UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

November 13, 2009

EA-09-248

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 05000387/2009004 AND 05000388/2009004

Dear Mr. Rausch:

On September 30, 2009, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station Units 1 and 2. The enclosed integrated inspection report presents the inspection results, which were discussed with you and other members of your staff during a preliminary exit meeting on October 9, 2009.

This inspection examined activities completed 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.

Based on the results of this inspection, two examples of an apparent violation (AV) were identified, involving PPL Susquehanna, LLC (PPL) failing to ensure that individual license holders, on shift in the capacity of senior reactor operators (SROs), met the medical prerequisites required for holding a license prior to performing the duties of a licensed operator as required by 10 CFR 55.3. In one occasion in August 2009, an SRO failed a medical examination which identified a disqualifying condition, in that, the examination identified that the SRO's vision did not meet the health requirements stated in ANSI/ANS 3.4-1983, Section 5.4.5, "Eyes." However, he performed the function of an SRO during three watches with a license that was not appropriately conditioned to require that corrective lenses be worn. In the second occasion, a different SRO performed licensed operator duties 52 times between April 1, 2009, and July 22, 2009, after the deadline for his biennial medical examination had passed. The medical examination may have identified an issue with the SRO's medical condition and general health that would have disqualified him from being authorized by a license.

This apparent violation is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html).

Upon discovery, PPL removed both individuals from watchstanding duties pending follow-up medical evaluations and, in the August 2009 example involving the SRO who failed his vision examination resulting in a disqualifying condition, PPL requested a conditional NRC license to address the disqualifying medical condition. For the July 2009 example, the SRO passed his biennial medical examination when administered. Both issues have been entered into PPL's corrective action program. See Section 1R11 of the attached report for additional details. In addition, since you identified the violation, and based on our understanding of your corrective actions, a civil penalty may not be warranted in accordance with Section VI.C.2 of the Enforcement Policy.

The NRC believes we have enough information to make a final decision on the matter. Before the NRC makes its enforcement decision, we provided you an opportunity to either: (1) respond to the apparent violation addressed in this inspection report within 30 days of the date of this letter or, (2) request a predecisional enforcement conference. On November 9, 2009, I contacted Mr. Jeff Helsel, Susquehanna Plant Manager, and members of your staff and informed them of this opportunity.

On November 10, 2009, Michael Crowthers, Susquehanna Regulatory Assurance Manager, informed my staff that you elected to provide a written response. Your written response should be clearly marked as a "Response to an Apparent Violation in Inspection Report 05000387/2009004 AND 05000388/2009004; EA-09-248" and should include for each example of the AV: (1) the reason for the AV, or, if contested, the basis for disputing the AV; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision.

In addition, please be advised that the number of violations and characterization of the AV described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

In addition, this report documents two NRC-identified findings and one self-revealing finding of very low safety significance (Green). Two of these findings were determined to involve a violation of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program (CAP), the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC 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 NRC, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station. In addition, if you disagree with the characterization of 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 Inspector at the

Susquehanna Steam Electric Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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/

David C. Lew, Director
Division of Reactor Projects

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

Enclosures: Inspection Report 05000387/2009004 and 05000388/2009004
Attachment: Supplemental Information

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/RA/

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RidsNrrPMPeachBottom Resource
RidsNrrDorlLpl1-2 Resource
ROPreports@nrc.gov

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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:	05000387/2009004 and 05000388/2009004
Licensee:	PPL Susquehanna, LLC
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	July 1, 2009 through September 30, 2009
Inspectors:	F. Jaxheimer, Senior Resident Inspector P. Finney, Resident Inspector G. Meyer, Senior Reactor Inspector S. Chaudhary, Reactor Inspector J. Furia, Senior Health Physicist A. Rosebrook, Senior Project Engineer O. Masnyk-Bailey, Health Physicist S. Hammann, Health Physicist J. Nicholson, Health Physicist
Reviewed By:	Paul G. Krohn, Chief Projects Branch 4
Approved By:	David C. Lew, Director Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000387/2009004, 05000388/2009004, 07/01/2009 – 09/30/2009; Susquehanna Steam Electric Station, Units 1 and 2; Fire Protection, Licensed Operator Requalification Program, Maintenance Effectiveness, ALARA Planning and Controls.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by regional reactor inspectors. Two Green non-cited violations (NCVs), and one Green finding were identified. In addition, one apparent violation (AV) item being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html). The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects associated with findings are determined using IMC 0305, "Operating Reactor Assessment Program," dated August 2009. 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 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of the Susquehanna, Unit 2 Operating License Condition 2.C.(3), Fire Protection for failure to administratively control combustible loading in an area on the 686' elevation of the control structure. As a result, a normally locked storage area was discovered to contain numerous combustibles without designated detection, suppression, or a pre-fire plan. This issue was placed in PPL's corrective action program (CAP) and immediate corrective actions included the removal of some of the combustible materials and the assignment of hourly fire watches.

  The finding was more than minor because it was associated with the external factors attribute (fire) of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, PPL did not ensure that plant procedures controlled the use and storage of combustible materials and that a combustible loading analysis was maintained for a locked storage area fire zone in the control structure. The inspectors assessed this finding in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process", and determined the finding to be of very low safety significance (Green) because the fire barrier between the safety-related equipment in the lower relay room and this storage area was being properly maintained and found in good physical condition. The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not implement a CAP with a low threshold for identifying issues [P.1(a)]. Specifically, PPL had reasonable opportunities to identify the combustible loading issue on multiple occasions during access of the storage room. (Section 1R05)

AV. PPL identified two examples of an apparent violation (AV), involving PPL Susquehanna, LLC (PPL) failing to ensure that individual license holders, on shift in the capacity of senior reactor operators (SROs), met the medical prerequisites required for holding a license prior to performing the duties of a licensed operator as required by 10 CFR 55.3. In one occasion in August 2009, an SRO failed a medical examination which identified a disqualifying condition, in that, the examination identified that the SRO's vision did not meet the health requirements stated in ANSI/ANS 3.4-1983, Section 5.4.5, "Eyes." However, he performed the function of an SRO during three watches with a license that was not appropriately conditioned to require that corrective lenses be worn. In the second occasion, a different SRO performed licensed operator duties 52 times between April 1, 2009, and July 22, 2009, after the deadline for his biennial medical examination had passed. The medical examination may have identified an issue with the SRO's medical condition and general health that would have disqualified him from being authorized by a license. Upon discovery, PPL removed both individuals from watchstanding duties pending follow-up medical evaluations and, in the case involving the SRO whose failed medical examination resulted in a disqualifying condition, PPL requested a conditional NRC license to address the disqualifying medical condition. Both issues have been entered into PPL's corrective action program.

Each example was evaluated independently using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, medical certification and conditional licensing are used by the NRC to ensure health conditions will not adversely affect operator duties or performance. The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because PPL did not systematically collect, evaluate, and communicate relevant external operating experience [P.2(a)]. Specifically, PPL failed to evaluate NRC Information Notice 2004-20 for medical examination issue applicability in accordance with their operating experience review program as evidenced by the 2008 SL-IV NCV (NRC IR 50-387 & 50-388 2008302-01), for an initial licensed operator application submitted to the NRC with a disqualifying medical condition, as well as these two events in July and August of 2009. (Section 1R11.2)

- Green. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," in that PPL did not implement timely corrective actions to preclude repetition of a significant condition adverse to quality. Specifically, actions taken to address causes of the Unit 1 high pressure coolant injection (HPCI) stop valve failure to close in 2006 did not prevent the same HPCI stop valve from failing to close on August 18, 2009. In both cases, the stop valve failure to close rendered this single train HPCI system inoperable as it was unable to meet the 30 second injection response time as described in the design basis. Corrective maintenance was performed on the valve and the issue was entered into PPL's CAP.

  The finding is more than minor because it adversely affected the performance attribute of the Mitigating Systems cornerstone objective, to ensure the availability, reliability, and capability of equipment that respond to initiating events to prevent undesirable consequences. Specifically, a full closed stop valve indication resets the HPCI ramp generator via a lower limit switch. Without this reset, the governor is unprepared to restart the turbine from an idle state during a designed basis event. The inspectors assessed this finding in accordance with IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings" and determined the finding to be of very low

safety significance because it did not result in an actual loss of safety function for greater than the Technical Specification allowed outage time. The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not take appropriate corrective actions to address safety issues in a timely manner, commensurate with their safety significance and complexity [P.1(d)]. Specifically, PPL did not appropriately implement corrective actions following the 2006 failure of the HPCI stop valve. (Section 1R12)

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing, Green finding was identified that involved inadequate work planning relative to the in-vessel visual inspection/ inservice inspection (IVVI/ISI) of the reactor vessel that resulted in additional unplanned collective exposure contrary to as-low-as-is-reasonably-achievable (ALARA) controls. Specifically, the utilization of inexperienced workers to perform the various tasks involved in the IVVI/ISI activity resulted in the additional collective exposure to perform this routine task. This finding was entered into PPL's Correction Action Program for resolution.

  This finding is more than minor because it resulted in unplanned, unintended collective exposure that was greater than 50 percent above the intended collective exposure and greater than 5 person-rem. Additionally, the performance deficiency adversely affected the radiation protection cornerstone objective. The inspectors assessed the finding in accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," and determined that the finding was of very low safety significance (Green) because the finding was due to ALARA work control planning and the 3-year rolling average collective exposure at Susquehanna was less than 240 person-rem (107 person-rem for 2005-2007). This finding was determined to have a cross-cutting aspect in the area of Human Performance, Resources, because PPL did not utilize sufficiently qualified personnel to assure occupational radiation safety requirements were met [H.2(b)]. Specifically, PPL's use of inexperienced contract workers resulted in additional collective exposure that could have been avoided. (Section 2OS2)

B. Licensee Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 began the inspection period at the authorized licensed power level of 94.4 percent rated thermal power (RTP). On September 4, 2009, Unit 1 was reduced to 70 percent over 26 hours in support of a control rod sequence exchange and pattern adjustment. Unit 1 remained at 94.4 percent RTP for the remainder of the inspection period.

SSES Unit 2 began the inspection period at the authorized licensed power level of 94.4 percent RTP. On September 12, 2009, Unit 2 was reduced to 58 percent over 26 hours in support of a control rod sequence exchange and pattern adjustment. Unit 2 remained at 94.4 percent RTP for the remainder of the inspection period.

Note: The licensed RTP for both units is 3952 megawatts thermal. The Extended Power Uprate (EPU) License Amendment for SSES was approved in January 30, 2008, and was implemented for both units in accordance with the issued license conditions. For the current inspection period, the authorized power level for both units is 94.4 percent of the EPU licensed power limit.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial Walkdown (71111.04 - 3 Samples)

a. Inspection Scope

The inspectors performed partial walkdowns to verify system and component alignment and to identify any discrepancies that would impact system operability. The inspectors verified that 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. Documents reviewed are listed in the Attachment. The walkdowns included the following systems:

- Unit 1, 1B residual heat removal (RHR) components and instrumentation with focus on behavior during pressurization and venting;
- Plant discharge line (blow down) and river water make-up system parameters and lineup during investigation of groundwater issue described by CR 1167146; and
- "A" and "E" emergency diesel generators (EDGs) when "E" EDG substituted for "B" EDG.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (71111.04S - 1 Sample)

a. Inspection Scope

The inspectors performed a detailed review of the alignment and condition of the station nitrogen system and the Unit 2 containment instrument gas system. The inspectors reviewed operating procedures, checkoff lists, and system piping and instrumentation drawings. Walkdowns of accessible portions of the systems were performed to verify components were in their correct positions and to assess the material condition of systems and components. The inspectors evaluated ongoing maintenance and outstanding Condition Reports (CR) associated with both systems to determine the effect on system health and reliability. The inspectors verified proper system alignment and looked at system operating parameters. Documents reviewed are listed in the Attachment. The walkdown included the following system and its interconnection:

- Unit 2, Nitrogen and Primary Containment Instrument Gas.

b Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q – 5 Samples)

Fire Protection – Tours

a. Inspection Scope

The inspectors reviewed PPL's fire protection program to evaluate the specified 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. Documents reviewed are listed in the Attachment. The inspected areas included:

- Unit 1, battery rooms, fire zones 0-28 B-1 (11) and 0-28 I thru N;
- Unit 1, containment access area (I-401);
- Security control center, fire zone 0-83, FP-013-360;
- Control structure charcoal filter area and operations storage area on elevation 687', FP-013-135; and
- Central access control area and chemistry laboratory, elevation 676', FP-013-134.

b. Findings

Introduction: The inspectors identified that PPL was not administratively controlling combustible loading in an area on the 686' elevation of the control structure as specifically required by the Susquehanna Fire Protection Program and specifically described as a provision of the Fire Protection Program Report (FPPR). This finding

was determined to be of very low safety significance (Green) and an NCV of the SSES Unit 2 Operating License Condition 2.C(3), Fire Protection.

Description: During a fire walkdown inspection in the control structure, the resident inspectors identified that an operations department space, a normally locked storage area on 686' elevation, contained numerous combustibles. Most items stored in the area were found on open shelves or stacked on the floor. The accumulation of combustibles included (but was not limited to) wood, plastic, cardboard boxes, old paper records, rubber drain hoses, radio equipment, refueling support furniture, and labeling supplies. Inspectors immediately asked operations staff if this room was part of any fire pre-plan (fire fighting guideline/procedure). The room was not incorporated in any of the site fire pre-plans and inspectors did not locate any combustible storage permits. When inspectors could not verify the area was being controlled by the design control process as a combustible storage area and could not verify that PPL was procedurally controlling the use and storage of combustible materials in this area, the issue was brought to PPL management's attention. PPL took immediate action to dispatch the fire protection engineer (FPE) and field unit supervisor to the area. An hourly fire watch was started for the area and some of the combustibles were promptly removed from the room. The operations shift manager determined that the area was overcrowded with materials that were no longer needed. Longer term correction actions are planned and the issue is being tracked by CR 1179995.

As part of the evaluation of this performance issue, inspectors also completed additional walkdowns and drawing reviews which revealed that the operations department storage area was actually located directly below the following rooms on the 698' elevation of the control structure: the computer maintenance room, the uninterrupted power supply computer room, Corridor C-200, and the Unit-2 lower relay room. Inspectors reviewed design drawings, the FPPR and held a discussion with the site FPE, to verify that there was no automatic detection, no automatic suppression, and no fire pre-plan for this storage area.

Analysis: The inspectors determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, PPL did not ensure that fire combustible storage was procedurally controlled in the control structure. Fire combustibles accumulated in an area directly below the Unit 2 relay room and three other separated rooms. This storage area did not have any fire suppression or detection capability.

The inspectors assessed this finding in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process." This finding was determined to be of very low safety significance (Green) in Phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because the fire barrier between the safety-related equipment in the lower relay room and this storage area was being properly maintained and found in good physical condition.

The finding was determined have a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not implement a CAP with a low threshold for identifying issues [P.1(a)]. Specifically, PPL

had reasonable opportunities to identify the combustible loading issue on multiple occasions during access of the storage room.

Enforcement: The Susquehanna Unit 2 Operating License Condition 2.C.(3), requires that PPL implement and maintain in effect all provisions of the Fire Protection Program as described in the FPPR. FPPR section 1.4 requires that plant procedures control the use and storage of combustible materials and section 6.0 also requires that the combustible loading analysis was maintained through the design control process. Contrary to these requirements, prior to September 2009 PPL did not procedurally control the use and storage of combustible materials on the 686' elevation of the control structure and did not evaluate changes to combustible storage in this area through the design control process. Because the finding is of very low safety significance and has been entered into PPL's CAP (CR 1179995), this violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. (**NCV 05000388/2009004-01, Failure to Implement and Maintain the Fire Protection Program with Respect to the Use and Storage of Combustibles in the Control Structure**)

1R06 Flood Protection Measures (71111.06 – 1 Sample)

Underground Cables

a. Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and entered four underground vaults to evaluate the conditions of risk-significant cables. The inspection focus included a visual inspection of cable integrity. Additionally, the material condition of support structures and credited components such as watertight plugs, floor drains, flood detection equipment, and alarms were also assessed to determine whether the components were capable of performing their intended function. Some dewatering devices were observed in operation. Documents reviewed are listed in the Attachment. The following risk significant area was reviewed:

- Engineered Safeguards Service Water pump house and spray pond vault inspections VA006, VA007, VA011, and VA012.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07T – 3 Samples)

Triennial Heat Sink

a. Inspection Scope

Based on safety significance and prior inspection history, the inspectors selected the following heat exchangers to evaluate PPL's means (inspection, cleaning, maintenance, and performance monitoring) of ensuring adequate heat sink performance.

- Unit 1 A RHR heat exchanger;

- 'A' Emergency diesel generator heat exchangers:
    1) Intercooler heat exchanger;
    2) Jacket water cooler; and
    3) Lubricating oil cooler.
- 'E' Emergency diesel generator heat exchangers:
    1) Intercooler heat exchanger;
    2) Jacket water cooler; and
    3) Lubricating oil cooler.

The inspectors assessed the external condition of the above heat exchangers in the field, reviewed the eddy current, surveillance test and inspection results, and reviewed the applicable system health reports since the last inspection to confirm that results were acceptable and that design basis assumptions for flow rate, plugged tube percentage, and heat transfer capability had been met. The inspectors discussed piping corrosion, and heat exchanger practices, including the specifications and procedures for heat exchanger maintenance, and consistency with the Generic Letter 89-13 requirements with cognizant, system engineers, and chemistry personnel. The inspectors reviewed applicable corrective action program documents to confirm that identified problems and degraded conditions had been resolved properly.

In addition to the inspections of heat exchangers in the RHR and EDG systems, the inspectors visually examined equipment, slope protection and water level in the spray pond, and the apparent condition of primary and support equipment in the intake structure.

The inspectors assessed the condition of the spray pond (ultimate heat sink) and the pump house, and reviewed the August 2009 inspection/evaluation of spray pond sediment depth. The review included discussions with the RHR service water system engineer, a walk-down of the spray pond and pump house, and discussions with chemistry personnel and the emergency service water (ESW) system engineer.

The chemical treatment programs for the spray pond (ESW ultimate heat sink) and the cooling tower basin (service water heat sink) were reviewed to verify that potential bio-fouling mechanisms were being addressed, including on-going treatment and monitoring as specified in the chemistry manual. The inspectors noted that the SSES results were aided by the ability to chemically control their ultimate heat sink, the extensive use of stainless steel AL-6XN in tubing, and the experience of involved engineering, testing, and chemistry personnel.

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

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

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On August 10, 2009, the inspectors observed as-found licensed operator simulator performance. The inspectors compared their observations to Technical Specifications (TSs), emergency plan implementation, and the use of system operating procedures. The inspectors also evaluated PPL's critique of the operators' performance to identify discrepancies and deficiencies in operator training. Documents reviewed are listed in the Attachment. The following training was observed:

- Anticipated transient without scram, reactor pressure vessel power and level control, and event declaration.

b. Findings

No findings of significance were identified.

.2 Licensed Operator Medical Review (1 sample)

a.. Inspection Scope

The inspectors reviewed two instances in July 2009 and August 2009 where PPL had identified issues with the medical qualification records for two separate Senior Reactor Operators. The inspectors reviewed the medical certification forms, reviewed the PPL's formal correspondence with the NRC upon discovery of the issue to ensure timeliness requirements were met, PPL conditional license request submittal and reviewed PPL's corrective actions.

b. Findings

Introduction: The licensee identified two examples of an AV of 10 CFR 55.3, Licensed Requirements, for two cases in which PPL licensed operators failed to have valid medical examinations consistent with their position. Specifically, one licensed operator performed duties with an expired biennial medical examination while another licensed operator performed duties with a failed visual examination. In both cases, operators performed the function of a senior reactor operator without meeting the medical requirements for requalification specified in 10 CFR 55.21, 10 CFR 55.23 and 10 CFR 55.33. As such both operators were not qualified while being assigned to and performing licensed duties as required by 10 CFR 55.3.

Discussion: During July and August 2009, two instances were identified where SSES licensed operators failed to meet the medical requirements to maintain their license, and these operators subsequently performed licensed operator duties.

Event 1: On October 13, 2008, a senior reactor operator (SRO) self-identified a medical issue that resulted in his disqualification, a medical restriction entered into a corporate database and an automatic update of TMX, (the site's training and qualification database) was completed from the corporate source. The operator subsequently

completed a medical follow-up and was reinstated on December 12, 2008. While the corporate database entry could have been deleted upon reinstatement, manual corrections to TMX were made. When the restriction was manually updated with a December 12, 2008 date, TMX automatically and incorrectly changed the medical examination due date to October 31, 2010, to reflect a biennial requirement from the date of the SRO's self-identified medical issue.

In 2004, the NRC issued NUREG-1021, Revision 9, which clarified the periodicity of medical examinations. Appendix F of the NUREG defines biennial as 730 days and allows for an extension to include the remaining days in the anniversary month. For example, the subject SRO had a biennial medical examination due on March 9, 2009, exactly two years from the previous examination but the permitted extension carried the due date to March 31, 2009.

During a medical record review on July 22, 2009, PPL discovered that the SRO had not received a biennial licensed medical examination by March 31, 2009. The SRO qualifications for the individual were immediately revoked and a physical was scheduled for July 24, 2009. The operator passed the physical examination and was subsequently reinstated on July 30, 2009. Upon review, it was determined that the SRO stood a total of 52 watches in a TS licensed position without a certifying medical examination as outlined in ANSI/ANS-3.4-1983, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants." Upon discovery, PPL placed this issue in their corrective action program under CR 1166686.

Event 2: On August 18, 2009, a PPL health services specialist determined that an on-shift SRO did not pass the corrected or uncorrected visual examination which had been performed during the previous week. Upon discovery, the SRO was disqualified for the licensed position and the operator was removed from standing watch. PPL operations staff promptly initiated Condition Report 1173182, which described the non-compliance and established corrective actions to implement measures to mitigate the recurrence of similar conditions. PPL also implemented actions to request a conditional license for this SRO adding a condition to the operator's license requiring corrective lenses be worn.

It was determined that the licensed operator performed licensed duties during three scheduled work shifts which included assuming the role of the refueling SRO during fuel moves for a dry fuel storage campaign. This SRO performed licensed duties even though he had not met the medical condition and general health prescribed for licensed operators at the facility as outlined on NRC Form 396 and required by 10 CFR 55.21.

Information Notice (IN) 2004-20, "Recent Issues Associated with NRC Medical Requirements for Licensed Operators," states, "Given the importance of the operators' role in maintaining reactor safety, the NRC staff becomes concerned whenever inspection results, facility audits, and other indicators suggest that facility medical programs may not be receiving sufficient management oversight to ensure that the fitness of licensed operators is being maintained at the required level." Despite the fact that PPL entered IN 2004-20 into their corrective action program for operating experience evaluation (CRs 625137 and 622658), that evaluation did not occur.

Analysis:

Event 1: The inspectors determined that PPL's failure to ensure that the licensed operator received a biennial medical examination was a performance deficiency. This finding was evaluated using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, there was potential for license termination or the issuance of a conditional license to accommodate the medical problems.

This operator performed licensed duties during 52 scheduled work shifts as an SRO. The NRC notes that the operator was actually qualified the entire time (his follow-up medical examination results were satisfactory), he had not developed any condition that required a license condition and there was no actual impact to his requalification; the fact that the SRO was never the only SRO being credited to met minimum TS manning requirement; and the fact that the SRO's job performance was satisfactory during the period of the expired physical examination, and these factors will be considered prior to a final severity level determination.

Event 2: The inspectors determined that PPL's failure to ensure that the licensed operator received the required vision examination and passed the required visual before assuming licensed reactor operator duties was a performance deficiency. This finding was evaluated using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, there was a potential for license termination or the issuance of a conditional license to accommodate for medical problems.

This operator perform licensed duties during three scheduled work shifts, which included assuming the role of the refueling SRO during fuel moves for the ongoing dry fuel storage campaign, but he did so with a disqualifying condition that would have required his license to be amended. The NRC notes that the Fuel Handling SRO position is a procedurally required position which was performed by a qualified individual; the SRO had an actual disqualifying medical condition which required an amended license; and the SRO's job performance was satisfactory during three watches he stood with this identified condition, and these factors will be considered prior to a final severity level determination.

Each of the two events would be considered violations of the same regulatory standard (10 CFR 55.3) and share a common root cause of programmatic issues within PPL's licensed operator medical reviews.

The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because PPL did not systematically collect, evaluate, and communicate relevant external operating experience [P.2(a)]. Specifically, PPL failed to properly evaluate IN 2004-20 for medical examination issue applicability in accordance with their operating experience review program as evidenced by the 2008 SL-IV NCV (NRC IR 50-387 & 50-388 2008302-01), for an initial licensed operator application submitted to the NRC with a disqualifying medical condition, as well as these two events in July and August of 2009.

Enforcement:

Event 1: 10 CFR 55.21 requires, in part, that "a licensee shall have a medical examination by a physician every two years. The physician shall determine that the applicant or licensee meets the requirements of 10 CFR 55.33(a)(1).
10 CFR 55.33(a)(1) states, in part, that the applicants medical condition and general health will not adversely affect the performance of assigned job duties or cause operational errors endangering public health and safety. 10 CFR 55.3 states that, "A person must be authorized by a license issued by the Commission to perform the function of an operator or a senior operator as defined in this part".

Contrary to the above, between April 1, 2009, and July 22, 2009, PPL failed to ensure that the individual licensee, an SRO, while on shift, was authorized by a license to perform the function of an SRO, after he failed to have the required two-year medical examination. Specifically, the SRO performed licensed operator duties 52 times between April 1, 2009, and July 22, 2009, after the deadline for his medical examination had passed. The medical examination may have identified an issue with the SRO's medical condition and general health that would have disqualified him from being authorized by a license.

Event 2: 10 CFR 55.21 requires, in part, that a licensee shall have a medical examination by a physician every two years. The physician shall determine that the applicant or licensee meets the requirements of 10 CFR 55.33(a)(1).
10 CFR 55.33(a)(1) states, in part, that the applicant's medical condition and general health will not adversely affect the performance of assigned job duties or cause operational errors endangering public health and safety. 10 CFR 55.33(b) states, in part, if an applicant's general medical condition does not meet the minimum standards under 10 CFR 55.33(a)(1) the Commission may approve the application and include conditions in the license to accommodate the medical defect.

10 CFR 55.23(b) states in part, when the certification requests a conditional license based on medical evidence, the medical evidence must be submitted to the Commission and the Commission then makes a determination in accordance with 10 CFR 55.33.

10 CFR 55.3 states that a person must be authorized by a license issued by the Commission to perform the function of an operator or a senior operator as defined in this part.

Contrary to the above, between August 10, 2009, and August 18, 2009, PPL failed to ensure that the individual licensee, an SRO, while on-shift, was authorized by a license to perform the function of an SRO, after he failed a medical examination which identified a disqualifying condition. Specifically, a medical examination conducted on August 10, 2009, identified that the SRO's vision did not meet the health requirements stated in ANSI/ANS 3.4-1983, Section 5.4.5, "Eyes." However, he performed the function of an SRO during three watches with a license that was not appropriately conditioned to require that corrective lenses be worn.

Each example was evaluated independently using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact or impede the regulatory process. Specifically, medical certification and conditional licensing are used by the NRC to ensure health conditions

will not adversely affect operator duties or performance. (**AV 05000387; 388/2009004-02, Violation of 10CFR55.3, Senior Reactor Operators Performing Licensed Duties While Not Qualified Due to Medical Examination Issues**)

1R12 Maintenance Effectiveness (71111.12Q – 3 Samples)

a. Inspection Scope

The inspectors evaluated PPL's work practices and follow-up corrective actions for selected structures, systems and components (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. Documents reviewed are listed in the Attachment. The following issues were reviewed:

- Unit 1, HPCI turbine stop valve failure and previous corrective actions for inadequate preventative maintenance;
- Multiple failures of EDG air start system relief valves which caused "A" EDG unavailability; and
- Station blackout (SBO) diesel generator (DG) unavailability due to radiator coolant leakage.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," in that, PPL did not implement timely corrective actions to preclude repetition of a significant condition adverse to quality. Specifically, the actions taken to address the causes of the Unit 1 HPCI stop valve failure to close in 2006 did not prevent the same Unit 1 HPCI stop valve from failing to close on August 18, 2009. In both cases, the failure of the stop valve to close rendered this single train high pressure injection system inoperable as it was unable to meet the 30 second injection response time as described in the design basis.

Discussion: On August 18, 2009, the Unit 1 HPCI stop valve (FV-15612) indicated dual position after performance of the weekly lubricating oil functional check. FV-15612 did not go full closed as expected and was verified to be approximately one inch from full closed. Operations cycled the valve with maintenance personnel present in the field and found that the valve did not operate smoothly when closing. Based on previous history with FV-15612, engineering recommended that the HPCI system be declared inoperable. Unit 1 HPCI was declared inoperable and the FV15612 valve was disassembled and repaired.

The failure of FV-15612 significantly impacts HCPI operation because the HPCI ramp generator resets to idle when the lower limit switch opens (at the full closed indication on

FV-15612). Thus, FV-15612's closure is necessary to prepare the governor to restart the turbine and if FV-15612 does not fully close, the generator can not reset, and the governor would demand full open when the turbine restarts. This condition greatly increases the probability of an overspeed trip upon turbine start. Historical data from the original HPCI speed control design reveals that it would be expected to have at least 1 or 2 overspeed trips before the HPCI governor would be able to control turbine speed. In this condition the HPCI 30 second design basis response time would not be met. (Ref: TS 3.5.1.13). Therefore, HPCI was not able to perform its safety function with design limits and was inoperable. In addition, this degraded component also challenges the system protective features (overspeed trip function) which reduces the reliability of the system to function.

The safety system remained unavailable for several days as extensive effort was required to repair the component for this type of degradation. Inspectors witnessed some of the maintenance work and observed that there were many physical similarities to the conditions found when this valve was disassembled and repaired following the failure to close in August of 2006.

One documented cause for the 2006 FV-15612 failure was an observed seal area that is periodically wetted by HPCI operation and a material which is susceptible to general corrosion and requires periodic replacement to maintain proper operation. In 2006, PPL took the action to replace the rod bushing. However, there were no actions to address the cause and reduce moisture exposure, change or evaluate materials to reduce the susceptibility to corrosion, and no actions to increase component monitoring for moisture or corrosion. The second documented apparent cause for the 2006 FV-15612 failure was inadequate preventive maintenance (PM). An administrative error had caused this component to go past the PM expiration date. PPL performed the inspections as part of the 2006 repair and recalculated a new due date for the PM task. PPL did not change the 10 year interval for maintenance and inspection and did not increase the PM frequency for this component to more appropriately address this identified apparent cause (inadequate PM). The inspectors determined that the limited corrective actions taken following the apparent cause evaluation in 2006 contained in CR 806988 were a primary contributor to the repeat failure of the FV-15612 in 2009. In both cases, valve FV15612 failed in the same manner and would not travel to the full closed position. In both cases, the actuator stem to bushing interface was very tight and required the use of pullers and/or hammers during actuator disassembly. For both failures the most likely cause was due to increased friction between the actuator shaft and the rod bushing as a result of corrosion. The inspectors also identified that the corrective action report CR 806988 did not have an effectiveness review plan. The CR stated that given the long duration of the PM interval, it would be unreasonable to hold an effectiveness review open for several years.

The inspectors reviewed PPL's cause evaluation for the August 2009 valve failure, as documented in CR 1172997. This evaluation described how the leakage through the seat of the Unit 1 HPCI Steam Admission Valve (HV-155F001) was a contributing cause to the 2009 component failure. The HV-155F001 had chronic through seat leakage for the last decade. Inspectors concluded that this leakage and moisture source was also a contributing factor from 2006, and that more aggressive action to fix the seat leakage which contributed to the corrosive environment would have reduced the probability and/or frequency of the experienced component failure.

Analysis: The finding is more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems cornerstone objective, to ensure the availability, reliability and capability of equipment that respond to initiating events to prevent undesirable consequences. Specifically, with FV-15612 unable to fully close, the HPCI 30 second design basis response time would not be met. Not only did this degraded component make the HPCI system inoperable; it also challenged the system protective features (overspeed trip function) which reduced the reliability of the system to function. In addition, the repairs necessary to restore the system required extensive effort and resulted in several days of unplanned unavailability for a single train safety system.

The inspectors assessed this finding in accordance with IMC 0609 Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings" and determined the finding to be of very low safety significance (Green) because it did not result in an actual loss of safety function for greater than the TS allowed outage time. The finding was not potentially risk significant due to seismic, flood, or severe weather initiating events.

This finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PPL did not take appropriate corrective actions to address safety issues in a timely manner, commensurate with their safety significance and complexity [P.1(d)]. Specifically, PPL did not take appropriate corrective actions for a significant condition adverse to quality from the 2006 failure of the HPCI stop valve to prevent the 2009 failure of the same valve.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in-part, for significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, PPL did appropriately identify several causes but corrective actions following the 2006 valve failure did not prevent repetition of the same HPCI stop valve failure on August 18, 2009. In both cases, the failure of the stop valve to close rendered this single train high pressure injection system inoperable as it was unable to meet the 30 second injection response time as described in the design basis. In 2009 this particular failure also caused several days of unplanned unavailability due to the extensive effort to repair the component. Because the finding is of very low safety significance and has been entered into PPL's CAP (CR 710737), this violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000387/2009004-03, Inadequate Corrective Actions Result in a Repeat Failure of Unit 1 HPCI Turbine Stop Valve**).

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 Samples)

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to evaluate the effectiveness of PPL's risk management for planned and emergent work. The inspectors compared the risk assessments and risk management actions to the requirements of 10 CFR Part 50.65(a)(4) and the recommendations of NUMARC 93-01, Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine

whether risk assessments were performed when specified and appropriate risk management actions were identified.

The inspectors reviewed scheduled and emergent work activities with licensed operators and work-coordination personnel to evaluate 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 emergent work activities. The inspectors performed control room and field walkdowns to evaluate whether the compensatory measures identified by the risk assessments were appropriately performed. Documents reviewed are listed in the Attachment. The selected maintenance activities included:

- Unit 1, 2-4 GPM leak on RWCU filter demineralizer outlet isolation valve emergent work control;
- Unit 1, Yellow Risk during corrective maintenance on SBO DG concurrent with Unit 1 HPCI stop valve and "B" EDG jacket water heater failures on August 21;
- Units 1 and 2, 2A residual heat removal service water (RHRSW) pump inoperable due to loose electrical junction box supports concurrent with Unit 1 RHRSW subsystem inoperable for scheduled maintenance; dual unit 72 hour shutdown limiting condition for operation (LCO);
- Orange equipment out-of-service risk for both Unit 1 and Unit 2 during "A" EDG outage and emergent "E" EDG inoperability, CR 1165553;
- Replace recirculation/standby gas treatment system (SGTS) damper actuator; dual unit 4 hour shutdown LCO;
- Emergent wiring repairs on ESS transformer OX203 in 72 hour LCO; and
- T20 startup transformer (T20) high voltage bushing replacement and Bus 20 clean and inspect.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – 7 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 TSs. In addition, the inspectors reviewed the selected operability determinations to evaluate whether the determinations were performed in accordance with NDAP-QA-0703, "Operability Assessments." The inspectors used the TSs, Technical Requirements Manual, Final Safety Analysis Report (FSAR), and associated Design Basis Documents as references during these reviews. Documents reviewed are listed in the Attachment. The issues reviewed included:

- Unit 1, RHR Division I, gas entrainment issue;
- Unit 1, repeat failure of 1B RHRSW pump IST;
- Unit 2, 'D' main steam line radiation monitor on multiple alarms and work orders;

- Unit 2, HPCI operators disabled auxiliary oil pump during surveillance restoration steps on May 16, 2009;
- Common cause analysis after "C" EDG trip on overspeed;
- "E" EDG with failed turbocharger overspeed speed trip circuit, OFR 1166085; and
- "D" EDG, ESW piping clamp support on floor, CR 1181216.

b. Findings

No findings of significance were identified

1R18 Plant Modifications (71111.18 - 2 Samples)

.1 Temporary Plant Modifications (1 Sample)

a. Inspection Scope

The inspectors reviewed a temporary plant modification to determine whether the 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 FSAR, TSs, and assessed the adequacy of the safety determination screening and evaluation. The inspectors also assessed configuration control of the change by reviewing selected drawings and procedures to verify whether appropriate updates had been made. The inspectors compared the actual installation to the temporary modification documents to determine whether the implemented change was consistent with the approved documents. The inspectors reviewed selected post-installation test results to determine whether the actual impact of the change had been adequately demonstrated by the test. Documents reviewed are listed in the Attachment. The following modification and document was included in the review:

- Unit 1, Temporary Engineering Change 1136133, bypass gas discharge temperature trip on 1K206B.

b. Findings

No findings of significance were identified.

.2 Permanent Plant Modifications (1 Sample)

a. Inspection Scope

The inspectors reviewed a permanent plant modification to determine whether the 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 FSAR, TSs, and assessed the adequacy of the safety determination screening and evaluation. The inspectors also assessed configuration control of the change by reviewing selected drawings and procedures to verify whether appropriate updates had been made. The inspectors compared the actual installation to the permanent modification documents to determine whether the implemented change was consistent with the approved documents. The inspectors reviewed selected

post-installation test results to verify whether the actual impact of the change had been adequately demonstrated by the test. Documents reviewed are listed in the Attachment. The following modification and document was included in the review:

- Engineering Work Request 1086364, T20 H1 bushing replacement.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors observed portions of post-maintenance test (PMT) activities in the field to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated acceptance criteria to determine whether the test demonstrated that components satisfied the applicable design and licensing bases and TS requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. Documents reviewed are listed in the Attachment. The PMT activities reviewed included:

- Unit 1, HPCI PMT after stop valve repair;
- Unit 1, single control rod scram during scram switch functional check;
- Unit 1, core spray valve exercising, HV152F0005A and F015A after breaker swaps;
- Unit 2, reactor core isolation cooling (RCIC) pump and flow testing and overspeed trip test following resolution of turbine trip tappet nut alignment, CR 1146099;
- Unit 2, PMT of PSV 251F087 after maintenance to eliminate emergency core cooling system keepfill leakage past valve; and
- T20 high bushing replacement, tap charger inspection and bus 20 cleaning and inspection.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 – 4 Routine Surveillance and 1 IST Samples)

a. Inspection Scope

The inspectors observed portions of selected surveillance test activities in the control room and in the field and reviewed test data results. The inspectors compared the test results to the established acceptance criteria and the applicable TS or Technical Requirements Manual operability and surveillance requirements to evaluate whether the systems were capable of performing their intended safety functions. Documents

reviewed are listed in the Attachment. The observed or reviewed surveillance tests included:

- Unit 1, quarterly functional test of reactor vessel water level channels LIS-B21-IN031A, 3B, C, D, SI-180-203;
- Unit 2, IST testing of RCIC pump flow indication from remote shutdown panel;
- "A" SGTS filter and absorber leak tests;
- "D" EDG full load rejection test, SE-024-D01; and
- Monthly operation of SGTS train "A", SO-070-001.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 Sample)

a. Inspection Scope

The inspectors reviewed the combined functional drill scenario (2009 Gold Team Emergency Drill) that was conducted on August 25, 2009, and observed selected portions of the drill in the simulator control room and technical support center. The inspection focused on PPL's ability to properly conduct emergency action level classification, notification, and protective action recommendation activities and on the evaluators' ability to identify observed weaknesses and/or deficiencies within these areas. Ten performance indicator (PI) opportunities were included in the scenario. The inspectors attended the evaluators' post-drill critique and compared identified weaknesses and deficiencies including missed PI opportunities against those identified by PPL to determine whether PPL was properly identifying weaknesses and failures in these areas. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Control to Radiologically Significant Areas (71121.01 – 6 Samples)

a. Inspection Scope

The inspectors reviewed and assessed the adequacy of PPL's internal dose assessment for any actual internal exposure greater than 50 mrem committed effective dose equivalent.

The inspectors examined PPL's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools.

For high radiation work areas with significant dose rate gradients (factor of 5 or more), the inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel.

The inspectors discussed with the radiation protection manager high dose rate-high radiation area, and very high radiation area controls and procedures. The inspectors focused on any procedural changes since the last inspection. The inspectors verified that any changes to PPL's procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with health physics supervisors the controls in place for special areas that have the potential to become very high radiation areas during certain plant operations. The inspectors determined that these plant operations required communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors verified adequate posting and locking of entrances to high dose rate-high radiation areas, and very high radiation areas.

The inspectors evaluated PPL's performance against the requirements contained in 10 CFR 20 and Plant Technical Specification 5.7.

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02 – 3 Samples)

a. Inspection Scope

The inspectors obtained from PPL a list of work activities ranked by actual/estimated exposure that are in progress or that have been completed during the last outage and select the 2 work activities of highest exposure significance (in-vessel ISI/IVVI and EPU alternate decay heat removal modification).

The inspectors reviewed PPL's method for adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work are encountered. The inspectors evaluated whether adjustments to estimated exposure (intended dose) were based on sound radiation protection and ALARA principles or just adjusted to account for failures to control the work.

The inspectors evaluated PPL's performance against the requirements contained in 10 CFR 20.1101.

Documents reviewed are listed in the Attachment.

b. Findings

Introduction: A self-revealing Green finding was identified due to a deficiency in the area of maintaining occupational radiation exposures ALARA. Work performance involving the IVVI/ISI during the Unit 2 14th Refuel and Inspection Outage was less than adequate resulting in collective exposure for the work to expand from 5.00 person-rem to 11.04 person-rem.

Description: The IVVI/ISI dose overrun was primarily due to the utilization of inexperienced contract workers to perform the task. The contractor selected by PPL utilized workers for major IVVI/ISI tasks, including: inspection; camera placement and repair; and, pressure washing/surface preparation, were inexperienced in performing these tasks. The work hours to perform these tasks then expanded to include an additional 294 hours for inspection; 207 hours for camera placement and repair; and, 1000 hours for pressure washing/surface preparation. These examples of additional in-field high radiation work resulted in additional collective exposure that could have been avoided had sufficient pre-job training been provided. Pre-task training for workers, as described in the pre-outage work plan, was inadequate for the tasks to be performed, based on the use of inexperienced workers. Outage planning for this work was based upon past performance in earlier outages with experienced work crews, and estimated to require less than 3000 hours. Actual hours to perform these tasks with the inexperienced workers were over 5000 hours. The original exposure estimate was 5.00 person-rem. When compared to the actual work activity exposure of 11.04 person-rem, the results were 120 percent greater than the exposure estimate.

Analysis: Inadequate work planning that resulted in significant unplanned collective exposure was a performance deficiency which was reasonably within PPL's ability to foresee and correct and which should have been prevented. Specifically, the original exposure estimate was 5.00 person-rem. When compared to the actual work activity exposure of 11.04 person-rem, the results were 120 percent greater than the exposure estimate.

The finding is more than minor because the issue involved actual collective exposure greater than 5 person-rem that was greater than 50 percent above the estimated or intended exposure and the dose overrun was due to activities within PPL's control. This issue is similar to the greater than minor examples provided in Appendix E of Manual Chapter 0612. Further, the performance deficiency is associated with the radiation safety cornerstone attribute of the program (ALARA planning) and adversely affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. The finding was evaluated in accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process." The inspectors determined that the finding was of very low safety significance (Green) because: (1) it involved an ALARA planning issue, and (2) the 3-year rolling average collective dose history was less than 240 person-rem (107 person-rem annual exposure for 2005-2007). This finding was entered into PPL's CAP (CR 1140623 and 1137835).

This finding was determined to have a cross-cutting aspect in the area of Human Performance, Resources, because PPL did not utilize sufficiently qualified personnel to assure occupational radiation safety requirements were met [H.2(b)]. Specifically, PPL's use of inexperienced contract workers resulted in additional collective exposure that could have been avoided.

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirement. The ALARA rule contained in 10 CFR 20.1101(b) Statements of Consideration indicates that compliance with the ALARA requirement will be judged on whether the licensee has incorporated measures to track and, if necessary, to reduce exposures and not whether exposures and doses represent an absolute minimum or whether the licensee has used all possible methods to reduce exposures. The overall exposure performance of the nuclear power plant is used to determine compliance with the ALARA rule. Since SSES is below the three-year-rolling-average of 240 person-rem and PPL has an established ALARA program to reduce exposure consistent with the statements of consideration for 10 CFR 20.1101, no violation of regulatory requirements [10 CFR 20.1101(b)] is considered. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as (**FIN 05000388/2009004-04, Failure to Maintain Occupational Radiation Exposure as Low as Reasonably Achievable during the Unit 2 Refueling Outage**)

2OS3 Radiation Monitoring Instrumentation (71121.03 – 1 Sample)

a. Inspection Scope

The inspectors verified the calibration, operability, and alarm setpoints of several types of instruments and equipment. Verification methods included: review of calibration documentation and observation of PPL's source check or calibrator exposed readings. The inspectors reviewed the detector measurement geometry, calibration method and appropriate selection of calibration sources to closely represent the actual measurement conditions in the plant. The inspectors observed electronic and radiation calibration of these. The inspectors reviewed the alarm set point determinations and observed in-field source checks. The inspectors determined what actions were taken when, during calibration or source checks, an instrument was found significantly out of calibration (>50 percent). The inspectors determined the possible consequences of instrument use since last successful calibration or source check. The inspectors determined if the out of calibration result was entered into the CAP.

During an on-site visit, the inspectors reviewed calibration data, quality assurance (QA) data and National Voluntary Laboratory Accreditation Program audits and intercomparison test data for PPL's personnel dosimetry laboratory located in Allentown.

The inspectors evaluated PPL's performance against the requirements contained in 10 CFR 20.1501, 10 CFR 20.1703 and 10 CFR 20.1704.

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 8 Samples)

Initiating Events

a. Inspection Scope

The inspectors reviewed PPL's PI data for the period of August 2008 through August 2009 to verify whether the PI data was accurate and complete. The inspectors examined selected samples of PI data, PI data summary reports, and plant records. The inspectors compared the PI data against the guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline." Documents reviewed are listed in the Attachment. The following PIs were included in this review:

- Units 1 and 2 unplanned scrams per 7000 critical hours (IE01);
- Units 1 and 2 unplanned power changes per 7000 critical hours (IE03);
- Units 1 and 2 unplanned scrams with complications (IE04);
- Common Occupational Exposure Control Effectiveness (OR01); and
- Common RETS/ODCM Radiological Effluents (PR01)

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 – 1 Sample)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As specified by Inspection Procedure 71152, Problem Identification and Resolution, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of all items entered into PPL's CAP. This was accomplished by reviewing the description of each new action request/condition report and attending daily management meetings.

b. Findings

No findings of significance were identified.

.2 Annual Sample: Review of PPL's Progress in Implementing Corrective Actions to Address General Work Environment and Potential Chilling Effect Concerns

a. Inspection Scope

The inspectors performed a detailed review of PPL's corrective actions associated with the Root Cause Analysis (RCA) conducted in response to the NRC's Potential Chilling Effect (PCE) letter of January 28, 2009 and the associated action plan. The inspectors reviewed the RCA, the general work environment action plan, Employees Concern

Program (ECP), QA documents, and selected reference RCA documents. The inspectors also reviewed the corrective action schedules and reviewed completed corrective actions such as revised procedures, training material, and records. The inspectors also conducted interviews with site ECP and QA personnel, and several focus groups consisting of workers and supervisors from the Security, Work Management, Health Physics, and Operations Departments. These interviews were performed in order to assess how the staff viewed the effectiveness of the corrective actions to date in addressing the general work environment. The inspectors also assessed PPL's longer term action plan items by verifying action item entries in the CAP as well as through interviews of responsible personnel.

b. Findings and Observations

No findings of significance were identified.

Background: On January 28, 2009, the NRC issued a PCE letter advising PPL of concerns related to the safety conscious work environment (SCWE) at SSES and requested PPL provide: (1) a description of PPL's current action plans to address existing SCWE concerns to preclude a chilled work environment at SSES; (2) PPL plans for further evaluating the health of the SCWE at SSES; and (3) the metrics PPL intended to monitor to determine the effectiveness of their actions and ensure a SCWE at SSES (ML090280115). Also, on January 28, 2009, the NRC issued SSES – NRC Integrated Inspection Report 05000387/2008005 and 05000388/2008005 (ML090230434) which described the SCWE concerns at PPL and provided additional background. PPL completed their formal RCA of the work environment issues in May 2009. The NRC's review of that RCA is documented in NRC Integrated Inspection Report 05000387/2009003 and 05000388/2009003 (ML092230158).

Root Cause Analysis Corrective Actions

The inspectors determined that the corrective actions developed by the RCA team to address the root cause and causal factors were being appropriately scheduled and that the actions were being completed in accordance with that schedule. The time frame for completion of these scheduled actions was also determined to be appropriate. Any changes to the schedule required a review by the Management Review Committee and approval by senior management.

Corrective actions completed to date included the roll out of the RCA through formal site presentations and small group discussions, the establishment of two methods for workers to raise an anonymous concern (Safety Hotline and anonymous computer-generated CRs), developing training materials and case studies related to work environment issues and conducting this training with all first line supervisors and positions above, and revising several procedures. The training was well received by plant personnel and the new anonymous concern processes was being utilized by plant personnel.

In addition, several organizational changes were made including the arrival of the new CNO in July 2009, the establishment of a plant manager position, restructuring to have QA, ECP, and Regulatory Affairs directly reporting to the CNO, and the selection of several new personnel for key management positions. The inspectors observed that these changes were well communicated to the site and generally have been well

received. Most personnel interviewed felt the organizational changes were appropriate and the personnel selected were a good fit for their new positions. These changes have allowed progress to be made in re-establishing trust between the workers and upper management and improving the general work environment.

Employee Concerns Program

Another corrective action from the RCA was to evaluate and make changes to the ECP. A strong ECP is a pillar of a successful safety culture. However, in the past at SSES, the ECP was not seen by many plant employees as a viable and effective program. During the third quarter 2009, PPL restructured the ECP program by eliminating the Ombudsman position and hiring an additional ECP representative who was full time on-site at SSES. The inspectors interviewed ECP representatives and discussed the ECP program re-organizations with each of the focus groups. The inspectors concluded that PPL did a good job communicating the changes in the ECP program to the site. All groups interviewed knew who the new ECP representative was and were aware that the Ombudsman position had been eliminated. Most had a positive impression and an inherent level of trust for the new on-site ECP representative selected. In addition, corrective actions were completed changing the organizational reporting requirements, taking the ECP program out to the line organization and making it a direct report to the CNO.

However, additional organizational changes in the ECP Oversight Team remain to ensure that the ECP process is viewed by the workforce as a viable alternative for issues. See NRC Integrated Inspection Report 05000387/2009003 and 05000388/2009003 (ML092230158) for further details on this concern.

Challenges: The inspectors identified two upcoming challenges which have the potential to impact the general work environment. The first challenge will be the implementation of the NRC Fatigue Rule (10 CFR 26 Subpart I) which went into effect October 1, 2009. The inspectors observed that the plant had done a good job communicating the new rule, and had done a good job working with the departments most heavily impacted (Operations and Security); however, several workers and supervisors interviewed expressed uncertainty as to how the rule will be implemented and what will be the true impact. PPL acknowledged it was slow in engaging the bargaining unit regarding potential shift rotation adjustments in the Health Physics Department, which was a concern to the majority of the Health Physics personnel interviewed. In a similar note, the upcoming collective bargaining unit negotiations have the potential to impact the general work environment.

Assessment

During the 3rd quarter of 2009, PPL made reasonable process in implementing their action plan and RCA corrective actions to address the general work environment at SSES. Based on interviews with a sample population of site employees, the actions to date have been well received and are making a positive impact on the general work environment at SSES. Overall, the workers stated they were cautiously optimistic that changes were being implemented; however, they acknowledged that significant work remained to be done and several significant challenges still need to be addressed. The NRC plans to continue monitoring PPL's progress in this area.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

b. Findings

No findings of significance were identified.

.2 Independent Spent Fuel Storage Installation (60855 and 60855.1)

a. Inspection Scope

The inspectors observed selected activities associated with loading of a dry cask canister to ensure that TSs were met and equipment operated properly. The inspectors reviewed documents and records associated with the operation of the SSES independent spent fuel storage installation (ISFSI), including training records for personnel involved with loading of a dry cask canister. A list of the documents reviewed is provided in the Supplemental Information section. The inspectors met with reactor engineering personnel to review the fuel selection process and associated documentation. The inspectors discussed how the cask loading computer program is created for each cask loading. The video recording of the fuel bundles placed into the canister was reviewed to ensure that each bundle was placed into the proper location. The inspectors observed work activities on the refuel floor associated with the fuel selection, loading of fuel into the cask, vacuum drying, welding, and moving of the loaded canister to the truck bay.

b. Findings

No findings of significance were identified. However, the inspectors did identify an issue regarding compliance with procedure MT-GM-014, "Rigging and Lifting Equipment Inspection." This procedure references ASME code B30.9–2003, "Slings." Both documents require that slings are to be inspected annually. While the licensee also performs an inspection of each sling prior to use in accordance with the same procedure, the pre-job inspection does not meet the annual inspection requirement. Inspectors noted that when synthetic slings used in dry cask storage are inspected by PPL they receive an August 5th due date sticker for the following year, regardless of when they are inspected in the current year. This presented a potential for a sling to exceed its annual inspection based on the annotated date. PPL entered this issue into their corrective action program under CR 1173698, "SSES Rigging Committee review of procedural guidance." The licensee's extent of condition review did not identify any slings used in safety related activities which had actually exceeded the annual inspection criteria. As a result, this issue was determined to be of minor significance and a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. However, for assessment purposes, this issue does

illustrate a weakness in PPL's Corrective Action Program because it did not identify a non compliance with a regulatory requirement.

.3 Operation of an ISFSI at Operating Plants (60855)

a. Inspection Scope

The inspectors verified by direct observation and independent evaluation that PPL had performed loading activities at the ISFSI in a safe manner and in compliance with applicable procedures. This included observing the loading of one canister of spent fuel into the ISFSI on August 10, 2009. The inspectors verified by direct observation that radiation dose and contamination levels were within prescribed limits after a dry cask storage system container had been installed at the ISFSI.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On August 14, 2009, the health physics inspector presented inspection results to Mr. C. Gannon and other members of his staff, who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On August 21, 2009, the health physics inspectors presented inspection results to Mr. C. Gannon and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

On October 9, 2009, the resident inspectors presented their findings to Mr. T. Rausch, and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by PPL and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV:

- On 25 August 2009, while performing pre-start checks to place Unit 2 RHR in suppression pool cooling, a field operator identified the ESW cooling water valves 211193 and 211194 to be unlocked and closed. These valves are required to be locked open to assure supply of cooling to a Unit 2 RHR room cooler and 2C RHR pump motor oil cooler. This was an identified violation of TS 5.4.1, and a violation of those procedures that must be implemented for operation of the unit and for the performance of maintenance as delineated in Regulatory Guide 1.33. Contrary to NDAP-QA-0302, "System Status and

Equipment Control," PPL did not use a proceduralized method to maintain status control of these valves and contrary to NDAP-QA-502, "Work Control Process," these valves were not returned to the original design configuration following maintenance. PPL determined that the status control of these valves was most likely lost during the post-modification testing performed in late April 2009. Upon discovery, the valves were promptly aligned to provide cooling flow and the performance issue was captured in CR 1174837. Using a Phase III risk evaluation model, the region staff determined this finding to be of very low safety significance (Green).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

N. D'Angelo, Manager, Station Engineering
R. Doty, Radiation Protection Manager
T Iliadis, GM - Nuclear Operations
S. Ingram, Dosimetry Supervisor
R. Kessler, Health Physicist – ALARA
A. Klopp, Heat Exchanger Program Engineer
D. Leimbach, Eddy Current Level III, In-service Inspection
R. Pagodin, GM – Nuclear Engineering
G. Ruppert, GM – Work Management
S. Davis, Fire Protection Program Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000387; 388/200900402	AV	Violation of 10CFR55.3, Senior Reactor Operators Performing Licensed Duties While Not Qualified Due to Medical Examination Issues (1R11.2)

Opened/Closed

05000388/200900401	NCV	Failure to Implement and Maintain the Fire Protection Program with Respect to the Use and Storage of Combustibles in the Control Structure (1R05)
05000387/200900403	NCV	Inadequate Corrective Actions Result in a Repeat Failure of Unit 1 HPCI Turbine Stop Valve (1R12)
05000388/200900404	FIN	Failure to Maintain Occupational Radiation Exposure As Low As Reasonably Achievable during the Unit 2 Refueling Outage (2OS2)

BASELINE INSPECTION PROCEDURE PERFORMED

LIST OF DOCUMENTS REVIEWED
(Not Referenced in the Report)

Section 1R04: Equipment Alignment

Condition Reports:

1168300, 1175048, 1176331, 1174964

Procedures:

OP-225-001, Containment Instrument Gas System, Revision 30
CL-225-0012, Unit 2 Containment Instrument Gas Mechanical, Revision 13

Drawings:

M-2126, Unit 2 Containment Instrument Gas Sheets 1 and 2, Revision 33 and 13
M-157, Unit 1 Containment Atmosphere Control, Revision 47
M-134, A-D Diesel Auxiliaries Fuel Oil, Lube Oil, Air Intake and Exhaust and Jacket Water Cooling System, Revision 45

Engineering Work Request:

EWR 1168578

Other:

Chemistry Analysis and Sample Results Attached to CR 1167146
Drainage Contour Map, Potentiometric Surface Contours Overburden Monitoring Wells – August/September 2008

Section 1R05: Fire Protection

Condition Reports:

1172702

Procedures:

FP-113-113, Containment Access Area (1-401, 1-404, 1-405) Fire Zones 1-4A-N, S, W, Elevation 719'-0", Revision 6
FP-013-168, Equipment and Battery Rooms Unit 1 West Side (C-605, 606, 600, 601, 607) Fire Zones 0-28B-11, 0-28K, 0-28L, 0-28I, Elevation 771'-0", Revision 5
FP-013-169, Equipment and Battery Rooms Unit 1 East Side (C-604, 602, 603, 608) Fire Zones 0-28B1, 0-28M, 0-28N, 0-28J, Elevation 771'-0", Revision 4

Section 1R06: Flood Protection Measures

Condition Reports:

1121942, 1171337, 1172365, and 606589

Work Order:

606837

Section 1R07: Heat Exchanger Performance

Condition Reports and Action Requests:

1003096, 915409, 984635, 1136415, 1153052, 1178867, 1095358, 1109759, 1172704, 892305, 1095358, 1109759, 1162322, 1084289, 1162414, 1108376, and 1044430

Procedures:

H-1001, Heat exchanger tube cleaning, Revision 5
H-1004, Heat exchanger inspection and condition assessment, Revision 6
H-1005, Eddy Current Examination Services, Revision 6
NDAP-QA-0504, Heat Exchanger Program, Revision 4
TP-149-079, RHR Heat Exchanger Performance Test, Revision1
ER-AA-340, GL 89-13 Program Implementing Procedure, Revision 4
ER-AA-340-1001, GL 89-13 Program Implementation Instructional Guide, Revision 6
ER-AA-5400, Buried Pipe and Raw Water Corrosion Program Guide, Revision 1
ER-AA-5400-1001, Raw Water Corrosion Program Guide, Revision 0
ER-AA-5400-1002, Buried Piping Examination Guide, Revision 1
Limerick GL 89-13 Program Basis Document, Revision 0
CY-LG-120-828, Clam Control Activities, Revision 5
CY-LG-120-1102, Outside Chemistry/NPDES related Sampling and analysis schedule, Revision 18
CY-LG-120-1117, Spray Pond Chemistry Guide, Revision 2
ST-2-011-390-0, ESW/Diesel Generator Heat Transfer Test, Revision 4
M-011-001, LGS Preventive Maintenance Procedure for Diesel Generator Heat Exchanger Cleaning and Examination, Revision12
Standing work order R0920468-01, EDG heat exchangers

Drawings

Drawing # M-109/E106214, Service Water System, Revision 50,
Drawing # M-111/E106216, Emergency Service Water System, Revision 48
Drawing # M-112/E106217, RHR Service Water System, Revision 47
Drawing # M-120/E106225, Diesel Oil Transfer System, Revision 32
SIM-M-12, Emergency Service Water/ RHR Service Water Overview, Revision 9
8031-M-11, Sh. 1-5, Emergency Service Water, Revision 68, 81, 53, 50, 48, respectively
8031-M-12, Sh. 1-2, Residual Heat Removal Service Water, Revision 62, 6, respectively
8031-E-1045, Cathodic Protection Plan – Spray Pond & Cooling Towers Area, Revision 14
8031-E-1046, Cathodic Protection Plan – PCMU, RHR & ESW Piping, Units 1 & 2, Revision 14
Unit 2 RHR Heat Exchanger Assembly & Cross Section Drawings, April 1972

Work Orders:

796290, 796291, 2E205A, 889724, 888029, 0E505A1&2, 1078542, 808322, 0E505E1&2, 889732, 889516, 0E506A, 1111425, 1067871, 0E506E, 916733, 889717, 0E507A, 1111426, 1067872, 0E507E, 941280, 889240

Miscellaneous Documents

Regulatory Guide 1.27, Ultimate Heat Sink for Nuclear Power Plants, dated January 1976
Generic Letter 89-13 and Supplement 1, Service Water System Problems Affecting Safety-Related Equipment, Dated July 1989
PPL responses to GL 89-13, dated Feb. 23, 1990, through Feb. 12, 1997, et al
Spray Pond Inspection Report, November 13, 2007
Zebra Mussel & Asiatic Clam Survey, November 6, 2007
ECT Test Report for Heat Exchanger 2A-E205, March 2005
WO R0966553, Clean and eddy current test 2A-E205, performed May 19, 2005
IC-C-11-02021, Testing of Cathodic Protection System, performed September 4, 2007
RT-1-012-390-0, RHR Heat Exchanger Heat Transfer Performance Computation Test, performed Feb. 15, 2005
RT-2-011-251-0, ESW Loop A Flow Balance, Rev. 15, performed April 26, 2008
RT-6-012-390-2, 2A-E205 Heat Exchanger Heat Transfer Test, performed Feb. 9, 2005
RT-6-109-001-0, Cathodic Protection Monthly Inspection, performed September 4, 2007
ST-1-012-901-0, Spray Pond Structural Inspection, performed September 5, 2002, August 10, 2003, August 10, 2005, and July 27, 2007
ST-6-011-231-0, A Loop ESW Pump, Valve, and Flow Test, performed May 9, 2008, and August 8, 2008
ST-6-012-232-0, A Loop RHRSW Pump, Valve, and Flow Test, performed May 16, 2008, and August 7, 2008
Structural Integrity Associates, Inc., Limerick ESW/RHRSW Pre-Outage Support, May 7, 2008
Nuclear Event Report NC-07-044, Essential Service Water Piping Degradation, Rev. 0 & 1
Operational Event Review – Degradation of Essential Service Water Piping, January 15, 2008
Technical Evaluation - Cumulative Leakage from the ESW System (CR 714581-02)
Technical Evaluation – EDG Permissible Fouling Factors as a Function of ESW Flow and Plugged Tubes (IR 691841)
Apparent Cause Evaluation – Internal Corrosion of RHRSW System Piping (CR 731389)
Apparent Cause Evaluation – Increased Frequency of ESW Throttle Valve Silting (11/14/05)
Apparent Cause Evaluation - Diesel Heat Exchanger GL 89-13 Heat Transfer Test Performed Too Soon After Cleaning (CR 174574)
RHRSW Pipe Minimum Wall Thickness Action Plan (IR 693495-32)
1D-G501, EDG Heat Exchanger Inspection Report, June 23, 2008
2D-G501, EDG Heat Exchanger Inspection Report, December 10, 2007
LG 96-02349-000, Undersized Lube Oil Cooler
LG 01-01096-000, LGS Unit 1 & 2 GL 98-13 Program Recommendation – Heat Exchanger Cleaning
LG 01-00968-000, Final Report on DG Heat Exchanger Performance Tests GL 89-13
Calculation LM-0225, Performance Curve for EDG Heat Exchanger for GL 89-13
Engineering Analysis LEAM-0007, Emergency Diesel Heat Exchanger Performance Tests GL 89-13, September 10, 2001.
Evaluation of D-22 EDG Heat Exchanger Performance Test of August 26, 2003
Evaluation of D-22 EDG Heat Exchanger Performance Test of July 24, 2004

Evaluation of lube oil cooler fouling factor increases in winter, October 1, 2008
Commitment Change Evaluation 2006-002
ECR LG 96-02349, Undersized Lube Oil Cooler
ECR LG 01-01096, GL 98-13 Program Recommendation – Heat Exchanger Cleaning
ECR LG 01-00968, Final Report on DG Heat Exchanger Performance Tests GL 89-13
ECR LG 04-00433, Licensing Basis of RHRSW Flow
Summary of RHRSW/ESW Valve Pit Inspections

Other:

Station Health Reports for RHR and EDG Systems:

2009, 1st period – Jan 1 – May 31
2008, 1st period - Jan 1 - Apr. 30
2nd period – May 1– Aug. 31
3rd period – Sept 1 - Dec. 31
2007, 1st period - Jan 1 – Apr 30
2nd period – May 1 – Aug 31
3rd period – Sept 1- Dec 31

Eddy Current Testing Final Reports

1E205B - 1B RHR Hx, 2E205A - 1A RHR Hx, 0E505 - A1, A2, E1, E2, 0E505, 0E506 A, E, 0E526 E, 0E507 A, E
ESSW Spray Pond Dive Inspection Report
Ecology III, Inc. report dated 3 August 2009
SO-054-A03, Quarterly ESW flow verification - Loop A, February 23, 2005 and November 24, 2004
SO-054-B03, Quarterly ESW flow verification - Loop B, February 16, 2005 and November 17, 2004
TP-054-076, ESW flow balance, September 24, 2004
Chemistry Matrix Ch-054-001 (ESW), Revision 23, March 05, 2008

Design Calculations

CALC EC-CHEM-1018, Justification for the Assurance of Adequate Heat Removal Capabilities, Revision 5
CALC EC-054-0537, ESW System Heat Load and Flow Rate Requirements for Updated Power Conditions, Revision 5
CALC-049-1001, RHR Heat Exchanger Performance at 8000 gpm RHR Flow, Revision 5

Section 1R11: Operator Re-qualification Program

Condition Report:

1159194, 1173155, 1173182, 622658, 625137, 389555, 1166686

Procedures:

ON-164-002, Loss of Reactor Recirculation Flow, Revision 28
ON-178-002, Core Flux Oscillations, Revision 14

ON-100-101, SCRAM, SCRAM Imminent, Revision 22
EO-000-113, Level/Power Control, Revision 6
EO-000-102, RPV Control, Revision 7
NDAP-QA-0725, Operating Experience Review Program, Revision 7

Other:

OP002-09-06-01, Simulator Scenario, Revision 0

Section 1R12: Maintenance Effectiveness

Condition Report:

1172458, 1173175, 1173454, 1173859, 1174337

Procedure:

ES-002-001, Supplying 125 VDC Loads with Portable Diesel Generator, Revision 12

Work Orders:

1172466, 1172530

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Condition Report:

1162039, 1172088, 1171760, 1171814, 1171764, and 1137572

Procedure:

MT-GE-030, ITT Damper Hydramotor Model NH91 NH93 Overhaul, Revision 17
OI-AD-029, Emergency Load Control, Revision 13
MT-GE-030, ITT Damper Hydramotor Model NH91 and NH93 Overhaul, Revision 17

Drawings:

E-102, Sheet 17, ESS Transformer 101R201 Isolating Relay Control, Revision 13
E-102, Sheet 17 Circuit Breaker DA10406 Control, Revision 11
M-144, Sheet 2, Reactor Water Clean-Up, Revision 11
M-144, Sheet 1, Reactor Water Clean-Up, Revision 41
E6-8, sheet 1, ESS Trans EX201 and 0X203, Revision 8
VC-175, Heating, Ventilation and Air-Conditioning Control Diagram SBGT System, Revision 31
M-145, Sheet 1, Clean-up Filter Demineralizer, Revision 21

Work Order:

1162052 and 828214

Other:

2009 RFM Daily Status Report August 3-4, 2009 – Cask 53

Section 1R15: Operability Evaluations

Condition Reports:

1159448, 1159214, 1159461, 478425, 794697, 478350, 1160418, 1160653, 1112465, 1119661, 1147886, 1145418, 1152053, 1152076, 1161825, 1162050, 1172110, and 1172113

Procedures:

FSAR 7.3.1
TRO 3.3.6

Drawings:

J-412, Sheet 6, RHR SW Pump Discharge Pressure, Revision 6
M-134, Sheet 3, A – D Diesel Auxiliaries Starting Air System, Revision 15

Work Order:

1159273

Engineering Work Request:

EWR 118707

Other:

IOM 183-2, KSV Diesel Generator Instruction Manual, Revision 89

Section 1R18: Permanent Plant Modifications

Condition Reports:

1179204, 1179788, 1179777, 1178870, 1136097, 1136107, 1136188, 1141687, 1136189, 1135663

Procedures:

FSAR 9.4.2.2, 9.2.12.3, Table 9.4-4, 5
TRO 3.8.6 and bases
LA-1K206B-001, 1K206B Reactor Building Chiller B Safety Indicator Panel, Revision 2

Drawings:

M310-245, Sheet 2, Chiller 1K206B, Revision 2

Work Order:

1180017, 1104170, 1082776, 1136153, 1136156, 1136013

Engineering Work Request:

EWR 1086364
TEC 1136133, Bypass Gas Discharge Temperature Trip on 1K206B

Other:

IOM 694, Type SL Core Form Substation Transformer Type UTT-B Load Tap Changer Spare Startup Transformer, Revision 2

Section 1R19: Post-Maintenance Testing

Condition Reports:

1079703, 1161553, 1174414, 1174403, 1177692, 1177906, 1183410

Procedures:

SO-151-014, Core Spray System Cold Shutdown Valve Exercising, September 28, 2009, Revision 16
SO-151-A04, Quarterly Core Spray Valve Exercising Division I, September 28, 2009, Revision 9
SO-152-006, High Pressure Coolant Injection Comprehensive Flow Verification, Revision 8
SO-158-001, "Weekly Manual Scram Control Switch Functional Check," Revision 12
OP-003-003, Startup Bus 20 (0A104)/T20 Outage and restoration, Revision 1

Drawing

922D248, Connection Diagram Hydraulic Control Unit, Revision 3
105D5411, Box and Cables Hydraulic Control Unit, Revision 3
105D5634, Connection Diagram Hydraulic Control Unit, Revision 2
922D234, Assembly Electrical box, Revision 3
E-157, Sheet 3, Trip Signals to hydraulic control unit Unit 1, Revision 7
MI-C72-22, Sheet 12, Elementary Diagram Reactor Protection System, Revision 13

Work Orders:

1046829, 1177693, 1012176

Engineering Work Request:

EC 1100766, Generic ECO 480V MCC Bucket Replacement

Section 1R22: Surveillance Testing

Condition Reports:

10419999, 1159516, 1159518, 1159520, 1176579, 917309, 1041999, 1176718, 1176719

Procedures:

SE-070-A09, "A" SGTS HEPA Filter and Charcoal Adsorber in-Place Leak Test, Revision 5
MT-GM-076, Operations of the Aerosol Detector and Aerosol Generator for Testing HEPA Filters, Revision 3
MT-GM-077, Operation of the Halide Detector and Halide Generator for Testing Charcoal Filters, Revision 4
SI-250-312, 24 Month calibration of RCIC System Pump Flow Channel FT-E51-2N003 Remote Shutdown Monitor
SE-150-004, RCIC Functional Test at 1C2014, January 21, 2008, Revision 0
SE-100-008, RCIC Functional test at Remote Shutdown Panel, Revision 4
SE-200-008, RCIC Functional test at Remote Shutdown Panel, January 21, 2009, Revision 2
SE-100-011, HV143F023B, Functional Test at 1C2014, March 5, 2008, Revision 0

Work Orders:

875249, 1130776

Drawing:

VC-175, Sheet 3, HVAC Control Diagram RB SGTS, Revision 31
E-201, Sheet 9, SGTS Dampers HD-0755A & B, Revision 17
E-154, Sheet 3, RCIC Outboard Steam Line Isolation Valve Unit 1, Revision 18
E-154, Sheet 22, RCIC Outboard Steam Line Isolation Valve Unit 2, Revision 5
E-149, Sheet 6, Remote Shutdown Panel – 2C201, transfer Switches Unit 2, Revision 9

Section 1EP6 Drill Evaluation

Condition Reports:

1174697, 1174731

Procedures:

EP-TP-001, EAL Classification Levels, Revision 2

Other:

August 25, 2009 Drill Results Summary

Section 2OS1: Access Control to Radiologically Significant Areas

Condition Reports:

1168353; 1167515; 1167427; 1162310; and 1165207

Section 2OS2: ALARA Planning and Controls

Condition Reports:

1155780; 1153396; and 1140623

Section 2OS3: Radiation Monitoring Instrumentation

Quality Assurance Internal Audit Reports:

665555; 819260; and 1093653

NIST NVLAP On-Site Assessment Report, March 13, 2009

Personnel Dosimetry Performance Testing Quarterly Report, 4th Quarter 2007

Section 4OA1: Performance Indicator Verification

Procedures:

NDAP-QA-0737, Reactor Oversight Process Performance Indicators, Revision 5

Other:

Operator Logs, Unit 1 and Unit 2

Section 4OA2: Identification and Resolution of Problems

Condition Reports:

1159518, 1159523, 1160653, 1161370, 1161398, 1162307, 1168487, 1168500, 1172365, 1173445, 1173454, 1174011, 1174052, 1174964, 1175030, 1175048, 1175140, 1175332, 1175332, 1176331, 1176959, 1177165, 1177499, 1177965, 1178870, 1179656, 1179995, 1027040, 1044490, 1073866, 1114121, 1128499, 1147908, 1148761, 1148762, 1148765, 1148790, 1148824, 1148828, 1148834, 1148851, 1148852, 1148853, 1148854, 1148859, 1148862, 1148879, 1148884, 1148887, 1148891, 1148895, 1148900, 1157872, 1158039, 1162998, 1173604, 1173611, 1173614, 1173619, 1173697, 1181243

Engineering Work Request:

1161370

Procedures:

NDAP-00-0109, "Employee Concerns Program", Revision 13
NDAP-QA-0702, "Action Request and Condition Report Process", Revision 23

Other:

NRC Letter-EA-09-003, Work environment Issues at SSES-PCE, dated January 28, 2009
PPL Letter PLA-6486, SSES NRC Request to Address Work Environment Issues at SSES, dated February 27, 2009
PPL Letter PLA-6489 SSES NRC Request to Address Work Environment Issues at SSES, dated March 13, 2009
PPL Letter PLA-6528 SSES PPL Susquehanna LLC Work Environment Improvement Plan, dated June 23, 2009
SSES Organization chart dated 9/10/2009
SSES Concerns Hotline flyer

Safety Conscious Work Environment Trending Survey November 2008, Revision 0
General Work Environment-PCE Power Point Presentation, dated June 15, 2009
Communication Plan for Work Environment Root Cause Analysis report, dated June 3, 2009
USNRC Allegation Website allegation data from January 2005 - August 2009
SSES Organizational Effectiveness Oversight Panel, Employee Focus Group Meeting May 5-7, 2009 summary report
SSES Focus (Internal Communications newsletter) dated July 16, 2009; July 21, 2009; July 29, 2009; July 31, 2009:;August 7, 2009 (2); August 14, 2009, August 17,2009, August 20, 2009, August 24, 2009, August 26, 2009, August 31, 2009; September 1, 2009, September 4, 2009; September 11, 2009; September 14, 2009 (2); September 15, 2009; September 22, 2009; and September 23, 2009
SSES Grapevine dated August 28, 2009; September 2, 2009; and September 8, 2009
SSES Work Environment Performance Indicators for July 2009 and August 2009
Proposed Draft General Work Environment Performance Indicator data dated September 23, 2009
PPL Performance Planning and Review Process- Personnel Goals and Observation planning sheet dated April 21, 2009
Nuclear culture review survey provided to Operations Department on 8/19/09 and preliminary evaluation of the data
Memorandum of Agreement between PPL and IBEW Local 1600 dated may 9, 2002
SSES RCA rollout Presentation and feedback forms

Section 4OA5: Other

Condition Reports:

1173698
ISFSI related Condition Reports since July 12, 2006

Procedures:

ME-0RF-023, Dry Fuel Storage 61BT Dry Shielded Canister, Revision 14
MT-EO-045, Guidance and Use of NUHOMS Automated Welding System for Welding Operation, Revision 1
ME-0RF-179, Dry Fuel Storage Equipment List and Reference Information, Revision 8
NDAP-QA-0658, Dry Fuel Storage Program, Revision 6
ME-0RF-152, Dry Fuel Storage Response to Crane/Rigging/Transfer Equipment, Malfunction and Certificate of Compliance Technical Specification Requirements, Revision 2
MT-EO-058, E1000 Series Vacuum Drying System Operation, Revision 8
ME-0RF-150, Dry Fuel Storage Dry Shielded Canister Unloading, Revision 1
RE-081-43, Selection and Monitoring of Fuel for Dry Storage, Revision 5
ON-089-001, Dry Fuel Storage Temperature Anomaly, Revision 6
MT-199-001, Reactor Building Crane Operating Procedure, Revision 18
MT-199-002, Reactor Building Crane Main & Auxiliary Hoist Limit Switch Testing, Revision 6
MT-GM-014, Rigging and Lifting Equipment Inspection, Revision 16

Work Orders:

ERPM 937419, Inspect 1H213 Crane for Proper Operation
ERPM 1065158, 1H213 Perform 4 year Weld Inspections, completed May 30, 2009

Other:

2008 PPL SSES LLC Dry Fuel Storage Project Completion Review Self Assessment
2009 Dry Fuel Storage Readiness Review
Annual Synthetic Round Sling Inspection Checklist
72.48 Screens, SD 00041, SD 00035, SD 00038, SD 00033, SD 00035, SD 00028, SD 00027, SD 00024, SD 00000022, SD 00016, SD 00015, SD 00006
Final safety Analysis Report (FSAR), November 9, 2007
Decay Heat Calculation, EC-Fuel-1185, Revision 26
FACCTAS for DSC #53, July 31, 2009, Revision 0
ISFSI Temperature Monitoring System Software Requirement Specification, July 2, 1999, Revision 1.1
Annual Preventative Maintenance Plan for Unit 1 Reactor Building Crane, WO 19018, completed December 5, 2008

SSES Area Survey Map, ISFSI Facility, dated: January 28, 2008; April 22, 2008; July 25, 2008; October 24, 2008; January 22, 2009; April 25, 2009; May 1, 2009

LIST OF ACRONYMS

ADAMS	Agencywide Document and Access Management System
ALARA	As Low As Is Reasonably Achievable
AV	Apparent Violation
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DG	Diesel Generator
ECP	Employee Concerns Program
EDG	Emergency Diesel Generator
EPU	Extended Power Uprate
ESW	Emergency Service Water
FIN	Finding
FPE	Fire Protection Engineer
FPPR	Fire Protection Program Report
FSAR	[SSES] Final Safety Analysis Report
HPCI	High Pressure Coolant Injection
HV	High Voltage
IN	Information Notice
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
IVVI/ISI	In Vessel Visual Inspection/Inservice Inspection
LCO	Limiting Condition for Operation
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PCE	Potential Chilling Effect
PI	[NRC] Performance Indicator
PM	Preventive Maintenance

PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
QA	Quality Assurance
RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RTP	Rated Thermal Power
SBO	Station Blackout
SCWE	Safety Conscious Work Environment
SDP	Significance Determination Process
SGTS	Standby Gas Treatment System
SRO	Senior Reactor Operator
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
TS	Technical Specifications
T20	T20 Startup Transformer