April 29, 2004

Mr. Bryce L. Shriver
Senior Vice President and
Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION - NRC INTEGRATED INSPECTION REPORT 05000387/2004002 AND 05000388/2004002

Dear Mr. Shriver:

On March 31, 2004, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station Units 1 and 2. The enclosed integrated inspection report presents the results of that inspection, which was discussed with you, Mr. R. Anderson, Vice President - Nuclear Operations, and other members of your staff on April 8, 2004.

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

This report documents two self revealing findings of very low safety significance (Green). The findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because the issues were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A of the NRC Enforcement Policy. If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station.

Since the terrorist attacks on September 11, 2001, the NRC has issued five Orders and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over access authorization. In addition to applicable baseline inspections, the NRC issued Temporary Instruction 2515/148, "Inspection of Nuclear Reactor Safeguards Interim Compensatory Measures" and its subsequent revision to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspection activities for Susquehanna were completed in February 2004. The NRC will continue to monitor overall safeguards and security controls at Susquehanna Steam Electric Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publically 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).

If you have any questions please contact me at 610-337-5209.

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000387/2004002, 05000388/2004002
Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 05000387, 05000388

License Nos.: NPF-14, NPF-22

Report No.: 05000387/2004002 and 05000388/2004002

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station

Location: 769 Salem Boulevard
Berwick, PA 18603

Dates: January 1, 2004 to March 31, 2004

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F. Jaxheimer, Resident Inspector
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SUMMARY OF FINDINGS

IR 05000387/2004002, 05000388/2004002; 01/01/2004 - 03/31/2004; Susquehanna Steam Electric Station, Units 1 and 2. Personnel Performance During Non-Routine Plant Evolutions.

The report covered a 3 month period of inspection by resident inspectors and announced inspections by a regional health physicist, regional reactor inspector, regional security specialist and a regional preparedness inspector. Two Green non-cited violations (NCVs) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC Identified Findings

Cornerstone: Mitigation Systems

- **Green.** A self-revealing event resulted in a non-cited violation of Technical Specification section 5.4.1, because a non-licensed plant operator (NPO) did not implement the alternating current (AC) electrical system shutdown procedure TP-105-006, "Load Center 1B210 Outage Coordination Procedure," as written in accordance with Technical Specification 5.4.1.a. The error resulted in an unplanned start of the "A" emergency diesel generator and extended the unavailability of the "A" emergency service water (ESW) pump.

  This finding is greater than minor because it adversely impacts the equipment performance attribute of the mitigating system cornerstone and adversely affects the cornerstone objective in that the finding is associated with the increased unavailability of the "A" ESW pump to support Unit 2, the operating unit. A Phase-1 significance determination evaluation screened this finding as Green because the issue does not result in an actual loss of safety function of a system, or the loss of safety function of a single train for greater than the Technical Specification allowed ESW outage time of 7 days, or the loss of safety function for a TS risk significant system for greater than 24 hours. In addition, the finding is not risk significant due to seismic, fire, flooding, or severe weather initiating events.

  A contributing cause of this finding was related to the Human Performance cross-cutting area, in that a non-licensed plant operator did not follow an electrical bus shutdown procedure. As a result, an unplanned start of the "A" emergency diesel generator occurred. The untimely restoration of the electrical bus resulted in the "A" emergency service water pump unavailability time was extended by 14 hours. (Section 4OA2)

- **Green.** A self-revealing non-cited violation was identified following the loss of one offsite electrical power supply when the normal Emergency Core Cooling System (ECCS) keepfill pumps lost power. The recent ECCS passive keepfill tank modification did not properly translate the expected or the minimum ECCS system keepfill pressure into operating procedures as is required by Appendix B, Criterion III. As a result, station operators declared one loop of RHR inoperable and disabled both pumps making them unavailable for greater than 2 hours. Operating procedures did not contain the expected

or minimum keepfill pressures from current design calculations and this resulted in the removal of fully functional stand-by safety systems during a plant electrical transient.

This finding is more than minor because it is associated with both the design control and procedure quality attributes and adversely affects the objective of the Mitigating Systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The Phase-1 significance determination evaluation screened this finding as Green because the issue does not result in an actual loss of safety function of a system, or the loss of a safety function of a single train for greater than the Tech Spec time of 7 days or the loss of safety function for a TS risk significant system for greater than 24 hours. In addition, the finding is not risk significant due to seismic, fire, flooding, or severe weather initiating events.

The finding is related to the Human Performance cross-cutting area because PPL engineering did not adequately translate the design information (minimum ECCS keepfill pressure) into the operating procedures.

Report Details

Summary of Plant Status

On January 1, 2004 Susquehanna Steam Electric Station (SSES) Unit 1 reached the end of full power operation due to fuel depletion and started the reactor power coastdown. Reactor power was 78% on February 28, when the unit was shut down to begin a refueling and maintenance outage. Unit 1 remained in the refueling and maintenance outage for the remainder of the inspection period.

Unit 2 was operated at or near full power during the inspection period, with exceptions for brief power reductions to support control rod pattern adjustments and main turbine control valve testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01- 1 Sample)

a. Inspection Scope

The inspectors reviewed PPL's preparations for cold weather in the week prior to record sub-zero degree temperatures. This included a review of open work on heat trace and other freeze protection measures and included plant walkdowns for selected structures, systems, and components. The walkdowns and reviews were conducted to determine the adequacy of PPL's weather protection activities and system features for prolonged sub-zero weather. The inspectors reviewed and evaluated plant conditions related to the severe weather and PPL's risk assessment. This inspection activity included three risk significant systems and one site specific adverse weather condition.

- Cold weather preparation & operation - (sub zero weather the week of January 6th through 16th).

Procedures and Documents

- OP-185-001, "Freeze Protection System"
- SO-100-006, "Shiftly Surveillance Operating Log"
- NDAP-00-0024, "Winter Preparation Checklist"
- CR 537533, CST Heat Trace Trouble Alarm sealed in.
- CR 539786, Heat Trace circuit not repaired prior to onset of cold weather.
- CR 538916, ESW Pump house heater setpoint change.
- CR 538801, Freezing of River intake bubbler causing alarms.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (7111104 - 3 samples)

a. Inspection Scope

Partial System Walkdowns. The inspectors performed partial system walkdowns to verify system and component alignment and to note any discrepancies that would impact system operability. The inspectors verified selected portions of redundant or backup systems or trains were available while certain system components were out of service. The inspectors reviewed selected valve positions, electrical power availability, and the general condition of major system components. The walkdowns included the following systems:

- EDGs “A, B, C and D,” February 02
- EDG “B,” “C” and “D” with “A” EDG out of service for replacement of the governor motor operated potentiometer, EOOS Yellow Risk, February 23
- Unit 2 HPCI/RCIC, March 11

b. Findings

No findings of significance were identified

1R05 Fire Protection

1. Routine Plant Area Observations (71111.05Q - 7 Samples)

a. Inspection Scope

The inspectors reviewed PPL's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for selected areas. The inspectors walked down those areas to assess PPL’s control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures to assess PPL's fire protection program in those areas. The inspectors reviewed the respective pre-fire action plan procedures for the inspected areas. This inspection activity represented seven samples. The inspected areas included:

- Unit 1 vital uninterrupted power supply area, January 29 and February 2, CR 544660 and 544699
- Unit 1 suppression pool/suppression chamber, March 4
- Unit 2 control of chemical decon equipment used for Unit 1 refuel outage, March 2
- Unit 2 670' RB Z-102 and Z-105 including HPCI and RCIC lube oil deluge stations and remote shutdown panel area
- Unit 1 drywell during refuel outage, March 23
- Unit 1 “B” and “D” RHR pump room during quarterly flow surveillance after maintenance outage, March 26
- FP-013-141, “Computer Maintenance Area and Corridor, CS Elevation 698"

b. Findings

No findings of significance were identified.

2. Fire Drill Observations (71111.05A - 1 Sample)

a. Inspection Scope

On February 9, the inspector observed an announce fire brigade drill in the control structure. The fire was a simulated class 'A' fire caused by an unattended soldering iron in the computer maintenance room (area C-206). The inspector assessed PPL's strategies to fight a fire on-site and to evaluate the readiness of PPL to prevent and fight fires.

The inspector observed the fire brigade members don protective clothing and turnout gear. In addition, the inspector observed the fire fighting equipment brought to the fire area scene to evaluate whether sufficient and proper equipment was available for the simulated fire. The inspector observed fire fighting directions and radio communications between the brigade leader, brigade members, and the control room. The inspector attended and reviewed the post drill critique to evaluate whether the drill objectives met the acceptance criteria. This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) (7111108 - 5 samples)

a. Inspection Scope

The inspector observed in-process non-destructive examination (NDE) activities and reviewed documentation of NDE and repair/replacement activities. 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. The direct observations and documentation reviews verified activities were performed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section IX and XI requirements. The inspector reviewed a sample of inspection reports initiated to document the performance and record results of in-service inspection (ISI) examinations completed during the current Unit 1, 13th refueling outage as well as the previous Unit 1, 12th refueling outage. Also, the inspector evaluated PPL's effectiveness in resolving relevant indications identified during ISI activities.

The inspector observed in-process data analysis review of eddy current testing of the Unit 1 "B" residual heat removal (RHR) system heat exchanger and reviewed selected documentation of ultrasonic testing (UT) of the Unit 1 "A" RHR heat exchanger head 1E-205A-15 circumferential weld and UT and magnetic particle examinations of reactor core isolation cooling (RCIC) weld DBB1211-FW-8 to verify the effectiveness of the licensee's program for monitoring degradation of risk significant piping systems, structures and components. The inspector evaluated the activities for compliance with the requirements of ASME Section XI of the ASME Boiler and Pressure Vessel Code. The inspector examined PPL's evaluation and disposition for continued operation

without repair or rework of non-conforming conditions identified during ISI activities by review of condition report 555758 which documented various indications observed during the visual VT-1 examinations of the Unit 1 steam dryer.

The inspector reviewed two ASME Section XI code repairs and non-destructive examinations from the Unit 1, 12th refueling outage. Specifically, the inspector reviewed liquid penetrant (PT) and magnetic particle (MT) examination data records associated with repair activities on the disc and valve guide of the high pressure coolant injection (HPCI) turbine steam supply outboard isolation valve HV 155F003, ASME Class I component. In addition, the inspector reviewed PT examination data records associated with the replacement of an ASME Class II component, "A" reactor recirc pump seal excess flow check valve XV 143F017A and associated piping spool piece. This review was to verify the activities were in accordance with the applicable ASME Sections IX and XI code requirements.

The inspector performed a video tape review from the Unit 1 2004 refueling outage of a portion of the remote Unit 1 reactor in-vessel visual inspections EVT-1 of the CRGT-3 structural welds on the bottom of the control rod guide tubes and a sample of structural welds of the steam dryer. The review was conducted to evaluate examiner skill, test equipment performance, examination technique, and inspection environment (water clarity), to assess PPL's and their contractor's ability to identify and characterize observed indications.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

1. Routine Licensed Operator Requalification (71111.11Q -1 Sample)

a. Inspection Scope

On February 19, 2004, the inspectors observed licensed operator performance in the simulator during the operator re-qualification training. The inspectors compared their observations to Technical Specifications, emergency plan implementation, and the use of emergency operating procedures. The inspectors' evaluation focused on the operating crew's satisfactory completion of crew critical tasks, and satisfactory implementation of the emergency plan and emergency action level (EAL) classifications for the simulated plant conditions. Critical tasks are operational limits placed on key reactor plant and containment parameters that will ensure safety margins are maintained during the simulated malfunctions. The review included a comparison of the simulator's ability to model the actual plant performance. The inspectors also evaluated PPL's critique of the operators' performance to identify discrepancies and deficiencies in operator training. This inspection activity represented one sample. The following training scenario was observed:

- Licensed Operator Requalification simulator training scenario SA-4, RPV Level Control and Rapid Depressurization to low automatic depressurization system (ADS) bottle header pressure.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

1. Routine Maintenance Effectiveness Observations (71111-EP - 2 Samples)

a. Inspection Scope

The inspectors evaluated PPL's work practices and follow-up corrective actions for selected system, structure, or component (SSC) issues to assess the effectiveness of PPL's maintenance activities. The inspectors reviewed the performance history of those SSCs and assessed PPL's extent of condition determinations for these issues with potential common cause or generic implications to evaluate the adequacy of PPL's corrective actions. The inspectors reviewed PPL's problem identification and resolution actions for these issues to evaluate whether PPL had appropriately monitored, evaluated, and dispositioned the issues in accordance with PPL procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals, and PPL's corrective actions that were taken or planned, to verify whether the actions were reasonable and appropriate. This inspection activity represented two samples. The following issues were reviewed:

Equipment Issues

- Unit 2 rod position indication system (RPIS) failure of 4 control rods, CR 545008
- Unit 1 feedwater check valves 141-F010A&B local leakage rate test (LLRT) failures, CRs 555077 and 554166

Procedures and Documents

- Maintenance Rule Bases Document and system health report for Containment, Feedwater, and reactor manual control systems
- Technical Specifications and Bases 3.1.3, "Control Rod Operability"
- ON-255-001, "Control Rod Problems," performed on 2/1/04
- ON-255-004, "RPIS Failure," performed on 2/1/04
- Engineering Work Requests 390468, 389534
- Condition Reports 561477, 561273, 555077, 554166, 560425, 563058, 92721, 546352, 488120, and 520458
- RTPMs V0702-01 and V0702-02

b. Findings

No significant observations or findings were identified.

1R13 Maintenance Risk Assessments & Emergent Work Evaluation (71111.13 - 5 Samples)

a. Inspection Scope

The inspectors reviewed scheduled and emergent work activities with licensed operators and work-coordination personnel to verify whether risk management action threshold levels were correctly identified. In addition, the inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the issue. The inspectors performed control room and field walkdowns to verify whether the compensatory measures identified by the risk assessments were appropriately performed. This inspection activity represented five samples. The selected maintenance activities included:

- EDGs governor bolt removal
- Unit 2 TBCCW heat exchanger leak on the service water supply "B" discharge valve closed and SCT
- RLWO 542427 installation of ESW flanges on TBCCW and RBCCW connections
- 1A203 bus outage - TP-105-008 (yellow risk)
- "B" Recirculation; Unit 1, suction nozzle weld crack and repair

b. Findings

No findings of significance were identified.

1R14 Non-Routine Plant Evolutions (71111.14 - 3 Samples)

1. Loaded Fuel Grapple Movement Caused Control Rod to Move from Position 00 to Position 02

a. Inspection Scope

On March 2, 2004, an irradiated fuel assembly was being withdrawn from control cell 18-39 as part of refueling operations. When the assembly was raised to approximately 4 inches above the fuel support piece, control rod 18-39 settled from a position of 00 to position 02. The combination of the fuel hoist being loaded, and a control rod withdrawn beyond position 00 resulted in fuel hoist interlocks and control rod selection blocks. PPL entered this issue into their corrective action program as condition report 554140.

The inspectors reviewed operating logs, plant procedures, and interviewed plant personnel for this issue to independently determine what occurred and evaluate the initiating cause. The inspectors assessed personnel performance during this event to evaluate whether the operator response was appropriate and in accordance with procedures and training. This inspection activity represented one sample.

Procedures and Documents

- ON-155-001, "Control Rod Problems"
- Licensed Operator Training material, Control Rod Drive System
- CRD System Operability Assessment 420151, channel friction.

b. Findings

No findings of significance were identified.

2. "A" EDG Unplanned Start due to Procedure Implementation Error

a. Inspection Scope

The inspectors reviewed PPL's initial evaluation and associated corrective actions for an unplanned start of the "A" emergency diesel generator (EDG) on March 7, 2004. Unit 1 was shutdown for a planned refuel and maintenance outage and Unit 2 was operating at full power. PPL was removing all electrical loads from the Unit 1 "A" 4.16 kV safety related bus to perform planned maintenance. An operator error resulted in an unplanned start of the "A" emergency diesel generator. The inspectors observed PPL's actions to restore the "A" EDG to a standby alignment. In addition, the inspectors evaluated the plant risk associated with the "A" EDG start and operation at minimum load for 10 hours. This inspection activity represented one sample. The following documents were included in the review:

Procedures and Documents

- Maintenance Rule Bases Document for emergency diesel generators
- Technical Specifications for the emergency diesel generators and emergency service water pumps
- TP-105-006, "Load Center 1B210 Outage Coordination Procedure"
- Condition Reports 555676,
- SSES Significant Operating Occurrence Report 94-003

b. Findings

Introduction. A Green self-revealing NCV was identified because a non-licensed plant operator (NPO) did not implement the alternating current (AC) electrical system shutdown procedure TP-105-006, "Load Center 1B210 Outage Coordination Procedure," as written in accordance with Technical Specification 5.4.1.a. The error resulted in an unplanned start of the "A" emergency diesel generator and extended the unavailability of the "A" emergency service water pump.

Description. On March 7, 2004, Unit 1 was shutdown for a planned refuel and maintenance outage. PPL was removing all electrical loads from the Unit 1 "A" 4.16 KV safety related bus to perform planned maintenance. In an attempt to open and disable the automatic start of the "A" EDG, TP-105-006 directed the NPO to remove two fuses from breaker cabinet 1A20101. Instead, the NPO removed two fuses from breaker cabinet 1A20104 which resulted in the unplanned start of the "A" emergency diesel generator due to an undervoltage condition that was sensed on the Unit 1 "A" 4.16 KV electrical bus. The "A" EDG started and its output breaker closed to energize the Unit 1 "A" 4.16 KV electrical bus. The EDG ran for 10 hours at minimum load and an additional three hours at full load before the diesel was placed back in a standby alignment.

The "A" EDG start and re-alignment resulted in a 14 hour extension for the planned electrical bus work. The delay also extended the unavailability of the "A" ESW pump, a safety related cooling water pump shared between Unit 1 and Unit 2. The "A" ESW

pump 4.16 KV breaker was opened and disabled as a planned action in TP-105-006, prior to de-energizing the electrical bus and prior to the unplanned start of the “A” EDG. The procedure error and subsequent recovery resulted in an additional 14 hours of unavailability for the “A” ESW pump, a risk significant system.

Analysis. The non-licensed plant operator’s procedure implementation error is a performance deficiency which resulted in an unplanned start of the “A” EDG. Traditional enforcement does not apply because the issue did not have any actual safety consequence, or potential for impacting the NRC’s regulatory function, and is not the result of any willful violation of NRC requirements. This finding affects the Mitigating Systems cornerstone attributes because it is associated with the extended unavailability of the “A” emergency service water pump. This finding is more than minor because it is associated with the configuration control of equipment, equipment performance availability, and human error. The operator error adversely affected the objective of the Mitigating Systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

This finding is of very low safety significance (Green) using the NRC IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." A Phase-1 significance determination evaluation screened this finding as Green because the issue does not result in an actual loss of safety function of a system, or the loss of safety function of a single train for greater than the Technical Specification allowed ESW outage time of 7 days, or the loss of safety function for a TS risk significant system for greater than 24 hours. In addition, the finding is not risk significant due to seismic, fire, flooding, or severe weather initiating events.

A contributing cause of this finding was related to the Human Performance cross-cutting area, in that a non-licensed plant operator did not follow an electrical bus shutdown procedure. As a result, an unplanned start of the “A” emergency diesel generator occurred and the “A” emergency service water pump unavailability time was extended by 14 hours.

Enforcement. Technical Specification section 5.4.1 requires, in part, that "Written procedures shall be established and implemented as recommended in NRC Regulatory Guide 1.33, Revision 2, February 1978, Appendix A. Regulatory Guide (RG) 1.33 Appendix A, Section 4.w.(2)(b), "Onsite A.C. Electrical System," is a system that meets the requirements of NRC's RG 1.33.

Contrary to the above, on March 7, 2004, a non-licensed plant operator (NPO) did not implement alternating current (AC) electrical system shutdown procedure TP-105-006, “Load Center 1B210 Outage Coordination Procedure,” Section e.2., as written for the “A” emergency diesel generator (EDG). Instead of pulling fuses in 4.16 KV electrical breaker cabinet 1A20101 to prevent an automatic start of the “A” EDG as required, the NPO removed fuses from electrical breaker cabinet 1A20104 resulting in an unplanned start of the “A” EDG. Because this violation is of very low safety significance and PPL entered this finding into their corrective action program (CR 555676), this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000387,388/2004002-01)**

3. Unavailability of RHR on Loss of the Normal ECCS Keepfill Pumps

a. Inspection Scope

The inspectors reviewed PPL's initial actions and evaluation of a loss of one offsite power source on March 21, 2004. Unit 1 was shutdown for a planned refuel and maintenance outage and Unit 2 was operating at full power. The station unexpectedly lost power to the T-10 Startup Transformer when a manlift basket was mistakenly maneuvered into direct contact with an associated 230 KV overhead line. This action grounded and damaged the conducting line and resulted in the loss of the T-10 transformer and the loss of power to numerous plant components for both units. The inspectors reviewed the performance of equipment and the operator performance during the transient including recovery actions. This inspection activity represented one sample. The following documents were included in the review:

Procedures and Documents

- CR 563889, Increased Risk on U2 during recovery from T-10 Transformer Transient
- Operator Logs from 3/21/04.
- ON-037-001, "Loss of Condensate Transfer System"
- CR 561459,
- EC-037-1006, Calculation of Minimum Pressure to Assure ECCS pump discharge lines are filled with water.

b. Findings

Introduction. A Green self-revealing NCV was identified following the loss of one offsite electrical power supply when the normal Emergency Core Cooling System (ECCS) keepfill pumps lost power. The recent ECCS passive keepfill tank modification did not properly translate the minimum ECCS system keepfill pressure into operating procedures as is required by 10 CFR 50 Appendix B, Criterion III.

Description. In 2002, PPL installed an ECCS passive keepfill tank modification to maintain the ECCS filled in an operational ready condition if the normal keepfill pumps (condensate transfer pumps) became unavailable. This modification determined that 34 psig of pressure would be required to maintain the RHR system full of water. Station procedure ON-037-001, was not changed to reflect the modification. The procedure maintained the previous minimum ECCS keepfill pressure value of 50 psig.

On March 21, 2004, the station unexpectedly lost power to the T-10 Startup Transformer when a manlift basket was mistakenly maneuvered into direct contact with an associated 230 KV overhead line. This action grounded and damaged the 230 KV line and resulted in the loss of the T-10 transformer and the loss of power to numerous plant components including the loss of the normal ECCS keepfill pumps (condensate transfer pumps). During this event the operators monitored the ECCS keepfill pressures. The operators entered procedure ON-037-001, on the loss of condensate transfer pumps. Twenty minutes after the initial electrical power transient, operators declared the Unit 2 "A" RHR loop inoperable because the 'A' loop keepfill pressure was below 50 pounds. One hour later the operators started the Unit 2 "B" RHR pump before keepfill pressure trended below 50 psig to maintain the "B" loop operable. Operators opened the control and trip knife switches for the 2A and 2C RHR pump breakers (A loop RHR) making this low pressure injection loop unavailable for over 2 hours. All

operator actions were consistent with procedures and training that specified 50 psig as the minimum keepfill pressure to maintain the RHR system operable. The station electrical transient revealed that the ECCS keepfill tank configuration in combination with the current operating procedures will not provide the intended function of keeping all ECCS operable on loss of the condensate transfer pumps.

After the event, PPL determined that the ECCS keepfill system hydraulic response was as expected for the current design and it would maintain the systems operable by providing approximately 45 pounds of keepfill pressure. Therefore operators responded properly to the plant conditions using the station procedures. However, the failure to properly translate the new minimum keepfill pressures into station procedure ON-037-001, resulted in the operators manually disabling a fully operable ECCS subsystem during a plant electrical transient.

Analysis. This finding is a performance deficiency because PPL did not translate the appropriate minumum ECCS keepfill pressure values into operating procedures following a design change to the ECCS passive keepfill system. Traditional enforcement does not apply because the issue did not have any actual safety consequence, or potential for impacting the NRC's regulatory function, and is not the result of any willful violation of NRC requirements. This finding affects the Mitigating Systems cornerstone because it is associated with the availability of low pressure ECCS injection systems. This finding is more than minor because it is associated with both the design control and procedure quality attributes and adversely affected the objective of the Mitigating Systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

This finding is of very low safety significance (Green) using the NRC IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." A Phase-1 significance determination evaluation screened this finding as Green because the issue does not result in an actual loss of safety function of a system, or the loss of safety function of a single train for greater than the Technical Specification allowed RHR outage time of 7 days or the loss of safety function for a TS risk significant system for greater than 24 hours.

The finding is related to the Human Performance cross-cutting area because PPL engineering did not adequately translate the design information (minimum ECCS keepfill pressure) into the operating procedures.

Enforcement. 10CFR 50, Appendix B Criterion III requires that the design basis, as defined in 50.2, be correctly translated into operating procedures. 10CFR50.2 provides that Design Basis includes the specific functions and specific values or ranges of values chosen for controlling parameters as reference bounds for the design. Contrary to the above, Operating procedure ON-037-001, "Loss of Condensate Transfer System," did not have the appropriate technical changes which correctly translated an appropriate RHR discharge pressure to maintain the ECCS systems operable. Because this violation is of very low safety significance and PPL entered this finding into their corrective action program (CR 561459), this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000388/2004002-02)**

1R15 Operability Evaluations (71111-EP - 5 Samples)

a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights, to assess the adequacy of the evaluations, the use and control of compensatory measures, and compliance with the Technical Specifications. In addition, the inspectors reviewed the selected operability determinations to verify whether the determinations were performed in accordance with NDAP-QA-0703, "Operability Assessments." The inspectors used the Technical Specifications, Technical Requirements Manual, Final Safety Analysis Report (FSAR), and associated Design Basis Documents as references during these reviews. This inspection activity represented five samples. The issues reviewed included:

- Unit 1 LIS-B21-1N031D high contact resistance, CR 541808
- Unit 2 Smoke Det. (2D666 UPS area), CR 544366
- “A” and “B” EDG operability reviews, during tampering investigations for loose fasteners, CR 546020
- RCIC room cooler vibration is higher than desired, CR 548995
- ESW flow to “B” control building chiller less than design flow, CR 550150

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17 - 1 Sample)

1. Replacement of the Unit 1 RBCCW and TBCCW Inlet and Outlet ESW Isolation Butterfly Valves

a. Inspection Scope

The inspectors reviewed the system design package and the associated design and licensing documents. All functions and design attributes of the modification that could affect the plant specific SDP worksheets were reviewed. Field implementation activities were observed and compared to the design requirements and installation standards. Inspectors evaluated system interactions and component and system performance during post modification testing.

The inspectors also reviewed the affected procedures and design basis documents to verify that the affected documents were appropriately updated. This inspection activity represented one sample. The following documents were included as part of the review:

Procedures and Documents

- CR 556423 (various issues with ESW valve modification)
- RLWO 528898, Perform 'A' Loop ESW Work Including Replacement of HV11024A1, A2, HV109443A2, HV11143A, Spool Pieces, and Removal of Blanks at TBCCW and RBCCW
- ECO 432625, Unit 1 ESW Isolation Valve Replacement Including LDCN 3590, Revision 0 (50.59 screening for the valve replacement)
- CR 330188, Operability Assessment for Leaking ESW Valves, Revision 0
- TP-154-072, Pumpdown of Unit 1 'A' Loop ESW Piping, Revision 6

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111-ST - 4 Samples)

1. Routine Post Maintenance Testing Observations

a. Inspection Scope

The inspectors observed portions of post maintenance testing (PMT) activities in the field to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test's adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated the test acceptance criteria to verify whether the test demonstrated that the tested components satisfied the applicable design and licensing bases and the Technical Specification requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. This inspection activity represented four samples. The post maintenance testing activities reviewed included:

- "A" EDG monthly operability run after replacement of the governor motor operated potentiometer, SO-024-001
- "A" EDG operability following unexpected start during TP-105-006, AR 555676, March 7
- Unit 1 LOOP A ESW valve replacement PMT (TP-054-097, RCWO 528898)
- Unit 1 "B" and "D" RHR pump quarterly flow verification after maintenance during refuel outage, March 26, SO-149-B02, "92 Day Flow Verification "B" LOOP"

b. Findings

No findings of significance were identified.

1R20 Unit 1 Refueling Outage Activities (71111.20 - 1 Sample)

1. Reactor Plant Shutdown Activities

a. Inspection Scope

The inspectors observed selected portions of operator activities during the plant shutdown, plant cooldown, and residual heat removal system operation in the shutdown cooling mode. The inspectors evaluated whether the activities were performed in accordance with approved procedures and training. The inspectors reviewed computer data and operator logs to spot check whether the cool down rate remained below the Technical Specification limit of 100 °F per hour. The following documents were included in the review:

- GO-100-004, "Plant Shutdown to Minimum Power"
- GO-100-005, "Plant Shutdown to Cold Shutdown"
- GO-100-006, "Cold Shutdown, De-fueled and Refueling"

b. Findings

No findings of significance were identified.

2. Refuel Outage Plan Review

a. Inspection Scope

The inspectors reviewed PPL's risk assessment for the scheduled outage plan to evaluate whether PPL had appropriately considered overall plant risk, industry experience, and previous SSES outage problems. In addition, the inspectors reviewed PPL's ORAM-Sentinel model. The following documents were included in the review:

- U1 13RIO Outage Schedule Logic for Residual Heat Removal, Core Spray, Core Alterations, and Electrical Division-1 and 3 Work
- Unit 1 ORAM Risk Profile
- Unit 2 EOOS Risk Profile Mode 1
- EWR 383453, "Fuel Pool Time-to-Boil Predictions"
- NDAP-QA-0613, "Outage Implementation and Assessment"

b. Findings

No findings of significance were identified.

3. Control of Outage Activities

a. Inspection Scope

Decay Heat Removal: While the service water system was removed from service, PPL used a temporary supplemental decay heat removal (SDHR) system to provide river water cooling directly to the Unit 1 fuel pool cooling heat exchangers. The Unit 2 residual heat removal (RHR) system, in the fuel pool cooling assist mode, provided a backup for the SDHR. The inspectors performed a walk-down of the SDHR system and those portions of Unit 2 RHR system that would be operated in the fuel pool cooling assist mode. The inspectors observed SDHR system operation and reviewed operating logs, operating procedures, and off-normal procedures to verify that activities were performed in accordance with PPL procedures and appropriate design basis documents.

Configuration Management & Risk Management: The inspectors observed selected portions of maintenance activities, equipment and system operations and restoration, and reviewed selected test procedures. The inspectors monitored the availability of reactor coolant makeup water sources to evaluate whether PPL maintained a defense-in-depth commensurate with the outage risk management goals and in accordance with Technical Specification requirements. The inspectors evaluated selected work activities to ensure the component configuration management, test control, and post maintenance checks were performed in accordance with NRC requirements and approved PPL procedures. In addition, inspectors reviewed unexpected plant conditions, emergent work, and system configuration control during testing and maintenance activities to evaluate whether PPL appropriately identified, assessed, and managed plant risk during those activities.

Refueling Activities: The inspectors observed portions of fuel handing and refueling operations to assess the impact on the fuel barrier during handling and from related activities that could impact the integrity of the fuel barrier during subsequent reactor operation. The inspectors spot checked fuel assembly movement from the refuel platform to verify the locations of fuel assemblies were tracked, from core off-load through core reload. In addition, the inspectors reviewed related reactor vessel maintenance, inspection, and testing activities to evaluate whether the activities were performed in accordance with the Technical Specification requirements and approved procedures. The following activities and documents were observed or reviewed:

- New fuel receipt inspection and channeling
- Fuel handling between spent fuel pool and reactor core
- Foreign material exclusion control around fuel pools, reactor cavity, suppression pool, and drywell
- Evaluation and inspection of rippled control blades and control cells with known friction
- Refuel floor secondary containment integrity during fuel handling operations
- Highly radioactive discrete particle control on refuel floor

- Jet pump mixer assembly removal, modification, and re-installation
- Main steam isolation valve stem repair work
- Unit 1 turbine building closed cooling water system temporary tie-in to Unit 2
- In-vessel Visual Inspection of core support assemblies and jet pump assemblies
- Replacement of three rippled control rod blades
- Recirculation system chemical decontamination
- Main turbine replacement modification

Procedures and Documents

- PL-NF-02-007, Rev. 14 "Channel Management Plan"
- OP-149-002, "RHR Shutdown Cooling Operation"
- OP-135-001, "Fuel Pool Cooling and Cleanup System Operation"
- ON-149-001, "Loss of RHR Shutdown Cooling Mode"
- Condition Reports (CRs) 555477, 554140, 504071, 554236, 555054, and 557348
- NDAP-QA-0507, "Conduct of Refuel Floor Operations"
- OP-0RF-008, "Fuel and Blade Guide Handling Activities"
- OP-181-001, "Unit 1 Refueling Platform Operation [on either Unit 1 or Unit 2]"
- ON-081-001, "Fuel Handling Accident"
- ON-081-002, "Refueling Platform Operation Anomaly"

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111-ST - 4 Samples)

a. Inspection Scope

The inspectors observed portions of selected surveillance test activities in the control room and in the field and reviewed the test data results. The inspectors compared the test result to the established acceptance criteria and the applicable Technical Specification or Technical Requirements Manual operability and surveillance requirements to evaluate whether the systems were capable of performing their intended safety functions. This inspection activity represented four samples. The observed or reviewed surveillance tests included:

- SI-155-302, “24 month Calibration of Control Rod Scram Accumulator Leak Detectors,” CR 544376.
- SE-024-301, “DG “B” Integrated Test,” February 4 and 5
- SI-258-204, “Quarterly Functional Test of Unit 2 SDV High Water Level Channels” (switches out of position), February 19
- SE-104-102, “24 month 4.16 KV Class 1E Bus 1C Offsite Supply transfer test”

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modification (71111.23 - 1 Samples)

a. Inspection Scope

The inspectors reviewed a temporary plant modification to determine whether the temporary change 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 Final Safety Analysis Report (FSAR), Technical Specifications, and assessed the adequacy of the safety determination screenings and evaluations. The inspectors also assessed configuration control of the temporary change by reviewing selected drawings and procedures to verify that appropriate updates had been made. The inspectors compared the actual installation of the temporary modification to determine that the implemented change was consistent with the approved documents. The inspectors reviewed selected post installation test results to verify that the actual impact of the temporary change had been adequately demonstrated by the test. This inspection activity represented 1 sample. The following temporary modification and documents were included in the review:

- Temporary Modification # 399313, "Unit 1 Main Turbine Vibration alarm and trip points changed due to high vibration" and PCWO # 399346

b. Findings

No findings of significance were identified.

1EP2 Alert and Notification System (ANS) Testing

a. Inspection Scope

An onsite review of PPL's Public Notification System (PNS) was conducted to ensure prompt notification of the public for taking protective actions. The inspection included a review of the following procedures: (1) EP-AS-011, "Public Notification System," Revision 2; (2) EP-AD-007, "PNS Annual Test Procedure," Revision 3; and (3) EP-AD-018, "Problem Solving," Revision 2. In addition, the inspector interviewed the siren program manager and reviewed 2002/2003 test records and associated condition reports (CRs) to determine if test failures were being immediately assessed and repaired and sirens were being routinely maintained. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 02, and the applicable planning standard, 10 CFR 50.47(b)(5) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation Testing

a. Inspection Scope

An onsite review of PPL's Nuclear Emergency Response Organization (NERO) augmentation staffing requirements and the process for notifying the NERO was conducted to ensure the readiness of key staff for responding to an event and timely

facility activation. The inspector reviewed the 2002/2003 communication pager test records and associated CRs. A review was also conducted of the backup notification systems that would be used in case of a power outage. An interview was conducted with the EP training instructor to discuss various lesson plans for determining if the training was sufficient for NERO to understand their duties as an emergency responder. Finally, the emergency plan qualification records for key NERO positions were reviewed to ensure qualifications were current. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, and the applicable planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) Revision Review

a. Inspection Scope

A regional in-office review was conducted of PPL's revisions to the emergency plan, implementing procedures and EALs which were received by the NRC during the period of January 2004 through March 2004. A thorough review was conducted of plan aspects related to the risk significant planning standards (RSPS), such as classifications, notifications and protective action recommendations. A cursory review was conducted for non-RSPS portions. During the inspection, the inspector evaluated the associated 10 CFR 50.54(q) reviews to determine if the changes had decreased the effectiveness of the plan. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed corrective actions identified by PPL pertaining to findings from 2002/2003 drill/exercise reports and the associated CRs to determine the significance of the issues and to determine if repeat problems were occurring. A list of CRs are contained in an attachment to this report. Also, the 2002/2003 audit reports were reviewed to assess PPL's ability to identify issues, assess repetitive issues and the effectiveness of corrective actions through their independent audit process. In addition, the inspector reviewed several 2002/2003 self assessment reports to assess the licensee's ability to be self critical for avoiding complacency and making program improvements. A list of self assessment reports are contained in an attachment to this report. Finally, apparent cause evaluation reports were reviewed to assess PPL's capability to determine and evaluate the root causes of significant issues for preventing recurrence. This inspection was conducted according to NRC Inspection Procedure

71114, Attachment 05, and the applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 Sample)

a. Inspection Scope

On February 19, 2004, the inspectors observed a control room simulator based training event. The inspectors assessed licenced operator adherence to emergency plan implementing procedures, and their response to simulated degraded plant conditions to identify weaknesses and deficiencies in classification and notification. The inspectors observed PPL's critique of the simulator control room participants to evaluate PPL's identification of weaknesses and deficiencies. The inspectors compared PPL's identified findings against the inspectors' observations to determine whether PPL adequately identified problems. This inspection activity represented one sample. The inspectors' review included the following documents and procedures:

- Susquehanna Emergency Plan, revision 44
- EP-PS-100, "Emergency Director - Control Room"

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01 - 5 Samples)

a. Inspection Scope

The inspector identified two exposure significant work areas within radiation areas, high radiation areas (<1 R/hr), or airborne radioactivity areas in the plant and then reviewed the associated controls and surveys of these areas to determine if the controls (e.g., surveys, postings, barricades) were acceptable. The areas reviewed were the Unit 1 drywell access point and chemical decontamination skid and tanks (719' elevation - Unit 2 reactor building).

The inspector walked down these exposure significant areas to determine if the RWP controls, procedural controls and engineering controls were being implemented correctly. The inspector also reviewed PPL's surveys and postings for completeness and accuracy, and reviewed the placement of air samplers within these areas. The controls implemented were compared to those required under plant technical specifications (TS 5.7) and 10 CFR 20, Subpart G, for control of access to high and locked high radiation areas.

The inspector reviewed radiation work permits (RWPs) used to access these exposure significant areas and other high radiation areas to identify that work control instructions and control barriers were correctly specified. The inspector reviewed electronic personal dosimeter (EPD) alarm set points (both integrated dose and dose rate) for conformity with survey indications and plant policy.

The inspector reviewed RWPs for airborne radioactivity areas with the potential for individual worker internal exposures of >50 mrem CEDE (20 DAC-hrs). The inspector verified barrier integrity and engineering controls performance (e.g., HEPA ventilation system operation).

During job performance observations, the inspector observed radiation worker performance with respect to stated radiation protection work requirements. The inspector determined that they were aware of the significant radiological conditions in their workplace, and the RWP controls/limits in place, and that their performance took into consideration the level of radiological hazards present.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02 - 5 Samples)

a. Inspection Scope

The inspector reviewed a list of work activities the Unit 1 13th refueling outage (U1 13RIO) ranked by actual/estimated exposure, and selected two of the work activities of highest exposure significance (undervessel work and scaffolding/shielding).

The inspector reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspector reviewed PPL's procedural controls, engineering controls, and work controls to ensure they were based on sound radiation protection principles and would achieve occupational exposures that are ALARA.

The inspector compared the results achieved (dose rate reductions, person-rem used) with the intended dose established in the PPL's ALARA planning for these work activities.

Based on scheduled work activities and associated exposure estimates, the inspector selected two work activities, listed above, in radiation areas, airborne radioactivity areas, or high radiation areas for observation. The inspector evaluated PPL's use of ALARA controls for these work activities by evaluating PPL's use of engineering controls to achieve dose reductions; evaluating procedures and controls for consistency with PPL's ALARA reviews; determined if sufficient shielding of radiation sources was provided for; and, determined if dose expended to install/remove the shielding exceed the dose reduction benefits afforded by the shielding.

The inspector observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspector observed that workers

demonstrated the ALARA philosophy in practice. The inspector also observed radiation worker performance to determine whether the training/skill level was sufficient with respect to the radiological hazards and the work involved.

The inspector discussed the 2004 station exposure goal (235 person-rem) with PPL. The inspector also reviewed the 2004 Unit 1 refueling outage exposure goals. The licensee established an outage goal of 145 person-rem, which includes exposure goals of: 19.25 person-rem for in-service inspection; 16.50 person-rem for drywell shielding; 17.85 person-rem for scaffolding and insulation; and, 11.07 person-rem for undervessel work.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation (7112103 - 2 Samples)

a. Inspection Scope

The inspector reviewed the types of portable radiation detection instrumentation used for job coverage of high radiation area work, temporary area radiation monitors currently used in the plant, and continuous air monitors associated with jobs with the potential for workers to receive 50 mrem CEDE.

The inspector conducted a review of selected radiation protection instruments located in the RCA. Items reviewed were: verification of proper function; certification of appropriate source checks; and, calibration for those instruments used to ensure that occupational exposures were maintained in accordance with 10 CFR 20.1201.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 3 Samples)

a. Inspection Scope

The inspector performed a review of performance indicator (PI) data submitted by PPL for the physical protection cornerstone. The review was focused on PPL's programs for gathering, processing, evaluating, and submitting data for the Fitness-for-Duty, Personnel Screening, and Protected Area Security Equipment Performance Indicators (PIs). This review verified that these PIs had been properly reported as specified in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 1 and Rev 2, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators.

The review included PPL's tracking and trending reports, personnel interviews and security event reports for the PI data collected from the 1st quarter of 2003 through the 4th quarter of 2003. The inspector noted from PPL's submittal that there were no reported failures to properly implement the requirements of 10 CFR 73 and 10 CFR 26 during the reporting period. This inspection activity represents the completion of three (3) samples relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Routine PI&R Review

a. Inspection Scope

The inspectors reviewed selected condition reports (CRs), as part of the routine baseline inspection documented in this report. The CRs were assessed to verify whether the full extent of the various issues were adequately identified, appropriate evaluations were performed, and reasonable corrective actions were identified. The inspectors evaluated the CRs against the requirements of NDAP-QA-0702, "Action Request and Condition Report Process," and 10 CFR 50, Appendix B. During this inspection period, the inspectors performed a screening review of each item that PPL entered into their corrective action program, to assess whether there were any unidentified repetitive equipment failures or human performance issues that might warrant additional follow-up.

b. Findings

No findings of significance were identified.

2. Annual Sample Review - Equipment and Component Configuration Control

a. Inspection Scope

The inspectors reviewed PPL's initial evaluation and associated corrective actions for twenty-three condition reports (CRs) related to equipment configuration control problems between March 2003 and March 2004. The review evaluated PPL's threshold for identifying and resolving problems. This inspection activity represented one sample. The following documents were included in the review:

Procedures and Documents

- OP-AD-001, "Operations Standards for System and Equipment Operation
- OP-AD-002, "Standards for Shift Operations"
- NDAP-QA-0702, "Action Request and Condition Report Process"
- Condition Report Nos. 530818, 552240, 538125, 508954, 550323, 550329, 514471, 538916, 507618, 512990, 483607, 551786, 537691, 544366, 481199, 463631, 476469, 471786, 457491, 464330, 458152, 550709, and 458148

b. Finding and Observations

No findings of significance were identified.

Observations

In 2003, during the initial investigation of mis-positioned components, the shift manager (SM) closed the initial investigation after performing a limited review. On two occasions, the SM closed the review of mis-positioned components without knowing the reason for the error. The operator initial equipment checks did not find any unusual problems such as a cut locking wire or damaged equipment. The reason used to close the investigation was listed as "equipment does not affect safe operation of the plant and equipment is not in a vital area." The reasons the SM listed for closing the review did not meet the intent of OP-AD-001, "Operations Standards for System and Equipment Operation."

The SM procedure errors were considered minor issues when compared to the NRC significance determination process (SDP) process. When found, the mis-positioned components were restored promptly to the proper position. The SM's procedure adherence performance deficiency did not impact the availability, reliability, or operability of Technical Specification or risk significant equipment.

In all cases, PPL entered the mis-positioned component issues into their corrective action program. In response to the SM problems, OP-AD-001 procedure was revised to include the site security group earlier in the mis-positioning review process. Operation management issued a directive to clearly state the operator expectations when a mis-positioning event occurs. Operator response to component mis-positioning events has improved after making changes to the process.

3. NDE/ISI Activities

a. Inspection Scope

The inspector reviewed various condition reports which identified deficiencies during non-destructive testing activities. The inspector verified that identified deficiencies were reported, characterized, evaluated, and resolved within the corrective action program.

b. Findings

No findings of significance were identified.

4. Radiation Protection Activities

a. Inspection Scope

The inspector reviewed 13 notifications (547889, 521249, 537378, 533914, 491138, 490960, 512396, 504299, 463946, 476405, 525136, 525053, and 552190) related to the problems identified in the radiation protection program.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153 - 3 Samples)

1. (Closed) LER 05000387/2003005-00 "D" Diesel Generator Fuel Rack Linkage Became Disconnected

On March 19, 2003, the "D" emergency diesel generator (EDG) woodward governor positioner arm became disconnected from the fuel supply rack when the linkage connecting bolt fell out. PPL identified that the governor had been installed on July 2000. The inspectors determined that the linkage connecting bolt had not been tightened to the required torque value when the governor was installed in July 2000. As a result, on March 19, 2003, after approximately 205 diesel run hours, the bolt fell out and disconnected the governor from the fuel rack during an EDG monthly surveillance run. PPL corrected the condition and verified that the linkage connecting bolts on all 5 EDGs were tightened to acceptable torque values.

This self-revealing violation was documented and discussed in detail in NRC Inspection Report 50-387,388/2003-004, in section 4OA2.2. In addition, an NRC Special Inspection 50-387,388/2004-007 will review this issue, as well as other related EDG issues. This LER was reviewed by the inspectors and no additional findings were noted. This finding was documented in PPL's corrective action program as condition report 504149. This LER is closed.

2. (Closed) LER 05000387/2003006-00 Unit 1 Reactor Scram due to Loss of "C" Reactor Feed Pump

On September 24, 2003, a self-revealing finding was identified when a PCO did not implement operating procedure OP-145-001, "Reactor Feed Pump and RFP Lube Oil System," Section 2.11, "Emergency Governor and Trip Lockout Exerciser Test," as written for the "C" RFP. Instead of re-setting the "C" RFP trip as discussed in step 2.11.8, the PCO moved the RFP turbine emergency governor key lock switch from "Lockout" to "Normal," prior to verifying that the turbine trip signal was reset. As a result, the "C" RFP tripped and the Unit 1 reactor automatically shutdown due to low reactor vessel water level.

This self-revealing violation was documented and discussed in detail in NRC Inspection Report 50-387,388/2003-004, in section 1R14.2. PPL provided self checking and peer checking training to all operation personnel. This LER was reviewed by the inspectors and no additional findings were noted. This finding was documented in PPL's corrective action program as condition report CR 510950. This LER is closed.

3. (Closed) LER 05000387/2003007-00 Common Cause Inoperability of Multiple Core Spray Channels

On October 23, 2003, following the performance of Core Spray quarterly flow surveillances, the Unit 1 and the Unit 2 "D" Core Spray pumps were declared inoperable due to oil foaming observed in the upper bearing oil reservoirs for each pump motor. This event was reportable as a common cause inoperability of multiple Core Spray channels per 10 CFR 50.73(a)(2)(vii).

Inspectors found that corrective actions were not effective in preventing this common cause inoperability following the previous indications of oil foaming in July of 2003. This Corrective Action, 10 CFR 50, Appendix B, Criterion XVI, violation was documented and discussed in detail in NRC Inspection Report 50-387,388/2004-006. As part of a root cause evaluation, PPL determined which components had experienced the same modification to lubrication products and changed out the lubricating oil in all Core Spray pump and RHR Service Water pump motors to eliminate the potential for problem recurrence. This LER was reviewed by the inspectors and no additional findings were noted. This finding was documented in PPL's corrective action program as condition report CR 546574. This LER is closed.

4OA4 Cross Cutting Aspects of Findings

Cross-References to Human Performance Findings Documented Elsewhere

Section 1R14 describes a finding where a non-licensed plant operator did not follow an electrical bus shutdown procedure. As a result, an unplanned start of the "A" emergency diesel generator occurred and the "A" emergency service water pump unavailability time was extended by 14 hours.

Section 1R14 describes a finding where engineering did not adequately translate the modification design information (minimum ECCS keepfill pressure) into the operating

procedures or licensed operator training materials. As a result, operators manually disabled a fully operable ECCS subsystem during the event.

4OA5 Other

1. TI 2515/154 Spent Fuel Material Control and Accounting at Nuclear Power Plants

a. Inspection Scope (TI 2515/154)

Temporary Instruction TI 2515/154, “Spent Fuel Material Control and Accounting at Nuclear Power Plants.” Phase I and Phase II of the inspection were completed during this inspection period. Appropriate documentation was provided to NRC management as required.

b. Findings

No findings of significance were identified.

The inspectors completed several of the inspections using inspection procedures 71111.EP, "Equipment Availability, Reliability, and Functional Capability - Pilot" and 71111.ST, "Post-Maintenance and Surveillance Testing - Pilot." The resident staff utilized these new procedures as part of the Efficiency Focus Group to determine if the new procedures improve the effectiveness and efficiency of the inspection program. This pilot process is expected to be a one year program.

4OA6 Meetings, Including Exit

On April 8, 2004, the resident inspectors presented the inspection results to R. Anderson, Vice President - Nuclear Operations, and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINT OF CONTACT

1EP

T. Harpster, General Manager, Plant Support
J. Grisewood, Supervisor, Nuclear Emergency Planning
R. Tripolli, Nuclear Regulatory Affairs

2OS Occupational Radiation Safety

J. Fritzen, Radiological Operations Supervisor
V. Schuman, Radiological Operations Supervisor
R. Smith, Radiation Protection Manager

4OA1 Performance Indicator Verification
Licensee Personnel:

R. Ferentz	Security Manager
B. McBride	Security Analyst
B. Lowthert	Supervisor, Site Access Services
J. Keating	Site Access Services

NRC Personnel:

P. Frechette	Physical Security Inspector
D. Caron	Physical Security Inspector
A. Dimitriadis	Physical Security Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000387,388/2004002-01	NCV	“A” EDG Unplanned Start due to Procedure Implementation Error (Section 1R14.2)
05000387,388/2004002-02	NCV	Unavailability of RHR on Loss of Condensate Transfer (Section 1R14.3)

Closed

05000387/2003005-00	LER	"D" Diesel Generator Fuel Rack Linkage Became Disconnected
05000387/2003006-00	LER	Unit 1 Reactor Scram due to Loss of “C” Reactor Feed Pump

05000387/2003007-00	LER	Common Cause Inoperability of Multiple Core Spray Channels

Discussed

None

LIST OF DOCUMENTS REVIEWED
(Not Referenced in the Report)

1R08 Inservice Inspection

NDT Examination Reports
DBB1211-FW-8, RCIC system, UT & MT, Work Order 410374
1E-205A-15, "A" RHR head cicrc weld, UT, Work Order 410398

In Vessel Remote Visual Examination

EVT-1	CRGT-3 structural weld - bottom of control rod guide tubes
VT-1	Steam dryer structural welds

Repair-Replacement

Work Order 389672	HV 155F003, high pressure coolant injection (HPCI) valve, replaced valve disc and weld repaired valve guide, PT & MT
Work Order 392175	XV 143F017A, "A" reactor recirc pump seal excess flow check valve and associated piping spool piece, cut out and replace, PT, SPDCB-111-4-FW1B, SPDCB-101-2

Flaw Evaluation
Steam Dryer Structural Welds

Condition Reports

CR-555758	Unit 1 Main Steam Dryer Indications
CR-391355	Unit 1 "1B" Recirc Pump Small Bore Pipe Socket Weld Cracking
CR-463535	Unit 1 Core Spray Sparger Cracking Subsequent Evaluations Not Performed
CR 506771	Unit 1 HPCI Degraded Flow
CR-508633	Unit 1 HPCI Valve HV 155F008, 360 Degree Crack Between Lower Cage Assembly And Valve Body Seal Weld
CR-508634	Unit 1 HPCI Valve 155F008 Stem/Disc Cage Has Seven Small Cracks Between Holes And Edge Of Ribbed Areas

1R17 Permanent Plant Modifications

Condition Reports
CR 555876 (spool pieces too short)
CR 556462 (horizontal alignment of the valve incorrect)
CR 555795 (terminal box not dynamically qualified)
CR 555704 (IOM requirement improperly waived)
CR 556943 (workers improperly skipped QC check)
CR 556369 (rework of the valve without instructions/approval)
CR 556923 (removal of the wrong ESW blank)
CR 330188 (for Green NCV in 2001)

1EP Emergency Preparedness

- Susquehanna Emergency Plan
- EP-PS-100, Emergency Director, Revision 19
- NDAP-OA-0014, NERO Call-out Procedure, Revision 8
- EP-AD-124, Pager Test Analysis, Revision 0
- NEP-01-03, Self Assessment, Control of Contractor Services for PNS, 12/31/03
- NEP-02-06, Self Assessment, Program Evaluation Using the USA EP Checklists
- NEP-02-03, Self Assessment, SSES Drill Critique Process
- NEP-02-02-04, Self Assessment, Effectiveness of Emergency Response Facilities
- NEP-03-02, Self Assessment, EP Self Evaluation Report
- NEP-03-03, Self Assessment, Review of EP Standards
- NEP-03-06, Self Assessment, EP Program Gap Analysis
- NDAP-QA-0702, Corrective Action Program
- NDAP-OO-0745, Self Assessment
- EP-AD-024, EP Lower Tier Performance Indicators
- CR 417561, Process for Developing and Issuing News Releases did not Meet Objectives
- CR 419955, Recommendations Provided in Plan and Procedure Audit Should have Been Classified as Findings.
- CR 423689, Decline in DEP Performance Indicator, 4/28/02
- CR 504218, There is an Apparent Downward Trend in the NRC ANS PI
- CR 415117, Annual PNS Maintenance not Completed with the Calendar Year
- CR 477826, Review General EAL Criteria 4.3, for Accuracy
- CR 441747, No Procedural Method for Determining Loss of Sirens in EPZ
- CR 404277, Plan Drill Event Classification not per Scenario Design
- CR 457354, Procedure Training Matrices Allows Changes without QA Document Review
- CR 415330, Failure to Complete an EP Inventory Surveillance and Insufficient Follow-up of Corrective Action Effectiveness
- CR 423689, SSES Drill and Exercise Performance Trend
- CR 427668, NERO did not Fully Develop an Overall Understanding of the Scenario Event
- CR 478169, TSC Command and Control Issues Emergency Plan Drill
- CR 434852, NIMS/TMX Qualification System Contain Questionable Training Data for NERO
- CR 509845, Procedural Guidance on Timeliness of Tracking Concurrent EALs Needs Improvement
- CR 510186, 7.2 KV Power Supply to Tank Mountain Repeater Lost
- CR 350041, Telenotification System Inoperable
- CR 351313, Emergency Plan Training Deficiencies
- CR 538258, Offsite Sirens are Experiencing Repeat Failures after Maintenance

2OS Occupational Radiation Safety

- 7112101 Access Control (2OS1)
- 7112102 ALARA Planning and Controls (2OS2)
- 7112103 Radiation Monitoring Instrumentation (2OS3)

4OA1 Performance Indicator Verification

Baseline Inspection Procedure Performed

- 71151 Performance Indicator Verification
- Performance Indicator Report, Protected Area Security Equipment Performance, 1st Quarter 2003 - 4th Quarter 2003
- Susquehanna Steam Electric Station Semi-Annual Part 26 Performance Data Report for January 1, 2003 to June 30, 2003 PLA-5665.
- Susquehanna Steam Electric Station Semi-Annual Part 26 Performance Data Report For July 1, 2003 to December 31, 2003 PLA-5718.

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents and Management System
ANS	Alert and Notification System
ASME	American Society of Mechanical Engineers
CEDE	committed effective dose equivalent
CFR	Code of Federal Regulations
CR	Condition Report
CY	Calendar Year
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOOS	Equipment Out of Service
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESW	Emergency Service Water
FSAR	Final Safety Analysis Report
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
ISI	In-service Inspection
LER	Licensee Event Report
LOR	Licensed Operator Requalification
MT	Magnetic Particle Testing
NCV	Non-cited Violation
NDAP	Nuclear Department Administrative Procedure
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NERO	Nuclear Emergency Response Organization
NPO	Non-licensed Plant Operator
NRC	Nuclear Regulatory Commission

ORAM	Outage Risk Assessment and Management
PI	[NRC] Performance Indicator
PI&R	Problem Identification and Resolution
PMT	Post Maintenance Test
PNS	Public Notification System
PPL	PPL Susquehanna, LLC
PT	Liquid Dye Penetrant Testing
QA	Quality Assurance
RB	Reactor Building
RCIC	Reactor Core Isolation Cooling
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RLWO	Release Work Order
RPIS	Rod Position Indication System
RSPS	Risk Significant Planning Standards
RWP	radiation work permit
SDHR	Supplemental Decay Heat Removal
SDP	Significant Determination Process
SM	Shift Manager
SSC	Structure, System, or Component
SSES	Susquehanna Steam Electric Station
TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specification
U1 13RIO	Unit 1Refueling Outage 13
UT	Ultrasonic Testing
VT	ASME Code Visual Examination
WO	Work Order