



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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January 28, 2009

Mr. William H. Spence
Executive Vice President
Chief Operating Officer/Chief Nuclear Officer
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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC INTEGRATED
INSPECTION REPORT 05000387/2008005 AND 05000388/2008005

Dear Mr. Spence:

On December 31, 2008, 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 on January 13, 2009, with Mr. C. Gannon and other members of your staff.

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

This report documents one self-revealing finding of very low safety significance (Green). This finding did not involve a violation of NRC requirements. Additionally, two licensee-identified violations which were determined to be of very low safety significance (Green), are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 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 Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosures: Inspection Report 05000387/2008005 and 05000388/2008005
Attachment: Supplemental Information

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Sincerely,
/RA/
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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: 05000387/2008005 and 05000388/2008005

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: October 1, 2008 through December 31, 2008

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SUMMARY OF FINDINGS

IR 05000387/2008005, 05000388/2008005; 10/01/2008 – 12/31/2008; Susquehanna Steam Electric Station, Units 1 and 2; Event Follow-up.

The report covered a 3-month period of inspection by resident inspectors, and announced inspections by regional reactor inspectors, an operation engineer, and a senior health physicist. Two Green licensee-identified non-cited violations (NCVs) and one Green self-revealing finding were identified. 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 January 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. A self-revealing finding was identified for failing to properly implement PPL procedure NDAP-QA-0725 regarding the incorporation and evaluation of operating experience (OE) into the corrective action program and control of field work. Specifically, in December 2007 an industry operating experience report regarding the control of field work for nitrogen freeze seals in plant vital areas was entered into Susquehanna's corrective action program. However, the inspectors identified that PPL's review and evaluation of this OE resulted in no corrective actions taken or planned and that the relevant information was not communicated to the affected station groups as required by NDAP-QA-0725, Appendix D. Inspectors determined that the lack of corrective actions and inadequate communication of industry OE were primary contributors to the Susquehanna Unit 2 Alert declaration on October 27, 2008. This emergency declaration was required when the oxygen level in the 2B residual heat removal (RHR) pump room, which is a plant vital area, dropped below the minimum allowable threshold of 19.5 percent, which is the Immediately-Dangerous-to-Life-and-Health (IDLH) limit.

This finding was more than minor because the failure to properly implement NDAP-QA-0725, Appendix D, to evaluate external industry OE, implement corrective actions, and communicate the OE information to those who performed the relevant tasks at Susquehanna resulted in prohibiting access to safety-related equipment in the RHR room, resulted in the declaration of an emergency event (Alert), and increased the Technical Specification (TS) out-of-service (OOS) time for the 2B RHR pump. This finding affected the equipment performance attribute of the Mitigating Systems cornerstone and was of very low safety significance (Green) because it was not a design or qualification deficiency, there was no loss of safety function, and it was not potentially risk significant due to external events. The finding was not a violation of regulatory requirements but represented a failure to properly implement NDAP-QA-0725, Appendix D, in that external OE was not correctly evaluated and as a result, relevant information was not communicated to the affected work groups. PPL entered

this issue into their corrective action program (CR # 1086125) and implemented corrective actions that included procedure revisions, reinforcement of procedure adherence, and training and qualification revisions. The inspectors determined that this finding has a cross-cutting aspect in the area of Problem Identification and Resolution (operating experience component) because PPL did not systematically or effectively evaluate and communicate industry OE to affected internal stakeholders in a timely manner. [IMC 0305 aspect: P.2(a)]. (Section 4OA3)

B. Licensee Identified Violations

Two violations of very low safety significance (Green), which were identified by PPL, have been reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into PPL's corrective action program. The violations 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 reactor thermal power (RTP). On October 26, 2008, Unit 1 was reduced to 80 percent RTP over 24 hours for a condenser tube leak investigation. On November 1, 2008, Unit 1 was reduced to 80 percent power over 24 hours in support of repairs to an offsite voltage transformer in Wescosville, PA. On November 8, 2008, Unit 1 was reduced to 80 percent power over 21 hours for a second condenser tube leak investigation. On November 23, 2008, Unit 1 was reduced to 71 percent power in support of scram time testing and a control rod sequence exchange. On December 6, 2008, Unit 1 was reduced to 75 percent power over 39 hours in support of corrective maintenance on the "A" condensate pump. Unit 1 remained at 94.4 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at full RTP. On October 9, 2008, Unit 2 experienced an unplanned circulating water pump trip which resulted in a reactor runback to 74 percent power for a three hour period. On October 27, 2008, an Alert was declared at Unit 2 based on low oxygen levels during a freeze seal evolution in the 2B residual heat removal (RHR) pump room. On November 1, 2008, Unit 2 was reduced to 80 percent power over 24 hours in support of the same transformer repairs mentioned for Unit 1. On November 3, 2008, Unit 2 experienced another unplanned circulating water pump trip that resulted in a reactor runback to 71 percent over 22 hours. On December 7, 2008, Unit 2 was reduced to 64 percent power over 18 hours in support of a control rod sequence exchange. Unit 2 remained at full RTP for the remainder of the inspection period.

Note: The licensed RTP for Unit 1 is 3952 megawatts thermal. The Extended Power Uprate (EPU) License Amendment for SSES was approved in January 30, 2008, and was implemented for Unit 1 in accordance with the issued license conditions. For the current operating cycle, the Unit 1 authorized power level is 94.4 percent of the EPU licensed power limit. For the purposes of this report, full RTP for Unit 2 remains at 3489 megawatts thermal since EPU power level increases have not yet been implemented on that unit.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 Sample)a. Inspection Scope

During the week of November 3, 2008, the inspectors reviewed system operations and preparations for extreme cold weather. Plant walkdowns for selected structures, systems, and components (SSCs) were performed to determine the adequacy of PPL's weather protection features. Inspectors reviewed operator actions to address failures of equipment due to freezing and compensatory actions during the adverse cold weather conditions. The inspectors also reviewed and evaluated considerations in PPL's Maintenance Rule station risk assessment. Additional documents that were reviewed are listed in the Attachment. The readiness of the following systems were reviewed:

- Engineered safeguard service water (ESSW) pump house, station blackout (SBO) diesel, and fire protection (diesel-driven fire pump and fire engine pumper shed).

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04 – 3 Samples)

.1 Partial Walkdown (2 Samples)

a. Inspection Scope

The inspectors performed two partial equipment alignment 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 (OOS). The inspectors reviewed selected valve positions, electrical power availability, and the general condition of major system components. The walkdowns included the following systems:

- Unit 1, instrument air system supply cross-connects, indication and controls; and
- Units 1 and 2, control rod drive (CRD) system and alternate rod insertion instrument air supply and solenoid valves.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (1 Sample)

a. Inspection Scope

The inspectors conducted a detailed review of the alignment and condition of the station ultimate heat sink and Emergency Service Water (ESW) 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 that 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 (CRs) associated with the ESW system to determine the effect on system health and reliability. The inspectors verified proper RHR service water (SW) system alignment, and reviewed system operating parameters when there was a significant change to the available decay heat removal systems for Unit 1 or Unit 2. The walkdown included the following system:

- Ultimate heat sink and ESW system.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q – 6 Samples)a. Inspection Scope

The inspectors reviewed PPL's fire protection program to evaluate the required fire protection design features, fire area boundaries, and combustible loading requirements for six selected areas. The inspectors walked down the areas to assess PPL's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures to assess PPL's fire protection program in those areas. The inspected areas included:

- Unit 1, condensate pump rooms;
- Unit 2, reactor building (RB) chiller room, Standby Liquid Control (SLC) area, reactor protection system motor-generator set room, (FP-213-254);
- Unit 2, RB load center rooms, elevation 749' 1", (FP-213-258);
- Unit 2 core spray pump rooms "A" and "B", (FP-213-236 and FP-213-237);
- Common, radwaste control room/sample room and HVAC areas, (FP-013-321 and FP-013-311); and
- Common, control structure battery rooms and heating and ventilation equipment rooms, (FP-013-171 and FP-013-186).

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11 – 2 Samples).1 Operations Licensing Inspector In-office Review (1 Sample)a. Inspection Scope

On November 14, 2008, a region-based inspector conducted an in-office review of results of the licensee-administered annual operating tests and comprehensive written examinations for 2008. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process (SDP)." The inspector verified that:

- Crew failure rate was less than 20 percent (crew failure rate was 5.3 percent);
- Individual failure rate on the dynamic simulator test was less than or equal to 20 percent (individual failure rate was 6.6 percent);
- Individual failure rate on the walk-through test was less than or equal to 20 percent (individual failure rate was 1.3 percent);
- Individual failure rate on the comprehensive written examination was less than or equal to 20 percent (individual failure rate was 2.6 percent); and
- Overall pass rate among individuals for all portions of the examination was greater than or equal to 75 percent (overall pass rate was 89.4 percent).

b. Findings

No findings of significance were identified.

.2 Resident Inspector Quarterly Review (1 Sample)

a. Inspection Scope

On December 23, 2008, the inspectors observed licensed operator simulator training during routine operator requalification training. The inspectors compared their observations to Technical Specifications (TSs), emergency plan implementation, and the use of system operating procedures. Inspectors reviewed reactor vessel level control and changes to Emergency Operating Procedures (EOPs) that resulted from CR 739371.

The inspectors also evaluated PPL's critique of the operators' performance to identify discrepancies and deficiencies in operator training. The following training was observed:

- OP002-09-02-04, primary containment control and RHR containment spray cooling (anticipated transient without scram (ATWS) with loss-of-coolant accident (LOCA) at reactor water cleanup (RWCU) isolation valve)

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 – 3 Samples)

a. Inspection Scope

The inspectors evaluated PPL's work practices and followup corrective actions for selected 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. The following issues were reviewed:

- Units 1 and 2, EPA breaker failures;
- 13.8 kV system lockout relay preventative maintenance; and
- Startup transformer 0X104 (T-20) high voltage bushing degradation and load tap changer high combustible gas concentration.

Regarding T-20, the inspectors reviewed a Doble testing evaluation performed on October 13, 2008, with a power factor result of 0.77 percent which indicated a degraded condition in one of the Type O+ bushings (H1). The Doble testing capacitance results were also evaluated. The inspectors evaluated whether a significant change in capacitance was obtained from the testing. The inspectors reviewed results which indicated that moisture intrusion would eventually affect the bushing insulation and the

bushing dielectric properties. The inspectors also reviewed load tap-changer data acquired during a tap-changer activity signature analysis (TASA) on October 22, 2008, which revealed an increase in total dissolved combustible gas concentration with a TASA assessment of 2. The inspectors reviewed the licensee plans to perform the TASA analysis within five months of the last sample.

The inspectors reviewed the operability report of the transformer, the Doble testing results from 2002 and 2008, the tap-changer activity signature analysis results from 2002 and 2008, and conditions reports associated with T-20. The inspectors assessed whether the startup transformer was operable with a degraded bushing and high combustible gas concentration. The inspectors reviewed the licensee's action plans regarding the T-20 transformer to ensure safety of personnel and the continued operation of the safety components powered from this transformer.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 3 Samples)

a. Inspection Scope

The inspectors reviewed the assessment and management of three 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 required 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. The selected maintenance activities included:

- Unit 2, emergent high pressure coolant injection (HPCI) lubricating oil moisture reduction work;
- Unit 2, emergent station risk Division 2 ESS 480V swing bus failed surveillance testing on November 16, 2008, and Division 1 ESS swing bus M-G set removed from service due to voltage control failure on November 11, 2008; and
- Units 1 and 2, yellow risk due to Unit 2 HPCI service outage window and "B" emergency diesel generator (EDG) control in manual on November 21, 2008.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – 6 Samples)

a. Inspection Scope

The inspectors reviewed six risk significant operability determinations 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 PPL procedure 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. The issues reviewed included:

- Unit 1, "D" RHR pump loss of indication following ESW run;
- Unit 1, non-Q circuit breaker installed in safety-related 480V load center 1B210;
- Unit 2, center cubicle 1B21013 core spray pump room "B" Appendix R fire barrier degraded;
- Common, startup transformer T-20 high voltage bushing degraded;
- Common, loss of Zone III D/P due to actuator problem with exhaust fan, CR 1095894; and
- Operability Follow-up Report (OFR) 1091573, secondary containment isolation dampers not in accordance with FSAR design description, CR 1095433.

b. Findings

No findings of significance were identified

1R18 Plant Modifications (71111.18 - 4 Samples)

a. Inspection Scope

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

- Unit 2, nitrogen freeze seal on ESW lines to RHR motor cooler;

- Unit 2, revised bypass of recirculation runback in TP-242-033, in field modification to support troubleshooting and post-maintenance test (PMT) of circulating water pumps;
- Common, provide supplemental heating and ventilation flow path for ESSW pump house; and
- Common, states link maintained open in EDG control panel OC521B.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors observed portions of six post-maintenance testing 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 was satisfied. The post-maintenance testing activities reviewed included:

- Unit 1, control rod movement and other PMT following replacement of rod drive control system transponder cards;
- Unit 1, emergency switchgear room cooler work PMT;
- Unit 2, TP-242-003, PMT for 2C circulating water pump with jumper intended to bypass recirculation runback;
- Unit 2, HPCI pump flow testing following system outage, SO-252-002;
- Common, startup bus 20 lockout relay replacement; and
- "B" Control Room Emergency Outside Air Supply (CREOAS) operability run following fan preventive maintenance.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 – 7 Samples)

a. Inspection Scope

The inspectors observed portions of seven surveillance test activities both 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. The reviewed surveillance tests included:

- Unit 2, reactor core isolation cooling (RCIC) quarterly flow surveillance (IST);
- Unit 2, SO-253-004, 92 day verification of SLC suction flow path;

- Unit 2, "B" RHR SW pump and flow surveillance, SO-216-803;
- Unit 2, SI-280-206, quarterly functional test of LITS-B21-2N026A, B, C, and D;
- Common, SBO diesel 1 hour unloaded run in accordance with OP-002-001;
- Common, particulate and water check on "A" EDG fuel oil storage tank; and
- Quarterly containment atmospheric control valve exercising.

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 (2008 White Team Emergency Drill) that was conducted on November 18, 2008, and observed selected portions of the drill at 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 deficiencies within these areas. Eight 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 performance indicator opportunities against those identified by PPL to determine whether PPL was properly identifying weaknesses and failures in these areas. The drill observation sample included:

- 2008 White Team Emergency Drill, November 18, 2008.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Material Processing and Transportation (71122.02 – 6 Samples)

a. Inspection Scope

The inspectors reviewed the solid radioactive waste system description in the FSAR and the recent radiological effluent release report for information on the types and amounts of radioactive waste disposed. The inspector reviewed the scope of PPL's audit program to verify that it meets the requirements of 10 CFR 20.1101(c).

The inspector walked-down the liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions contained in the FSAR and in the Process Control Program (PCP). The inspector reviewed the status of any radioactive waste process equipment that was not operational and/or was abandoned in place. The inspector reviewed PPL's administrative and physical controls to ensure that the equipment will not contribute to

an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure.

The inspector reviewed the adequacy of any changes made to the radioactive waste processing systems since the last inspection. The inspector verified that the changes were reviewed and documented in accordance with 10 CFR 50.59, as appropriate. The inspector reviewed the impact, if any, to radiation doses to members of the public. The inspector reviewed current processes for transferring radioactive waste resin and sludge discharges into shipping/disposal containers to determine if appropriate waste stream mixing and/or sampling procedures and methodology for waste concentration averaging provide representative samples of the waste product for the purposes of waste classification as specified in 10 CFR 61.55 for waste disposal.

The inspector reviewed the radio-chemical sample analysis results for each of PPL's radioactive waste streams. The inspector reviewed PPL's use of scaling factors and calculations used to account for difficult-to-measure radionuclides. The inspector verified that PPL's program assures compliance with 10 CFR 61.55 and 10 CFR 61.56 as required by Appendix G of 10 CFR Part 20. The inspector reviewed PPL's program to ensure that the waste stream composition data accounts for changing operational parameters and thus remains valid between the annual or biennial sample analysis update.

The inspector observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and PPL verification of shipment readiness. The inspector verified that the requirements of any applicable transport cask Certificate of Compliance had been met. The inspector verified that the receiving licensee was authorized to receive the shipment packages. The inspector observed radiation workers during the conduct of radioactive waste processing and radioactive material shipment preparation activities. The inspector determined if the shippers were knowledgeable of the shipping regulations and whether shipping personnel demonstrated adequate skills to accomplish the package preparation requirements for public transport with respect to NRC Bulletin 79-19 and 49 CFR Part 172 Subpart H. The inspector verified that PPL's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

The inspector sampled non-excepted package shipment records. The inspector reviewed these records for compliance with NRC and DOT requirements. The inspector reviewed PPL's Licensee Event Reports, Special Reports, audits, state agency reports, and self-assessments related to the radioactive material and transportation programs performed since the last inspection. The inspector determined if identified problems were entered into the corrective action program for resolution. The inspector reviewed corrective action reports written against the radioactive material and shipping programs since the previous inspection.

The inspector interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;

- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in corrective action system(s); and
- Implementation/consideration of risk significant operational experience feedback.

For repetitive deficiencies or significant individual deficiencies in problem identification and resolution identified above, the inspector determined if PPL's self-assessment activities were also identifying and addressing these deficiencies.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151 – 10 Samples)

.1 Mitigating Systems Performance Index (MSPI)

a. Inspection Scope

The inspectors reviewed PPL's performance indicator (PI) data for the period of December 2007 through October 2008 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 (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," and PL-NF-06-002, "SSES Mitigating System Performance Index Basis Document," Revision 4. The following MSPI performance indicators were included in this review:

- Units 1 and 2 MSPI – emergency AC power systems;
- Units 1 and 2 MSPI – high pressure injection systems;
- Units 1 and 2 MSPI – heat removal systems;
- Units 1 and 2 MSPI – RHR systems; and
- Units 1 and 2 MSPI – cooling water systems.

b. Findings

No findings of significance were identified.

.2 Public Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed a listing of licensee action reports for the period January 1, 2008 through December 1, 2008 for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/qtr whole body or 5 mrem/qtr organ dose for liquid effluents;

or 5 mrads/qtr gamma air dose, 10 mrads/qtr beta air dose; or 7.5 mrems/qtr organ doses from I-131, I-133, H-3, and particulates for gaseous effluents.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 – 4 Samples; 71004 – 1 Sample)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As required by Inspection Procedure (IP) 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for followup, the inspectors performed screening of all items entered into PPL's corrective action program.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

As required by IP 71152, "Identification and Resolution to Problems," the inspectors performed a review of PPL's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. This trend review considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1 of this report. The review also included issues described in system health reports, quality assurance (QA) audits, engineering work requests, PPL management meetings, inspector exit meetings, and maintenance rule assessments. This review concentrated on the six-month period from July 2008 to December 2008, although some examples were prior to this time period to confirm potential trends. Inspectors compared their results with the results in PPL's latest integrated semi-annual corrective action trending report.

b. Findings and Assessments

No findings of significance were identified.

Quality Assurance Audit Findings and Hold Point Notifications

The inspectors identified a potential adverse trend pertaining to corrective actions associated with previously identified QA findings. PPL QA conducted independent, periodic audits on PPL procedures and programs. From July 2008 through December 2008, QA audited the corrective action program and the transient combustible program. Documented in these audits were QA findings that were previously identified by QA in earlier audits in 2007 and 2008. Though these findings were previously identified by QA, PPL had not successfully identified the root cause of the issues and implemented

corrective actions. As a result, QA again identified them in audits performed in the latter part of 2008.

In addition, the inspectors identified a potential adverse trend pertaining to missed QA hold points associated with maintenance activities. On several occasions, the notifications to QA to perform steps designated with a QA hold point were not performed, therefore, not allowing the QA organization to perform the required independent verification of the work. For instance, the inspectors identified that a QA hold point to verify proper RHR service water pump motor rotation was missed, which later caused QA to question the proper rotation of the pump. PPL ensured that the pump rotation was correct, and that it was verified by both a system engineer and an experienced maintenance worker. PPL included the issue in their corrective action program. Although a violation of procedure requirements, none of the missed QA hold points was considered more than minor since no equipment was returned to service in a degraded state.

Work Controls and Energy Control Process

The inspectors identified a potential adverse trend related to work control scheduling. For instance, due to scheduling problems, a “near miss” coordination error occurred when the Unit 2 Operations department performed filling evolutions for the 2B RHR pump and pump minimum flow line. This test was scheduled to declare the RHR loop operable. However, the schedule failed to show that electricians were performing breaker testing on the same pump’s electrical breaker. This schedule conflict resulted in an 80-minute delay to declare the RHR loop operable. Other instances identified by the inspectors involving work control issues included:

- Unit 2 plant process computer maintenance deferred because contingency plans were not scheduled; and
- 2D RHR system outage window scheduled motor oil cooler flush and motor megger/inspection simultaneously.

The inspectors also noted that PPL had not identified work control scheduling issues as an adverse trend in their “Work Management 2008 Second Quarter Trend Analysis” report.

In addition, the inspectors identified a potential adverse trend related to the energy control process. On multiple occasions, the inspectors identified maintenance activities with inadequate energy controls which were not in accordance with the station energy control procedure. For instance, work clearances were revised and authorized twice to depressurize the 2B station air compressor. An isolation valve was missed on both work clearance revisions, and as a result, an unexpected 50 psig of air was found by maintenance workers during disassembly of the compressor unloader valves. The package had been reviewed by several personnel including an independent reviewer.

The inspectors identified another event involving instrumentation and control personnel, who discovered that while attempting to replace an EDG fuel oil storage tank level indicator, the level indicator was energized to 120 volts. The clearance failed to completely de-energize the level indicator transmitter. As a result, one of the electricians received a small electrical shock. PPL entered the energy control process issues into their corrective action program and developed an action plan to correct the

problem (AR 1089224). Although violations of station procedures, these energy control process examples were considered minor violations since no actual loss of safety function occurred and the errors occurred when the equipment had already been removed from service.

.3 Annual Sample: Review of October 2008 SSES Safety Culture Survey

a. Inspection Scope

From November 17 to 21, 2008, the inspectors reviewed the results of a SSES safety culture survey that was performed during October 2008. The survey was performed by an independent, third party vendor. The inspectors performed a review of the survey data, conducted interviews with plant management and staff, and evaluated corrective action program (CAP) data to gain insights into SSES's safety conscious work environment (SCWE).

The survey was conducted in a multi-question, anonymous format with opportunities for write-in comments. All employees assigned to SSES and the Allentown General Office, including contractors, were provided the opportunity to participate in the survey. Seven groups were specifically analyzed in the survey including Operations, Health Physics, Electrical Maintenance, Instrumentation and Controls (I&C) Maintenance, Mechanical Maintenance, Fix-it-Now (FIN) Maintenance, and 'Other' Maintenance. Inspectors evaluated the survey results to identify trends and to perform comparisons against baseline data established in a previous 2006 SSES safety culture survey. Criteria used in this inspection sample were taken from NRC inspection procedure 71152, "Identification and Resolution of Problems," dated January 2008. This inspection effort represented one sample.

In addition, the inspectors considered past PPL efforts to address work environment issues; selected 2008 allegation data; the results of independent, third party evaluations; and the results of a focus group discussion.

b. Findings and Observations

Background

In December 2006, the NRC advised PPL of concerns raised and feedback provided to its Office of Investigations by workers at Susquehanna regarding the negative perceptions of SCWE that existed among those performing refuel floor activities (ML063460470). Also in late 2006, PPL performed a site-wide culture survey, which indicated that some work groups, including Maintenance and Health Physics, warranted additional attention. Based on the 2006 survey results, PPL developed action plans, implemented several corrective actions through 2007, and appeared to make appropriate progress (ML070330186, ML072070055, ML080770308, ML071060192, and ML081650435).

In contrast to the 2007 trend, the NRC received a significantly increased number of allegations in early 2008, several of which involved concerns with the SCWE at Susquehanna. Using the allegations process, the NRC engaged PPL in March 2008 regarding multiple allegations with similar work environment concerns. However, in May 2008, PPL did not provide sufficient detail to support its assessment of the station's safety conscious work environment. As a result, the NRC re-engaged PPL in June 2008

requesting additional details and bases regarding PPL's conclusions that employees and contractors were willing to raise nuclear safety issues without fear of retaliation.

In a June 2008 response, PPL concluded that the work environment at Susquehanna had declined and PPL attributed the decline, in large part, to (1) ineffective change management of personnel and work policies that occurred prior to the spring 2008 refueling outage, and (2) selected events involving management that were widely known across the site and were negatively perceived by certain PPL staff. As a result, PPL developed a work environment improvement plan in August 2008 to address these issues and communicated the plan to employees in September 2008. The plan included a SCWE survey focused on the Operations, Maintenance, and Health Physics departments to be conducted by an independent, third party contractor during October 2008.

October 2008 SSES Survey Results

The survey had a participation rate of 78 percent (876 of 1116 possible responses). The survey vendor computed metrics related to: 1) indications of a potentially chilled work environment; and 2) whether an individual would inform their supervisor, and/or document an issue, and if not satisfied, whether the individual would escalate the issue up the management chain. Overall, when compared to a similar peer group in the vendor's database, SSES's 2008 SCWE ratings were among the lowest recorded.

Regarding informing supervision of issues and escalating concerns, the inspectors noted that the willingness to escalate an issue up the management chain was lowest in Operations (20.3% negative) and Health Physics (20.0% negative). When compared to salaried employees, union-hourly workers scored lower in areas where they would be willing to escalate an issue.

The vendor concluded that Susquehanna's SCWE had declined since 2006 with an unfavorable comparison to others in their nuclear database. The magnitude and rate of decline was most pronounced within the union-hourly employee ranks. From 2006 to 2008, SCWE trends were declining in all targeted organizations with the exception of I&C Maintenance and Mechanical Maintenance. The most negative trends were apparent in the Operations and Health Physics departments. Additionally, ratings of management and senior management were lowest in Operations and Health Physics. The inspectors also noted that the October 2008 survey indicated declining SCWE trends with broader organizational impacts as compared to 2006. In addition, negative response percentages for the metrics worsened. Specifically, for the metric associated with:

- indications of a potentially chilled work environment, the negative response rate increased from 7.2% in 2006 to 13.2% in 2008;
- informing supervision and escalating an issue up the management chain, the negative response rate increased from 3.5% in 2006 to 5.3% in 2008; and
- overall SCWE, the negative response rate increased from 5.3% in 2006 to 9.3% in 2008.

Regarding the write-in portion of the survey, 1028 comments were provided by 38 percent of survey respondents. Ninety-three percent of the write-in responses were negative in nature, with a majority of the comments focused on growing tensions between management and the workforce, particularly with trust in management. Most

notably, there were a small number of negative write-in comments related to the willingness of workers to raise concerns associated with nuclear safety. Other write-in themes included:

- Lack of confidence in management's current strategies to address work environment issues;
- A view of SCWE as having declined and personnel not being treated properly for bringing issues forward; and
- Expressions that management had not modeled professional behaviors or made decisions consistent with promoting and maintaining a strong SCWE.

PPL Plans to Address Work Environment Issues

Following the NRC's engagement of PPL in March and June 2008, PPL developed a plan to address work environment issues in August 2008. Following the October 2008 survey results, however, PPL revised the August plan using:

- Independent, third party assessment data and analyses;
- October 2008 survey information;
- Corrective action program cause analyses;
- Trend analyses of Condition Reports; and
- Benchmarking trips to other nuclear sites to gain safety culture insights.

The work environment plan was revised in December 2008 and included creation of an Executive Review Committee to address work environment and SCWE oversight; creation of a Susquehanna Work Environment Review Team to perform routine environment, SCWE, and Problem Identification & Resolution (PI&R) analyses; and a change to the accountability review process to engage the Executive Review Committee to ensure consistent application of personnel actions.

NRC Actions to Monitor SCWE

The NRC took several actions, including this inspection sample, to evaluate PPL's progress and effectiveness in addressing work environment and SCWE issues at Susquehanna during 2008. Specifically, the NRC:

- Conducted 13 interviews representing a cross-section of Susquehanna employees during September and October 2008. While several employees expressed work environment concerns, none indicated that they would not bring a safety concern forward. Nonetheless, interviewees discussed negative perceptions of SCWE and the Employee Concerns Program, as well as other work environment issues including personnel and work policies, schedule pressure, perceptions of a double standard between managers and employees, and perceived punitive aspects associated with event review boards.
- Interacted with managers onsite, observing that not all first-line supervisors and mid-level managers were fully aligned with the August 2008 work environment and SCWE improvement initiatives. This observation was consistent with the assessment of an additional, third party contractor.
- Regional Branch Chief and resident inspectors engaged approximately 25 personnel, representing a cross-section of the site population, in a focus group discussion on December 18, 2008. The purpose of the focus group discussion

was to facilitate a dialogue regarding SSES work environment issues and to obtain input regarding the October 2008 SCWE survey results. Overall, the discussions confirmed the inspector's independent analysis of the survey results.

Assessment

Taken collectively, the above information indicated a lack of PPL progress and effectiveness in addressing work environment concerns, negative employee perceptions, and indications of a declining safety conscious work environment at Susquehanna during 2008.

The NRC will continue to monitor PPL's progress in addressing work environment issues to ensure employees remain willing to raise safety issues at the site. Additional regulatory actions, if deemed necessary, will be addressed via separate correspondence.

.4 Annual Sample: Review of Missed Surveillances and High Number of Technical Specification Surveillances Being Performed in the Grace Period

a. Inspection Scope

The inspectors selected CR 1041999 as a PI&R sample for a detailed follow-up review. CR 1041999 was initiated to address the number of missed surveillances and the lack of rigor associated with the surveillance test program at PPL. This issue was identified by PPL as a QA finding, and the condition report was processed as a Level 1 root cause evaluation to address potentially ineffective actions following missed surveillance tests in 2007.

The inspectors assessed PPL's problem identification threshold, cause analysis, extent-of-condition reviews, and the prioritization and timeliness of corrective actions associated with this issue. This review was focused on determining whether PPL was completing corrective actions that were appropriate to prevent recurrence. The inspectors reviewed 19 surveillances that were in grace (not performed within the nominal TS frequency) as reported on November 24, 2008. The inspectors evaluated the reason for each surveillance schedule date by interviewing cognizant plant personnel. In addition, the inspectors reviewed surveillance records to determine whether some surveillances had a history of being performed later than the nominal TS interval.

b. Findings and Assessment

No findings of significance were identified.

The inspectors determined that PPL properly implemented their corrective action process regarding the missed surveillances and grace period reported in CR 1041999. The CR package was complete and included a cause evaluation, extent-of-condition reviews, and planned corrective actions. Corrective actions were appropriate to prevent recurrence of the issues. The inspectors determined that adequate tracking mechanisms were in place to ensure proper management of the TS surveillance program which included improved visibility at the daily plant status meeting of surveillances in the interval grace period, and the establishment of routine performance monitoring and assessment as described in PPL procedure NDAP-QA-0722.

.5 Extended Power Uprate (EPU) Sample and Annual PI&R Sample: Corrective Actions to Address Inconsistencies Between FSAR Containment Analysis and Emergency Operating Procedures

a. Inspection Scope

The inspectors reviewed PPL's corrective actions to address inconsistencies between the FSAR and EOPs as described in NCV 05000387/2008006-01, as well as in section 4OA2.a.3(b) of NRC inspection report 05000387/2008006; 05000388/2008006. This inspection sample was also an EPU inspection sample in accordance with EPU inspection procedure 71004 because it was directly related to the verification of PPL's EPU license condition 2.C.(39), which described the regulatory commitment to complete the corrective actions needed to assure consistency between the constant pressure power uprate containment analysis and station emergency operating procedures (EOPs).

This PPL license commitment was first met by a temporary modification, EC 978361, as described in Section 1R18 of NRC inspection report 05000387/2008003; 05000388/2008003 until changes to emergency operating procedures could be implemented and incorporated into licensed operator training. Inspectors reviewed all of the corrective actions in PPL condition report 739371 to verify that the inconsistencies between the analysis assumptions for suppression pool cooling response and the EOPs were resolved. The inspectors also reviewed PPL's corrective actions to prevent recurrence which included a review of the engineering design process as described in AR 1107056 and several process improvements to the corrective action program procedures.

The inspectors verified that changes to EOPs were properly included into licensed operator requalification training by observing simulator training, which covered the validity of reactor pressure vessel (RPV) level instrumentation during primary coolant accidents and proper RPV level control that avoids premature entry into the RPV flooding procedure. Relevant licensed operator requalification (LOR) training was observed as part of this inspection sample, and also during the LOR inspection sample described in the resident quarterly review in section 1R11 of this report.

b. Findings and Assessment

No findings of significance were identified.

The inspectors concluded that PPL had met the EPU license condition 2.C.(39) to assure consistency between the Susquehanna EPU containment analysis and EOPs. The inspectors determined that PPL properly implemented corrective actions appropriate to prevent recurrence.

4OA3 Event Followup (71153 – 3 Samples)

.1 Susquehanna Unit 1 Recirculation Pump Runback on October 9, 2008

a. Inspection Scope

On October 9, 2008, Susquehanna Unit 2 was operating at 100 percent power when the 2C circulating water pump automatically tripped off due to a sensed motor fault. This pump breaker trip caused an automatic reactor recirculation runback which reduced reactor power to 73 percent. Based on the existing recirculation system flow and power level, operators identified that the plant was not in the restricted area of the power-to-flow map, and that feedwater level control and reactor recirculation response was appropriate for plant conditions. The resident inspector responded promptly to the control room and observed the operators taking actions to verify proper operation of plant systems. The inspectors reviewed several aspects of this event, including compliance with core thermal limits at reduced reactor core flows, and PPL's evaluation of the transient response in the corrective action program.

b. Findings

No findings of significance were identified.

.2 Alert Declared Due to Oxygen Deficient Atmosphere in Unit 2 "B" RHR Room

a. Inspection Scope

At 4:15 a.m. on October 27, 2008, PPL began maintenance work on Unit 2 RHR motor cooling water lines. This work involved the use of freeze seals which were created by placing a device containing liquid nitrogen over two sections of cooling water piping so that the water inside the line would stay frozen. The frozen lines isolated water and moisture and allowed maintenance work to proceed. PPL shift operations declared an Alert for Unit 2 at 12:06 p.m. when lower than acceptable levels of oxygen were detected inside the RHR room. The nitrogen exhausting from the freeze seal into the room had displaced the oxygen as indicated by two independent monitors reporting oxygen levels less than the Immediately Dangerous to Life and Health (IDLH) level of 19.5 percent. All workers in the RHR room safely evacuated. Both resident inspectors promptly responded to observe the actions of PPL's emergency response organization. The NRC Region I office began formally monitoring the event at 1:02 p.m. Resident inspectors and the Region Incident Response Center monitored recovery actions, emergency plan communications, procedure compliance, and command and control during the event response. Following the event response, inspectors performed additional reviews of the maintenance work package documents, procedures, and recent external industry operating experience.

b. Findings

Introduction. A self-revealing finding was identified for failing to properly implement PPL procedure NDAP-QA-0725 regarding the incorporation and evaluation of operating experience (OE) into the corrective action program and control of field work. Specifically, in December 2007 an industry operating experience report regarding the control of field work for nitrogen freeze seals in plant vital areas was entered into Susquehanna's corrective action program. However, the inspectors identified that PPL's review and evaluation of this OE resulted in no corrective actions taken or planned and that the relevant information was not communicated to the affected station groups as required by NDAP-QA-0725, Appendix D.

Description. On October 27, 2008, PPL workers were implementing modifications to the ESW piping that supplies the RHR motor oil cooling. The modification involved the use of freeze seals, because manual block valves were not available, and in some cases, manual block valves were not leak tight as needed for pipe welding activities. Two freeze seals were established at approximately 4:15 a.m. October 27, 2008, and area air monitor alarms were received as early as 4:45 a.m. that day. Workers moved the air monitor and reset the alarm without informing shift operations, writing a CR or relaying this information to oncoming dayshift personnel. At approximately 11:42 a.m. the air monitor alarmed again and personnel evacuated the 2B RHR room. After a confirmatory sample indicated that oxygen levels were below the IDLH limit of 19.5 percent in a plant vital area, an Alert was declared by the operations shift manager.

As a result of the Alert declaration, emergency response, and interruption of the maintenance effort, the overall RHR system outage time was increased for the desired maintenance modification on safety-related systems. Following the event, PPL performed a root cause evaluation and identified root and contributing causes. The inspectors evaluated PPL's CR 940023 and 974500 which both described previous operating experience which was a nearly identical event at another reactor plant in November 2007. Inspectors concluded that PPL failed to evaluate and take appropriate corrective actions for external operating experience related to nitrogen freeze seal activities potentially causing oxygen-deficient atmospheres as required by NDAP-QA-0725, Appendix D, which described the evaluation and communication of operating experience. Inspectors determined that the lack of corrective actions and inadequate communication of industry OE were primary contributors to the Susquehanna Unit 2 Alert declaration on October 27, 2008. This emergency declaration was required when the oxygen level in the 2B residual heat removal (RHR) pump room, which is a plant vital area, dropped below the minimum allowable threshold of 19.5 percent, which is the IDLH limit.

The inspectors determined that PPL's failure to properly evaluate industry OE, implement corrective actions, and communicate the OE information to those who performed the relevant tasks at Susquehanna was a performance deficiency. Specifically, this prevented access to vital area safety equipment in the RHR room, resulted in the declaration of an emergency event (Alert), and increased the Technical Specification OOS time for the 2B RHR pump.

Analysis. This finding is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to properly implement NDAP-QA-0725, Appendix D, to evaluate external industry OE, implement corrective actions, and communicate the OE information to those who performed the relevant tasks at Susquehanna resulted in prohibiting access to safety-related equipment in the RHR room, resulted in the declaration of an emergency event (Alert), and increased the Technical Specification (TS) out-of-service (OOS) time for the 2B RHR pump. The inspectors estimated that this performance issue resulted in not completing the desired work with the freeze seal in place on a safety-related system, and in turn resulted in an additional 12 hours of 2B RHR pump unplanned unavailability time.

Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements. The inspectors determined the significance of this finding using guidance in NRC inspection manual chapter (IMC) 0609, "SDP," Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." This finding affected the Mitigating Systems cornerstone and was of very low safety significance (Green) because it was not a design or qualification deficiency, there was no loss of safety function, and it was not potentially risk significant due to external events.

The cause of this finding is related to the operating experience component of the Problem Identification and Resolution cross-cutting area because PPL did not systematically or effectively evaluate and communicate industry OE to affected internal stakeholders in a timely manner, actions which could have prevented loss of access to a vital area, an Alert emergency declaration, and increased Unit 2 'B' RHR system unavailability. (IMC 0305 aspect: P.2(a)).

Enforcement. This finding was not a violation of regulatory requirements. However, the finding involved a failure to properly implement NDAP-QA-0725, Appendix D, in that external OE was not correctly evaluated prior to October 27, 2008, and as a result, relevant information was not communicated to the affected work groups. PPL has this performance issue in the corrective action program (CR # 1086125) and has implemented corrective actions that include procedure revisions, reinforcement of procedure adherence, and training and qualification revisions. Because this finding does not involve a violation of regulatory requirements, and has very low safety significance (Green), it is identified as a finding. **(FIN 05000387; 05000388/2008005-001, Ineffective Evaluation and Incorporation of Operating Experience Into the Corrective Action Program).**

.3 2C Circulating Water Pump Testing Causes Reactor Recirculation Pump Runback, November 3, 2008

a. Inspection Scope

On November 3, 2008, Operators were attempting to start the 2C circulating water pump in accordance with operating procedures. The pump start was followed by a pump breaker trip and a recirculation flow runback was received. Operators entered TS Limiting Condition for Operation (LCO) 3.2.2 for about 10 minutes due to the minimum critical power ratio being exceeded during the reactor power runback to 72 percent reactor power. The resident inspectors responded promptly to the control room to observe the operators taking actions to verify proper operation of plant systems. Inspectors reviewed the response and PPL's entry into off-normal and alarm response procedures. Inspectors determined that feedwater and reactor level control responded as expected for the initiated runback. However, inspectors observed that the runback signal and limiter were intended to be bypassed by operating procedure for this work activity. Thus, the response of reactor recirculation flow and the plant transient were not expected for the planned post maintenance testing. Following the event response, inspectors conducted additional reviews of maintenance work package documents and corrective actions to prevent reactor transients.

b. Findings

No findings of significance were identified.

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.

c. Findings

No findings of significance were identified.

.2 (Closed) NCVs 05000387/2008302-01 and 05000388/2008302-01, Failure to Provide Complete and Accurate NRC License Application

a. Inspection Scope

The NRC documented this finding in Examination Report 05000387; 388/2008302 as an NRC-identified Severity Level IV non-cited violation of 10 CFR 50.9, "Completeness and Accuracy of Information," because PPL submitted a license application for a reactor operator to take an initial NRC license examination that incorrectly stated that the applicant was medically qualified with restrictions. The finding was of very low significance because it did not result in the NRC making an incorrect licensing decision. On October 16, 2008, a region-based Operations Branch inspector discussed and reviewed completed corrective actions with station management. The licensee's corrective actions included: 1) an extent-of-condition review that was conducted regarding the medical qualifications for all of their currently licensed operators; 2) refresher training that was conducted for all licensed operators on the requirements of ANSI 3.4 with emphasis on the need for licensed operators to report any changes in their medical conditions in a timely manner; 3) the medical review procedure (NTP-QA-31.12) was revised to ensure proper communications for similar issues; and 4) an operating experience notification was sent out to the industry. The corrective actions appear to have adequately addressed the root causes of the issue. No further inspection is required. This item is closed.

b. Findings

No findings of significance were identified.

.3 Implementation of Temporary Instruction (TI) 2515/176 – Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing

a. Inspection Scope

The objective of TI 2515/176, "Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing," was to gather information to assess the adequacy of nuclear power plant EDG endurance and margin testing as prescribed in plant-specific TS. The inspectors reviewed EDG ratings, design basis event load calculations, surveillance testing requirements, and EDG vendor's specifications and gathered information in accordance with TI 2515/176.

The assessment and information gathered while completing this TI was discussed with licensee personnel. This information was forwarded to the Office of Nuclear Reactor Regulation for further review and evaluation.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On January 13, 2008, the resident inspectors presented their findings 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 December 5, 2008, the HP inspector presented inspection results to Mr. C. Gannon and other members of his staff who acknowledged the findings.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by PPL and are violations of NRC requirements, which meet the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation.

- 10 CFR Part 50, Appendix B, Criterion VIII, "Identification and Control of Materials, Parts and Components," requires measures be established for the identification and control of material parts and components. These measures shall assure that identification of the item is maintained by part number, serial number or other appropriate means, traceable to the item throughout fabrication, installation, and use of the item. These control measures shall be designed to prevent the use of incorrect or defective parts or components. Contrary to this requirement, on December 16, 2008, PPL identified that the safety-related, 480 volt motor control center 1B217 supply breaker installed in the safety-related, 480 volt bus 1B 210 was not an Appendix B, Quality Controlled component. This issue was entered into PPL's CAP (CR 1101415). This violation is of very low safety significance (Green) because it resulted in a qualification deficiency that reduced component reliability but was confirmed not to result in the loss of component or safety system function.
- Technical Specifications 6.12.2 require that the areas where the radiation level exceeds 1000 mrem per hour be provided with locked doors, and that the keys shall be maintained under the administrative control of the shift foreman. Administrative control for these keys is that they be in the physical possession of a health physics technician. Contrary to this requirement, on October 23, 2008,

the key to a posted locked high radiation area was left unattended and not in the possession of a health physics technician, for approximately 15 minutes. This was identified in the licensee's CAP as CR 1085400. This finding is of very low safety significance (Green) because while the key was not in the physical possession of a health physics technician, the door to the area remained locked, and no unauthorized entry to the area was made.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

- D. Brophy, Regulatory Affairs
- L. Casella, Systems Engineer
- A. Fitch, Manager, Work Management
- C. Gannon, VP Nuclear Operations
- J. Helsel, Manager, Training
- M. Jacopetti, Program Lead, Operator Requalification Program
- M. Micca, Health Physicist
- W. Morrissey, Manager, Electrical Maintenance
- R. Paley, Manager, Plant Support
- T. Price, Manager, General Work Environment Improvement Project
- D. Shane, Technical Training
- R. Stigers, Senior Health Physicist
- V. Zukaukis, Health Physics Foreman

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened/Closed

05000387; 388/2008005-01	FIN	Ineffective Evaluation and Incorporation of Operating Experience into the Corrective Action Program (Section 4OA3.3)
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Closed

05000387; 388/200830201	NCV	Failure to Provide Complete and Accurate NRC License Application (Section 4OA5.2)
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LIST OF DOCUMENTS REVIEWED

(Not Referenced in the Report)

Section 1R01: Adverse Weather Protection

Condition Reports:

1079980 and 1088314

Procedure:

NDAP-00-0024, Winter Operations Preparations, Revision 13

Section 1R05: Fire Protection

Procedures:

FP-113-209, Sump and Condensate Pump Rooms (I-2) (I-3) Fire Zone 1-31A, elevation 646'-2",
Revision 3

FP-113-211, Condensate Pump Rooms (I-30, I-31) Steam Packing Exhauster Room (I-33)
Recombiner Piping Room (I-35) Pipeway (I-56) Fire Zone 1-31C, Elevation 656'-0",
Revision 3

Section 1R12: Maintenance Effectiveness

Condition Reports:

1082316/1082498, 1097273, 1097166, 1097337, 1097344, 1085185, 1086364, 1089395,
1089400, 1090651, 1094021, 1097273

Reference:

Operability Follow-up Request Form, Revision 1

Other:

Tap Changer Activity Analysis TASA October 27, 2004

Tap Changer Activity Analysis TASA October 22, 2008

PCWO 426077 Double Testing Inspection Results October 03, 2002

PCWO 894717 Double Testing Inspection Results October 13, 2008

US Department of the Interior Bureau of Reclamation FIST, Vol. 3-2, Testing and Maintenance
of High-Voltage Bushings, November 1991

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Condition Report:

1097341

Procedure:

NDAP-QA-1902, Maintenance Rule Risk Assessment and Management Program

Section 1R15: Operability Evaluations

Condition Reports:

1086853, 1095894, and 1101415

Work Orders:

800224 and 852004

Section 1R18: Permanent Plant Modifications

Condition Report and Action Request:

CR 1099314 and AR 845611

Work Order:

PCWO 946412

Drawing:

M 30-124, Sheet 6A, 1 DCN 3

Other:

EC 899048

Section 1R19: Post-Maintenance Testing

Procedures:

SO-030-001B,

Section 1R22: Surveillance Testing

Condition Report

1096779

Procedures

SO-173-003, Quarterly Containment Atmosphere Control Valve Exercising, Revision 17
SO-250-002, Quarterly RCIC Flow Verification, Revision 36

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Condition Reports:

1038967, 1049540, 1049754, 1053933, 1055067, 956911, 897875, 1076795, 1076798,
1076793, 1076803, 1076807, 1076812, and 1001378

Other:

EPRI Low-Level Waste Assistance Program, PPL Susquehanna, LLC, August 2007
QA Audit 732777, Solid Radwaste Audit Report, December 13, 2007
WMG Characterization and Classification of the Susquehanna Unit 1 Steam Dryer
Lesson Plan HP230, Rev 1, Hazmat Training for Health Physics Technicians
Procedure NDAP-QA-0648, Rev 18, Purchase, Receipt and Shipment of Radioactive Material
Report of Analysis/Certificate of Conformance, Teledyne Brown Engineering, dated 2/12/2008
Radioactive Material Shipping Records: 08-099; 08-095; 08-055; 08-054; 08-030

Section 4OA1: Performance Indicator Verification

Condition Reports:

1052285, 1054090, 1054115, 1054375, 1055314, 1055618, 1056627, 1045759, 1011717, 1024746, and 1095450

Section 4OA2: Identification and Resolution of Problems

Action Requests:

1086033, 1091686, 1072676, 1088724, 1081139, 1085936, 1055194, 1055266, 1080995, 1089084, 1101242, 1101261, 1101267, 1072134, 1083533, and 1100265

Apparent Cause Evaluation:

1088724

Miscellaneous:

CAA Semi-Annual Trend Report Jan- Jun 30, 2008
CAA Semi-Annual Trend Report for 07/01/2007 to 12/31/2007 (Revision 0)
AR MGNT 967797 Work Management 2008 Second Quarter Trend Analysis

Section 4OA3: Event Response

Condition Reports:

1081435 and 1081438

Procedures

NDAP-00-0906, SSES Material/Vehicle Authorization

Other:

Event Review Board record for October 28, 2008

Section 4OA5: Other

Completed Surveillance Procedures

SO-024-001, "Monthly Diesel Generator Operability Test," Revision 37, performed February 26, 2003
SE-024-A01, "Diesel Generator A Integrated Surveillance Test," Revision 3, performed April 27, 2005 and February 23, 2006
SE-024-A01, "Diesel Generator A Integrated Surveillance Test," Revision 4, performed February 23, 2007
SE-024-B01, "Diesel Generator B Integrated Surveillance Test," Revision 1, performed February 3, 2004

SE-024-B01, "Diesel Generator B Integrated Surveillance Test," Revision 2, performed February 14, 2004 and February 2, 2008

SE-024-C01, "Diesel Generator C Integrated Surveillance Test," Revision 2, performed March 15, 2003

SE-024-C01, "Diesel Generator C Integrated Surveillance Test," Revision 3, performed May 5, 2005 and September 7, 2006

SE-024-C01, "Diesel Generator C Integrated Surveillance Test," Revision 4, performed May 8, 2007 and July 1, 2008

SE-024-D01, "Diesel Generator D Integrated Surveillance Test," Revision 2, performed July 16, 2003

SE-024-D01, "Diesel Generator D Integrated Surveillance Test," Revision 3, performed July 15, 2005

SE-024-D01, "Diesel Generator D Integrated Surveillance Test," Revision 4, performed December 17, 2005 and July 11, 2007

SE-024-E01, "Diesel Generator E Integrated Surveillance Test," Revision 1, performed January 6, 2004

SE-024-E01, "Diesel Generator E Integrated Surveillance Test," Revision 2, performed April 13, 2006, January 4, 2008, and January 26, 2008

SM-275-104, Division 1 24 VDC Battery Discharge and Capability Performance Test, Revision 10

SM-206-000, 2 Year Primary Containment Penetration and Breaker Test, Revision 13

SI-079-330, 24 Month Calibration of Refueling Floor Wall Exhaust Duct High Radiation Monitor Channel, Revision 13

SI-079-329, 24 Month Calibration of Refueling Floor Wall Exhaust Duct High Radiation Monitor Channel, Revision 13

SI-261-302, 24 Month Reactor Water Cleanup High Differential Flow Channel Calibration, Revision 19

SI-261-502, 24 Month Reactor Water Cleanup Isolation Logic System Functional, Revision 12

SI-250-312, 24 Month RCIC Pump Flow Channel Functional, Revision 12

SE-259-084, LLRT HPCI Turbine Exhaust Penetration X-210, Revision 14

SE-250-001, Unit 2 RCIC Logic System Functional, Revision 10

SE-252-001, Unit 2 HPCI Logic System Functional, Revision 10

SE-134-C1A, Reactor Building Zone 1 "A" Charcoal Test, Revision 2

SE-234-C2B, Reactor Building Zone 2 "B" Charcoal Test, Revision 2

SE-133-B01, Turbine Building HEPA and Charcoal Filter Efficiency Test, Revision 4

SE-133-C1B, "B" Turbine Building Charcoal Test, Revision 1

SE-252-003, Unit 2 High Pressure Coolant Injection Isolation Logic System Functional Test, Revision 1

SE-250-003, Unit 2 Recirculation Isolation Logic System Functional Test, Revision 1

SO-054-002, Quarterly Emergency Service Water Valve Exercising, Revision 19

SE-013-011, 18 Month Functional Test of Fire Deluge Systems DS-091, DS-092, DS-093, DS-094, Revision 1

Calculations

EC-024-0503, "Diesel Generator Load Study," Revision 0

EC-024-1014, "Justification for ITS Diesel Generator Frequency Acceptance Limits of 60 ± 1.2 Hz," Revision 0

EC-024-0629, "Susquehanna Steam Electric Station FSAR 8.3 Diesel Generator Loading Tables Update," Revision 10

Section 4OA7: Licensee Identified Violations:Condition Report:

1101415

LIST OF ACRONYMS

ALARA	As Low As Is Reasonably Achievable
AR	Action Report
ASME	American Society of Mechanical Engineers
ATWS	Anticipated Transient Without Scram
CFR	Code of Federal Regulations
CR	Condition Report
CRD	Control Rod Drive
CREOAS	Control Room Emergency Outside Air Supply
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EPU	Extended Power Uprate
ESSW	Engineered Safeguard Service Water
ESW	Emergency Service Water
EWR	Engineering Work Request
FSAR	[SSES] Final Safety Analysis Report
GL	Generic Letter
HPCI	High Pressure Coolant Injection
IDLH	Immediately Dangerous to Life and Health
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISI	Inservice Testing
kV	Kilovolts
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOR	Licensed Operator Requalification
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OA	Other Activities
OE	Operating Experience
OOS	Out-of-Service
PCP	Process Control Program
PI	[NRC] Performance Indicator
PI&R	Problem Identification and Resolution
PIM	Plant Issues Matrix
PMT	Post-Maintenance Test
PPL	PPL Susquehanna, LLC
QA	Quality Assurance
RB	Reactor Building

RCIC	Reactor Core Isolation Cooling
RETS	Radiological Effluent Technical Specification
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RMS	Radiation Monitoring System
RO	Reactor Operator
ROP	Reactor Oversight Process
RPV	Reactor Pressure Vessel
RTP	Rated Thermal Power
RWCU	Reactor Water Cleanup
SBO	Station Blackout
SDP	Significance Determination Process
SLC	Standby Liquid Control
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
SW	Service Water
TASA	Tapchanger Activity Signature Analysis
TI	Temporary Instruction
TS	Technical Specifications
WO	Work Order