 05000388/2012003
w/Attachment: Supplemental Information

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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:	05000387/2012003 and 05000388/2012003
Licensee:	PPL Susquehanna, LLC (PPL)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	April 1, 2012 through June 30, 2012
Inspectors:	P. Finney, Senior Resident Inspector J. Greives, Resident Inspector S. Hansell, SRI, Peach Bottom T. Burns, Reactor Inspector R. Rolph, Health Physicist A. Bolger, Reactor Engineer H. Gray, Senior Reactor Inspector
Approved By:	Paul G. Krohn, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2012003, 05000388/2012003, 04/01/2012 – 06/30/2012; Susquehanna Steam Electric Station, Units 1 and 2; Maintenance Effectiveness, Operability Evaluations.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified four NCVs and one self-revealing NCV 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 (FINs) 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: Barrier Integrity

- Green. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to prevent recurrence of a significant condition adverse to quality (SCAQ) when secondary containment bypass leakage (SCBL) was in excess of its TS allowed value for two consecutive tests. In this case, the SCAQ, as defined by PPL procedure NDAP-QA-0702, "Action Request (AR) and Condition Report (CR) Process," was the same condition as reported in LER 05000387/2010-001 and actions taken in 2010 to prevent recurrence were inadequate because they did not fully consider all the penetrations that account for SCBL. PPL subsequently entered the issue into the CAP as CR 1582747.

  The finding was determined to be more than minor because it was associated with the structures, systems and components (SSCs) and barrier performance attribute of the Barrier Integrity cornerstone and affected its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors assessed the finding to be of very low safety significance (Green) because it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve an actual reduction in function of hydrogen igniters in containment. This finding has a cross-cutting aspect in the area of Human Performance, Decision Making, because PPL did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action. Specifically, the decisions to not rework valve HV151F016B or perform work on valve 141818A when leakage was at a value that potentially challenged the SCBL limit was not based on conservative assumptions. [H.1(b)] (Section 1R12)

- Green. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for PPL's failure to correct excessive seat leakage associated with the Unit 1 'D' outboard MSIV, HV141F028D, such that the leakage was in excess of the Technical Specification (TS) allowed value for two consecutive tests.

Specifically, work instructions to perform maintenance and post-maintenance testing on the valve following a local leak rate test (LLRT) failure in 2010 were inadequate to ensure the CAQ was corrected. PPL subsequently entered the issue into the CAP as CRs 1554813 and 1590506.

The finding was determined to be more than minor because it was associated with the SSCs and barrier performance attribute of the Barrier Integrity cornerstone and affected its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors assessed the finding to be of very low safety significance (Green) because it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve the actual reduction in function of hydrogen igniters in containment. This finding has a cross-cutting aspect in the area of Human Performance, Resources, because PPL did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, the instructions used to perform maintenance and testing on the MSIVs were inadequate to ensure that excessive seat leakage was corrected. [H.2(c)] (Section 1R12)

- Severity Level IV. Inspectors identified a Severity Level (SL) IV NCV of 10 CFR Part 50.73 (a)(2(i)(B) for PPL's failure to submit a Licensee Event Report (LER) of a condition prohibited by plant TS associated with seat leakage from the Unit 1 'D' outboard main steam isolation valve (MSIV). On April 8, 2012, the 'D' outboard MSIV failed to pressurize during its LLRT indicating that leakage was in excess of its TS limit. The same MSIV had failed to pressurize during its LLRT in 2010. The inspectors determined there was firm evidence to indicate that seat leakage from the MSIV was in excess of the TS limits during the previous two operating cycles for greater than the allowed outage time of 20 hours, which constitutes a condition prohibited by TS 3.6.1.3. PPL entered the issue into the CAP as CR 1590506.

  This finding was evaluated using the traditional enforcement process because the failure to accurately report events has the potential to impact or impede the regulatory process. The finding was determined to be a Severity Level (SL) IV NCV based on example 6.9.d.9 of the NRC Enforcement Policy. The significance of the associated performance deficiency was also screened against the ROP per the guidance of IMC 0612, Appendix B, "Issue Screening." No associated ROP finding was identified and no cross-cutting aspect was assigned. (Section 1R12)

- Green. A self-revealing Green NCV of TS 5.4.1, "Procedures," was identified regarding PPL's conduct of maintenance during a Unit 1 refueling outage which impacted the operating unit, Unit 2. Specifically, improperly performed maintenance on a Unit 1 main stop valve (MSV) and outboard main steam isolation valve (MSIV) affected safety-related equipment to include the standby gas treatment system (SGTS) and Unit 2 secondary containment in an unplanned manner.
  PPL entered this issue in their CAP via CRs 1558764, 1558718, and 1560235 and performed a root cause analysis (RCA) on this.

  Improperly performed MSIV and MSV maintenance was a performance deficiency within PPL's ability to foresee and correct. This finding was considered more than minor because it was similar to IMC 0612, Appendix E, Examples 3.j and 3.k, in that a physical plant condition and subsequent engineering calculation resulted in a condition where there was reasonable doubt on the operability of a system or component, in this case secondary

containment. Further, the performance deficiency affected the procedure quality and SSC and barrier performance attributes of the Barrier Integrity cornerstone and its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. In this case, lack of coordination resulted in a loss of reasonable assurance that secondary containment was operable. The issue screened to Green via IMC 0609, Attachment 4, since it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve the actual reduction in function of hydrogen igniters in containment. The issue was determined to have a cross-cutting aspect in the area of Human Performance to plan and coordinate work activities, consistent with nuclear safety. In this case, the MSV and MSIV work activities were not coordinated amongst various departments to address the operational impact of sequence changes on plant configuration. [H.3(b)] (Section 1R15)

Cornerstone: Radiation Safety

- Green. The inspectors identified an NCV of TS 5.4.1.a, "Procedures," which requires that written procedures be implemented covering the activities in the applicable procedures recommended by Regulatory Guide (RG) 1.33, including procedures for the as low as reasonably achievable (ALARA) program. Specifically, the Station ALARA Committee (SAC) did not review the scaffold work prior to Refueling and Inspection Outage (RIO) 17 for Unit 1. Procedure NDAP-QA-1191, "ALARA Program," Appendix A, provides specific criteria for tasks that must be reviewed by the SAC. One of these criteria is to review job specific radiation work permit (RWPs) evolutions where the initial dose estimate is greater than 5 person-rem. All of the actions were not completed prior to the start of the refueling outage. Specifically, the SAC did not review the scaffold work inside the drywell even though the dose was estimated to be 7 person-rem. The performance deficiency could lead to additional unexpected personnel exposure without additional evaluation by and approval of the SAC. PPL subsequently entered the issue into the CAP as CR 1555458.

The finding is more than minor because it is associated with the Radiation Safety – Occupational Radiation Safety cornerstone attribute of the program, and the process affected the cornerstone objective of protecting worker health and safety from exposure to radiation. Specifically, PPL did not take the appropriate actions defined in the procedure to evaluate the activity and challenge the actions to reduce dose for the task. Using the IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding was of very low safety significance (Green) because even though it involved an ALARA issue, the site's three-year rolling average is less than 240 person-rem and it did not involve: (1) an overexposure, (2) a substantial potential for overexposure, or (3) an impaired ability to assess dose. This finding was caused by inadequate procedure compliance that resulted in a lack of planning and review of a risk significant task. Consequently, the cause of this deficiency had a cross-cutting aspect in the area of Work Controls. Specifically, PPL failed to appropriately plan the scaffold work activity by incorporating risk insights or radiological safety and the need for planned contingencies, compensatory actions, and abort criteria. [H.3(a)] (Section 2RS02)

Other Findings

No findings were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period shutdown in Mode 4 for a refueling outage. Unit 1 commenced a reactor startup on June 4 and reached 100 percent power on June 13. On June 19, the Unit was shut down due to an increasing unidentified leakage rate in the drywell that was later attributed to pressure boundary leakage from a recirculation loop decontamination connection. Unit 1 commenced a reactor startup from this forced outage on June 30 and ended the inspection period in Mode 2.

Unit 2 began the inspection period at 100 percent power. On May 29, Unit 2 was shut down for a maintenance outage to inspect low pressure main turbine blades. Unit 2 commenced a reactor startup on June 13, and reached 100 percent power on June 19. The unit remained at or near 100 percent power for the remainder of the inspection period

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Summer Readiness of Offsite and Alternating Current (AC) Power Systems (71111.01 – 1 sample)

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed PPL's procedures affecting these areas and the communications protocols between the transmission system operator and PPL. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether PPL established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports and open work orders, and walking down portions of the offsite and AC power systems including the 500 kilovolt (KV) and 230 KV switchyards.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 5 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, supplemental decay heat removal (SDHR) to Unit 1 spent fuel pool (SFP) heat exchangers (HXs)
- Unit 1, secondary containment during operation with a potential for draining the reactor vessels (OPDRV)
- Unit 2, 'A' loop of residual heat removal (RHR) during maintenance of '2B' residual heat removal service water (RHRSW)
- Unit 2, Division II core spray
- Common, 'A' emergency diesel generator (EDG)

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 Updated Final Safety Analysis Report (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

The inspectors performed a complete system walkdown of accessible portions of the Unit 1 Division I RHR 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 and equipment cooling, hanger and support functionality, 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.

- Unit 1, Division I RHR

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, 699' turbine building (Fire Zone 1-33C)
- Unit 1, drywell (Fire Zone 1-4F)
- Unit 2, elevation 719' reactor building (RB) (Fire Zones 1-4A-N, W, S and 2-4C)
- Unit 2, reactor core isolation cooling (RCIC) (Fire Zone 2-1D)
- Common, A-D emergency diesel generators (EDGs) (Fire Zones 0-41A, 0-41B, 0-41C, 0-41D)

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the corrective action program to determine if PPL identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors also focused on the Unit 2 reactor building 645' elevation (HPCI, RCIC, and core spray rooms) to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers.

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, '1B' RHR heat exchanger (HX). This review was performed to ensure the performance capability for the HX was consistent with design assumptions. Additionally, the inspectors reviewed the WOs associated with the latest as-found maintenance inspection for the HX to evaluate whether maintenance procedures were adequate to ensure the minimum assumed design heat removal capability. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection (71111.08 - 1 sample)

a. Inspection Scope

The purpose of this inspection was to assess the effectiveness of PPL's Inservice Inspection (ISI) activities for monitoring degradation of reactor pressure vessel (RPV) internals, reactor coolant system boundary, risk significant piping system boundaries, and the containment boundary. The inspectors assessed the ISI activities using requirements and acceptance criteria for component examination specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, and applicable NRC Regulatory Requirements.

The inspectors selected a sample of non-destructive examination (NDE) activities and observed the performance of those examinations to verify the test activities were in compliance with the requirements of ASME Section XI and applicable regulatory requirements. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation could result in a significant increase in risk of core damage in the event of a loss of structural integrity or pressure retaining capability.

The inspectors verified by documentation review that test procedures and examiner qualifications were current and in accordance with the ASME Code requirements. Also, the inspectors reviewed examiner qualifications for use of the performance demonstration initiative (PDI) manual ultrasonic test (UT) procedures. The inspectors selected a sample of CRs and corrective actions for review of PPL's effectiveness in the identification and resolution of relevant indications discovered during ISI activities. The inspector's review of selected samples of NDE included the following:

- Manual UT examination of carbon steel pipe to elbow butt weld in the HPCI system using UT procedure NDE-UT-002, Revision 6. Examination was performed with WO 1320102 and results documented on Report No. UT-12-031.
- Magnetic particle test (MT) of three, 12 inch carbon steel pipe welds to core spray

(CS) pump 1DIP206A-361-4-6 system using MT procedure NDE-MT-001, Revision 5. Examination was performed with WO 1319705 and results documented on Report No. MT-12-001. No recordable indications were identified.

- Visual Examination (VT)-1 and VT-3 examination using NDE-VT-003, Revision 9, and VT-005, Revision 8, of reactor pressure valve internals consisting of jet pump (JP) main wedges, auxiliary wedges, steam dryer (structural members and lifting lugs,) and various welds of in-vessel CS piping and re-inspection of indications that were identified during the previous outage. Indications identified in that outage were selected for repeat VT and evaluation for indication growth or configuration/orientation change.
- Liquid penetrant test (PT) of four (4) integrally attached carbon steel lugs to the outside diameter of RCIC piping. Liquid penetrant test was performed using procedure NDE-LP-001, Revision 4, with WO 1320392.

The inspectors selected three ASME Section XI repair/replacement plans for review where welding was performed. The review was performed to confirm that appropriately qualified weld procedures and welders were assigned this work and that essential parameters were indicated as "hold points" on the weld traveler. The inspectors verified these "hold point" attributes were examined by inspection personnel and documented on the weld traveler. The inspectors reviewed base materials and weld filler metal specifications to verify they were in accordance with ASME Code requirements. Also, the inspectors reviewed documentation that the completed weld examinations were performed in accordance with the ASME Section XI code requirements. The three ASME Section XI repair/replacement activities reviewed were:

- WO 1408700. This WO governed repair of a steam leak on valve HV10111 in the Main Steam system (system 183). This repair consisted of performing an ASME Section XI "seal weld" on an existing packing leak-off plug. The existing plug was not replaced; it was "seal welded" to arrest the leakage. The repair activity was governed by ASME Section XI, safety class 2. Welding was performed by qualified welders using qualified welding procedures and weld filler materials meeting the requirements of ASME Section XI. Repair acceptance was based on satisfactory results of specified liquid PT, pressure test and visual surface examination. No recordable indications were identified and no leakage was noted.
- WO 1466113. This WO governed the installation of new gate valve and globe valve test connections at two locations in the RHR system (system 149) to establish a new SCBL barrier. Fabrication and installation instruction for pipe and valves were completed by welding in accordance with the requirements of ASME Section XI. The inspectors noted that appropriate verification "hold points" were established on the replacement work instruction. The welds were specified to be either magnetic particle or liquid penetrant tested. The work instruction specified post-work testing consisting of VT-2 for leakage during a system pressure test for final acceptance. No recordable indications were identified and no leakage was noted.
- WO 1372552. This WO governed the replacement of a portion of piping and an elbow which had developed a through-wall leak. This piping provides cooling water to the HPCI room cooler and the leak was discovered at the 1V209B cooler between T111174B and the 2RV-FP-1114B flow orifice. The leak was eliminated by removal of the failed piping and installation of a new spool piece. Installation of the spool

piece was by welding in accordance with ASME Section XI. Welding was performed by qualified welders using qualified welding procedures and weld filler materials in accordance with ASME Section XI. The inspectors noted that appropriate verification "hold points" were established on the applicable work instructions to control the installation and welding process. The inspectors reviewed the welding procedure and procedure qualification record (PQR) to determine that the welding process, including welders, was appropriate in meeting the requirements of ASME Section XI.

The inspectors performed a walkdown to view portions of the primary containment and additional structural members attached to the liner for assessment of the condition of the protective coating. The inspectors performed this visual assessment of locations on elevations 719', 738', 752', and 767'. The assessment included the extent of any peeling, blistering, coating loss or other damage or degradation as a result of corrosion, foreign material impact or lack of maintenance. Also, the inspectors evaluated coating integrity at accessible locations where the primary containment liner intersects the containment floor using the requirements provided in ASME Section XI, IWE-3510.2 (VT-3).

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on June 25, 2012, and evaluated operator performance during the simulated event in scenario OP002 12-04-01A 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 perform a Unit 1 reactor startup on June 5, 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. The inspectors observed the pre-evolution brief to ensure that the crew was ready to perform the evolution.

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

- Unit 1, repeat SCBL test failures and FW-10A failures during LLRTs
- Units 1 and 2, repetitive MSIV failures

b. Findings

.1 Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to prevent recurrence of a significant condition adverse to quality (SCAQ) when secondary containment bypass leakage (SCBL) was in excess of its TS allowed value for two consecutive tests.

Description. On April 6, 2012, during a Unit 1 refueling outage, PPL determined that the as-found minimum pathway SCBL had exceeded its TS allowed value of 7,079 standard cubic centimeters per minute (sccm) as specified by TS SR 3.6.1.3.11. PPL submitted an eight hour report per 10 CFR 50.72 b(3)(ii)(A) based on the failure representing a degraded condition (ENS 47812).

In review of the failure, the inspectors determined that the previous evaluation for a SCBL failure in 2010 was narrowly focused such that it failed to look holistically at SCBL performance to ensure that corrective actions for individual valve failures were adequate. SCBL is calculated by summing the LLRT results for ten containment penetration pathways that could bypass secondary containment. In 2010, the as-found minimum pathway leakage was 7,977 sccm, in excess of the TS limit of 7,079 sccm. This condition represented a SCAQ, as specified in PPL procedure NDAP-QA-0702, “AR and CR Process,” since it was “reportable via an LER where a quality-related/risk significant SSC could not perform its function” and was evaluated via a Level 1 apparent cause

evaluation (ACE) in CR 1243436. As reported by PPL in LER 05000387/2012-001, valve maintenance was performed and the as-left SCBL pathway met its TS limit. However, maintenance that was performed on HV151F016B (SCBL penetration X-39B) was marginally effective since the as-left leakage was 3,893 sccm, or roughly 55 percent of the TS limit. Inspector review of maintenance performed on this valve over the last three outages identified that the maintenance on this valve was usually much more effective at reducing leakage. Specifically, the as-found (pre-maintenance) and as-left (post-maintenance) values over the last three outages were:

	LLRT Results (sccm)	
Outage	As-found	As-Left
2006	12,700	257
2008	2,178	573
2010	4,515	3,893

Despite being only a marginal improvement from the as-found results, rework was not performed on HV151F016B (SCBL penetration X-39B) to ensure that there was adequate margin to the TS limit for the next two-year operating cycle.

The inspectors determined that the ACE for the 2010 SCBL failure adequately evaluated and proposed permanent corrective actions to address repeat challenges to the TS limit from the X-39A and X-39B penetrations. However, the inspectors determined that interim corrective actions, necessary to ensure TS compliance until the long term corrective actions were implemented, were inadequate. Specifically, when looking holistically at SCBL performance over the past several outages, the inspectors determined that, although the X-39A and 39B penetrations routinely account for roughly 50 percent of
the TS limit each outage, the other 50 percent is routinely dominated by the feedwater penetrations, X-9A and X-9B. Each of these feedwater penetrations consists of three primary containment isolation valves (PCIVs) in series and each penetration's contribution to the SCBL measurement is the lowest leakage observed, or minimum pathway, of the three. At least one of these valves has consistently failed to pressurize each refueling outage, placing an over-reliance on performance of the remaining two valves.

In a review of the 2010 SCBL performance for the X-9A penetration, the inspectors identified that valve 141818A, one of the three PCIVs for this penetration and historically the best performer of the group, was as-found tested at 17,450 sccm. Despite this valve leakage being greater than its administrative limit of 12,000 sccm, no valve repair work was performed to reduce its leakage and the results were accepted use-as-is. NDAP-QA-0412, "Leakage Rate Test Program," Revision 14, Section 6.1.4.a(2), requires an evaluation be documented per the station's CAP if a valve exceeds its administrative limit. Additionally, the procedure requires that a cause for the failure be determined, corrective actions specified, and actions to prevent recurrence documented. Despite these requirements, no CAP evaluation was performed in 2010 to document the decision to accept the excessive leakage for the X-9A penetration, valve 141818A. Instead, an engineering work request (EWR 1240975), an action outside of the station's CAP, was written to document the acceptance of the LLRT result and stated that corrective actions were not required during the 2010 refueling outage because the other two valves, 141F010A and HV141F032A, in the X-9A penetration were being worked. Although this

justification appeared reasonable, an historical performance review of these two valves revealed that they routinely leaked in excess of their 10 CFR 50, Appendix J and SCBL TS requirements during as-found testing despite being scheduled and receiving maintenance every refueling outage.

The inspectors determined that the decision to accept leakage from feedwater valve 141818A at 17,450 sccm was non-conservative because it placed undue reliance on the performance of two historically less-reliable valves. On April 6, 2012, while testing the X-9A penetration, valves 141F010A and HV141F032A both failed to pressurize. This required the leakage from valve 141818A, the remaining valve in the penetration series, to be used for the as-found minimum pathway leakage SCBL results. As previously discussed, the expected, 2010 as-left value of 17,450 sccm would have been in excess of the SCBL limit of 7,079 sccm by itself. Despite the valve performing better than expected at 2,855 sccm, SCBL was determined to be in excess of the TS limit when summed with the remaining penetrations, which included the 3,893 sccm from the X-39B penetration.

The inspectors determined that the decisions to not perform rework on valve HV151F016B, for the X-39B penetration, and to not perform work on valve 141818A, for the X-9A penetration, were non-conservative such that insufficient margin was available to account for potential poor performance of other penetrations. Overall, inspectors determined that PPL did not take adequate corrective actions to prevent recurrence of the SCAQ. In this case, the SCAQ, as defined by NDAP-QA-0702, “AR and CR Process,” was the same condition as reported in LER 05000387/2010-001 and actions taken in 2010 were inadequate because they did not holistically consider all of the penetrations that account for SCBL. PPL entered this issue in their CAP as CR 1582747.

Analysis. The failure to prevent recurrence of a SCAQ associated with SCBL in excess of its TS limit was a performance deficiency within PPL’s ability to foresee and correct. The finding was determined to be more than minor because it was associated with the SSC and barrier performance attribute of the Barrier Integrity cornerstone and affected its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors assessed the finding to be of very low safety significance (Green) because it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve an actual reduction in function of hydrogen igniters in containment.

This finding has a cross-cutting aspect in the area of Human Performance, Decision Making, because PPL did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action. [H.1.(b)]. Specifically, the decisions to not rework valve HV151F016B or perform work on valve 141818A, when leakage was at a value that potentially challenged the SCBL limit, was not based on conservative assumptions.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that CAQ, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-

conformances are promptly identified and corrected. Additionally, in the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to this, prior to April 6, 2012, PPL did not take adequate interim corrective actions to preclude repetition of a SCAQ, specifically Unit 1 SCBL in excess of its TS requirements. Because the finding is of very low safety significance and has been entered into PPL's CAP as CR 1582747, this violation is being treated as a non-cited violation, consistent with the NRC Enforcement Policy. (**NCV 05000387/2012003-01, Failure to Prevent Recurrence of Secondary Containment Bypass Leakage Significant Condition Adverse to Quality)**

.2 Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PPL's failure to correct excessive seat leakage associated with the Unit 1 'D' outboard MSIV, HV141F028D, such that the leakage was in excess of the TS allowed value for two consecutive tests.

Description. On April 28, 2012, the Unit 1 'D' outboard MSIV, HV141F028D, failed to pressurize during its as-found LLRT. Troubleshooting determined that leakage through this valve was greater than 150,000 sccm. This value was in excess of the TS required value of 47,187 sccm. PPL entered the condition into the CAP as CR 1554813. After performing a valve overhaul to correct the condition, a post-maintenance test (PMT) was performed. During the PMT penetration would not pressurize, indicating that the maintenance performed was inadequate. After performing rework on the 'D' MSIV, a satisfactory PMT was performed and the valve was left at 36,650 sccm leakage.

Inspectors reviewed the work performed and results of PPL's ACE into the failed LLRTs. PPL's ACE discussed that this was a repeat LLRT failure for this valve. PPL's ACE identified that maintenance performed in 2010 under WO 688216, in response to the previous LLRT failure, was inadequate which resulted in the failure in 2012. Specifically, the ACE identified that the maintenance instruction, MT-083-011, "MSIV Disassembly, Inspection and Reassembly (Longnose Poppet)," Revision 10, was inadequate. The procedural inadequacies resulted in improper boring bar set-up and machining of the seating surfaces. Additionally, the procedure did not ensure a proper valve inspection methodology was implemented. Inspectors determined that the results of PPL's ACE were reasonable.

During further review, inspectors identified that the PMT performed for the maintenance implemented via MT-083-011 did not provide sufficient data for plant personnel to appropriately judge the effectiveness of the maintenance performed on the Unit 1 'D' outboard MSIV, HV141F028D. Specifically, the PMT identified in the work instructions was performance of SE-159-024, "LLRT of 'D' MSIVs Penetration Number X-7D." This test pressurizes the volume between the inboard and outboard MSIVs, HV141F022D and HV141F028D respectively, to test pressure and determines leakage through the combination of the valves. When performed as a PMT for maintenance on the outboard MSIV, this test functions as both the as-found LLRT for the inboard MSIV as well as the as-left LLRT for the outboard MSIV. Though this test methodology is consistent with the requirements of 10 CFR 50, Appendix J, "Containment Leak Rate Testing," inspectors determined that it did not provide an adequate measure of the effectiveness of the maintenance performed on the Unit 1 'D' outboard MSIV, HV141F028D. PSP-29, "Post-Maintenance Testing Matrix," Revision 11, step 1.1.1, states that "post-maintenance testing shall accomplish the following: a. demonstrate that the problem has

been corrected. b. has not caused a new problem." In this case, the inadequate set-up of the boring bar and improper machining of the seating surfaces on the Unit 1 'D' outboard MSIV, HV141F028D, should have been identified during the PMT. However, since the PMT tested both valves, PPL attributed all the post-maintenance leakage to the inboard MSIV. Though this is conservative with regard to a containment leak rate testing methodology, it did not provide the necessary data to ensure that the issue with the outboard MSIV was corrected and that no new problems were induced. While PPL's ACE identified inadequate maintenance's contribution to the issue, NRC identification of inadequate PMT added value and therefore made this issue NRC-identified. PPL entered this issue into their CAP as CR 1590506.

Analysis. The failure to correct a CAQ associated with seat leakage on the 'D' outboard MSIV, HV141F028D, was a performance deficiency. The finding was determined to be more than minor because it was associated with the SSC and barrier performance attribute of the Barrier Integrity cornerstone and affected its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors assessed the finding to be of very low safety significance (Green) because it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve the actual reduction in function of hydrogen igniters in containment.

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because PPL did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety [H.2.(c)]. Specifically, the instructions used to perform maintenance on the MSIVs were inadequate regarding the set-up of the boring bar and improper machining of the seating surfaces on the Unit 1 'D' outboard MSIV, HV141F028D, to ensure that excessive seat leakage was corrected.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to this requirement, prior to April 28, 2012, PPL did not perform adequate maintenance and testing on the Unit 1 'D' outboard MSIV following a failed 2010 LLRT to ensure that the condition was corrected. Because the finding is of very low safety significance and has been entered into PPL's CAP as CRs 1554813 and 1590506, this violation is being treated as a non-cited violation, consistent with the NRC Enforcement Policy. **(NCV 05000387/2012003-02, Failure to Correct MSIV Seat Leakage)**

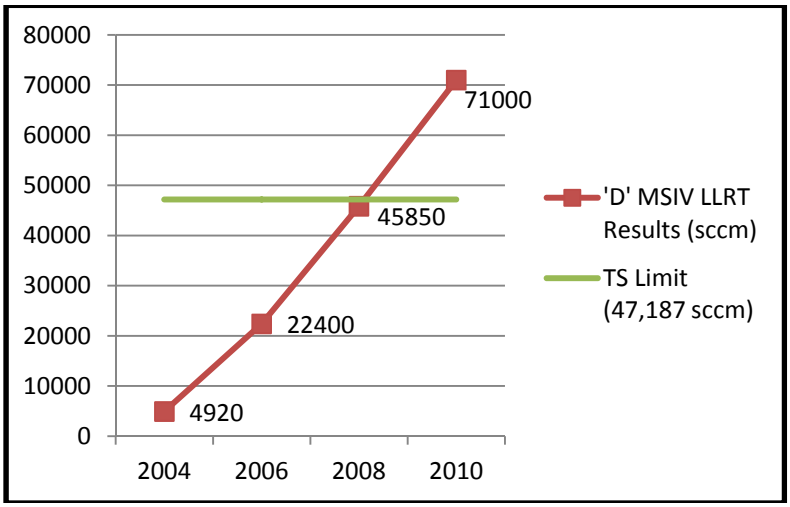
.3 Introduction. Inspectors identified a SL IV NCV of 10 CFR 50.73 (a)(2(i)(B) for PPL's failure to submit an LER for a condition prohibited by TSs associated with seat leakage from the Unit 1 'D' outboard MSIV.

Description. On April 8, 2012, the Unit 1 'D' outboard MSIV, HV141F028D, failed to pressurize during its LLRT indicating that leakage was in excess of its TS limit. Troubleshooting determined that leakage through this valve was greater than 150,000 sccm. At the time, Unit 1 was in Mode 5 and TS 3.6.1.3, "Primary Containment Isolation Valves," was not applicable. TS SR 3.6.1.3.12 states: "Verify leakage rate through each

MSIV is ≤ 100 standard cubic feet per hour (scfh) and ≤ 300 scfh for the combined leakage." The UFSAR Chapter 15 analyses are based on these specified leakage rates.

A Level 2 ACE (CR 1554813) was performed to evaluate the LLRT failure and determined that excessive leakage of the 'D' outboard MSIV was "due to inadequate maintenance of the MSIV seating surfaces" performed in 2010. Specifically, as discussed in NCV 05000387/2012003-002 above, the ACE identified that the maintenance instructions, MT-083-011, "MSIV Disassembly, Inspection and Reassembly (Longnose Poppet)," were inadequate and resulted in improper boring bar set up and machining of the seating surfaces. This maintenance directly led to the excessive leakage observed on April 8, 2012.

During additional reviews of valve performance, the inspectors identified that this was the second consecutive outage that HV141F028D had failed its as-found LLRT. Specifically, in 2010, the as-found LLRT would not pressurize. A Level 3 ACE (CR 1242099) determined the cause of that LLRT failure was failure to perform maintenance on the valve in the previous outage (2008) due to an adverse trend in leakage. Despite the 2008 as-found LLRT leakage value being ~97 percent of the TS limit and the trend showing strong evidence that the subsequent LLRT would exceed the TS limit, no valve maintenance was performed to restore margin.



Based on the results of these ACEs, inspectors questioned whether an LER was required in accordance with 10 CFR 50.73 (a)(2(i)(B) for a condition prohibited by TSs. This requirement is amplified in NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2, section 3.2.2, which states that for the purpose of evaluating the reportability of a discrepancy found during surveillance testing that is required by the TSs:

"For testing that is conducted within the required time (i.e., the surveillance interval plus any allowed extension), it should be assumed that the discrepancy occurred at the time of its discovery unless there is firm evidence, based on a review of relevant information such as the equipment history and the cause of failure, to indicate that the discrepancy existed previously."

Based on this information, inspectors determined there was firm evidence to indicate that seat leakage from HV141F028D was in excess of the TS limits during the previous two operating cycles for greater than the allowed outage time of 20 hours, which constitutes a condition prohibited by TS 3.6.1.3.

In discussion with the inspectors, PPL plant engineers presented that MSIV degradation likely occurs in discrete events (i.e., when a valve stroke occurs) vice continuously over the operating cycle. PPL proposed that since the MSIV passed its LLRT in 2008, it could have maintained adequate performance until the next LLRT two years later. Because the safety function is valve closure with steam in the lines, thereby cushioning the closure, PPL contended that it is possible that no additional degradation would occur during this closure and that while the trend provides data that it could have failed during the operating cycle, it was not "firm" evidence. Upon review of this information, the inspectors agreed that discrete-event degradation was reasonable and re-examined the data. The 2008 LLRT performed on March 12, 2008 resulted in 45,850 sccm (~97.2 percent of TS limit). The inspectors reviewed operating logs and discovered that during the time period between LLRT performance and reactor startup, the 'D' outboard MSIV was slow-closed with spring force twice and fast closed with air, which is the type of stroke most likely to cause degradation, six additional times. Following unit startup, the valve remained open until it was stroked closed prior to the 2010 LLRT. This LLRT was performed on March 10, 2010 and exceeded the TS limit at 71,000 sccm (~150 percent of TS limit). The inspectors concluded that the number of discrete closure events provided additional evidence that the minimal margin that remained following the LLRT in 2008 was insufficient to ensure that the TS limit was met throughout the operating cycle. Contrary to the requirements of 10 CFR 50.73(a)(2)(i)(B), PPL failed to submit a 60-day report in 2010. For the 2012 failure, based upon inspector questioning, PPL was able to submit an LER prior to the 60-day requirement (ML12195A019).

During interviews with plant personnel, the inspectors identified that the event was not reported, in part, because of specific guidance in NDAP-QA-0720, "Station Report Matrix and Reportability Evaluation Guidance," Revision 18, Attachment R which states:

"If it is discovered that any of the below limits have been exceeded an immediate and/or written report to the NRC is required."

Test	Limits	Calculation Method	Other References
MSIVs (includes MSIVs, MSL Drains, HPCI Steam Supply and RCIC Steam Supply)	300 scfh□ NOTE: Tech Specs also specify a limit of 100 scfh per valve; exceeding this limit is not reportable.	Minimum Pathway	FSAR 15.6.5

The inspectors determined that the inclusion of the note was a correction to PPL submittals of Emergency Notification System (ENS) reports associated with single MSIV failures in the 1990s and early 2000s. Though inspectors agreed that there is likely no 50.72 report for a single MSIV failure, since the successful stroking of the redundant

valve ensured the safety function was met and that there was no significant degraded or unanalyzed condition, the note prevented the station from considering other potential 10 CFR 50.73 reportable conditions. PPL agreed that this note was not specific enough for its intended purpose and generated CR 1590506 to evaluate and correct the deficiency in the NDAP, to evaluate the missed LER, and evaluate the extent of condition.

Analysis. The inspectors determined that PPL's failure to report a condition prohibited by TSs in 2010 was a performance deficiency and impacted the NRC's ability to perform its regulatory function. This finding was evaluated using the traditional enforcement process because the failure to accurately report events has the potential to impede or impact the regulatory process. The finding was determined to be a SL IV violation based on example 6.9.d.9 of the NRC Enforcement Policy.

The significance of the associated performance deficiency was also screened against the ROP per the guidance of IMC 0612, Appendix B, and the inspectors determined it to be minor because it was not similar to Appendix E examples, was not a precursor to a significant event, did not cause a PI to exceed a threshold, did not adversely affect cornerstone objectives, and if left uncorrected would not have lead to a more significant safety concern. As such, no ROP finding was identified and no cross-cutting aspect was assigned.

Enforcement. 10 CFR 50.73(a)(2)(i)(B) requires, in part, that "any operation or condition which was prohibited by the plant's TSs" is reportable. Contrary to this requirement, in 2010, PPL failed to report an instance where an MSIV failed TS surveillance testing in accordance with TS SR 3.6.1.3.12 and was inoperable. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into PPL's CAP (CR 1590506), this violation is being treated as an NCV consistent with the NRC Enforcement Policy. (**NCV 05000387/2012003-03, Violation of 10 CFR 50.73(a)(2)(i)(B), Failure to Report Condition Prohibited by TSs**)

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

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

- Unit 1, limiting condition of operation (LCO) 3.0.4 risk assessment due to 'B' control structure (CS) chiller inoperability

- Unit 1, JP removal/repair and associated OPDRVs
- Unit 1, LCO 3.0.4 requirements during OPDRVs
- Unit 2, 0ATS526 replacement
- Common, RHRSW valves 112061 and 212061 replacement
- Common, 1A201 4kV bus during multiple spurious operation (MSO) modification

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 9 samples)

a. Inspection Scope

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

- Unit 1, N1 plug installation
- Unit 1, elevated suppression pool (SP) level due to diving evolution
- Unit 1, disconnected supports on SP cooling line in SP
- Unit 1, '1B' RRP suction valve failed to close
- Unit 1, RCIC steam pressure indicator failed during surveillance
- Unit 1, elevated drywell radiation levels and unidentified leakage
- Unit 2, secondary containment during MSIV maintenance
- Common, 'B' EDG greater than 10 seconds to rated frequency
- Common, TS compliance during modifications to Engineering Safeguard System (ESS) buses

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 technical specification 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 technical specifications and UFSAR to PPL's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PPL. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction. A self-revealing Green NCV of TS 5.4.1, "Procedures," was identified regarding PPL's conduct of maintenance during a Unit 1 refueling outage which impacted the operating unit, Unit 2. Specifically, improperly performed maintenance affected safety-related equipment to include the SGTS and secondary containment in an unplanned manner.

Description. During the 2012 refueling outage on Unit 1, PPL applied status control tags on the main stop valves to preclude breaches of secondary containment in response to

the NRC's EGM 11-003, "Operations with Potential to Drain the Reactor Vessel (OPDRV)." On April 2, 2012, main turbine work that also included the #2 main stop valve (MSV) was released prior to the planned date on the outage schedule. The associated MSV work order did not reference the requirements of TS 3.6.4.1, "Secondary Containment," and was not intended to be released until Zone 1 (Unit 1 RB heating, ventilation and air conditioning (HVAC)) secondary containment was no longer required.

On April 9, 2012, the Unit 1 'D' outboard MSIV failed to pressurize and meet its LLRT acceptance criteria. Four days later, the 'D' MSIV was released for repair work. On April 17, 2012, maintenance technicians were working on the 'D' outboard MSIV in the RB. When the technicians removed the valve poppet at 5:44 a.m., positive air flow came from the valve. Around 9:00 a.m., the resident inspectors contacted the Outage Control Center and inquired as to whether PPL would incorporate the air flow into their drawdown calculations and whether the ongoing MSV work was the source of the flow path. At 3:30 p.m., Operations staff determined that the source of the air was from the #2 MSV in the turbine building that had been opened for maintenance. PPL declared secondary containment inoperable, entered TS 3.6.4.1 for Units 1 and 2, and cleared the LCO at 4:45 p.m. after realigning secondary containment. PPL submitted ENS 47844 per 10 CFR 50.72(b)(3)(v)(c) for an event or condition that could have prevented the fulfillment of a safety function, specifically control or release of radioactive material. PPL also conducted a Human Performance Event evaluation and reset the site event clock. Finally, PPL noted that a similar event had occurred in 2001 when air migration occurred from the disassembled Unit 1 #1 MSV to the 'B' outboard MSIV (OM 333189).

While secondary containment was not required for Unit 1 at this time, the Unit 1 RB (HVAC Zone I) was connected with the online, operating Unit 2's RB (HVAC Zone II) and the common refueling floor (HVAC Zone III) via the recirculation plenum. Therefore, Unit 1 secondary containment was established. When secondary containment is established, it is maintained at a minimum of 0.25" water vacuum. When the 'D' outboard MSIV poppet was removed, a ventilation pathway was created from the Unit 1 turbine building to the Unit 1 RB. In an accident scenario, the SGTS would have to draw down all three zones to greater than or equal to 0.25" water vacuum. The additional opening in Unit 1 secondary containment via the MSIV-MSV pathway would cause the SGTS to incur additional time to drawdown the zones to that criterion. Subsequent to the issue, PPL performed a calculation, under CR 1559808, that determined that with the additional opening in secondary containment, the SGTS system drawdown time was 390 seconds. Based on PPL calculation, EC-RADN-1170, "DBA-LOCA Dose Analysis," this value was less than 600 seconds which was a pre-established value to ensure that offsite dose consequences did not exceed 10 CFR 50.67 limits. Based on this, PPL retracted the ENS.

The inspectors reviewed the CR and noted that 390 seconds exceeded TS R 3.6.4.1.4 requirements. SR 3.6.4.1.4 requires that a single train of the SGTS system be able to drawdown the secondary containment configuration in the times allotted in the TS bases. The TS bases table for SR 3.6.4.1.4 designates 300 seconds as the maximum time for the combination of Zones I, II, and III. Since PPL's calculated value of 390 seconds exceeded the SR 3.6.4.1.4 value of 300 seconds, the SR was not met and secondary containment should have been considered inoperable per TS SR 3.0.1. After the inspectors made PPL aware of this issue, PPL revised their calculation and determined

that a single train of SGTS system would have drawn down the secondary containment in approximately 255 seconds.

The inspectors determined that improperly performing maintenance that affected safety-related equipment to include the SGTS and secondary containment was a performance deficiency. PPL entered this issue in their CAP via CRs 1558764, 1558718, and 1560235 and performed a RCA on this issue as well as another recent secondary containment issue. PPL's RCA associated its root causes with the safety culture aspect of H.2(c), Human Performance - Resources. While the inspectors agreed that H.2(c) was the most appropriate aspect common to the root causes, they determined that Human Performance - Coordination, H.3(b), was the most appropriate safety culture aspect specific to the MSIV-MSV issue. PPL agreed with this determination.

Analysis. Improperly performed MSIV and MSV maintenance was a performance deficiency within PPL's ability to foresee and correct. The finding was not subject to Traditional Enforcement because the issue was not willful, did not impact the regulatory process, or have actual safety consequence. This finding was considered more than minor because it was similar to IMC 0612, Appendix E, examples 3.j and 3.k in that a physical plant condition and subsequent engineering calculation resulted in a condition where there was reasonable doubt on the operability of a system or component, in this case secondary containment. Further, the performance deficiency affected the procedure quality and SSC and barrier performance attributes of the Barrier Integrity cornerstone and its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. In this case, lack of coordination resulted in a loss of reasonable assurance that secondary containment was operable. The issue screened to Green via IMC 0609, Attachment 4, since it did not represent a degradation of the barrier function of the control room, did not represent an actual open pathway in the physical integrity of reactor containment, and did not involve the actual reduction in function of hydrogen igniters in containment.

The issue was determined to have a cross-cutting aspect in the area of Human Performance to plan and coordinate work activities, consistent with nuclear safety. In this case, the MSV and MSIV work activities were not coordinated amongst various departments to address the operational impact of sequence changes on plant configuration. [H.3(b)]

Enforcement. TS 5.4.1, "Procedures," require, in part, that "written procedures shall be established, implemented, and maintained covering the following activities: a. the applicable procedures recommended in RG 1.33, Revision 2, Appendix A." RG 1.33, Revision 2, Appendix A, Section 9.a, "Procedures for Performing Maintenance," states in part, that "maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to this, during the 2012 refueling outage on Unit 1maintenance was not properly pre-planned and performed in that an unforeseen affect on safety-related equipment performance occurred which impacted the operating unit, Unit 2. Since this issue was entered into PPL's CAP as CR 1560235, it is being treated as an NCV in accordance with the NRC's Enforcement Policy. **(05000387;388/2012003-04, Improperly Performed Maintenance Impacts Secondary Containment)**

1R18 Plant Modifications

.1 Temporary Modifications (71111.18 – 1 sample)

a. Inspection Scope

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

- Units 1 and 2, SDHR supplied to both units' fuel pool cooling (FPC) HXs

b. Findings

No findings were identified.

.2 Permanent Plant Modifications (2 samples)

a. Inspection Scope

The inspectors evaluated the permanent plant modifications listed below to determine whether the changes adversely affected system or support system availability, or adversely affected a function important to plant safety. The inspectors reviewed the associated system design bases, including the FSAR, TSs, and assessed the adequacy of the safety determination screenings and evaluations. The inspectors also assessed configuration control of the changes by reviewing selected drawings and procedures to verify whether appropriate updates had been made. The inspectors compared the actual installations to the permanent modification documents to determine whether the implemented changes were consistent with the approved documents. The inspectors reviewed selected post-installation test results to evaluate whether the actual impact of the changes had been adequately demonstrated by the test. Documents reviewed are listed in the Attachment.

- Unit 1, installation of seismic island associated with SCBL penetration
- Unit 1, Reactor recirculation decontamination flange modification

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the

maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Unit 1, '1B' RHR pump motor replacement
- Unit 1, reactor cavity to drywell seal extruded
- Unit 1, swap of breaker 1D62513
- Unit 1, '1A' RRP motor generator (MG) set drive motor replacement
- Unit 1, pressure test of '1A' reactor recirculation loop
- Unit 2, RHR F008 valve restoration following MSO modification
- Unit 2, 'B' EDG restoration following MSO modification and relay work
- Unit 2, '2B' 4kV bus restoration following MSO modification

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 3 samples)

.1 Unit 1 Refuel Outage (RFO)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 refueling outage (1R17), which was conducted March 31 through June 7, 2012. The inspectors reviewed PPL's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and fuel receipt inspections

- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

.2 Unit 2 Maintenance Outage

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance outage, which was conducted May 29 through June 15, 2012. The inspectors reviewed PPL's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

.3 Unit 1 Forced Outage for RCS Leakage

a. Inspection Scope

On June 15, 2012, Unit 1 drywell unidentified leakage began to increase. On June 19, Unit 1 commenced a shutdown to conduct an inspection to identify the source of the leak. The leakage had increased from 0.13 gallons per minute (gpm) to 1.62 gpm over a 4 day period. PPL identified a leak in the weld for a 4-inch decontamination pipe connection on the 28 inch diameter '1A' reactor recirculation loop and determined that the cause of the leak was vibration induced fatigue of the weld. The connection is

designed to be used on an infrequent basis during outage periods to decontaminate the reactor coolant system piping. The vibration resulted from harmonic frequencies associated with reactor recirculation pump operation. PPL repaired the cracked weld and also shortened the length of the decontamination connection pipe on both recirculation pump loops to remove the pipes' susceptibility to the recirculation pump harmonics. Additionally, PPL conducted an extent of condition review and did not identify similar issues. The resident inspectors and a regional specialist reviewed the circumstances surrounding the event. The resident inspectors monitored the shutdown, repair activities, and PPL's immediate corrective actions. The inspectors reviewed PPL's evaluation of the cause of the cracked weld as well as corrective actions taken, and concluded the plant was safe for restart. On June 30, PPL performed a reactor startup of Unit 1 and connected to the grid on July 2. During the outage and through reactor startup, as appropriate, inspectors performed the activities below to verify PPL's controls over outage activities:

- Shutdown activities – monitored the shutdown, cooldown and transfer to the shutdown cooling mode of decay heat removal;
- Outage activity control – monitored or verified the following:
  1) Clearance activities
  2) RCS Instrumentation
  3) Electrical power
  4) Decay heat removal and spent fuel pool cooling
  5) Inventory and reactivity control
  6) Containment closure
  7) Fatigue management
- Drywell - walkdowns after shutdown;
- Monitoring of Heatup and Startup Activities, and
- Identification and Resolution of Problems – reviewed CAP entries to verify an adequate threshold for issues and appropriate corrective actions.

During the conduct of the inspection activities, the inspectors reviewed the associated documentation to ensure that the tasks were performed safely and in accordance with plant TS requirements and operating procedures.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 9 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 technical specifications, 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, feedwater valves 10A(B) LLRT (PCIV)
- Unit 1, 'D' outboard MSIV as-found LLRT (PCIV)
- Unit 1, SE-100-007 emergency service water (ESW)/RHRSW functional test at 1C201B
- Unit 2, quarterly calibration of drywell pressure channels PS-E11-2N011A,B,C,D
- Unit 2, quarterly SBLC flow surveillance
- Unit 2, MSIV stroke time testing
- Unit 2, quarterly RHRSW flow surveillance, Division I
- Common, 'E' EDG monthly surveillance
- Common, 'B' EDG monthly surveillance

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The Nuclear Security and Incident Response (NSIR) headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) located under the ADAMS accession number ML12108A039, as listed in the Attachment.

PPL transmitted the EPIP revisions to the U.S. Nuclear Regulatory Commission (NRC) pursuant to the requirements of 10 CFR 50, Appendix E, Section V, "Implementing Procedures." The NRC review was not documented in a safety evaluation (SE) report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety (PS)

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Radiological Hazard Assessment

a. Inspection Scope

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 and exposure control measures for both individual and collective exposures, (2) verify PPL is properly identifying and reporting Occupational Radiation Safety cornerstone performance indicators, and (3) identify those performance deficiencies that were reportable as a performance indicator and which may have represented a substantial potential for overexposure of the worker.

During the inspection on April 2, 3, and 10 through 13, 2012, the inspectors interviewed the radiation protection manager (RPM), radiation protection supervisors, and radiation workers. The inspectors performed walkdowns of various portions of the plant, performed independent radiation dose rate measurements, observed work activities in radiological control areas (RCAs) 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.

The inspectors conducted walkdowns and independent radiation measurements in the facility, including radioactive waste processing, storage, and handling areas to evaluate material and radiological conditions.

The inspectors selected the following radiologically risk-significant work activities that involved exposure to radiation:

- Refuel activities on RB 818'
- Control rod drive (CRD) change out under vessel
- In Service Inspection (ISI) work inside the drywell

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the radiological survey program to determine if radiological hazards were properly identified (e.g., discrete radioactive hot particles, alpha emitters contamination, transuranics and hard to detect nuclides in air samples, transient dose rates, and large gradients in radiation dose rate).

The inspectors observed work in potential airborne areas and evaluated whether the air samples from abrasive prep work inside the drywell, pressure safety valve (PSV) breach on the '1A' LOOP of RHR, and preparation of a pipe end during the SCBL modification, were representative of the breathing air zone and were properly evaluated. The inspectors evaluated whether continuous air monitors (CAMs) (e.g., particulate, iodine and noble gas (SPING) monitors), were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated PPL's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to Instructions to Workers.

The inspectors reviewed the following RWPs used to access high radiation areas (HRA) and evaluated if the specified work control instructions and control barriers were consistent with TS requirements for HRAs.

- 20121372 ISI: Piping/Hangers/Erosion Corrosion outside of bioshield (nozzle) doors and N9 Nozzle inside drywell, estimated dose - 9.14 person-rem
- 20121002 ISI: (In vessel, Dryer, Separator); control rod blades (CRB), and low power range monitors (LPRM) exchange activities, estimated dose – 8.516 person-rem
- 20121320: Scaffolding work in the drywell, estimated dose – 7.83 person-rem

For these RWPs, the inspectors assessed whether allowable stay times or permissible dose for radiologically significant work under each RWP were clearly identified. The inspectors evaluated whether electronic personal dosimeter (EPD) alarm setpoints were in conformance with survey indications and plant procedural requirements.

The inspectors reviewed three occurrences where a worker's EPD noticeably malfunctioned or alarmed.

- Scaffold foreman working on 738' elevation in the drywell
- ISI worker working on 704' elevation in the RB (reactor water clean-up (RWCU) line)
- Scaffold worker working on 704' elevation in the drywell

The inspectors evaluated whether workers responded appropriately to the off-normal condition (ON). The inspectors assessed whether the issue was included in the CAP and whether compensatory dose evaluations were conducted as appropriate.

For work activities that could suddenly and severely increase radiological conditions, the inspector assessed PPL's means to inform workers of these changes that could significantly impact their occupational dose.

Contamination and Radioactive Material Control

The inspectors observed Units 1 and 2 control point locations where PPL monitors potentially contaminated material leaving the RCA and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures. The inspectors assessed whether the radiation monitoring instrumentation used for equipment release and personnel contamination surveys had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed PPL's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

Radiological Hazards Control and Work Coverage

The inspectors evaluated ambient radiological conditions and performed independent radiation measurements during the walkdown of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, RWPs, and associated worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage and contamination controls. The inspectors evaluated PPL's use of EPDs in high noise areas that were also high radiation areas.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with PPL procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that PPL properly implemented an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures.

- 20121120 abrasive preparation work for ISI
- 20121101 breach and decontamination HV151F024A valve
- 20121404 prepare pipe ends on SCBL modification
- 20121401 pressure safety valve breach (on '1A' LOOP RHR)

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels. The inspectors assessed applicable containment barrier integrity and the operation of temporary high-efficiency particulate air ventilation systems.

The inspectors examined the posting and physical controls for selected HRAs and VHRAs to verify conformance with the occupational performance indicator.

b. Findings

No findings were identified.

.2 Risk-Significant High Radiation Area and VHRA Control

Radiation Worker Performance

a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place, and whether their behavior reflected the level of radiological hazards present.

The inspectors reviewed CR 1554733, 1551403, 1552201, and 1552204 radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by PPL to resolve the reported problems.

Radiation Protection Technician Proficiency

The inspectors observed the performance of the radiation protection technicians with respect to radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP controls/limits, and whether their behavior was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed CR 1551799, 1551854, and 1555998 radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by PPL to resolve the reported problems.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by PPL at an appropriate threshold and were 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 that involve radiation monitoring and exposure controls. The inspectors assessed PPL's process for applying operating experience (OE) to their plant.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

This area was inspected during April 2, 3, and 10 through 13, 2012, to assess performance with respect to maintaining occupational individual and collective radiation exposures ALARA. The inspectors used the requirements in 10 CFR Part 20, guidance in RG 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be ALARA," RG 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposure ALARA," the TSs, and PPL's procedures required by TSs as criteria for determining compliance.

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed pertinent information regarding Susquehanna collective dose history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed the site's three year rolling average collective exposure.

The inspectors compared the site-specific trends in collective exposures against the industry average values and those values from similar vintage reactors. In addition, the inspectors reviewed any changes in the radioactive source term by reviewing the trend in average contact dose rate with reactor recirculation piping. The inspectors reviewed site-specific procedures associated with maintaining occupational exposures ALARA,

which included a review of processes used to estimate and track exposures from specific work activities.

b. Findings

No findings were identified.

.2 Radiological Work Planning

a. Inspection Scope

The inspectors selected the following work activities that had the highest exposure significance.

- 20121372 ISI: Piping/Hangers/Erosion Corrosion outside of bioshield (nozzle) doors and N9 Nozzle inside Dry Well, estimated dose – 9.14 person-rem
- 20121002 ISI: (In vessel, Dryer, Separator); CRB, and LPRM exchange activities, estimated dose – 8.516 person-rem
- 20121320: Scaffolding work in the drywell, estimated dose – 7.83 person-rem

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure reduction requirements. The inspectors determined whether PPL reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors assessed whether PPL's planning identified appropriate dose reduction techniques; considered alternate dose reduction features; and estimated reasonable dose goals. The inspectors evaluated whether PPL's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment. The inspectors determined whether PPL's work planning considered the use of remote technologies as a means to reduce dose and the use of dose reduction insights from industry OE and plant-specific lessons learned. The inspectors assessed the integration of ALARA requirements into work procedure and RWP documents.

b. Findings

Introduction. The inspectors identified a Green NCV of T.S. 5.4.1.a, "Procedures," involving PPL's failure to implement radiation protection procedures when the SAC reviewed work packages for the Unit 1, 17th Refueling and Inspection Outage (U117RIO). Specifically, the SAC failed to review the work package for the scaffold work inside the drywell.

Description. On January 30, 2012, the SAC met and determined the U117RIO presentations that they would review. The review is performed by SAC to challenge work groups to lower dose and ensure all aspects of the work include risk insights or radiological safety and the need for planned contingencies, compensatory actions, and abort criteria. The committee selected from a list of RWP work activities that included all tasks greater than one (1) person-rem. The committee selected the refuel floor, ISI, and operations for review in February, and the CRD/under vessel, snubbers, and

suppression pool diving for review in March. The scaffold work inside the drywell was on the list and was not selected. The scaffold work inside the drywell was estimated to be 7.200 person-rem. Susquehanna Procedure NDAP-QA-1191, "ALARA Program and Policy," Appendix A, Section 3.9(b) requires the SAC to review job specific RWP evolutions where the initial dose estimate is greater than 5 person-rem (for outage work). The scaffold work was never reviewed by the SAC.

Analysis. The failure to complete the actions of NDAP-QA-1191, Appendix A, is a performance deficiency. Specifically, Procedure NDAP-QA-1191, Appendix A, step 3.9 (b), requires the SAC to review job specific RWP evolutions where the initial dose estimate is greater than 5 person-rem (for outage work). This performance deficiency was within PPL's ability to foresee and correct, and should have been prevented. This issue is not subject to traditional enforcement in that it did not have actual safety consequence, it was not an issue that had the potential to impact NRC's ability to perform its regulatory function, and there were no willful aspects.

The finding is more than minor, because it affects the Radiation Safety - Occupational Radiation Safety cornerstone objective of protecting worker health and safety from exposure to radiation and the attribute of program and process. Specifically, PPL did not review the ALARA approach defined in the RWP prior to the U117RIO. The lack of review could have missed opportunities to reduce worker exposures.

Using the Occupational Radiation Safety SDP, the inspectors determined that the finding screened as very low safety significance (Green) because even though it was an ALARA issue, the site's three year rolling average is less than 240 person-rem and it did not involve: (1) an overexposure, (2) a substantial potential for overexposure, or (3) an impaired ability to assess dose. This finding was caused by personnel not complying with the procedure requirements that resulted in a lack of planning and review of a risk significant task. Consequently, the cause of this deficiency had a cross-cutting aspect in the area of Human Performance - Work Controls (H.3(a)). Specifically, PPL failed to appropriately plan the scaffold work activity by incorporating risk insights or radiological safety and the need for planned contingencies, compensatory actions, and abort criteria.

Enforcement. TS 5.4.1.a., "Procedures," requires that the licensee establish, implement, and maintain procedures specified in RG 1.33, Revision 2, Appendix A. RG 1.33, Appendix A, section 7(e), requires that procedures for the ALARA program shall be established and implemented. Procedure NDAP-QA-1191, "ALARA Program and Policy," Appendix A, step 3.9 (b), requires the SAC review job specific RWP evolutions where the initial dose estimate is greater than 5 person-rem (for outage work). Contrary to this requirement, prior to the Unit 1, 17th Refueling and Inspection Outage, the SAC did not review the RWP evolution for scaffold work inside the drywell where the initial dose estimate was 7.200 person-rem (greater than 5 person-rem). Because this finding is of very low safety significance and has been entered into PPL's CAP as CR 1555458, this violation is being treated as an NCV, consistent with NRC Enforcement Policy. (**NCV 05000387/2012003-05, Failure to Follow Radiation Protection Procedures)**

.3 Verification of Dose Estimates and Exposure Tracking Systems

a. Inspection Scope

The inspectors reviewed the assumptions and basis for the current annual collective exposure estimate for accuracy. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and for department and station dose goals.

The inspectors evaluated whether PPL had established measures to track, trend, and if necessary, to reduce occupational doses for ongoing work activities. The inspectors assessed whether dose threshold criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated PPL's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates were based on sound radiation protection and ALARA principles or if they were just adjusted to account for failures to plan/control the work.

b. Findings

No findings were identified.

.4 Source Term Reduction and Control

a. Inspection Scope

The inspectors used PPL records to determine the historical trends and current status of plant source term known to contribute to elevated facility collective exposure. The inspectors assessed whether PPL had made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

b. Findings

No findings were identified.

.5 Radiation Worker Performance

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice (e.g., workers are familiar with the work activity scope and tools to be used, workers used ALARA low-dose waiting areas) and whether there were any procedure compliance issues.

b. Findings

No findings were identified.

.6 Problem Identification and Resolution

a. Inspection Scope

The inspectors evaluated whether problems associated with ALARA planning and controls are being identified by PPL at an appropriate threshold and were properly addressed for resolution in its CAP.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

The inspectors reviewed the FSAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. This review included instruments used to identify changing airborne radiological conditions such that actions to prevent an overexposure may be taken. The review included an overview of the respiratory protection program and a description of the types of devices used. The inspectors reviewed the FSAR, TSs, and emergency preparedness (EP) documents to identify location and quantity of respiratory protection devices stored for emergency use. Inspectors reviewed PPL's procedures for maintenance, inspection, and use of respiratory protection equipment including self-contained breathing apparatus (SCBA), as well as procedures for air quality maintenance.

The inspectors reviewed reported performance indicators to identify any related to unintended dose resulting from intakes of radioactive material.

b. Findings

No findings were identified.

.1 Engineering Controls

a. Inspection Scope

The inspectors reviewed PPL's use of permanent and temporary ventilation to determine whether PPL uses ventilation systems as part of its engineering controls to control airborne radioactivity. The inspectors reviewed procedural guidance for use of installed plant systems to reduce dose and assessed whether the systems are used, to the extent practicable, during high-risk activities.

The inspectors selected one installed ventilation system used to mitigate the potential for airborne radioactivity, and evaluated whether the ventilation system operating parameters, were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable.

The inspectors selected two temporary ventilation system setups used to support work in contaminated areas. The inspectors assessed whether the use of these systems is consistent with PPL procedural guidance and ALARA concept.

The inspectors reviewed airborne monitoring protocols by selecting one installed system used to monitor and warn of changing airborne concentrations in the plant and evaluating whether the alarms and setpoints are sufficient to prompt licensee/worker action to ensure that doses are maintained within the limits of 10 CFR Part 20 and the ALARA concept.

The inspector assessed whether PPL had established threshold criteria for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05)

This area was inspected during the week of June 18 through 22, 2012, to verify PPL is assuring the accuracy and operability of radiation monitoring instruments that are used to protect occupational workers and to protect the public from nuclear power plant operations. The inspectors used the requirements in 10 CFR Part 20, 10 CFR Part 50 Appendix A - Criterion 60, “Control of Release of Radioactivity to the Environment and Criterion 64, Monitoring Radioactive Releases,” 10 CFR Part 50, Appendix I, “Numerical Guides for Design Objectives and LCO to meet the Criterion ALARA for Radioactive Material in Light-Water - Cooled Nuclear Power Reactor Effluents," 40 CFR Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations,” NUREG 0737, “Clarification of Three Mile Island Corrective Action Requirements,” the TS/Offsite Dose Calculation Manual (ODCM), applicable industry standards, and PPL’s procedures required by TSs as criteria for determining compliance.

1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the FSAR to identify radiation instruments associated with monitoring area radiation, airborne radioactivity, process streams, and effluents. Additionally, the inspectors reviewed the associated TS requirements for post-accident monitoring instrumentation. The inspectors reviewed a listing of in-service survey instrumentation including air samplers and small article monitors, along with radiation monitoring instruments used to detect and analyze workers’ external contamination as well as, external dose. Additionally, the inspectors reviewed personnel contamination monitors and portal monitors including whole-body counters to detect workers’ surface and internal contamination. The inspectors assessed whether an adequate number and type of instruments were available to support operations.

The inspectors reviewed PPL and third-party evaluation reports of the radiation monitoring program since the last inspection.

The inspectors reviewed procedures that govern instrument source checks and calibrations, focusing on instruments used for monitoring transient high radiological conditions, including instruments used for underwater surveys. The inspectors reviewed the calibration and source check procedures for adequacy. The inspectors reviewed the area radiation monitor alarm setpoint values and bases as provided in the TSs and the FSAR.

The inspectors reviewed effluent monitor alarm setpoint bases and the calculation methods provided in the ODCM.

b Findings

No findings were identified.

.2 Walkdowns and Observations

a. Inspection Scope

The inspectors walked down three effluent radiation monitoring systems (RMS), including at least one liquid and one gaseous effluent system. Focus was placed on flow measurement devices and all accessible point-of-discharge liquid and gaseous effluent monitors. The inspectors assessed whether the effluent/process monitor configurations align with what is described in the FSAR.

The inspectors selected ten portable survey instruments in use or available for issuance and assessed calibration and source check stickers for currency, as well as, instrument material condition and operability.

The inspectors observed PPL staff performance as the staff demonstrated source checks for three different types of portable survey instruments. The inspectors assessed whether high-range instruments are source checked on all appropriate scales.
The inspectors walked down seven area radiation monitors and five continuous air monitors to determine whether they are appropriately positioned relative to the radiation sources or areas they were intended to monitor. Selectively, the inspectors compared monitor response (via local readout or remote control room indications) with actual area radiological conditions for consistency.

The inspectors selected five personnel contamination monitors, five portal monitors, and two small article monitors and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and PPL procedures.

b. Findings

No findings were identified.

3. Calibration and Testing Program

Process and Effluent Monitors

a. Inspection Scope

The inspectors selected three effluent monitor instruments and evaluated whether channel calibration and functional tests were performed consistent with TSs/ODCM. The inspectors assessed whether: (a) PPL calibrated its monitors with National Institute of Standards and Technology (NIST) traceable sources; (b) the primary calibrations adequately represented the plant nuclide mix; (c) when secondary calibration sources were used, the sources were verified by comparison with the primary calibration source; and (d) PPL's channel calibrations encompassed the instrument's alarm setpoints.

The inspectors assessed whether the effluent monitor alarm setpoints are established as provided in the ODCM and station procedures.

For changes to effluent monitor setpoints, the inspectors evaluated the basis for changes to ensure that an adequate justification existed.

b. Findings

No findings were identified.

Laboratory Instrumentation

a. Inspection Scope

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicate that the frequency of the calibrations is adequate and there were no indications of degraded performance.

The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded performance.

b. Findings

No findings were identified.

Whole Body Counter

a. Inspection Scope

The inspectors reviewed the methods and sources used to perform functional checks on the whole body counter (WBC) before daily use and assessed whether check sources were appropriate and align with the plant's isotopic mix.

The inspectors reviewed calibration records for the WBC since the last inspection and evaluated whether calibration sources were representative of the plant radionuclide mix and that appropriate calibration phantom(s) were/was used. The inspectors looked for anomalous results or other indications of instrument performance problems.

b. Findings

No findings were identified.

Post-Accident Monitoring Instrumentation

a. Inspection Scope

Inspectors reviewed the calibration documentation for the drywell high-range monitors.

The inspectors assessed whether an electronic calibration was completed for all range decades and were also calibrated using an appropriate radiation source.

The inspectors assessed whether calibration acceptance criteria are reasonable, considering the large measuring range and the intended use of the instrument.

The inspectors selected two effluent/process monitors that are relied on by PPL in its EOPs as a basis for triggering emergency action levels (EALs) and subsequent emergency classifications, or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments.

The inspectors reviewed PPL's capability to collect high-range, post-accident effluent samples.

The inspectors did not observe electronic and radiation calibration of those instruments associated with the post accident effluent sampling as no opportunity was available.

b. Findings

No findings were identified.

Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors

a. Inspection Scope

The inspectors selected two of each type of these instruments and verified that the alarm setpoint values are reasonable under the circumstances to ensure that licensed material is not released from the site.

The inspectors reviewed the calibration documentation for each selected instrument and reviewed the calibration methods to determine consistency with the manufacturer's recommendations.

b. Findings

No findings were identified.

Portable Survey Instruments, Area Radiation Monitors, Electronic Dosimetry, and Air Samplers/Continuous Air Monitors

a. Inspection Scope

The inspectors reviewed calibration documentation for at least one of each type of portable instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and reviewed the use of its instrument calibrator as applicable.

The inspectors were not able to locate any portable survey instruments that did not meet acceptance criteria during calibration or source checks to assess whether PPL had taken appropriate corrective action for instruments found significantly out of calibration (greater than 50 percent). The inspectors did evaluate whether PPL evaluated the possible consequences associated with the use of an instrument that is "out-of calibration" since the last successful calibration or source check.

b. Findings

No findings were identified.

Instrument Calibrator

a. Inspection Scope

The inspectors reviewed the current radiation output values for PPL's portable survey and area radiation monitor instrument calibrator unit(s). The inspectors assessed whether PPL periodically verifies calibrator output over the range of the exposure rates/dose rates using an ion chamber/electrometer.

The inspectors assessed whether the measuring devices had been calibrated by a facility using NIST traceable sources and whether decay corrective factors for these measuring devices were properly applied by PPL in its output verification.

b. Findings

No findings were identified.

Calibration and Check Sources

a. Inspection Scope

The inspectors reviewed PPL's source term or waste stream characterization per 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

b. Findings

No findings were identified.

Problem Identification and Resolution

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by PPL at an appropriate threshold and were properly addressed for resolution in PPL CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by PPL that involve radiation monitoring instrumentation.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 6 samples)

.1 Mitigating Systems Performance Index (MSPI) (4 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 2011 through March 2012:

- Units 1 and 2, High Pressure Injection Systems, MS07, July 2011 – March 2012
- Units 1 and 2, Cooling Water Systems, MS10, July 2011 – 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. The inspectors also reviewed PPL's operator narrative logs, condition reports, 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.

.2 Reactor Coolant System (RCS) Leak Rate (2 samples)

a. Inspection Scope

The inspectors reviewed PPL's submittal for the RCS leak rate performance indicator for both Unit 1 and Unit 2 for the period of March 2010 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. The inspectors also reviewed control room logs of daily measurements for RCS leakage, and compared that information to the data reported by the performance indicator. Additionally, the

inspectors observed surveillance activities that determined the RCS identified leakage rate.

b. Inspection Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of PI&R Activities

a. Inspection Scope

As specified by IP 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 screening meetings.

The inspector reviewed a sample of CRs initiated during ISI examinations this outage for evaluation of problem identification characterization and corrective action(s) that were placed in the corrective action process. Also, one Customer Notification Form (CNF) was reviewed by the inspectors which recorded an indication that was seen last outage on the Unit 1 steam dryer. PPL reviewed results of NDE performed this outage to determine if any change had occurred during this operating cycle. The results of the visual examination performed this outage (CNF In-Vessel Visual Inspection (IVVI) 12-03) confirmed there was no change in the indication size, orientation, and characteristics.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by IP 71152, "PI&R," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by PPL outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed PPL's CAP database for the first and second quarters of 2012 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed the PPL quarterly trend report for the first quarter of 2011 through first quarter of 2012, conducted under NDAP-QA-0710, "Station Trending Program," Revision 6, to verify that PPL

personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

Substantive Cross-Cut in CAP – Evaluation (P.1(c))

On March 1, 2012, the NRC issued its End-of-Cycle Assessment Letter to PPL regarding Susquehanna performance from January 1, 2011 through December 30, 2011 (ML12061A021). In the letter, the NRC sustained a substantive cross-cutting issue (SCCI) in the CAP component of the PI&R cross-cutting area (CCA). Specifically, there were six findings with a PI&R cross-cutting aspect of P.1(c) - Evaluation of Identified Problems - during the assessment period. The same theme was identified in the 2011 Mid-Cycle assessment (ML112430469) and 2010 Annual Assessment letter (ML10260317). As part of the semi-annual trend review, the inspectors reviewed PPL's scope of efforts and progress in addressing the theme. Specific to this inspection, the inspectors reviewed RCAs on performance issues related to operability determinations, and the cross-cutting theme/SCCI in P.1(c). Additionally, the inspectors reviewed PPL's incorporation of a risk-informed screening and evaluation to their CAP.

RCA 1502875 on Operability Determinations

The inspectors observed that:

- The documentation of one corrective action, to add operability determinations to a departmental improvement matrix, implied it was not completed as intended. The review of the published matrix correspondingly suggested the gap in these evaluations was incorporated into another performance gap in Risk evaluations. PPL provided proof that the gaps were being tracked as two separate issues.
- The due date for a corrective action to develop operability determination training was extended twice and was due in late July. The delivery of that training to Operations staff is scheduled for August and the same training for Engineers remains scheduled for the same late July date for training development.
- An interim effectiveness review originally scheduled for May 18 was rescheduled to July 27. Two extensions of the review were incurred due to reliance on two corrective actions that were delayed one month.
- RCA corrective actions completed or planned included procedural changes regarding documentation of operability reviews, second checks of initial operability determinations by another SRO, development and presentation of initial and continuing training for SROs, and similar training for engineers who perform followup operability evaluations.

RCA 1461742 on P.1(c) SCCI

- The first interim effectiveness review was due March 29 and was changed to August 24 since three corrective actions were incomplete by their original due date. The inspectors noted that the final interim effectiveness review due on September 27 was not extended to be reflective of the change in the first interim review.

- RCA corrective actions include additional reviews for CAP extensions; procedural requirements for capturing NRC issues, questions, and deficiencies in CAP; and increased Regulatory Affairs actions and capabilities in CAP.

Incorporation of Risk-Informed Screening and Evaluation into CAP

- The inspectors compared CRs generated between January and June of 2011 to January and June 2012. There were 3858 CRs generated in the 2011 period and 7132 CRs generated in the 2012 period. This represented an average increase in CRs generated/month of 1.77.

  In the 2011 period, RCAs, ACEs, and Evaluations represented 0.26 percent, 2.05 percent, and 21.05 percent of all CRs respectively. In the corresponding 2012 period, the same categories were 0.17 percent, 0.91 percent, and 7.49 percent of all CRs. While the number of RCAs and ACEs remained relatively constant (10 vs. 12, 79 vs. 65), the number of Evaluations dropped from 812 to 534.

  Overall, the number of evaluation-type CRs (RCAs, ACEs, and Evaluations) dropped from 23.36 percent to 8.57 percent, or 901 to 611, of all CRs. Of the remaining 2012 period CRs, 4435 were coded as Level 4 Correct CRs and 2163 were coded as Level 4 Closure CRs.

  Taken collectively, data regarding the number of CRs generated indicates that, in general, PPL continues to enter issues into the CAP at a low threshold. Other data regarding RCAs, ACEs, and Evaluations reflects, in part, the number of CAP initiatives and changes that PPL has undertaken in the last year.

Secondary Containment Challenges

The inspectors observed a negative trend associated with the number of secondary containment challenges during their review. PPL's response to some of these issues included completion of an RCA on secondary containment:

- TS 3.6.4.1, "Secondary Containment," was entered on the following dates in 2012 due to a loss, at least, of Zone III HVAC; April 13, April 23, April 30, May 2, May 4, May 5, May 16, May 16, June 4, and June 12
- TS 3.6.4.1, "Secondary Containment," was entered on the following dates in 2012 for a loss of Zone I HVAC
  - April 17 for work on an MSIV and MSV with Zone I aligned to recirculation plenum that resulted in an opening in secondary containment
  - April 13 and April 23 due to loss of motor control centers 1B270 and 1B280
  - June 12 due to a loss of differential pressure
- A breach of secondary containment during preparations for a Feed and Bleed of Unit 1 RBCW without entering the associated TS 3.6.4.2
- LER 05000387/2012-003 issued for Unit 1 exceeding its SCBL TS limit during LLRT
- LER 05000387/2012-004 issued in June 2012 regarding the Nitrogen spectacle flange being open greater than its allowed completion times of TS 3.6.4.2
- A recent Green NCV related to SCIVs and TS 3.6.4.2 (05000387;388/2011003-01), and a recent Green NCV related to an inadequate TS SR implementing procedure for secondary containment drawdown testing (05000387;388/2012004-05).

H2O2 Analyzer Challenges

The inspectors observed that PPL entered the TRO for H2O2 inoperability on the following dates for reasons other than maintenance:

- August 4, 2011, '2B' Failed Channel Check Criteria
- September 9, 2011, '2A' Failed Channel Check Criteria
- October 8, 2011, '2A' Failed Channel Check Criteria
- October 14, 2011, '2A' Failed Channel Check Criteria
- February 22, 2012, '2A' TRO 3.0.3/3.3.4C
- February 25, 2012, '1A' H2 Channel upscale
- June 4, 2012, '1A' O2 Channel upscale
- June 13, 2012, '2B' Inoperable
- June 17, 2012, '2B' O2 Cell high and outside agreement criteria

Pressure Safety Valves (PSVs)

The inspectors observed a observed a negative trend associated with the number of PSVs or pressure relief valves (PRVs) failures over the first two quarters of 2012.

- January 4, PSV11022A, RBCCW 'A' HX leaking
- February 1, PSV20405C FWH 5C shell PSV leaking
- February 14, PSV05730 on liquid nitrogen tank leaking
- March 13, PSV12504A Instrument Air Compressor TBCCW leaking
- March 28, PSV152F012B Core Spray Division II Discharge Header failed high as-found testing
- April 4, PSV10613A RFP Suction Relief Valve failed as-found testing
- April 4, PSV10613B RFP Suction Relief Valve failed as-found testing
- April 19, PSV11213A RHR HX A RHRSW outlet failed high in as-found testing
- April 11, PSV151F025A LPCI Injection loop 'A' failed as-found testing
- April 23, PSV151F029 RHR suction from reactor failed as-found testing
- April 25, PSV151F126 Shutdown cooling suction line failed low in as-found testing
- April 26, PSV15106B RHR HX 'B' failed high in as-found testing
- April 26, PSV151F025B LPCI injection loop 'B' failed high in as-found testing
- April 27, PSV11213B RHR HX 'B' RHRSW outlet failed high as-found testing
- April 29, PSV148F029B SBLC Injection Pump 'A' failed as-found leakage testing
- April 30, PSV151F030A RHR pump 'A' suction failed as-found leakage testing
- May 9, PSV152F032A Core Spray Division I Suction Header failed high in as-found testing

AR/CRs with a Relay Equipment Issue Code

The inspectors observed a negative trend associated with an increase in the number of CRs that were due to equipment issues. During January to June of 2010, there were 14 CRs with a total for 2010 of 28 CRs. During January to June of 2011, there were 17 CRs with a total for 2011 of 33 CRs. During the first half of 2012, there were a total of 34 CRs. This value exceeds the previous first six months in 2010 and 2011 and already exceeds that for the entire year of 2011.

.3 Review of the Human Performance – Resources Procedural Quality H.2(c) SCCI Corrective Actions (71152A - 1 sample)

a. Inspection Scope

The inspectors reviewed the root cause evaluations and associated corrective actions from the open Human Performance – Resources - Procedural Quality H.2.(c) SCCI. The review included PPL's RCA, ACE, common cause evaluations, and individual CRs related to the 2011 and 2012 inspection findings associated with the (H.2.(c)) SCCI. The review focused on the 2012 operations and maintenance procedure upgrade program, a sample of PPLs current risk significant plant procedures, and the effectiveness of the 2003 - 2004 operations procedure upgrade program related to a prior human performance SCCI. The inspectors also reviewed the current site procedure revision process and the 2012 recovery team procedure upgrade process to determine the effectiveness and trends of both programs.

b. Findings and Observations

No findings were identified.

The station wide procedure upgrade program is a primary corrective action that is intended to reduce the probability of additional H.2(c) operations and maintenance human performance errors. PPL has developed the procedure upgrade guideline procedures and has identified the most risk significant procedures that will be revised to improve the format and content. The upgrade review plan was completed in February 2012 and the revised procedures are preliminarily scheduled to be completed by August 2016.

Procedure Upgrade Project Status

The procedure upgrade program prioritized the current 4667 technical procedures using the safety system association and site probabilistic risk assessment ranking. Plant technical procedures include Operations (surveillances, system operating procedures, off-normal procedures, emergency procedures, drain procedures, test procedures, and alarm response procedures) and Maintenance procedures (surveillances and instructions). The technical procedures were sorted into High priority (722 procedures), Medium priority (902 procedures), and Low priority (346 procedures). The remaining 2697 technical procedures were considered "not elevated risk significant." Only the high, medium, and low priority procedures will be revised using the procedure upgrade process.

The inspectors noted that PPL's risk ranking of the most significant procedures provides a reasonable method to ensure the proper prioritization is applied to the scheduled procedure revisions. Since April 2012, a total of 31 procedures were upgraded, reviewed, approved, and issued. The initial procedure revisions represent a noticeable improvement when compared to the existing plant procedures. The success of the procedure upgrade program is dependent upon a significant amount of effort from the site personnel to ensure the procedure revision schedule goals are met, management support, and continuous focus to ensure the project remains a site priority from start to completion.

The inspectors noted that a recent negative impact on the upgrade program scheduled activities was attributed to the unexpected and extended plant shutdowns during the first half of 2012. As a result, the plant impact has contributed to an increase in procedure change backlogs due to the limited personnel available to walk down and provide feedback on the upgraded procedures.

To summarize, the planned new procedure format and content changes should provide better human factored procedures and consistent written documents related to site personnel's frequently performed risk significant activities. The upgrade project is still in the early stages of implementation and the success of the program to reverse the current human performance procedure negative trend is dependent upon long term station support.

Existing Site Procedure Review and Revision Process

The inspectors reviewed a sample of eight current ON operating procedures that were not upgraded to the new standard. The inspectors noted some minor procedure deficiencies that were entered into PPL CAP.

The site procedure support group is processing the existing plant procedure change backlog in parallel with the new upgrade program. The number of Operations Procedure Changes Outstanding from January 2012 to date is 1284; Operations Procedure Revisions Open to date 893; and Operations Procedure Changes Completed in 2012 is 391. The Maintenance Procedure Changes Outstanding from January 2012 to date is 575; Maintenance Procedure Revisions Open to date is 465; and Maintenance Procedure Changes Completed in 2012 is 110.

Similar to the procedure upgrade program, the recent unexpected and extended plant shutdowns during the first half of 2012 have contributed to an increase in backlogs due to the limited personnel available to walk down and provide feedback on the existing plant procedures.

2003 – 2004 Operations Procedure Upgrade Project to Address Previous Human Performance SCCI

A Human Performance SCCI was identified in 2003 related to eight Green NRC findings that included examples of licensed and non-licensed operators not following procedures and examples of inadequate operating procedure content.

In response to the SCCI, PPL's corrective actions included an operations department procedure upgrade program that was initiated to improve the format and content of the ON, Annunciator Response, and System Operating procedures.

A dedicated procedure upgrade team was formed and initiated a comprehensive long term program to improve the operations procedures. After an initial six month effort to define the procedure upgrade process, the upgrade team revised, reviewed, approved, and issued a limited number of new procedures. Early in the process, the procedure upgrade program encountered numerous delays, inefficiencies, inconsistent resource commitments, and eventually lost management support for the project.

The inspectors noted that the lost momentum and initiative to upgrade the operating procedures, in 2004, was a missed opportunity to improve the content and consistent implementation of the operations department procedures; and reduce a contributor to additional human performance errors.

4OA3 Event Follow-up (71153 – 1 sample)

.1 Loss of One of Two Offsite Power Sources

a. Inspection Scope

On June 28, at approximately 1:53 p.m., Units 1 and 2 experienced a loss of the T20 startup transformer (T20), one of two offsite power sources, when it shutdown automatically. All ESS electrical busses fed by T20 automatically transferred to the other offsite power source (T10). Additionally, startup bus 20, which is normally fed from T20, automatically transferred to T10. The resident inspectors' response included immediately reporting to the control room to observe plant and PPL staff response and evaluation of the event, and general walkdown inspections of the T10, T20, and auxiliary bus equipment. PPL submitted ENS report 48055 for an unplanned, valid actuation of systems that mitigate the consequences of an accident.

b. Findings

No findings were identified.

4OA5 Other Activities

. 1 (Closed) NRC Temporary Instruction (TI) 2515/182 - Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks

a. Inspection Scope
PPL's buried piping and underground piping and tanks program was inspected in accordance with TI paragraphs 03.01.a through 03.01.c and verified all applicable aspects of NEI 09-14, "Guideline for the Management of Buried Piping Integrity," Revision 1, as set forth in Table 1 of the TI. Phase I of this TI is considered complete.

b. Findings

No findings were identified.

.2 Follow Up for Three or More SL IV Traditional Enforcement Violations in the Same Area in a 12-Month Period (92723 – 1 sample)

a. Inspection Scope

On February 9, 2011, in the 4th quarter 2010 resident inspection report (ML110400284), the NRC issued a SL IV violation of 10 CFR 50.9(a), "Completeness and Accuracy of Information," when MSPIs were not updated to reflect a change in PPL's MSPI basis document. This failure affected all five MSPIs on each unit and resulted in inaccurate reporting of MSPI values to the NRC for three consecutive quarters during 2010. After the correct values were updated, no PIs crossed the Green/White threshold.

On November 8, 2011, in the 3rd quarter 2011 resident inspection report (ML113120409), the NRC issued a SL IV violation of 10 CFR 50.9(a), “Completeness and Accuracy of Information,” when PPL inaccurately reported reactor coolant system (RCS) leakage values under the RCS leakage PI, BI02, from inception of the PI in April 2000 through June 2011. Since Susquehanna Units 1 and 2 do not have a TS limit for identified leakage, PPL should have used their maximum RCS total leakage calculation for each month and their TS limit for total leakage which is 25 gallons per minute. While PPL was correctly using the TS limit for total leakage in the PI, inspectors determined that PPL was incorrectly using their maximum identified leakage value resulting in a non-conservative PI value for both units. Upon review of all historical RCS PI data for Units 1 and 2, PPL noted slight reductions in margin, but no data crossed the Green/White threshold.

In the same report, the NRC issued a SL IV NOV of 10 CFR 55.25, "Incapacitation Because of Disability or Illness," for failing to notify the NRC of a known permanent change in medical status of a licensed operator, and 10 CFR 55.3, "License Requirements," for failing to ensure that an individual license holder, in the capacity of a reactor operator (RO), met the medical prerequisites prior to performing licensed operator duties. Specifically, biennial medical examinations conducted on April 16, 2009 and April 19, 2011 identified that an RO did not meet the health requirements stated in ANSI/ANS 3.4-1983, Section 5.4.5, "Eyes." However, PPL did not inform the NRC or request an amended license for the RO until August 2011. Therefore, the RO performed licensed duties without an NRC-approved, amended license from April 2009 through August 2011, until the NRC identified this issue. Upon notification, PPL submitted, and the NRC approved, a conditional license to address the disqualifying medical condition.

Therefore, during the 12-month period from the 4th quarter 2010 to 3rd quarter 2011, there were three traditional enforcement violations of SL IV significance which impacted the regulatory process. In response, the NRC elected to conduct an IP 92723 inspection and formally informed PPL of its intent via an NRC Annual Assessment letter dated March 1, 2012 (ML 12061A021).

The inspectors reviewed the ACE performed for each violation, an RCA conducted in response to a licensee-identified SL-IV violation in the 4th quarter of 2011 (ML 12045A383), a common cause analysis, related corrective actions, procedures, and relevant references to provide assurance that the causes of multiple traditional enforcement violations are understood by PPL, provide assurance that the extent of condition and extent of cause of multiple traditional enforcement violations are identified, and to provide assurance that PPL corrective actions to traditional enforcement violations are sufficient to address the causes. The inspectors conducted interviews with Plant Analysis, Quality Assurance (QA), Operations, Training, and Chemistry department personnel.

The inspectors also reviewed the IP 92702 follow-up inspection for the violation regarding inaccurately submitted MSPI data (ML112220409) and PPL's written response to the SL IV NOV related to a licensed operator medical issue. This included PPL’s written response (ML113420338) on December 10, 2009, describing the action taken to restore compliance and the actions planned to prevent recurrence.

b. Findings and Observations

No findings were identified.

In general, the inspectors determined that PPL had appropriately evaluated each issue, developed appropriate corrective actions, and implemented those actions in a timely manner. Corrective actions included revising procedures to better clarify requirements and expectations, training of personnel and management about these requirements and expectations, and ensuring accuracy of submitted PI data and licensed operator records. This review was limited to the traditional enforcement issues discussed above and did not include other issues resulting from additional PPL self-assessment activities.

The inspectors observed that the ACEs performed for the inaccurate MSPI and RCS leakage PI data submittals failed to evaluate prior opportunities to identify the problems as precursors. A total of three QA audits had reviewed the RCS leakage PI, did not identify the issue, and determined that the RCS leakage PI data was collected and reported in accordance with NEI 99-02 guidance. Also, MSPI data had never been evaluated during a QA audit.

PPL received a licensee-identified SL-IV violation in the 4th quarter 2011 Resident Inspection Report (ML12045A383) when an RO was removed from the requalification program for a period of six months and returned to licensed duties after three months of makeup training without obtaining NRC review. PPL recognized that previous corrective actions, extent of condition, and extent of cause evaluations of operator medical records were not broad enough to identify that the issues extended beyond medical requirements and subsequently performed an RCA. The inspectors determined that the corrective actions, extent of cause and extent of condition evaluations were reasonable as augmented by the expanded scope of the RCA.

4OA6 Meetings, Including Exit

On July 18, 2012, the inspectors presented inspection results to Mr. T. Rausch, Chief Nuclear Officer, and other members of his staff. PPL acknowledged the findings. No proprietary information is contained in this report.

4OA7 Licensee-Identified Violations

No findings were identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
J. Bakshi, Senior Engineer, BP Risk Ranking
L. Casella, Cathodic Protection Engineer
R. Collier, System Engineer
T. DeBortoli, Director, Program Excellence
R. Edwards, Support Engineer
D. Filchner, Nuclear Regulatory Affairs (NRA)
D. Flyte, PM, BP&T
R. Franssen, GM, Engineering
C. Goff, Training Manager
K. Griffith, Operations Training Supervisor
A. Iliadis, General Manager, Operations
R. Kessler, Radiation Operations Supervisor
R. Linden, ISI Specialist
D. Linebach, EM, ECT NDE Level III
D. Lock, Manager Nuclear Maintenance
C. Manges, Sr. Engineer, Regulatory Assurance
D. McGann, QA Supervisor, Audits
D. Mitchell, PE, BP&T
P. O'Malley, Manager QA
B. O'Rourke, NRA
B. Payne, Senior Technology Specialist
S. Peterkin, RPM
T. Rausch, CNO
J. Petrilla, NRA
B. Rhoads, Manager, Plant Chemistry/Environmental
R. Rodriguez-Gillroy, Radiation Operations Supervisor
S. Sienkiewicz, ISI Supervisor
S. Skoras, Plant Analysis
W. Snyder, Electrical Leader
J. Sukal, Performance Improvement
C. Young, Operations

NRC Personnel
D. Orr, Senior Reactor Inspector
K. Scales, NRC Operations Engineer
C. Schulten, Nuclear Reactor Regulation (NRR)

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened/Closed

05000387/2012003-01	NCV	Failure to Prevent Recurrence of Secondary Containment Bypass Leakage Significant Condition Adverse to Quality (Section 1R12.1)
05000387/2012003-02	NCV	Failure to Correct MSIV Seat Leakage (Section 1R12.2)
05000387/2012003-02	SLIV	Violation of 10 CFR 50.73(a)(2)(i)(B), Failure to Report Condition Prohibited by TSs (Section 1R12.3)
05000387;388/2012003-04	NCV	Improperly Performed Maintenance Impacts Secondary Containment (Section 1R15)
05000387/2012003-05	NCV	Failure to Follow Radiation Protection Procedures (Section 2RS.2)
2515/182	TI	Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Section 4OA5.1)

Closed
None.

LIST OF DOCUMENTS REVIEWED
(Not Referenced in the Report)

Section 1R01: Adverse Weather Protection

Procedures:
NDAP-00-0334, Summer Operation Preparations, Revision 5
GO-100-014, Unit 1 Hot Weather Operation, Revision 6
GO-200-014, Unit 2 Hot Weather Operation, Revision 3
OI-AD-029, Emergency Load Control, Revision 15

Condition Reports:
1420287, 1420299, 1420340, 1420904, 804730, 957471, 1269156, 1272638, 1272641, 1579977*, 1575139, 1585274*

Miscellaneous:
Information Notice (IN) 93-17

Section 1R04: Equipment Alignment

Procedures:
TP-135-011, Refuel Outage Decay Heat (DH) Removal and Tie in of the SDHR Temporary Cooling Equipment, Revision 9
ON-135-001, Loss of FPC Coolant Inventory, Revision 33
OP-149-003, RHR Operation in FPC Mode, Revision 23
OP-011-001, SDHR System, Revision 23
CL-149-0019, Unit 1 RHR System Common, Revision 6
CL-149-0018, Unit 1 RHR System Common, Revision 17
CL-149-0011, Unit 1 RHR System Division I, Revision 14
CL-149-0017, Unit 1 RHR System Common, Revision 6
CL-149-0012, Unit 1 RHR System Division I, Revision 22
CL-149-0011, Unit 1 RHR System Division I, Electrical, Revision 12
CL-149-0018, Unit 1 RHR System Common, Mechanical, Revision 12
OP-149-001, RHR System, Revision 41
CL-149-0012, Unit 1 RHR System Division I, Mechanical, Revision 17
CL-149-0013, Unit 1 RHR System Division I, Mechanical, Revision 7
CL-251-004, Unit 2 Core Spray System Division 2, Electrical, Revision 7
CL-251-005, Unit 2 Core Spray System Division 2, Mechanical, Revision 13
OP-024-001, Diesel Generators, Revision 63
SO-024-001A, Monthly DG 'A' Operability Test, Revision 9
CL-024-0011, DG 'A' Electrical
CL-024-0012, DG 'A' Mechanical

Condition Reports (* NRC identified):
1552014*, 1552242, 1545605, 1551888, 1551515, 1550357, 1550333, 1550355, 1545967, 1384196, 1383755, 1380166, 1391729, 1397048, 1554956*, 1554355*, 1554340*, 1554373*, 1554253, 1516699, 1550577, 1561863, 1562427, 1562978, 1563193, 1568346, 1570173, 1592499*, 1592498*, 1592572*

Calculations:
EC-STRV-2018, EDG Structure

Drawings:
M-1536, Sheet 1, SDHR, Revision 0
M-110, Sheet 1, "Unit 1 P&ID Service Water (SW)," Revision 43
M-187, Sheet 1, "Unit 1 P&ID RB Chilled Water," Revision 45
M-146, Sheet 1, "Unit 1 P&ID CRD Part A," Revision 40
E-105951, Sheet 1 of 5 and Sheet 2 of 5, Unit 2
M-151, Sheet 1, "Unit 1 RHR," Revision 66
M-151, Sheet 2, "Unit 1 RHR," Revision 53
M-2152, Sheet 1, Unit 2 P&ID Core Spray, Revision 27

Miscellaneous:
LO 11-001-1524634-0 and 55-001-1525914-0
EC-070-0526, "SGTS Drawdown Analysis," Revision 2
TM-OP-049-ST, RHR System Training Student Text, Revision 7

Section 1R05: Fire Protection

Procedures:
FPP-113, Condenser Mezzanine (I-211) Fire Zone 1-33C, Elevation 699', Revision 1
FPP-113-100, Drywell (I-400), I-516, I-607) Fire Zone 1-4F, Elevation 704' thru 807', Revision 3
FPP-213-248, Containment Access Area (11-401) Decontainment Station (11-404-405) Revision 5
FPP-213-250, Switchgear Rooms (11-406-407) Fire Zone 2-4 C/D, and Fire Zone 2-4A-N,W,S, Elevation 769', Revision 6
FP-013-189, DG Bay 'A', Fire Zone 0-41A, Revision 4
FP-013-192, DG Bay 'B', Fire Zone 0-41B, Revision 4
FP-013-195, DG Bay 'C', Fire Zone 0-41C, Revision 5
FP-013-198, DG Bay 'D', Fire Zone 0-41D, Revision 4
FP-213-239, RCIC Pump Room (II-12) Fire Zone 2-1D, Elevation 645'-0", Revision 7

Condition Reports (*NRC identified):
1580221*, 1579996*, 1579998*

Work Orders:
1531079, 1222631

Miscellaneous:
2-TR-12-0106

Section 1R06: Flood Protection Measures

Procedures:
NDAP-QA-0409, Door, Floor Plug, and Hatch Control, Revision 8
OP-269-004, Liquid Radwaste Collection, Revision 16

Condition Reports (* NRC identified):
1547251, 1547252, 1546931, 1569952*

Work Orders:
1548043, 1547153, 1548319, 520928, 1235513, 1548312, 1332442

Drawing:
M-2161, Unit 2 Liquid Radwaste Collection, Revision 29

Miscellaneous:
EC-RISK-0539, Internal Flooding Analysis for PRA, Revision 1

Section 1R7: Heat Sink Performance:

Condition Reports:
1566034, 1564501

Work Orders:
1286759, 1261349

Section 1R08: Inservice Inspection Activities

Procedures:
NDE-LP-001, Color Contrast Liquid Penetrant Examination, Revision 4
NDE-MT-001, Wet and Dry Magnetic Particle Examination, Revision 5
NDE-UT-001, Manual Ultrasonic Examination of Austenitic Pipe Welds, Revision 10
NDE-UT-002, Manual Ultrasonic Examination of Ferritic Welds, Revision 6
NDE-VT-001, Procedure to Visually Determine Condition of Component, Revision 4
NDE-VT-003, Visual Examination VT-3, Revision 9
NDE-VT-005, Underwater Remote Visual Examination of RPV Internals, Revision 8
NEPM-QA-1165, RPV Internals ISI Examinations, Revision 6
MT-AD-522, Repair, Alteration and Replacement of ASME Components, Revision 10
NDAP-QA-1214, Nuclear Program for ASME Code, Section XI Repair or Replacement, Revision 8

Condition Reports:
1552937, 1553985, 1554270, 1554279, 1554308, 1554267,

Work Orders:
1408700, 1466113, 1372552, 1466070

Miscellaneous:
PT-12-001, Liquid Penetrant Test Results of Four Integrally Attached Pipe Lugs RCIC System
MT-12-001, Magnetic Particle Test Results of Three Welds Attaching Pipe to CS Pump
BOP-PT-11-323, Liquid Penetrant Test Results of Repaired Steam Leak on Valve HV10111
UT-12-031 Ultrasonic Test Results of Piping Replacement of HPCI Piping
Weld Procedure Specification (WPS) N-A-IA-MA-11, Manual Gas Tungsten (GTAW) and Shielded Metal (SMAW) Welding of Carbon Steel, Revision 9
WPS N-A-IA-MA-88, GTAW and SMAW Welding of Stainless Steel, Revision 5
PQR 02-01, Weld PQR for N-A-IA-MA-11
PQR 82-05, Weld PQR for N-A-IA-MA-88

Section 1R11: Licensed Operator Requalification Program

Procedure:
GO-100-002, “Plant Startup, Heat and Power Operation,” Revision 72

Condition Report (* NRC identified):
1589204

Miscellaneous:
Startup Control Rod Sequence dated May 11, 2012
Simulator Scenario OP002, 12-04-01A, June 25, 2012, Revision 0
EP-PS-126-7, Tab 7, Emergency Notification Report, June 25, 2012

Section 1R12: Maintenance Effectiveness

Condition Report:
1581998*

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures:
ME-0RF-160, Reactor Recirculation Outlet Nozzle and JP Plug Installation and Removal, Revision 8
ME-1RF-102, JP Disassembly/Reassembly, Revision 2
NDAP-QA-0326, Operations with Potential for Drawing Reactor Vessel, Revision 12

Condition Reports:
1547517, 1548034, 1554927, 1553985, 1553583, 1553585, 1553586, 1553587, 1552938, 1552694, 1552653, 1552342, 1552543, 1552343, 1552575, 1527693, 1551775, 1551918, 1548100, 1544275, 1574391*, 1560885*, 1560887*, 1567787*, 1568467*, 1563578, 1244620, 1510028, 1500306, 1121863, 1300210, 1497853, 1565814, 1579347*

Work Order:
1555821

Miscellaneous:
Unit 2 Risk Profile for 1A201 4kV Bus Outage
50.59 SD 61031
ML11277A279 (EGM-11-003)
EC-RISK-1097, Risk Assessment and Requirements for JP Removal/Repairs, Revision 4

Section 1R15: Operability Evaluations

Procedures:
TP-105-006, “Load Center 1B210 Outage Coordination Procedure,” Revision 7
EO-100-103, Primary Containment Control, Revision 9
ON-100-009, “Control Room Evacuation,” Revision 24
OP-149-0859, “Appendix R Analysis for a Control Room Fire,” Revision 24
NDAP-QA-0312, Control of LCOs, TROs, and SFDP, Revision 16

Condition Reports (* NRC-identified):
1555821, 1559725, 1558743, 1558754, 1558783,1556620, 1556337, 1559401, 1559601, 559391, 1573977, 1551474, 1572814, 1249170, 1579347*, 1551282, 1551325, 1556505, 1569959, 1570043, 1551351, 1551542, 1561863, 1563021, 1561863, 1562195, 1562305, 1562800, 1584874, 1584930, 1591382*, 333189, 1560235, 1567683, 1560298*, 1558764, 1558718, 1558992, 1514040, 1560298, 1597637, 1595276

Work Orders:
1305834, 1551325, 1551337

Drawings:
C-331, Sheet 1, Units 1 and 2 RB Primary Containment General Arrangement, Revision 10
C-1932 Sheet 4, Reactor/Primary Containment Composite Overview, Revision 1
FF-105801, Sheet 4A, DG Control Schematic Starting Sequence, Revision 1
FF-105801, Sheet 5A, DG Control Schematic Starting Sequence, Revision 0
M-151, Sheet 1, “Unit 1 P&ID RHR,” Revision 66

C-279, Sheet 4, SSES RB Units 1 and 2 Containment RB Liner Rate Penetration Schedule," Revision 6
C-283, Sheet 1, "SSES Units 1 and 2 RB Liner Rate Suppression Chamber Details," Revision 14

Miscellaneous:
EC-070-1023, Air In-Leakage into Secondary Containment through an Open Unit 1 MSIV and Turbine Stop Valve, Revision 0
EC-SQRT-1378, "Stress and Seismic Analysis of Recirculation Section Piping Plug for SSES
50.59 SD 01031, PCWO 737813, 1255497, and 1367983, Revision 0
NL-00-008, Reactor Recirculation Outlet and JP Plugs 50.59 SE, Revision 1
EGM, "Dispositioning Boiling Water Reactor Licensee Noncompliance with TS Containment Requirements during Operations with a Potential for Draining the Reactor Vessel," ML11251A230
MFP-QA-5250, Control Structure PLRT and RB NLRT Boundary Breaches and Penetration Seals, Revision 9
Outage Logs for April 17, 2012
PLA-6817, License Amendment Request for TS 3.8.7 and 3.7.1, dated March 8, 2012
PLA-6148, License Amendment Request for TS 3.8.1
E-103, Sheet 3, "Schematic Diagram 4.16 kV Bus 1A Incoming Feeder Breaker from ESS Trans 201 – Unit 1" EDCN 15
E-103, Sheet 2, "Unit 1 Schematic Diagram 4.16 kV Bus 1A Auxiliary Relay Control," Revision 29
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Unit 1 Operator Logs for April 18, 2012
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FSAR 8.2, 6.3
TS 3.6.4.1, 5.5.11
NUREG-1022, Revision 2

Section 1R18: Permanent Plant Modifications

Procedure:
OP-249-003, "RHR Operation In Fuel Pool Cooling Mode," Revisions 0 and 22

Condition Reports (* NRC identified):
1243436, 1558977, 1561772*, 1559279*,1557122, 1557256, 1556647, 1556576, 1558318, 1557485, 1556044, 1557457

Calculations:
lDCN 35 for EC 1386053
EC-1386053, Install Two New SCBL Test Boundaries on Unit 1 RHR System
EC-1589495, Modify VRR-B31-1 Decontamination Connection, Revision 2
EC-1590173, Modify VRR-B31-2 Decontamination Connection, Revision 1

Drawing:
M-151, RHR, Revision 64

Miscellaneous:
FSAR Table 6.2-15
50.59 SD 01143

LDCN 4965, Discussion for the Temporary SDHR and RBCW SCIVs and Pipe Breaches
LDCN 4977, Install Two New SCBL Test Boundaries on Unit 1 RHR System
P49.1, RHR System Pre-Startup Testing, Revision 2
50.59 SD 01223

Section 1R19: Post-Maintenance Testing

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ON-135-001, Revision 33
ME-1RF-004, Reactor Cavity Inflatable Seal Tests, Revision 7
ME-ORF-100, Reactor Cavity Seal Ring Replacement, Revision 7
MT-GE-014, GE DC Switchgear Inspection and Breaker Maintenance, Revision 22
TP-149-080, "Initial Start and Run-in of New or Repaired RHR Pump Motor," Revision 2
SO-149-802, "Quarterly RHR System Flow Verification Division II," Revision 21
TP-164-044, "Maintenance Run of the 1A Reactor Recirculation M/G Drive Motor 15134A," Revision 2
SO-027-001B, "BEGD Surveillance," Revision 9
OP-027-001, "EDGs," Revision 63
TP-164-045, Local System Leakage Test of Reactor Recirculation LOOPs A and B, Revisions 0, 1, and 2

Condition Reports (*NRC-identified):
1550753, 1550753, 1572695*, 1572698*, 1310481, 1554977, 1559891, 1554977, 1562375*, 1562001*, 1310042, 1564793, 1530699, 1554062, 1554073, 1549781, 1548437, 1545998, 1545574, 1545529, 1583531, 1583529, 1582935, 1581007, 1581034, 1579496, 1578569, 1578492, 1581722, 1517794, 1517792, 1437492, 1591938*

Work Orders:
1279937, 1551033

Work Requests:
M80270, 576239, 1551038, 1551123, 1441235, 1282544, 1283711, 1282185

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C-392, Sheet 1, Reactor Cavity Seal Ring, Revision 14
C-392, Sheet 2, Primary Containment Reactor Cavity Seal Details and Specification Requirements, Revision 0
M-153, Sheet 2, Fuel Pool Cooling and Clean-Up

Miscellaneous:
EC-035-0528, Evaluation of NCR 98-085 for Reactor Cavity Seals Service Life
IE-Bulletin 84-03
IERP 85011
PLIS 18928
GES-6000A EC-1 Series Trip Device
RSCN 82-733
IDM 262, 125 VDC and 250 VDC Load Centers, Revision 13
E-11, Sheet 1, Single Line Meter and Relay Diagram 125 and 250 VDC System, Revision 19
EC-SOPC-0504, Relay Setting for RCIC and Isolation Valves, Revision 0

Section 1R20: Refueling and Other Outage Activities

Procedures:
GO-100-010, Emergency Core Cooling System (ECCS)/DH Removal in Mode 4, 5, or Defueled
GO-100-005, Plant Shutdown to Hot/Cold Shutdown, Revision 53
GO-100-006, Cold Shutdown, Defueled and Refueling, Revision 45
SI-251-301, Quarterly Calibration of Drywell Pressure Channels, PS-E11-2N011A,B,C,D (Core Spray, HPCI, LPCI Permissive), Revision 17
TM-OP-024A-ST, EDG E, Revision 10
SO-024-014, Monthly DG 'E' Operability Test, Revision 33
GO-100-002, "Plant Startup, Heatup and Power Operation," Revision 72
GO-100-012, "Power Maneuvers," Revision 41
GO-100-002, Plant Startup, Heatup and Power Operation, Revision 76

Condition Reports (*NRC identified):
1552014*, 1552361*, 1554955*, 15555316, 1555966*, 1555935*, 1572575*, 1575799*, 1578209*, 1581148, 1585430*, 1585470*, 1585851, 1587637, 1585329, 1587971*, 1593077, 1592584*, 1593069*, 1593070, 1593074, 1593513*, 1593517, 1593080, 1593073, 1593085*, 1593086*, 1593088*, 1593090*

Miscellaneous:
NFE-1-18-002, Unit 1 Cycle 18 Core Map
U1C18 Core Verification Videos
Startup Control Rod Sequence
Unit 1, Cycle 1 Sequence A2, dated June 22, 2012

Section 1R22: Surveillance Testing

Procedures:
SE-159-027, "LLRT of Feedwater Line B Penetration Number X9B and Check Valve Operability Tests (SCBL)," Revision 19
TM-OP-024-ST, "EDGs A-D," Revision 9
FSAR 9.5.6.4, 8.3.1.4.11.2, 8.3.1.4.11.4
FSAR Chapter 14
SR 3.8.1.7
SO-024-001B, Monthly DG 'B' Operability Test, Revision 9
SE-100-007, "ESW/RHRSW Functional Test at 1C201B," Revision 7
SO-253-004, "Quarterly SBLL Flow Verification," Revision 37
ST-6-041-202-2, MSIV Cold Shutdown Valve Test, Revision 19
SO-284-006, MSIV Stroke Timing, Revision 3
SO-184-006, MSIV Stroke Timing, Revisions 3 and 4
SO-216-A03, Quarterly RHRSW System Flow Verification Division I

Condition Reports (* NRC identified):
1553976*, 1553975*, 1526185, 1554881*, 1551282, 1573993, 1575066, 1573969, 1573725, 1573732, 1579029*, 1579028*, 1578931, 1550609, 1576373*, 1585302

Work Orders:
1536622, 645054, 776896, 815791, 856001, 1062237, 1172419, 727057, 758055, 913780, 991462, 1063656, 1266836, 1307688

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J-111, Sheet 2A, "Common Logic Diagram ESW System LOOP B ESW Pumps," Revision 5
E-146, Sheet 7, "Common Seismic Diagram ESW Pump D," Revision 23
E-146, Sheet 8, "Common Seismic Diagram ESW Pump 0P504D," Revision 40

Miscellaneous:
LDCN 4984, "Change to TS Bases Section 3.6.4.2"
RG 1.108
ASME O & M Code 3521(c)
SSES-Inservice Test (IST) PLN-200.0
NUREG-1482, Guidelines for ISI at Nuclear Power Plants, Revision 1
EC-083-0518, MSIV Stroke Time Testing – Adjustment Factor, Revision 0
IR 05000353/2003003
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IN-97-16, Preconditioning of Plant SSCs Before ASME Code IST or TS Surveillance Testing
IERP 97061, Preconditioning of Plant SSCs Before ASME Code IST or TS Surveillance Testing

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Procedure:
EP-TP-001, "EAL Classification Levels," Revision 5

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures:
HP-AL-400, RWP ALARA Reviews and Evaluations, Revision 16
HP-TP-310, Barricading, Posting and Labeling, Revision 39
HP-TP-311, Locking and Key Control, Revision 33
HP-TP-602, Free Release Surveys, Revision 30
NDAP-QA-0627, Radioactive Contamination Control, Revision 32

Work Orders:
2012-1001, RPV Disassembly, Fuel Moves and General Refuel Floor Work Activities, Revision 000
2012-1002, ISI (In Service Inspection) (In Vessel, Dryer, Separator); CRB, and LPRM (Low Power Radiation Monitor) Exchange, Revision 000
2012-1306, General Entry/ Work in the Drywell, Revision 000
2012-1320, Scaffolding Work in the Drywell, Revision 000
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Miscellaneous:
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UNIT 1 Drywell 779, March 31, 2012
UNIT 1 Drywell 767, April 1, 2012
UNIT 1 Drywell 752, April 1, 2012
UNIT 1 Drywell 738, April 1, 2012
UNIT 1 Drywell 719, April 1, 2012
UNIT 1 Drywell 704, April 1, 2012
UNIT 1 Drywell 704 Flush of 51A Valve, April 2, 2012

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UNIT 1 Drywell 719 Shoot Out Steel, April 6, 2012
UNIT 1 Drywell 719 Carousel/Chute/L/D Area, April 7, 2012
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UNIT 1 CRDs, 54-31, 58-27, 46-19, April 10, 2012, Time not provided
UNIT 1 CRDs, 7776, 7805, 5465, 9171, April 10, 2012
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UNIT 1 CRDs, 3851, 4255, 5443, 5835, April 11, 2012
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Section 2RS2: Occupational ALARA Planning and Control

Procedures:
NDAP-QA-1191, ALARA Program and Policy, Revision 14
HP-AL-400, RWP ALARA Reviews and Evaluations, Revision 16

Work Orders/ ALARA Review:
2012-1001, 2012-1002, 2012-1003 Refuel Floor Activities
2012-1350, CRD Rebuild Room
2012-1351, CRD Rebuild Room; CRD Exchange
2012-1352, Under Vessel Preparation Work
2012-1353, CRD Exchange; Under Vessel Work
2012-1320, Scaffolding Work in the Drywell
2012-1372, ISI

Miscellaneous:
Station ALARA Committee Meeting Minutes, January 30, 2012
Station ALARA Committee Meeting Agenda, January 30, 2012, February 13, 2012, March 12, 2012, March 14, 2012

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

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HP-TP-720, Airborne Concentration Sampling and Evaluation, Revision 38
HP-TP-721, Gamma-to-Alpha Ratio Determinations, Revision 10

Work Orders:
1351, CRD Exchange, Bullpen, April 10, 2012
1351, CRD Exchange, CRD Room at Spud, April 10, 2012

1351, CRD Exchange, CRD Room at Flange, April 10, 2012
1351, CRD Exchange, CRD Room at Spud, April 10, 2012
1351, CRD Exchange, Bullpen, April 10, 2012
1351, CRD Exchange, CRD Room at Flange, April 10
1351, CRD Exchange, Bullpen, April 10, 2012
1351, CRD Exchange, CRD Room, April 10, 2012
1351, CRD Exchange, Bullpen, April 11, 2012
1351, CRD Exchange , CRD Room, April 11, 2012
1352, Relamp/Add External Cords, Under Vessel, April 4, 2012
1352, Verify Tags, Under Vessel, April 5, 2012
1352, Under Vessel, April 5, 2012
1352, Under Vessel, April 6, 2012
1352, Under Vessel, April 6, 2012
1352, Pull Shoot Out Steel, Under Vessel, April 6, 2012
1352, Pull Shoot Out Steel, Under Vessel, April 6, 2012
1352, Grab Sample (Backup), Under Vessel, April 6, 2012
1352, Pull Shoot Out Steel, Under Vessel, April 7, 2012
1352, GE CRD Laydown, April 7, 2012
1352, GE Under Vessel, April 7, 2012
1352, Pull Shoot Out Steel, Under Vessel, April 7, 2012
1352, Stack Shoot Out Steel Under Vessel, April 7, 2012l
1352, Uncoupling CRDs, Under Vessel, April 7, 2012
1352, Uncoupling CRDs, Under Vessel, April 7, 2012
1352, Prep & Staging for CRD Rmv, Under Vessel, April 7, 2012
1352, Uncoupling CRDs, Under Vessel, April 8, 2012
1353, De-Torque CRD, Under Vessel, April 10, 2012
1353, CRD Exchange, Under Vessel, April 10, 2012
1353, CRD Exchange, Under Vessel, April 10, 2012
1353, CRD Exchange, Under Vessel, April 10, 2012
1353, CRD Exchange, Under Vessel, April 11, 2012
1353, Torque CRDs, Under Vessel, April 11, 2012
1353, Torque CRDs, Under Vessel, April 11, 2012

Section 4OA1: Performance Indicator Verification

Condition Reports (* NRC identified):
1560195*, 1357297, 1357373, 1517915, 1519893, 1473764, 1518018, 1357372, 1584156, 1514465, 1503444, 1300832, 1415683, 1591516, 1590559

Miscellaneous:
PL-NF-06-002, SSES Mitigating System Performance Index Basis Document, Revision 7
NEI-99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6

Section 4OA2: Identification and Resolution of Problems

Procedures:
SI-SO-006, Duties and Responsibilities of the Search Officer/Vehicle Escort Officer, Revision 45
ON-231-003, “ICS Component Failure(s),” Revision 3
ON-200-101, “Scram, Scram Imminent,” Revision 23
ON-243-001, “Main condenser Vacuum and Offgas System Off-Normal Operation,” Revision 32
ON-269-001, “Flooding In Turbine Building,” Revision 5
ON-256-001, “Unanticipated Reactivity Change,” Revision 23

ON-235-001, “Loss of Fuel Pool Cooling/Coolant Inventory,” Revision 34
NDAP-QA-0710, “Station Trending Program,” Revision 6
NDAP-00-0708, “Corrective Action Review Board,” Revision 12
SO-054-A08, “Comprehensive ESW Flow Verification Loop A, Current Procedure,” Revision 4
SO-054-A08, “Comprehensive ESW Flow Verification Loop A, Upgraded Procedure,” Revision 5
MT-093-001, “Low Pressure Turbine Disassembly Inspection and Reassembly, Current Procedure,” Revision 5
MT-093-001, “Low Pressure Turbine Disassembly Inspection and Reassembly,” Upgraded Procedure,” Revision 6

Condition Reports (* NRC identified):
1551279*, 1555139*, 1556927*, 1556893*, 1555748*, 1544227*, 1473771*, 1494585*, 1544227*, 1473771*, 1494585*, 1570550*, 1569952*, 1584391*, 1575176*, 1585795*, 1587831*, 1591516*, 1590559*, 1461742, 1502875, 1543463, 1346952, 1346952, 1491612, 1346952, 1413375, 1413375, 1461612, 1389530, 1421356, 1421356, 1453671, 1431750, 1431750, 1532611, 1453725, 1453725, 1413375, 1602763*, 1604800*, 1602765*, 1601760*, 1603916*

Miscellaneous:
System Health Reports for September to December 2011, June to August 2011, January to May 2011, September to December 2010, May to August 2010, January to April 2010, September to December 2009, June to August 2009, January to May 2009
Operations Logs for Unit 1 and Unit 2
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Station Quarterly Trend Report for 1st Quarter 2011through 1st Quarter 2012
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SCCI Recovery Project Plan P.1(c) dated May 2012, Revision 2
NRC Inspection Report 50-387&388/2011003
NRC Inspection Report 50-387&388/2011403
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NRC March 23, 2003, Annual Assessment Letter – SSES (REPORT 50-387/03-01, 50-388/03-01)
NRC August 27, 2003, Mid-Cycle Performance Review and Inspection Plan – SSES Units 1 and 2
NRC March 3, 2004, Annual Assessment Letter – SSES (REPORT 05000387/2004001 AND 05000388/2004001)

Section 4OA3: Event Followup

Procedure:
ON-149-001, Loss of RHR Shutdown Cooling Mode, Revision 25

Section 4OA5: Other Activities

Procedures:
M-1001, Revision 1, External Surface Treatment of Underground Steel Pipe, Revision 1
C1011, Site Preparation and Earthwork, Revision 0
NSEP-QA-402, Underground Piping and Tanks Examinations, Revision 2
NSEP-QA-403, Underground Piping and Tanks Inspections, Revision 1
NSEP-QA-0483, Underground Piping and Tanks Program, Revision 4

NDAP-00-0752, Cause Analysis, Revision 15
NDAP-QA-0737, ROP Performance Indicators, Revision 8
NDAP-QA-0737, ROP Performance Indicators, Revision 9

Condition Reports and Action Requests:
1436499, 1541702, 1541715, 1541717, 1541718, 1526429, 1526430, 1502093, 1452571, 1440010, 1440013, 1440017, 1417342, 1328561, 1359308, 1356823, 1448124, 1450138, 1501282, 1516317, 1516764, 1532634, 1541393, 1541928, 1546986, 1547666, 1549492, 1567769, 1592583*, 1592585*, 1592587*

Work Orders:

Calculations:
EC-BPIP-1001, Underground Piping and Tanks Program Risk Ranking (154 pages), Revision 2
EPRI BPWORKS 2.0, Computer Code for Buried Pipe Risk Ranking
EC-BPIP-1002, Pipe Segment Grouping for the Underground Piping Program Revision 0
PP&L Contract No. 283955-C Design Calculations for Cathodic Protection of Yard Piping and Underground Tanks

Drawings:
BP-C-1, Buried Pipe Overview of Selected Lines and Tanks, Revision 1
E6717-1, Replacement Cathodic Protection Project, Site Plan, General Notes, Revision 1
S-4-829, Prestressed Concrete Cylinder Pipe with R&S Expansion Joint, SP-5, 42" Pipe, Revision A
S-3-408, Prestressed Concrete, Embedded Cylinder, 48" Diameter Pipe, Revision A

Miscellaneous:
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Underground Piping and Tanks Integrity Initiative Inspection Plan, September 10, 2011, Revision 1
Structural Evaluation of Prestressed Concrete Cylinder Pipe by Pure Technologies US, Inc.
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QA Internal Audit Report 527456, Engineering, August 8, 2005 – September 13, 2005
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QA Independent Assessment Basis Document, Chemistry Audit Area, Revision 7
QA Independent Assessment Basis Document, Effluents Audit Area, Revision 7
QA Independent Assessment Basis Document, Emergency Preparedness Audit Area, Revision 6
QA Independent Assessment Basis Document, Engineering Audit Area, Revision 7
QA Independent Assessment Basis Document, Operations Audit Area, Revision 5
QA Independent Assessment Basis Document, Radiation Protection Audit Area, Revision 6
QA Independent Assessment Basis Document, TSs and License Conditions Audit Area, Revision 7

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
AR	Action Request
ASME	American Society of Mechanical Engineers
CAM	Continuous Air Monitors
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CCA	Cross-Cutting Area
CFR	Code of Federal Regulations
CNF	Customer Notification Forms
CNO	Chief Nuclear Officer
CR	Condition Report
CRB	Control Rod Blades
CRD	Control Rod Drive
CS	Core Spray
CS	Control Structure
DEP	Drill and Exercise Performance
DG	Diesel Generator
DH	Decay Heat
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
ENS	Emergency Notification System
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPD	Electronic Personnel Dosimeter
EPIP	Emergency Plan Implementing Procedure
EPU	Extended Power Uprate
ERO	Emergency Response Organization
ESS	Engineering Safeguard System
ESW	Emergency Service Water
EWR	Engineering Work Request
FIN	Finding
FPC	Fuel Pool Cooling
FSAR	[SSES] Final Safety Analysis Report
GE	General Electric
GTAW	Gas Tungsten Arc Welding
HP	Health Physics
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
HV	High Voltage
HVAC	Heating, Ventilation and Air-Conditioning
HX	Heat Exchanger
IMC	Inspection Manual Chapter

IN	Information Notice
IP	Inspection Procedure
IR	NRC Inspection Report
ISI	Inservice Inspection
IST	Inservice Testing
IVVI	In-Vessel Visual Inspection
JP	Jet Pump
kV	Kilovolts
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
LPRM	Low Power Radiation Monitor
MG	Motor Generator
MSIV	Main Steam Isolation Valve
MSPI	Mitigating Systems Performance Index
MSO	Multiple Spurious Activations
MSV	Main Stop Valve
MT	Magnetic Particle Testing
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NDE	Non-Destructive Examination
NDT	Non-Destructive Test
NEI	Nuclear Energy Institute
NIST	National Institute of Standards and Technology
NRA	Nuclear Regulatory Affairs
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NSIR	Office of Nuclear Security and Incident Response
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
OE	Operating Experience
ON	Off-Normal
OOS	Out-of-Service
OPDRV	Operation with a Potential for Draining the Reactor Vessel
PARS	Publicly Available Records
PCIV	Primary Containment Isolation Valve
PDI	Performance Demonstration Initiative
PF	Power Factor
PI	[NRC] Performance Indicator
PING	Particulate, Iodine and Noble Gas
PI&R	Problem Identification and Resolution
PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
PQR	Procedure Qualification Record
PRV	Pressure Relief Valve
PSV	Pressure Safety Valve
PT	Penetrant Test
QA	Quality Assurance
RB	Reactor Building
RCA	Radiologically Controlled Area

RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RFO	Refuel Outage
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual heat Removal Service Water
RMA	Risk Management Actions
RMS	Radiation Monitoring System
RO	Reactor Operator
ROP	Reactor Oversight Process
RPM	Radiation Protection Manager
RPV	Reactor Pressure Vessel
RRP	Reactor Recirculation Pump
RTP	Rated Thermal Power
RWCU	Reactor Water Clean Up
RWP	Radiation Work Permit
SAC	Station ALARA Committee
SCBA	Self-Contained Breathing Apparatus]
SCBL	Secondary Containment Bypass Leakage
SCCI	Substantive Cross-Cutting Issue
SDHR	Supplemental Decay Heat Removal
SDP	Significance Determination Process
SE	Safety Evaluation
SFP	Spent Fuel Pool
SGTS	Standby Gas Treatment System
SL	Severity Level
SP	Suppression Pool
SRI	Senior Resident Inspector
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
SW	Service Water
TBCCW	Turbine Building Closed Cooling Water
TI	Temporary Instruction
TRM	Technical Requirements Manual
TS	Technical Specifications
T20	T20 Startup Transformer
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Test
VHRA	Very High Radiation Areas
VT	Visual Examination
WBC	Whole Body Counter
WO	Work Order
WPS	Weld Procedure Specification