June 14, 2001

Mr. Robert G. Byram
Senior Vice President and
Chief Nuclear Officer
PPL Susquehanna, LLC
Susquehanna Steam Electric Station
2 North Ninth Street
Allentown, Pennsylvania 18101

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION - NRC INSPECTION REPORT 05000387/2001-005, 05000388/2001-005

Dear Mr. Byram:

On May 12, 2001, the NRC completed an inspection at your Susquehanna Steam Electric Station Units 1 and 2. The enclosed report documents the inspection findings which were discussed on May 25, 2001, with Mr. B. Shriver, Vice President - Nuclear Site Operations, 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, the NRC identified one violation that was evaluated under the significance determination process, and was determined to be of very low safety significance (Green). However, because of the very low safety significance and because this issue was entered into your corrective action program, the NRC is treating this issue as a Non-cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the non-cited violation, you should provide a response with the basis of your denial, within 30 days of the date of this letter to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Region I, the Director of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001, and the NRC Resident Inspector at the Susquehanna Steam Electric Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (The Public Electronic Reading Room).

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

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

Docket Nos. 05000387, 05000388
License Nos. NPF-14, NPF-22

Enclosure: Inspection Report 05000387/2001-005, 05000388/2001-005

Attachments: (1) Supplemental Information

cc w/encl:
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REGION I

Docket Nos.:	05000387, 05000388
License Nos.:	NPF-14, NPF-22
Report No.:	05000387/2001-005 05000388/2001-005
Licensee:	PPL Susquehanna, LLC
Facility:	Susquehanna Steam Electric Station
Location:	Post Office Box 35 Berwick, PA 18603
Dates:	April 1, 2001 to May 12, 2001
Inspectors:	S. Hansell, Senior Resident Inspector J. Richmond, Resident Inspector A. Blamey, Resident Inspector J. Yerokun, Senior Reactor Engineer
Approved by:	M. Shanbaky, Chief Projects Branch 4 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000387/2001-005, 5000388/2001-005, on 04/01-05/12/2001; PPL Susquehanna, LLC; Susquehanna Steam Electric Station; Units 1&2. Heat Sink Performance.

The inspection was conducted by resident inspectors and a regional senior reactor engineer inspector. The inspection identified one Green finding that was considered a non-cited violation. The significance of most findings are indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process web site at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Non-cited violation of Technical Specifications 5.5.6, "In-service Testing Program," for failure to leak test eight reactor building closed cooling water system and eight turbine building closed cooling water system valves. This finding was of very low safety significance because the leakage through the valves was subsequently determined to be less than the maximum flow that can be diverted from the emergency service water system to non-safety related loads during an accident. (Section 1RO7)

TABLE OF CONTENTS

Report Details

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 began the period at full power. On May 4, reactor power was reduced to approximately 20% and the main turbine generator was taken out of service to repair the main transformer lightning arresters. The main turbine generator was returned to service on May 6, and a reactor power increase to 100% was commenced. The power increase was stopped at approximately 75% to evaluate smoke from the “C” reactor feedwater pump. PPL determined that the smoke was from the pump's insulation which had become oil soaked due to a small oil leak. PPL replaced the insulation and corrected the oil leaks (CR 333197). The unit was returned to full power on May 10, and operated at or near full power for the remainder of the report period.

Unit 2 began the period shutdown in a maintenance and refueling outage. Operations restarted the unit on April 21, achieved full power on April 28, and operated at or near full power for the remainder of the report period.

1. REACTOR SAFETY
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

1R04 Equipment Alignments (71111.04)

.1 Partial System Walkdowns

a. Inspection Scope

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

- Emergency Service Water Supply to the Unit 2 Core Spray Pump Room Coolers
- "A", "C", and "D" emergency diesel generators (EDGs), while the "B" EDG was aligned for surveillance testing
- Unit 2 Reactor Core Isolation Cooling system when the High Pressure Coolant Injection system was aligned for surveillance testing during the Unit 2 Startup
- Unit 2 Standby Liquid Control System, following system modifications and return to service

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors reviewed the Fire Protection Review Report to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the areas examined during this inspection. The inspectors walked down these 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. The areas included:

- Unit 2 High Pressure Coolant Injection Pump Room, Fire Zone 2-1C
- Unit 2 Reactor Core Isolation Cooling Pump Room, Fire Zone 2-1D
- "B" Emergency Diesel Generator room during the monthly surveillance test
- Unit 2 primary containment (drywell), following completion of outage work
- Unit 2 Transversing In-core Probe System penetration room
- Unit 2 main steam line tunnel (reactor building wing slab area)
- Unit 2 Reactor Feedwater Pump Turbine area
- Unit 2 High Pressure Coolant Injection Pump Room, following overhaul

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspector reviewed PPL's processes and programs for ensuring that safety-related heat exchangers and the spray pond, the heat sink, are maintained capable of performing as designed. The inspector selected the following heat exchangers for this review:

- Emergency diesel generator (EDG) jacket water coolers 0E507A - E; EDG lube oil coolers 0E506A - D; and EDG inter-coolers 0E505A1&2 - E1&2
- Unit 1 Residual heat removal heat exchangers 1E205A&B
- Unit 1 High Pressure Coolant Injection pump room unit coolers 1E229A&B
- Unit 2 Residual heat removal heat pump room unit coolers 2E230A - D

The inspector reviewed PPL's methods (inspection and cleaning of the heat exchangers every refueling cycle, flow balance testing of the Emergency Service Water system every three years, and spray pond chemistry control) used to ensure heat removal capabilities for the selected components and compared them to the commitments made in response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment." The heat exchanger inspection, cleaning, and maintenance methods and frequencies were reviewed with PPL's system and test engineers to determine if they were consistent with predicted performance trends, based on prior performance data, and with industry practice. The heat exchanger design calculations, performance evaluations, and tube plugging calculations were reviewed with design and

heat exchanger performance engineers to determine if they were consistent with the required heat exchanger design capabilities. The SSES spray pond water chemical treatment program was reviewed and discussed with PPL to verify that potential bio-fouling mechanisms had been identified, treatments were conducted as scheduled, and results were monitored for effectiveness.

The inspector reviewed heat exchanger inspection and cleaning records to verify that the results were properly evaluated to ensure adequate heat transfer capabilities. The inspector reviewed heat exchanger design basis values and assumptions, tube plugging limit calculations, and vendor information, to verify that they were incorporated into the heat exchanger inspection and maintenance procedures. The inspector reviewed the results of the 1998 Emergency Service Water flow balance test to determine if the testing was consistent with industry standards, if test instrument accuracies were properly considered, if the test acceptance criteria was consistent with design basis values and if the test conditions properly reflected the differences between testing and design conditions.

In addition, the inspector reviewed a sample of condition reports (CRs) related to equipment and programs utilized to ensure heat sink performance to verify that identified problems were appropriately resolved. The inspector also reviewed other documents listed in Attachment 1 of this report. Finally, the inspector conducted a walkdown consisting of the spray pond and the emergency service water system including the selected heat exchangers to assess material condition.

b. Findings

The inspector identified that certain valves, which prevented leakage from the emergency service water (ESW) system into the reactor building closed cooling water (RBCCW) system and the turbine building closed cooling water (TBCCW) system, had not been leakage rate tested. The inspector determined that such valves are required to be leakage rate tested at least once every 2 years, in accordance with ASME Section XI In-service Testing requirements, which are required by Technical Specifications (TS) 5.5.6, "In-service Testing." The identified valves were:

- Eight RBCCW system 10-inch butterfly valves (HV-11024A1, A2, B1, B2, and HV-21024A1, A2, B1, and B2)
- Eight TBCCW system 4-inch butterfly valves (HV-10943A2 & B2, HV-11143A & B and HV-20943A2 & B2 and HV-21143A & B)

PPL had no documented test data or evaluation to justify an assumption that the potential leakage through the RBCCW and TBCCW valves would not result in an excessive loss of inventory from the ESW system during an accident. Although PPL had included these valves in their IST program, PPL had not performed leakage rate testing on these valves. PPL subsequently determined that the valves had not been appropriately tested for their safety function. PPL entered the lack of leakage testing in their corrective action program, completed an operability assessment, and conducted a preliminary measurement of leakage through the identified valves. PPL estimated that the total leakage through all of the valves would be less than 100 gpm, which was less than the value assumed to be lost from ESW to the non-safety related loads, which

interface with ESW, during a design basis accident (i.e., 2290 gpm were assumed to be lost to RBCCW, TBCCW, and spent fuel pool).

The failure to leak test these valves was more than a minor issue because it had a credible impact on safety in that excessive leakage through any valve, or the combined leakage though all valves in a train, could render a train of ESW incapable of performing its accident mitigation function. The failure to leak test these valves affected the Mitigating Systems cornerstone because excessive leakage through any valve, or the combined leakage through all of the valves in a train, could affect the operability of a train of ESW, a mitigating system. The failure to leak test the valves was considered to have very low safety significance (Green), using the Significance Determination Process (e.g., Reactor Inspection Findings for At-Power Situations, Phase 1) because there was no actual loss of any train or function. The failure to test these valves was a violation of TS 5.5.6, "In-service Testing." The IST program (ASME XI IWV-2000 and IWV-3421) required that these valves be leakage rate tested at least once every two years to ensure that the ESW system could perform its safety-related function without excessive loss of inventory to the non-safety related loads. This violation of TS 5.5.6 is being treated as a Non-cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy, issued May 1, 2000 (65FR25368). PPL entered this violation into their corrective action program as condition report 330188, “Apparent Lack of Testing for ESW Isolation Valves.” **(NCV 05000387, 388/2001005-01)**

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors evaluated the follow-up actions for selected system, structure, or component (SSC) issues and reviewed the performance of these SSCs, to assess the effectiveness of PPL's maintenance activities. 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(a)(1) and (a)(2), "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 that the actions were reasonable and appropriate. The following issues and documents were reviewed:

Equipment Issues

- Unit 1 Start-up Bus 10 Transformer Tap Changer Malfunction which resulted in the 13Kv startup bus voltage not being maintained within the normal range (CR 332609)
- Unit 1 "A" Standby Liquid Control (SLC) System Explosive Valve (squib) Continuity Indicator Monitor Failure which resulted in a loss of the control room Squib Ready light for the "A" SLC pump squib valve (CR 332619)

Procedures and Documents

- NDAP-QA-0413, "SSES Maintenance Rule Program"
- EC-RISK-0528, "Risk Significant SSCs for the Maintenance Rule"
- EC-RISK-1054, "SSC Availability Performance Criteria for the Maintenance Rule"
- EC-RISK-1060, "Acceptable Number of Failures for Risk Significant SSCs"
- Condition Reports 332609 and 332619

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work (71111.13)

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to assess 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 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 verify 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 verify whether risk management action threshold levels were correctly identified. The inspectors assessed those activities to evaluate whether appropriate implementation of risk management actions were performed, in accordance with the following PPL procedures:

- NDAP-QA-1902, "Maintenance Rule Risk Assessment and Management Program"
- NDAP-QA-0340, "Protected Equipment Program"
- PSP-22, "Susquehanna Sentinel Program"
- SSES Team Manual

In addition, the inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the issue. The inspectors performed control room and field walkdowns to verify whether the compensatory measures identified by the risk assessments were appropriately performed. The selected maintenance activities included:

- Unit 1 Start-up Bus 10 Transformer Tap Changer Malfunction. The inspectors reviewed PPL’s implementation of the following compensatory measures: control room operator monitoring of Unit 1 and 2 startup bus voltages to observe operation of tap changers, outside building operator checking that local transformer breakers were closed and tap changers were in auto operation, and increase startup transformer rounds. (CR 332609)

- Units 1 and 2 Emergency Service Water System Division-1 inoperable to support Remote Shutdown Panel testing (SE-200-007). Since PPL did not specify compensatory actions, the inspector reviewed PPL's Safety Function Determination. (CR 331801 & 335298)

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions and Events (71111.14)

.1 Unit 1 "B" Residual Heat Removal Pump Unexpected Start

a. Inspection Scope

On April 13, 2001, the Unit 1 "B" residual heat removal (RHR) pump unexpectedly started during the performance of SE-249-002, "Unit 2 RHR System Division-2 Logic System Functional Test." PPL entered the unexpected start of the RHR pump, during performance on SE-249-002, into their corrective action program as CR 327501.

The inspectors reviewed operating logs, test procedure SE-249-002, and logic diagrams, and interviewed plant operators and the test engineer for this unplanned event to independently determine what occurred and evaluate the initiating cause. The inspectors assessed personnel performance to determine whether the operator response was appropriate and in accordance with procedures and training.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

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

- Unit 1 "A" Standby Liquid Control System Explosive Valve (squib) Continuity Indicator Monitor (CR 332619)
- Unit 1 and 2 Core Spray and Residual Heat Removal pilot solenoid valves HV 52FO37A/B and 51FO50A/B containment isolation function (CR 327064)
- Unit 2 Jet Pump Inlet-mixer Wedge Damage and Set Screw Gap Justification for Continued Operation (CR 326415 and Safety Evaluation NL-01-012)

- "B" & "D" EDG Jacket Water and Lube Oil Heat Exchanger Fouling (CR 330806)

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed portions of selected modifications to risk significant systems, structures, or components (SSCs). The inspectors assessed whether the design and licensing basis and the performance capability of the SSC functions had been degraded by the modification. In addition, the inspectors compared the post-modification configuration to the pre-modification configuration to evaluate whether PPL had appropriately considered potential impacts of the physical changes on interfacing SSCs.

The inspectors reviewed the modification design and the installation work activities to assess whether the modifications could impair off-normal or emergency operating procedures, SSC risk significant functions, or impact operator response to off-normal plant conditions. The inspectors observed selected in-progress modification work activities and reviewed the installation work plans to verify whether the activities were properly performed, in accordance with the approved design change package. In addition, the inspectors reviewed PPL's risk management for the modification work activities to verify whether appropriate risk management actions had been identified and adequately performed.

The inspectors reviewed the post-modification tests to determine whether the tests were adequate to verify design assumptions and demonstrate operability of the affected SSCs. The inspectors observed selected portions of the testing and reviewed the test data to evaluate whether the test acceptance criteria were satisfied, and whether any unintended system interactions had been identified. The following modifications and documents were reviewed:

Modifications and Design Change Packages

- DCP-318267, Unit 2 SLC Pump Discharge Pressure Relief Valve PSV-248-F029A/B Setpoint Change
- RIE-91-0174, Unit 2 Feedwater Low Load Valve LV-20641 Pneumatic Positioner Equivalency Evaluation and Replacement

Procedures and Documents

- Maintenance Rule Basis for System 45 (LV-20641 identified as risk significant)
- MT-GM-005, "Safety/Relief Valve Setting"
- MT-EO-034, "Operation of Calder Safety/Relief Valve Testing System"
- Safety Evaluation 318280, "Design Pressure Rating of Standby Liquid Control System"
- Work Orders 231449, 231447, and 282433

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed portions of post-maintenance testing activities and reviewed selected test data. The inspectors assessed the adequacy of the test methodology, based on the scope of maintenance work performed, and evaluated whether the acceptance criteria demonstrated that the tested components satisfied the design and licensing bases requirements. The specific issues reviewed included:

- Unit 2 "B" RHR Pump Motor Load Sequence Relay Replacement, following test failure of the LOCA-LOOP timing relay (CR327802, WO 327803, WO 327952, SE-224-207)
- Unit 2 HPCI Pump Rated Flow Demonstration, following HPCI Turbine Overhaul (TP-252-012)
- Unit 2 Excess Flow Check Valve XV-243-F003A Functional Test, following valve replacement (SI-299-229, WO 258183, and CRs 91524, 328971, 329036)
- Unit 2 Reactor Coolant Pressure Boundary (ASME Class-1 boundary) Leakage Test, following Reactor Vessel Reassembly and Completion of Refueling Outage Maintenance, SE-200-002

b. Findings

No findings of significance were identified.

1R20 Refueling and Maintenance Outage Activities (71111.20)

.1 Control of Outage Activities

a. Inspection Scope

The inspectors observed selected maintenance, testing, and equipment restoration activities to verify whether component configuration management, test control, and post maintenance checks were performed in accordance with NRC requirements and PPL procedures. The inspectors reviewed unexpected plant conditions, emergent work, and system configuration control during testing and maintenance activities to evaluate whether the activities were performed in accordance with NRC requirements and PPL procedures.

The inspectors reviewed the ASME In-service inspection data and the surveillance test data, from the reactor coolant pressure boundary operational leakage test, to evaluate whether the test acceptance criteria were satisfied. In addition, the inspectors evaluated whether the activities were performed in accordance with NRC requirements and PPL approved procedures.

The inspectors observed operation of the supplemental decay heat removal system (SDHR, i.e., a temporary heat removal system) to verify that the system was operable during the time periods when the residual heat removal system was unavailable for shutdown cooling operation. The inspectors monitored the availability of reactor coolant emergency makeup water sources from the core spray system to verify whether PPL maintained a defense-in-depth commensurate with the outage risk management goals, and in accordance with the Technical Specification requirements. The following activities and documents were reviewed or observed:

Specific Activities

- Removal of the temporary SDHR system, following RHR system restoration
- Start-up PORC Meetings
- Engineering review meeting of potential startup restraints
- ASME In-service inspections during reactor coolant pressure boundary leakage test
- Division-2 RHR Logic System Functional Test
- Division-1 LOCA-LOOP Testing
- Foreign material exclusion control around suppression pool area
- In-vessel Visual Inspection of core spray headers and jet pump assemblies
- Post-maintenance walkdown of primary containment (drywell) prior to final closeout
- Reactor cavity to spent fuel pool gate installation and gate seal testing
- Reactor cavity drain down

Procedures and Documents

- TP-235-011, "Refuel Outage Decay Heat Removal and Tie-in of SDHR Temporary Cooling Equipment"
- OP-011-001, "SDHR System"
- ON-249-001, "Loss of RHR Shutdown Cooling Mode"
- OI-TA-009, "Determination of Heat Removal Capacities and Vessel Heatup Rates"
- NDAP-QA-0507, "Conduct of Refuel Floor Operations"
- OP-235-001, "Fuel Pool Cooling and Cleanup System Operation"
- OP-037-003, "Refueling Water Transfer Systems"

b. Findings

No findings of significance were identified.

.2 Refueling Activities

a. Inspection Scope

The inspectors observed portions of fuel handing and refueling operations to assess the impact on the fuel barrier during handling and from related activities that could impact the integrity of the fuel barrier during subsequent reactor operation. In addition, the inspectors reviewed related reactor vessel maintenance, inspection, and testing activities to verify whether the activities were performed in accordance with the Technical Specification requirements and PPL approved procedures. The following activities and documents were reviewed or observed:

Refueling Activities

- Fuel handling between spent fuel pool and reactor core
- Foreign material exclusion control around fuel pools and reactor cavity
- Refuel floor secondary containment integrity during fuel handling operations
- Foreign material review for objects dropped into reactor cavity not retrieved
- Refuel floor high energy particle control

Procedures and Documents

- NDAP-QA-0507, "Conduct of Refuel Floor Operations"
- Safety Evaluation NL-01-013, "Disposition of Missing Nylon Tie Wrap and Duct Tape"
- OP-0RF-005, "Refueling Operations"
- OP-181-001, "Refueling Platform Operation"
- ON-081-001, "Fuel Handling Accident"
- ON-081-002, "Refueling Platform Operation Anomaly"

b. Findings

No findings of significance were identified.

.3 Reactor Plant Startup Activities

a. Inspection Scope

The inspectors observed selected portions of the reactor startup from the control room to verify that Technical Specifications, license conditions, and administrative requirements were satisfied. The inspectors verified that reactor criticality occurred with the control rod positions within the allowed band predicted by the core design. The following activities and documents were reviewed or observed:

Plant Startup Activities

- Primary and secondary containment integrity established as required
- Startup preparations for mode change
- Control rod withdrawals and reactor criticality
- Average power range monitor adjustments at low power
- Reactor coolant system heat up
- Reactor core physics local criticality test
- HPCI and RCIC surveillance testing at low reactor pressure
- Thermal limits verification prior to exceeding 25% reactor power
- Core Flow Calibration (determination of recirculation loop drive flows and jet pump flows)
- HPCI surveillance test at 920 psig reactor pressure
- Reactivity manipulations with the reactor recirculation system
- Turbine generator excitation and synchronization to the grid

Procedures and Documents

- GO-200-006, "Cold Shutdown, De-fueled, and Refueling Operations"
- GO-200-010, "ECCS and Decay Heat Removal in Modes 4 and 5"
- GO-200-002, "Plant Startup, Heat up, and Power Operations"
- RE-0TP-120, "Local Criticality Testing"
- RE-2TP-022, "Core Flow Calibration"

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed selected surveillance tests, test data results, and the applicable Technical Specification requirements. In addition, the inspectors observed the performance of portions of surveillance tests to verify whether the systems and components were capable of performing their design basis functions. The observed or reviewed surveillance tests included:

- "B" EDG Monthly Run, SO-024-001
- Unit 2 Division-1 EDG LOCA LOOP Test, SE-224-107
- Unit 2 RHR System Division-2 Logic System Functional Test, SE-249-002

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed 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, 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 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 test. The following temporary modifications and documents were included in the review:

Temporary Modifications

- TP-235-011, "Refuel Outage Decay Heat Removal and Tie-in of SDHR Temporary Cooling Equipment"

Procedures and Documents

- OP-011-001, "SDHR (Supplemental Decay Heat Removal) System"
- Safety Evaluation NL-95-001, "Tie-in and Operation of SDHR System)
- PPL Memorandum PLI-72367, "Spent Fuel Pool Cooling"
- PPL Memorandum PLI-79268, "Classification of Effluent Pathway: SDHR Open Loop Cooling"
- NDAP-QA-1218, "Temporary Modifications"

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings

.1 Exit Meeting Summary

On May 25, 2001, the resident inspectors presented the inspection results to Mr. B. Shriver, Vice President - Nuclear Site Operations, and other members of your staff who acknowledged the findings.

The inspectors asked PPL whether any items discussed during the exit meeting should be considered proprietary. No proprietary information was identified.

Attachment 1 **SUPPLEMENTAL INFORMATION**

LIST OF DOCUMENTS REVIEWED

Procedures
NDAP-QA-0505, Heat Exchanger Program, Revision 3
H-1001, Heat Exchanger/Condenser Tube Cleaning at SSES, Revision 4
H-1004, Heat Exchanger/Condenser Condition Monitoring, Revision 4
M-1548, SSES Heat Exchanger Performance Monitoring Program, Revision 0
OP-054-001, Emergency Service Water System, Revision 19
OP-111-001, Service Water System, Revision 16
Chemistry Manual Chapter 5, Emergency Water Supplies

Test Results
TP-054-076, ESW Loop A&B Flow Balance, November 1998

Condition Reports
CR 330188, Apparent lack of testing of ESW isolation valves
CR 330806, EDG jacket water coolers as-found operability assessments
CR 330429, ESW/RHRSW Heat Exchangers with a NIMS design bases less than 97 degrees F
CR 310129, DG B jacket water outlet piping flange leaks with ESW in service
CR 308565, Debris in ESW side of EDG 0E505B1 Inter-coolers
CR 306291, Excessive Debris in EDG 0E507B Jacket Water Cooler
CR 290959, ESW Biocide Injection System OP5101A&B
CR 280729, D Diesel generator tripped on high jacket water temperature
CR 278035, Biocide has not been injected into the RHRSW system
CR 262271, ESW leakage occurred at the D/G during operation of the A ESW pump
CR 260247, Heavy Debris, EDG 0E507D Jacket Water Cooler
CR 246834, Review of possible “Water “Hammer” trends
CR 236766, “A” loop of ESW failed to meet acceptance criteria of SO-054-003A.
CR 235781, Address cumulative affects of piping minimum wall thickness occurrences.
CR 231658, PCPR written, HPCI room cooler end bell leaks when ESW is in service
CR 229116, 2E231B; B&D core spray room cooler has an ESW leak

Heat Exchanger Inspection Reports
ISI-HTX-282, 1E229A, HPCI Pump Room Cooler, March 1, 2000
ISI-HTX-244, 0E506A, Lube Oil Cooler (Diesel), October 27, 1999
ISI-HTX-244, OE506A, EDG Lube Oil Cooler, February 2, 1998
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ISI-HTX-342, 0E507D, EDG Jacket Water Cooler, June 8, 2000

Drawings
E106214, Piping and Instrument Drawing, Service Water, Unit 1, Sh. 2, rev. 7
E106215, Piping and Instrument Drawing, Service Water, Unit 1, Sh. 1, rev. 37
E106216, Piping and Instrument Drawing, Emergency Service Water, Common, Sh 1, rev. 41
E106216, Piping and Instrument Drawing, Emergency Service Water, Unit 1, Sh. 2, rev. 41
E106216, Piping and Instrument Drawing, Emergency Service Water, Common, Sh 3, rev. 12

E106217, Piping and Instrument Drawing, RHR Service Water, Unit 1, Sh. 1, rev. 42
E106217, Piping and Instrument Drawing, RHR Service Water, Common, Sh. 2, rev. 11
D107297, Schematic Diagram, RBCCW/ESW Transfer SOVs, Unit 1, Sh. 1, rev. 13

Engineering Calculation/Analysis
EC-HXPM-1001, Pilot Heat Exchanger Selection Evaluation Study, January 6, 1999
* EC-HXPM-1016, 1E205A RHR Heat Exchanger Thermal Performance Test Data Evaluation
* EC-HXPM-1025, 0E507E, EDG Jacket Water HX Thermal Performance Test Data Evaluation
* EC-HXPM-1024, 0E507E, EDG Jacket Water HX Thermal Performance Test Data Evaluation
EC-054-0537, ESW Heat Load and Flowrate Requirements for Uprated Power
EC-049-1001, RHR Heat Exchanger Performance at 7850 & 8000 gpm RHRSW flowrate, rev2
EC-034-0543, ECCS and RCIC Pump Room Cooler Performance for Power Uprate, rev 0
EC-CHEM-1018, Justification for Assurance of Adequate Heat Removal Capabilities, Revision 2
Heat Exchanger Data Sheet - Jacket Water Cooler, EDG "A" & "C", February 18, 1975
Heat Exchanger data Sheet - Lube Oil Cooler, EDG "A - D", February 18, 1975
Heat Exchanger data Sheet - Intercooler EDG "A - D", May 17, 1978
Heat Exchanger data Sheet - Jacket Water Cooler, EDG "E", September, 11, 1984
Heat Exchanger data Sheet - Lube Oil Cooler, EDG "E", September 11, 1984
Heat Exchanger data Sheet - Fuel Oil Cooler, EDG "E", September 11, 1984
Heat Exchanger data Sheet - RHR HX, Shutdown Cooling Mode
Heat Exchanger data Sheet - RHR HX, Containment Spray Cooling Mode

* Denotes Proprietary Document

System Health Reports
Quarterly System Health Report, Unit 1 RHR System, 4th Quarter 2000
Quarterly System Health Report, Unit 2 RHR System, 4th Quarter 2000
Quarterly System Health Report, Diesel Generators, 4th Quarter 2000
Quarterly System Health Report, Emergency Service Water, 4th Quarter 2000
Quarterly System Health Report, Unit 1 RHR Service Water System, 4th Quarter 2000

Other Documents
Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment
EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines
Safety Evaluation NL-99-082, Temporary Modification (1-99-319) of EDG Intercooler TCVs
Safety Evaluation NL-96-047, Extension of ESW Flow Balance Test Interval from 2 to 3 years

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000387, 388/2001005-01	NCV	Failure to include and conduct appropriate valve testing in the IST Program as require by Technical Specification 5.5.6 (1R07)

Opened and Closed

NONE

Closed

NONE

LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
FSAR	[SSES] Final Safety Analysis Report
gpm	Gallons per minute
HPCI	High Pressure Coolant Injection
IST	In-service Testing
Kv	Killivolts
LOCA	Loss of Coolant Accident
LOOP	Loss of Off-site Power
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
PPL	PPL Susquehanna, LLC
RBCCW	Reactor Building Closed Cooling Water
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDHR	Supplemental Decay Heat Removal
SDP	Significance Determination Process
SLC	Standby Liquid Control
SSC	Structure, System, or Component
SSES	Susquehanna Steam Electric Station
TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specification