



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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November 14, 2007

Mr. Britt T. M^cKinney
Senior Vice President, and
Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard - NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION - NRC INTEGRATED
INSPECTION REPORT 05000387/2007004 AND 05000388/2007004

Dear Mr. M^cKinney:

On September 30, 2007, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station Units 1 and 2. The enclosed integrated inspection report documents the inspection results, which were discussed on October 12, 2007, with you and other members of your staff.

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

Based on the results of this inspection, no findings of significance were identified.

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 05000387/2007004 and 05000388/2007004
Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-387, 50-388

License Nos.: NPF-14, NPF-22

Report No.: 05000387/2007004 and 05000388/2007004

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: July 1, 2007 through September 30, 2007

Inspectors: F. Jaxheimer, Senior Resident Inspector
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SUMMARY OF FINDINGS

IR 05000387/2007-004, 05000388/2007-004; 07/01/2007 - 09/30/2007; Susquehanna Steam Electric Station, Units 1 and 2; Routine Integrated Report.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by regional reactor inspectors and an operations engineer. 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 Findings and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 began the inspection period at full rated thermal power (RTP) and operated at or near full power, except for a planned power reduction to perform a control rod sequence exchange on July 14, 2007, and planned reductions to test and assess control cell friction issues on August 12 and September 9, 2007.

Unit 2 began the inspection period at full RTP and operated at or near full power, except for a planned power reduction to 80 percent RTP to perform control rod scram time testing and a control rod sequence exchange on August 26, 2007. The reactor was returned to full power after approximately 17 hours of reduced power operation.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04 - 4 Samples)

.1 Partial Walkdown

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 other system components were out of service. The inspectors reviewed selected valve positions, electrical power availability, and the general condition of major system components. The documents reviewed are listed in the Attachment. The walkdowns included the following systems:

- Common, "B" and "D" emergency diesel generator (EDG) auxiliaries;
- Unit 1, reactor core isolation cooling (RCIC);
- Unit 1, residual heat removal (RHR), both divisions; and
- Unit 2, control rod drive (CRD) including scram discharge volume - components near permanent and temporary scaffolding.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors conducted one complete system walkdown of the Unit 1 and Unit 2 emergency service water (ESW) system to assess the alignment and condition of the mechanical components and piping. The inspectors reviewed the system health report, open condition reports, system operating procedures, and process and instrument diagrams. The

inspectors evaluated the system's overall condition including a specific look at pipe corrosion which included discussions of system corrosion with the cognizant engineer.

- Units 1 and 2, ESW system condition, alignment, and review of pipe corrosion status, activity report (AR) 895266 and plant component work order (PCWO) 855802.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q - 9 Samples)

.1 Fire Protection - Tours

a. Inspection Scope

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

- Common, standby gas treatment filter area and control room emergency outside air system (CREOAS), EP-013-187;
- Common, "E" emergency diesel generator building, FP-013-236;
- Common, ESW pump house loop "A" and "B" pump rooms, FP-013-200, 201;
- Common, emergency diesel generator bay "B", FP-013-192;
- Common, emergency diesel generator bay "D", FP-013-198;
- Unit 1, east and west battery rooms, FP-013-168 and FP-013-169;
- Unit 1, reactor building Division 1, 4.16 kV switchgear room at elevation 749'-1";
- Unit 1, reactor building containment access area fire area R-1A and fire area 1-4A-S; and
- Unit 2, east and west battery rooms, FP-013-170 and FP-013-171.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07B - 2 Samples)

1. Biennial Inspection

a. Inspection Scope

The inspectors reviewed PPL's programs for maintenance, testing, and monitoring of risk significant heat exchangers (HXs) to determine whether potential HX deficiencies could mask degraded performance, and to assess the capability of the HXs to perform their design functions. The inspectors assessed whether Susquehanna's HX programs conformed to

PPL's commitments to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment." In addition, the inspectors evaluated whether any potential common cause heat sink performance problems could affect multiple HXs in mitigating systems or result in an initiating event. Based on risk significance and prior inspection history, the following HXs were selected:

- Unit 1, high pressure coolant injection (HPCI) turbine lubricating oil cooler (1E213); and
- Unit 2, reactor building closed cooling water (RBCCW) heat exchanger (2E201A).

The inspectors assessed the external condition of the HXs in the field: reviewed the most recent eddy current, inspection and cleaning work results; and reviewed the applicable system health reports to confirm that results were acceptable and that design basis assumptions for flow rate, plugged tube percentage, and heat transfer capability had been met.

Inspectors reviewed the chemical treatment programs for the spray pond (ESW ultimate heat sink) and the cooling tower basin (service water heat sink) to verify that potential bio-fouling mechanisms were being addressed, including on-going treatment and monitoring as specified in the chemistry manual. The review included discussions with chemistry personnel and the ESW and service water system engineer.

The inspectors reviewed a sample of condition reports (CRs) related to the selected HXs and service water system, to verify that PPL was appropriately identifying, characterizing, and correcting problems related to these systems and components. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

.1 Resident Inspector Quarterly Review (71111.11Q - 1 Sample)

a. Inspection Scope

On August 16, 2007, the inspectors observed licensed operator simulator training during routine operator requalification training. The inspectors compared their observations to Technical Specifications, 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. The documents reviewed are listed in the Attachment. The following training was observed:

- Scenario numbered OP002-07-06-09C - simulation of a series of electrical and mechanical problems including implementation of the plant Emergency Plan.

b. Findings

No findings of significance were identified.

.2 Review of the Annual Operator License Exams (71111.11B - 1 Sample)

a. Inspection Scope

The following inspection activities were performed using NUREG 1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors;" Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," Appendix A, "Checklist for Evaluating Facility Testing Material;" and Appendix B, "Suggested Interview Topics."

A review was conducted of recent operating history documentation found in inspection reports, licensee event reports, PPL's corrective action program, and the most recent NRC plant issues matrix (PIM). The inspectors reviewed specific events from PPL's corrective action program to verify that they had been appropriately addressed. The senior resident inspector was consulted for insights regarding licensed operator performance.

The inspectors reviewed three reactor operator and three senior reactor operator comprehensive biennial written examinations administered in 2006. In addition, the inspectors reviewed three sets of dynamic simulator exam scenarios (weeks 1, 5 and 6) and two sets of job performance measures (weeks 5 and 6) administered during this current examination cycle to ensure the quality of these examinations met or exceeded the criteria established in the Examination Standards and 10 CFR 55.59.

On September 28, 2007, the results of the annual operating tests for 2007 and the written examination for 2006 were reviewed to determine whether pass fail rates were consistent with the guidance of NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors." Examination results were also evaluated against criteria in NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors verified the following:

- Crew failure rate on the dynamic simulator test was less than 20 percent. (Failure rate was 6.7 percent);
- Individual failure rate on the dynamic simulator test was less than or equal to 20 percent. (Failure rate was 4 percent);
- Individual failure rate on the walk-through test job performance measures (JPMs) was less than or equal to 20 percent. (Failure rate was 1.3 percent); and
- Individual failure rate on the comprehensive biennial written examination was less than or equal to 20 percent. (Note: This exam was administered in the 2006 examination cycle and failure rate was zero percent).

More than 75 percent of the individuals passed all portions of the exam (94.7 percent of the individuals passed all portions of the exam).

Dynamic simulator exam and JPM administration was observed during the weeks of September 17 and September 24, 2007. These observations included facility evaluations of crew and individual performance during the dynamic simulator examinations and individual performance of five JPMs.

The remediation plans for a crew/individual's failure were reviewed to assess the effectiveness of the remedial training.

The inspectors interviewed instructors, training and operations management personnel, and licensed operators for feedback regarding the implementation of the licensed operator requalification program to ensure the requalification program was meeting their needs and responsive to their noted deficiencies and recommended changes. In addition, plant modifications were reviewed to ensure that they were adequately addressed in the Requalification Training Program.

For the site-specific simulator, the inspectors observed simulator performance during the conduct of the examinations. Simulator performance and fidelity were reviewed for conformance to the reference plant control room. Inspectors interviewed simulator staff regarding current status of hardware and software modifications and open deficiencies. A sample of completed American National Standards Institute (ANSI) ANSI/ANS-3.5-1985 simulator tests were reviewed to verify adherence with the standard and to confirm model fidelity. These sampled tests included normal operations, steady state, malfunction, transient, and deficiency resolution validation. The documents reviewed are listed in the Attachment.

A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 4 Samples)

a. Inspection Scope

The inspectors evaluated PPL's work practices and 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 those 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 determine whether the actions were reasonable and appropriate. In addition, the inspectors performed field walkdowns and interviewed PPL staff to determine whether the identified actions were appropriate and to verify that known performance problems were included and evaluated in accordance with the PPL Maintenance Rule program and the corrective action process. The documents reviewed are listed in the Attachment. The following issues were reviewed:

- Common, "B" emergency diesel generator kilovars (KVAR) fluctuations;
- Units 1 and 2, emergency diesel generator inaccessible underground power cable monitoring per PPL response to Generic Letter 2007-001, "Inaccessible or Underground Power, Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients";

- Unit 1, control cell friction with four inoperable control rods following testing on September 9, 2007; and
- Unit 2, rod control system issues within the reactor manual control system.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 6 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 Nuclear Utilities Management and Resources Council (NUMARC) 93-01, "Assessment of Risk Resulting from Performance of Maintenance Activities," Section 11. 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 verify that the compensatory measures identified by the risk assessments were appropriately performed. The selected maintenance activities included:

- Common, "A" engineering safeguard system (ESS) transformer OX201;
- Common, orange risk following declaring "E" EDG inoperable, CR 896129;
- Common, yellow risk during station blackout (SBO) diesel part replacement activities, PCWO 876900 and release work order (RLWO) 893763;
- Common, "E" EDG/OB565 bus agastat relay replacement, removed control power from "E" EDG and undervoltage protection, CR and RLWO 894084;
- Unit 1 RCIC out-of-service following failure of pump discharge check valve, CR 890913; and
- Unit 1 steam jet air ejector (SJAE) work 10701A(B).

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 Samples)

a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights to assess the adequacy of the evaluations, the use and control of compensatory measures,

and compliance with the Technical Specifications. In addition, the inspectors reviewed selected operability determinations to verify that the determinations were performed in accordance with NDAP-QA-0703, "Operability Assessments." The inspectors used the Technical Specifications, Technical Requirements Manual, Updated Final Safety Analysis Report (UFSAR), and associated Design Basis Documents as references during these reviews. The issues reviewed included:

- Common, standby gas treatment start, CR 889683;
- Common, refuel floor rad monitor setpoint calculation errors, CR 895253;
- Unit 1, flange bolting on reactor vessel hood spray line;
- Unit 1, RHR scaffolding deficiencies - clearances and tie off points, CR 892152;
- Unit 2, local power range monitor (LPRM) module reset and bypass of average power range monitor (APRM) #1; and

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 7 Samples)

a. Inspection Scope

The inspectors observed portions of 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 Technical Specification requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. The documents reviewed are listed in the Attachment. The post-maintenance testing activities reviewed included:

- Common, "A" EDG aligned testing following engine overhaul, TP-024-145;
- Common, standby gas treatment system (SGTS)/CREOAS in service data collection;
- Unit 1, RCIC flow verification SO-150-002;
- Unit 1, RHR 1A motor breaker replacement, RTPM 783149;
- Unit 1, control rod timing test to verify proper insert and withdraw times, TP-055-010, Revision 4;
- Unit 1, restoration of the "A" main steam supply to the steam jet air ejector to compensate for a degraded "B" main steam supply pressure, OP-172-001; and
- Unit 2, 2A residual heat removal service water (RHRSW) re-baseline of reference values for comprehensive flow test.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 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 Technical Specification or Technical Requirements Manual operability and surveillance requirements to evaluate whether the systems were capable of performing their intended safety functions. The documents reviewed are listed in the Attachment. The sampled surveillance tests included:

- Common, "D" EDG 24 hour endurance run/load rejects;
- Common, control structure ventilation system operability testing, SO-030-00 and SE-030-002;
- Unit 1, quarterly RHR system flow verification, Division 1, SO-149-A02;
- Unit 1, In-Service Test (IST) and inspection of "B" core spray check valve, 152F036B; and
- Unit 2, drywell leakage calculation SO-200-006, Revision 45.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 Sample)

a. Inspection Scope

The inspectors reviewed a temporary modification (TMOD) to determine whether the temporary change adversely affected system or support system availability, or adversely affected a function important to plant safety. The inspectors reviewed the associated system design bases, including the UFSAR, Technical Specifications, 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 that appropriate revisions 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 determine whether the actual impact of the temporary changes had been adequately demonstrated by the test. The documents reviewed are listed in the Attachment. The following temporary modification was included in the review:

- Unit 1, turbine control and stop valve closure input to the reactor protection system (RPS) - TMOD #EC 866700.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 Sample)

Simulator-based Training Event

a. Inspection Scope

The inspectors conducted this inspection to assess:

- Training quality and conduct;
- Emergency plan procedure implementation;
- Facility and equipment readiness;
- Personnel performance in drills and exercises;
- Organizational and management changes; and
- Communications equipment readiness.

On August 7, 2007, the inspectors observed a full scale drill. The primary focus of this inspection was to verify SSES's critique of classification, notification, and protective action recommendation (PAR) development activities. Selected portions of the drill were observed in the control room simulator and later in the technical support center (TSC). The inspectors observed licensed operator and emergency response organization (ERO) personnel adherence to the Emergency Plan implementing procedures. The ERO personnel responses to simulated degraded plant conditions were inspected to identify weaknesses and deficiencies in classification and notification. The inspectors also observed the transition of responsibility for the ERO from the shift manager in the simulated control room to the TSC. The inspectors observed SSES's critique of the drill to evaluate SSES's identification of weaknesses and deficiencies. The inspectors compared SSES's identified issues against the inspectors' observations to determine whether SSES adequately identified problems and entered them into the corrective action program (CAP). This inspection activity represented one sample. The 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)

a. Inspection Scope

The inspectors reviewed PPL's performance indicator (PI) data for the period of July 2006 through July 2007 to determine whether the PI data was accurate and complete. The inspectors examined selected samples of PI data, PI data summary reports, and other plant records. The inspectors compared the PI data against the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline." The documents reviewed are listed in the Attachment. The following performance indicators were included in this review.

Initiating Event Performance Indicators

- Units 1 & 2 Unplanned Scrams per 7000 Critical Hours (IE01)
- Units 1 & 2 Unplanned Power Changes per 7000 Critical Hours (IE03)

Barrier Integrity Performance Indicators

- Units 1 & 2 RCS Activity (BI01)
- Units 1 & 2 RCS Identified Leak Rate (BI02)

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 - 1 Annual 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 follow-up, the inspectors performed screening of all items entered into PPL's corrective action program. This was accomplished by reviewing the description of each new action request/condition report and attending daily management meetings. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed a sample of CRs related to the selected HXs and service water system, to verify that PPL was appropriately identifying, characterizing, and correcting problems related to these systems and components. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.3 Annual Sample Review

a. Inspection Scope

The inspectors reviewed PPL's evaluation and corrective actions associated with several truck operated cell (TOC) switch failures in 4 kV breakers. The inspectors reviewed condition reports and the associated actions against the requirements of PPL's corrective action program to ensure that the full extent of the issues were identified, appropriate evaluations were performed, and appropriate corrective actions were specified and prioritized. The inspectors interviewed relevant station personnel and reviewed applicable station procedures to ensure that the issues were appropriately addressed.

b. Findings and Observations

No findings of significance were identified. The failure mechanism of the TOC switches was adequately understood and corrective actions were appropriate. PPL adequately tracked the TOC switch issues and incorporated the issues into the overall system health. However, the inspectors noted that while the issues were adequately identified and tracked, PPL did not accurately prioritize the details of the long term corrective action plan. While the specific over-travel issues were fixed, procedures updated, and the old style TOC switches that failed were replaced with new style switches; there was a delay in completing long term corrective actions due to the lower priority the tasks were assigned. Inspectors observed that corrective actions were adequate to meet regulatory requirements (10 CFR 50 Appendix B), however, the lower priority of some long term corrective actions was unexpected given the number of examples and the known extent of the problem.

4OA3 Event Followup (71153 - 3 Samples)

.1 (Closed) Licensee Event Report (LER) 05000387/2006-006-00, Automatic Scram Due to Main Generator Lockout

On November 25, 2006, the Unit 1 reactor automatically scrammed from 100 percent power as a result of a turbine trip which was in response to a main generator lockout. The main generator automatic voltage regulation circuitry did not respond correctly to changes to the offsite grid which resulted in a loss of generator field and subsequent unit shutdown. All control rods inserted and all safety systems responded as designed in response to the reactor scram. This LER, including the determination of cause, was reviewed by inspectors. Corrective actions were evaluated against the contributing causes including the PPL identified cause of a lack of sufficient, in-house understanding of the automatic voltage regulator dynamic response and design. The auto-voltage regulator issues were previously inspected under an annual PI&R sample as documented in inspection report 05000387/2007003, Section 4OA2.3. This LER was reviewed by the inspectors and no findings of significance were identified. The inspectors found that the issue is properly captured in the PPL corrective action process with actions to address the apparent causes. The corrective actions for Unit 1 are scheduled for implementation in October, 2007. The documents reviewed are listed in the Attachment. This LER is closed.

.2 Misposition Control Rod During Sequence Exchange

On July 15, 2007, operators moved a control rod in the wrong direction. The human performance failure was the operator pressing the insert pushbutton instead of the withdraw pushbutton. Residents responded and performed followup inspection of this reactivity control related event. Inspectors observed that for this event the verifier did not prevent the mistake from occurring. Inspectors also performed followup review because PPL staff did not characterize this issue as a mispositioned rod, and the operators did not enter the offnormal procedure for a mispositioned rod. As a result, the inspectors provided PPL management with the observation that the offnormal procedure could be enhanced to define this type of issue as a mispositioned rod. Inspectors reviewed the operator response and the corrective action processing of this issue. This issue was entered into the Corrective Action process (Condition Report #888358). This condition report and associated level 2 cause determination has the specific action to change the procedure definition of a mispositioned rod so as to follow the BWR Owner's group definition. These issues were not considered to be more than minor because there was no effect on mitigating system reliability and the reactor remained within all analyzed core power distribution assumptions.

The documents reviewed are listed in the Attachment. No findings of significance were identified.

.3 Start of Both Trains of Standby Gas Treatment System (SGTS)

On Friday, July 20, 2007, both fans of the SGTS started automatically and several alarms were received. Shortly after starting, both fans of SGTS stopped automatically and additional alarms were received. Recognizing that two trains of inoperable SGTS would put Susquehanna in a dual-unit, four-hour Technical Specification (TS) required shutdown, the resident inspectors responded to the site to perform followup inspection, including an assessment of PPL's operability and reportability determination.

PPL's initial investigation revealed that this event was caused by work related to the ongoing CREOAS intake modification. Workers were applying a plastic template (for determining bolt hole measurements) over the outside air inlet opening when the template was sucked into and against the intake opening. The workers then immediately removed the template. The field workers reported that they did not realize this outside air inlet was a common inlet for normal control structure ventilation, CREOAS, and SGTS.

Inspectors observed PPL's response to the event including a work stoppage for all work on the associated ductwork modification, the declaration of the SGTS and CREOAS equipment as protected equipment, and the installation of appropriate protective equipment postings. Inspectors reviewed the engineering evaluation which concluded that the plant systems responded as designed for this condition.

Inspectors observed that problems in work control (work planning) and coordination of effected work groups appeared to be a cause of this event. Inspectors found through inspection that the availability of SGTS and CREOAS were not affected. The documents reviewed are listed in the Attachment. No findings of significance were identified.

4OA6 Meetings, Including Exit

On October 12, 2007, the resident inspectors presented the inspection results to Mr. C. Gannon, Vice President - Nuclear Operations, and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

- R. Bogar, EDG System Engineer
- B. Boesch, Supervisor Operations Instruction
- D. Brophy, Acting Site Supervisor
- P. Capotosto, Supervising Engineer, Electrical Engineering
- R. Centenaro, Senior Engineer, Nuclear Design
- C. Dodge, Supervisor Computer Engineering (Simulator)
- R. Fry, Operations Shift Manager
- C. Hess, Simulator Instructor
- M. Jacopetti, Simulator Instructor
- J. Jeanguenot, ESW System Engineer
- A. Klopp, Component Engineer
- E. Miller, Senior Engineer, Regulatory Affairs
- F. Negvesky, Senior Engineer, Electrical Breakers Program Engineering
- M. Peal, Training Manager
- B. Stitt, Supervisor Operations Training
- D. Szatkowski, 13.8KV System Engineer
- F. Tarselli, Simulator Instructor
- T. Walters, Service Water System Engineer
- J. Wolfer, Senior Chemist

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

None

Closed

05000387/2006-006-00 LER Automatic Scram Due to Main Generator Lockout
(Section 4OA3.1)

LIST OF DOCUMENTS REVIEWED

(Not Referenced in the Report)

Section 1R04: Equipment Alignment

- CR 892528, NRC residents raise questions about physical clearance violation on two scaffolds in Unit 1 RHR pump rooms
- CL-024-0013, "Diesel Generator "B" Electrical," Revision 15
- CL-024-0014, "Diesel Generator "B" Mechanical," Revision 14
- CL-024-0017, "Diesel Generator "D" Electrical," Revision 16

CL-024-0018, "Diesel Generator "D" Mechanical," Revision 12
E-106193, "Plant Design Drawing Diesel Generator Building," Sheets 1-3

Section 1R07: Heat Sink Performance

Procedures

H-1004, Heat exchanger/Condenser Inspection and Condition Assessment, Revision 6
H-1019, Inspection Program for Pipe Corrosion and Degradation, Revision 2
M-1453, Heat Exchanger Tube Plugging, Revision 6

Design Basis Documents and Generic Letter 89-13 Program Documents

Design Basis Document (DBD) - 004, High Pressure Coolant Injection, Revision 4
Design Basis Document (DBD) - 004.003, Resolution to Open Item DBD004.003, Heat Rejection from HPCI, Revision 0
Design Basis Document (DBD) - 004.003, Resolution to Open Item DBD004.004, Heat Rejection from HPCI Turbine, Revision 0
Generic Letter 89-13, "Service Water Problems Affecting Safety Related Equipment," July 18, 1989
PPL responses to Generic Letter (GL) 89-13, dated Feb. 23, 1990, through Feb. 12, 1997

System Health Reports

Service Water System, 1st Quarter 2007
Heat Exchangers Program/Components Health Report, 1st Quarter 2007

Work Orders

Work Order (WO) 796271, RBCCW HX Clean, Inspect and Repair, June 25, 2007
Work Authorization (WA) P02837, HPCI Lube Oil Cooler Clean and Inspect, September 1990

Miscellaneous

Eddy Current Testing Final Report, SSES 2E201A, July 2003
Instruction Manual M-1, Instructions for Installing and Operating Whitlock Heat Exchangers

Condition Reports

702856, 704354, 712005, 721179, 804700, 804720, 896041, 895948

Section 1R11: Licensed Operator Regualification Program

Simulator Admin

NTP-QA-71.1, "Simulator Testing," Revision 4

Simulator Tests (reviewed the most recent test performance):

Steady State Test 5501, "30% Power"
Steady State Test 5503, "100% Power and One Hour Stability"
Transient Test 5301, "Manual Scram"

Transient Test 5304, "Simultaneous Trip of All Recirculation Pumps"
Transient Test 5309, "Maximum Size Unisolable Main Steam Line Rupture"
Normal Operations Test 5103, "Reactor Trip Followed by Recovery to Rated Power"
Malfunction Test 5220, "Main Condenser Tube Leak at 1% Severity"
Malfunction Test 5233, "Loss of Protective System Channel (Failure to Scram - High Power main steam isolation valves (MSIVs) Open anticipated transient without scram (ATWS))"
Malfunction Test 5242, "Inadvertent (Spurious) HPCI Initiation"

Simulator Condition Reports

CSPR 756917, "Revise SRM Setpoints Per EC 644906"
CSPR 768455, "Simulator Does Not Fully Model EDG Trip on Low ESW Cooling Flow"
CSPR 837435, "Incorrect Value for Div 2 RPV WR Level LI-14203B"

Section 1R12: Maintenance Effectiveness

IOM 749-1, emergency standby KSV diesel generator, Revision 26
SO-024-001B, monthly diesel generator "B" operability test, Revision 1

Section 1R15: Operability Evaluations

AR 889060, July 18, 2007, PCWO 722198 had the incorrect torque value in work package
AR 889683, July 20, 2007, control room received unexpected SGTS "A" and "B" duct inlet pressure alarms

Section 1R19: Post Maintenance Testing

TP-030-032, data collection with CREOAS and SGTS in service, Revision 1
PCAF 2007-4425, EC 793950 data collection with CREOAS and SGTS in service
50.59 SD 00379, provide motive steam to Unit 1, SJAEs from main steam system and auxiliary steam system
OP-172-001, SJAE and offgas system, Revision 34
TP-055-010, CRD stroke timing in Mode 1 or 2, Revision 4
EWR 904247 and AR 904104
RHRSW system journal entry 265
SO-216-A04, RHRSW system comprehensive flow verification Division 1, Revision 0
NDAP-QA-0423, station pump and valve testing program, Revision 16
RACT 783149, G0002-09, Support OPS to Install 4 KV BKRS into their cubicle and install and remove seismic restraint brackets.
PCWO 893776, When 1A RHR 1P202A Pump Breaker 1A201-02 was racked in, the breaker safety floor tripper hung up.
PCWO 642088, 1A20102, Perform Receipt Inspection of 4 KV Breaker I.A.W. MT-GE-048
MT-GE-048, Revision 5, Cutler-Hammer type DHP-VR 4.16 KV Circuit Breaker and Switchgear inspection and maintenance.
50.59 SD 00379, "Provide Motive Steam to Unit 1 SJAE's from Main Steam and Auxiliary Steam System."
FSAR Sections 1.2.2.8.17, "Auxiliary Steam System" and 10.3.2, "Main Steam System."

Section 1R22: Surveillance Testing

SO-149-A02, Revision 13, Quarterly RHR System Flow Verification Div 1, completed 8/8/07

FSAR Section 6.3
P&ID M-151
OP-054-001, Emergency Service Water System
SE-024-D01, "D" EDG surveillance Z2152-04, AR 856982
SO-200-066, shiftly surveillance operating log, Revision 45

Section 1EP6: Drill Evaluation

2007 GREEN Team HP Drill Scenario - 8/7/2007
AR 894069, During the 8/7/07 E Plan Drill, the Scenario did not correctly assess the need to use unfiltered inputs in MIDAS dose projection calculations. As a result, the Scenario expected PAR was not correct.
AR 894086, Operations Coordinator did not update the unaffected unit white board in the TSC.
AR 893911, EAL RU1-2 is difficult to interpret due to the non-standard unit of measure used as an action level.

Section 4OA1: Performance Indicators

NDAP-QA-0737, reactor oversight process (ROP) performance indicators
SC-176-102, Unit 1 primary coolant specific activity - dose equivalent I-131
SC-276-102, Unit 2 primary coolant specific activity - dose equivalent I-131
SO-200-006, shiftly surveillance operating log, Attachments L and M (drywell leakage worksheet/instructions)

Section 4OA2: Identification and Resolution of Problems

Condition Reports

388219, 811196, 560587, 864760, 617245, and 882278

Condition Report Actions

409941, 409963, 834604, and 877638

Engineering Work Requests

420763, 811738, and 886344

Miscellaneous

IOM 211, "Switchgear", Revision 27
LER 50-387/2002-003-00
OFR 622048, Revision 0
Station Engineering Trending Report Second Quarter, 2007
System Health Report, 4.16KV System, Units 1 and 2, First Period 2007

Procedures

MT-GE-048, "Cutler Hammer Type DHP-VR 4.16KV Circuit Breaker and Switchgear Inspection and Maintenance", Revision 5
NDAP-00-0710, "Station Trending Program", Revision 0

NDAP-QA-0702, "Action Request and Condition Report Process", Revision 20
 OP-000-001, "Breakers", Revision 19
 OP-104-001, "4 kV Electrical System", Revision 7

Work Orders

388221, 438214, 560590, 593960, 617252, 811203, 878897, 878929, 878935, 881004, and 881009

40A3: Event Follow-up

NDAP-QA-0737, reactor oversight process ROP performance indicators
 SC-176-102, Unit 1 primary coolant specific activity - dose equivalent I-131
 SC-276-102, Unit 2 primary coolant specific activity - dose equivalent I-131
 SO-200-006, shiftly surveillance operating log attachments L & M (drywell leakage worksheet/instructions)
 AR 888358, July 15, 2007, operator moved rod one notch in wrong direction

LIST OF ACRONYMS

ANSI	American National Standards Institute
APRM	Average Power Range Monitor
AR	Activity Report
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
CRD	Control Rod Drive
CREOAS	Control Room Emergency Outside Air System
DBD	Design Basis Document
EDG	Emergency Diesel Generator
ERO	Emergency Response Organization
ESS	Engineering Safeguard System
ESW	Emergency Service Water
GL	Generic Letter
HPCI	High Pressure Coolant Injection
HX	Heat Exchanger
IP	Inspection Procedure
IST	In-Service Test
JPM	Job Performance Measure
kV	Kilovolts
KVAR	Kilovars
LER	Licensee Event Report
LPRM	Local Power Range Monitor
MSIV	Main Steam Isolation Valve
NDAP	Nuclear Department Administrative Procedure
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Utilities Management and Resources Council
OA	Other Activities
PAR	Protective Action Recommendation
PCWO	Plant Component Work Order

PI	Performance Indicator
PI&R	Problem Identification and Resolution
PIM	Plant issues Matrix
PPL	PPL Susquehanna, LLC
RBCCW	Reactor Building Closed Cooling Water
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RG	Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RLWO	Release Work Order
RPS	Reactor Protection System
RTP	Rated Thermal Power
SBO	Station Blackout
SDP	Significant Determination Process
SGTS	Standby Gas Treatment System
SJAE	Steam Jet Air Ejector
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
TMOD	Temporary Modification
TOC	Truck Operated Cell
TS	Technical Specifications
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
WA	Work Authorization
WO	Work Order