September 5, 2000

EA-00-192

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

SUBJECT: NRC'S SUSQUEHANNA STEAM ELECTRIC STATION INTEGRATED REPORT 05000387/2000-005, 05000388/2000-005

Dear Mr.Byram:

On August 12, 2000, the NRC completed an inspection at the Susquehanna Steam Electric Station Nuclear Power Plant. The enclosed report presents the results of that inspection. The results of this inspection were discussed on August 18, 2000, with Mr. B. Shriver and other members of your staff.

This inspection was an examination of 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. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC identified one violation that was evaluated under the significance determination process as having very low safety significance (Green). In addition, the NRC has determined that two Severity Level IV violations occurred. These violations were entered into your corrective action program, and are discussed in the summary of findings and in the body of the attached inspection report. These issues were determined to involve violations of NRC requirements, but because of their very low safety significance, the violations are not cited. If you contest these non-cited violations, 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, DC 20555-0001, with copies to the Regional Administrator, Region I, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, 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 Publicly 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 610-337-5233.

Sincerely,

/RA/

Curtis J. Cowgill, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000387/2000-005, 05000388/2000-005

cc w/encl:
B. L. Shriver, Vice President - Nuclear Site Operations
G. T. Jones, Vice President - Nuclear Engineering and Support
R. Ceravolo, General Manager - SSES
R. M. Peal, Manager, Nuclear Training
G. D. Miller, General Manager - Nuclear Assurance
R. R. Wehry, Nuclear Licensing - SSES
M. M. Golden, Manager - Nuclear Security
P. Nederostek, Nuclear Services Manager, General Electric
J. McCarthy, Manager, Nuclear Plant Services
A. M. Male, Manager, Quality Assurance
H. D. Woodeshick, Special Assistant to the President
G. DallaPalu, PP&L Nuclear Records
R. W. Osborne, Vice President, Supply & Engineering
Allegheny Electric Cooperative, Inc.
Commonwealth of Pennsylvania

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REGION I

Docket Nos.:	05000387, 05000388
License Nos.:	NPF-14, NPF-22
Report No.:	2000-005
Licensee:	PPL Susquehanna, LLC
Facility:	Susquehanna Steam Electric Station
Location:	Post Office Box 35 Berwick, PA 18603
Dates:	July 1, 2000 to August 12, 2000
Inspectors:	S. Hansell, Senior Resident Inspector J. Richmond, Resident Inspector A. Blamey, Resident Inspector S. Chaudhary, Senior Reactor Engineer J. Noggle, Senior Health Physicist
Approved by:	Curtis Cowgill, Chief Projects Branch 4 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000387/2000-005, 5000388/2000-005, on 07/01-08/12/2000; PPL Susquehanna, LLC; Susquehanna Steam Electric Station; Units 1&2. Maintenance Rule Implementation, Surveillance Testing, Human Performance.

The report covered a six-week period of resident inspection and announced inspections by a regional senior health physicist and a senior reactor engineer. The inspection identified three non-cited violations, two had no color and one was associated with a green issue. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process (Attachment 1).

Cornerstone: Barrier Integrity

- Green. On February 2, 2000, PPL identified that Technical Specification required leakage rate surveillance testing had not been performed on the Unit 1 or Unit 2 Hydrogen/Oxygen Analyzer System or the Post Accident Sampling System. This issue was of very low safety significance because the likelihood of an accident leading to core damage was not affected, the probability of early primary containment failure was negligible, and the as-found leakage results for these systems in both units was determined to be acceptable. The inspectors identified a Non-Cited Violation for failure to perform leakage rate testing as required by Technical Specification 5.5.12, "Primary Containment Leakage Rate Testing Program 10 CFR 50 Appendix J." (section 1R22.2)

Cross Cutting: Human Performance

- No Color. Performance deficiencies in communications and coordination between engineering groups had allowed the failure to perform Technical Specification required leakage tests on the Hydrogen/Oxygen Analyzer System to remain unidentified for an extended period of time. Specifically, the group that was knowledgeable of the leakage rate testing program requirements did not understand the Hydrogen/Oxygen Analyzer System primary containment isolation valve design configuration and the groups that were knowledgeable of the primary containment isolation valve configuration design did not understand leakage rate testing program requirements. PPL determined that they had multiple opportunities to identify this issue from August 1996 until February 2000. (section 4OA4.1)

Miscellaneous

- No Color. PPL failed to demonstrate that the performance of the Turbine Building Closed Cooling Water (TBCCW) system and the secondary containment isolation system had been effectively controlled through the performance of appropriate preventive maintenance and did not monitor against established goals. PPL did not identify that the TBCCW heat exchangers had exceeded their unavailability performance criteria and the secondary containment isolation system had exceeded its reliability performance criteria and, as a result, goal setting and

monitoring were not performed as required by 10 CFR 50.65, "The Maintenance Rule." The actual safety significance of this issue was very low because (1) TBCCW remained functional at the system level, and (2) a failure of the secondary containment isolation system does not influence the likelihood of an accident leading to core damage and does not affect the probability of an early primary containment failure. The inspectors identified a Non-Cited Violation for failure to meet the criteria in 10 CFR 50.65, paragraph (a)(2). (section 1R12)

- No Color. PPL did not adequately control the use of worker overtime in accordance with Technical Specification Section 5.2.2.e, "Administrative Controls - Unit Staff." Specifically, from February 11, 1999 to May 5, 1999, several plant personnel worked in excess of 72 hours in a seven day period and PPL did not pre-approve the overtime deviations. The safety significance of this violation was very low because there were no issues that were linked to personnel fatigue. The inspectors identified a Non-Cited Violation for failure to control worker overtime, as required by Technical Specifications. (section 4OA5.4)

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Report Details

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 began the period at full power and operated at or near full power for this report period.

Unit 2 began the period at full power and operated at or near full power for this report period with one exception. On July 22, power was reduced to approximately 55% to identify and correct a condenser tube leak. On July 24, the unit was returned to full power.

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

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

The inspectors performed partial system walkdowns to verify system and component alignment and note any discrepancies that would impact system operability on the Unit 1 and Unit 2 Average Power Range Monitoring Systems.

b. Issues and Findings

There were no findings identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors performed walkdowns of various plant 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 toured included the Unit 1 and 2 upper and lower relay rooms, Unit 1 and Unit 2 cable spreading rooms, Emergency System Service Water Pumphouse, and the Unit 1 reactor core isolation cooing room.

b. Observations and Findings

There were no findings identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On July 10, 2000, the inspectors reviewed licensed operator requalification written examinations for reactor operators and senior reactor operators. The review of the weekly exams was performed to assess the ability of the examinations to identify operators who possess a satisfactory level of safety significant knowledge and evaluate the adequacy of the written exam questions. In addition, the remedial training program

was reviewed for the operators that did not pass their initial exam. The content of the remediation training and reexamination results were reviewed to ensure that the operators' knowledge level was satisfactory prior to their return to operating duties in the plant. The following procedures were reviewed:

STCP-QA-328, "Operator Requalification Written Exams"
NUREG-1021, "Operator Licensing Examiner Standard"
LOR Cycle 00-02, Test No. 00-02-S1 and 00-02-R1

b. Issues and Findings

There were no findings identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed the performance of the selected structure, system, or component (SSC) to verify that problem identification and resolution of Maintenance Rule (MR) related issues had been appropriately evaluated and dispositioned in accordance with the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance," and PPL procedure NDAP-QA-0413, "SSES Maintenance Rule Program."

The inspectors reviewed PPL's follow-up actions for SSC issues, including Unresolved Item 05000387,388/2000004-04, and PPL's follow-up actions for a similar issue identified during a regional initiative inspection discussed in this inspection report (section 4OA5) to assess the effectiveness of PPL's maintenance activities. The specific issues included:

- Emergency Diesel Generator System Reverse Power Trips
- Control Rod Drive System Pump Motor Replacement
- Secondary Containment Isolation System Damper Failures
- Turbine Building Closed Cooling Water System (URI 05000387,388/2000004-04)

b. Issues and Findings

Turbine Building Closed Cooling Water (TBCCW) System

In NRC Inspection Report 05000387,388/2000004, the inspectors identified that PPL had not appropriately monitored the performance of the TBCCW system. Specifically, PPL had monitored only the pumps for unavailability and had not monitored the heat exchangers or the system valves for unavailability. PPL had classified the TBCCW system as a MR category (a)(2) system.

Based on the SSES probabilistic risk assessment (PRA) model, PPL determined that the TBCCW system was risk significant. This assessment was documented in EC-RISK-0528, "Risk Significant Systems, Structures, and Components for the Maintenance Rule and Generic Letter 89-10 Components." A failure of the system can initiate a plant shutdown and impact mitigating systems.

PPL determined the availability performance criteria for the TBCCW system in calculation EC-RISK-1054, "SSC Availability Performance Criteria of the Maintenance Rule." The calculation established an unavailability criterion of 5% over a 36 month period for the TBCCW pumps, heat exchangers, and valves based on TBCCW's risk reduction worth for primary containment failure and initiating event frequency. The inspectors considered the unavailability criteria to be reasonable and technically justifiable.

On July 14, PPL determined that the Unit 1 TBCCW heat exchangers had been unavailable for greater than 9% of the previous 36 months and the Unit 2 TBCCW heat exchangers had been unavailable for greater than 6% of the previous 36 months. Subsequently, PPL determined that the Unit 1 TBCCW system did not meet its established availability performance criteria in March 1998, and the Unit 2 TBCCW system did not meet its established availability performance criteria in January 2000. PPL documented this issue in condition report 271146 and changed the TBCCW systems on both Unit 1 and Unit 2 to a MR category (a)(1).

Secondary Containment Isolation System

During a regional initiative inspection of PPL's maintenance program, the inspectors identified that PPL had not appropriately monitored the performance of the secondary containment isolation system in order to determine the effectiveness of preventive maintenance on the system (see section 4OA5 of this report). Specifically, PPL had not evaluated all of the system related component failures and, as of July 10, had determined that only three Maintenance Rule Functional Failures (MRFFs) had occurred during the previous 36 months. PPL had classified the secondary containment isolation system as a MR category (a)(2) system.

PPL had determined that the reliability performance criterion for the secondary containment isolation system was three MRFFs over a 36 month period. The system is safety related and used in the emergency operating procedures to mitigate a design basis accident. A system failure could result in a loss of secondary containment differential pressure or an inability to isolate the secondary containment on a valid isolation signal. The inspectors considered the reliability performance criteria to be reasonable and technically justifiable.

As of July 10, 2000, PPL had not evaluated the failure of dampers HD-27524A on September 9, 1999, HD-27586A on April 5, 2000, or HD-27524B on May 12, 2000, to determine whether they constituted a MRFF. Subsequently, PPL identified that all three additional damper failures were MRFFs and determined that the secondary containment isolation system did not meet its established reliability performance criteria in September 1999. On July 13, PPL documented this issue in condition report 271070 and changed the system to a MR category (a)(1). The inspectors noted that five of the six MRFFs had occurred within the last 12 months.

Failure to Demonstrate Effective Preventive Maintenance nor Set Goals and Monitor

10 CFR 50.65, paragraph (a)(1), requires, in part, that the performance or condition of SSCs shall be monitored against established goals to provide reasonable assurance that such SSCs are capable of performing their intended functions.

10 CFR 50.65, paragraph (a)(2), requires, in part, that monitoring as specified in paragraph (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance such that the SSC remains capable of performing its intended function.

Contrary to the above, PPL failed to demonstrate that the performance of the TBCCW system and the secondary containment isolation system had been effectively controlled through the performance of appropriate preventive maintenance and did not to monitor against established goals. Specifically, the TBCCW heat exchangers had been unavailable for greater than 5% of the previous 36 months and the secondary containment system had experienced five MRFFs during the previous 12 months. PPL did not identify that the TBCCW heat exchangers had exceeded their unavailability performance criteria and the secondary containment isolation system had exceeded its reliability performance criteria and, as a result, goal setting and monitoring were not performed as required by 10 CFR 50.65. The inspectors determined that the condition of the TBCCW heat exchangers and the secondary containment isolation systems had not been effectively controlled through the performance of appropriate preventive maintenance and, as a result, goal setting and monitoring was required.

The actual safety significance of this issue was very low because (1) the TBCCW system with only one heat exchanger available and in-service remained functional at the system level and (2) a failure of the secondary containment isolation system does not influence the likelihood of an accident leading to core damage and does not affect the probability of an early primary containment failure. This issue was a violation of 10 CFR 50.65, paragraph (a)(2). This Severity Level IV violation (EA-00-192) is being treated as a Non-Cited Violation, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). This violation is documented in PPL's corrective action program as condition reports 266822, 271146 and 2710070.
(NCV 05000387,388/2000005-01)

1R13 Maintenance Risk Assessment and Emergent Work (71111.13)

a. Inspection Scope

The inspectors observed selected portions of planned and emergent maintenance work activities to assess PPL's risk management. The inspectors attended planning meetings and discussed the risk management aspect of the activities with maintenance personnel, operators, system engineers, and work coordinators for the following issues:

- Unit 1 Instrument Air to Service Air Crosstie Pressure Control Valve PM (WO 255770, Permit 1-00-1002)
- Unit 2 "A" Control Rod Drive System Pump, (2P132A) motor replacement (WO 220063)

b. Issues and Findings

There were no findings 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. The inspectors verified that the operability determinations were performed as required by procedure NDAP-QA-0703, "Operability Assessments." The inspectors used the Technical Specifications, Technical Requirements Manual, Final Safety Analysis Report, and associated Design Basis Documents as references. The specific issues reviewed included:

- Unit 1 and 2 Reactor Pressure Switch Setpoints Found Out-of-Tolerance (CRs 273783, 273920, 273999, 274212, 275070, 275071, and 275271)
- Unit 2 Drywell Nitrogen Make-up Required Daily, due to Loss of Nitrogen Pressure (CR 274036)
- Unit 1 Reactor Core Isolation Cooling System Trip and Throttle Valve Leakage (CR 275315)

b. Issues and Findings

There were no findings identified.

1R16 Operator Work-Arounds (71111.16)

a. Inspection Scope

The inspectors reviewed condition report 275315, "Leakage of the Unit 1 Reactor Core Isolation Cooling System Trip and Throttle Valve," to evaluate potential impacts on the operator's ability to implement abnormal or emergency operating procedures.

b. Issues and Findings

There were no findings identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed post-maintenance testing activities and reviewed the PPL test data. The inspectors verified the test success criteria addressed in the procedures was in compliance with Technical Specification requirements. The specific issues reviewed included:

- "D" Emergency Diesel Generator, following Reverse Power Trips and Governor Instability (SE-024-D01, PCWO 271921)
- Unit 1 "A" Reactor Building Chiller 4 kV Breaker 1A201-03, following Identification of Loose Pole Pieces (RTPM 219769, MT-GE-005, CRs 274727 & 274775)

b. Issues and Findings

There were no findings identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Test Observations

a. Inspection Scope

The inspectors observed the performance of selected portions of surveillance tests and reviewed portions of the test results to verify that the tested systems and components were capable of performing their safety functions, including:

- Unit 1 "A" Emergency 4kV Bus Degraded Grid Voltage Test (SE-104-103)
- Unit 2 “B” Core Spray Flow Verification Test (SO-251-B02)
- Unit 1 and 2 Reactor Pressure Switch Quarterly Calibrations for LPCI and Core Spray Low Pressure Permissive Interlocks (SI-180-301 & SI-280-301)

b. Issues and Findings

There were no findings identified.

.2 Missed Hydrogen/Oxygen Analyzer System Surveillance Testing

a. Inspection Scope

The inspectors reviewed Licensee Event Report (LER) 50-387/00-001-00, “Inadequate System Design Documentation Leads to Missed 10 CFR 50 Appendix J Testing,” to assess event significance, and determine if the cause of the event and corrective actions were appropriate. The inspectors reviewed selected information and compared it with Technical Specification criteria, NRC requirements, NRC Safety Evaluation Report, and SSES Final Safety Analysis Report (FSAR).

b. Issues and Findings

On February 2, 2000, PPL identified that leakage rate surveillance testing had not been performed on the Unit 1 or Unit 2 Hydrogen/Oxygen Analyzer (H2O2) systems or the Post Accident Sampling System (PASS) as required by Technical Specifications (TS). Specifically, TS 5.5.12, "Primary Containment Leakage Rate Testing Program 10 CFR 50 Appendix J," required periodic and post-maintenance leakage rate testing for piping systems designed as closed system boundaries (e.g., a system boundary used as a primary containment barrier in lieu of a redundant primary containment penetration isolation valve). PPL identified that required non-outage post maintenance leakage tests had never been performed on these systems since initial plant startup in mid 1980.

The inspectors determined that PPL had multiple opportunities to identify this issue in the past. The human performance issue is discussed in detail in section 4OA4.1 of this report. This finding effects the Barrier Integrity Cornerstone since it involves an issue relating to the primary containment. The primary containment, primary containment isolation valves, and extensions of primary containment are risk significant structures, systems, and components. This issue is considered to be more than minor because Technical Specification surveillance requirements for leakage testing of a primary containment barrier had not been performed for an extended period of time.

This issue was considered to have very low safety significance (GREEN) using the Significance Determination Process (SDP), because the likelihood of an accident leading to core damage was not affected, the probability of early primary containment failure was negligible, and the as-found leakage results for these systems in both units was determined to be acceptable. The failure to satisfy TS 5.5.12 leakage rate surveillance requirements was a violation of NRC requirements. This violation is being treated as a Non-Cited Violation, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). This violation is documented in PPL's corrective action program as condition reports 231662, 232477, and 233653. **(NCV 05000387,388/2000005-02)**

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the temporary modification (Bypass) that was used to secure the Emergency Service Water damper TD08206D4 in the open position. The Technical Requirements Manual section 3.7.6 Emergency System Service Water Pumphouse Ventilation, section 3.7.6 Basis, and the Fire Protection Review Report were reviewed to assess the adequacy of the temporary modification.

b. Issues and Findings

There were no findings identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

Radiological work permits, associated As-Low-As-Reasonably-Achievable (ALARA) instructions and radiological surveys were reviewed and were utilized in assessing the performance of the following radiologically significant work that was observed during the week of July 17-21, 2000.

- Spent fuel pool clean out project involving the underwater cut-up and packaging of control rod blades and local power range monitors
- Leak repair of the "B" reactor water cleanup demineralizer inlet flange
- Spent resin liner packaging for shipment No. 00-86

Independent surveys of accessible plant areas were conducted to verify surveys and plant posting conditions. Also, all high radiation and very high radiation area keys were inventoried in the Unit 2 health physics checkpoint and in the control room. Various locked high radiation and very high radiation area door locks were checked by the inspector. Interviews were conducted at all levels of the health physics department with respect to radiation work control.

b. Issues and Findings

There were no findings identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

Collective exposure performance was evaluated through a review of draft sections of the Unit 1 Spring 2000 refueling outage ALARA Report. The five highest exposure jobs were reviewed with respect to estimates. These included: scaffolding work in the drywell, insulation work in the drywell, health physics support in the drywell, temporary shielding, and non-drywell health physics support for the outage. Plant piping dose rate measurements over time were reviewed to determine trends with respect to the control of a source buildup. This included survey data from past refueling outages at both Units 1 and 2 and the results of the chemical decontamination of the Unit 1 recirculation piping system during the Spring 2000 refueling outage. Future PPL plans to control piping dose rates were discussed with the corporate health physics staff. Exposure estimating methods were reviewed with the corporate health physics and onsite ALARA staffs. Incorporation of radiation work permit preparation into the 13 week online maintenance program was discussed with applicable health physics department staff.

b. Issues and Findings

There were no findings identified.

4. OTHER ACTIVITIES

4OA3 Event Follow-up (71153)

.1 Radioactive Sandblast Filter Media Identified at Scrap Yard

a. Inspection Scope

The inspectors observed PPL's response to a potential radiological event. On July 27, a local scrap metal dealer's radiation detector alarmed when filters from a sandblasting machine used by PPL were brought onto the scrap metal dealer's property. PPL's Radiation Protection department responded promptly, determined that the alarm was due to natural occurring radioactivity, and verified that no licensed radioactive material had been released. PPL entered this issue into their corrective action program as condition report 274138.

b. Issues and Findings

There were no findings identified.

.2 (Closed) LER 05000387/2000-001-00 Inadequate System Design Documentation Leads to Missed 10 CFR 50 Appendix J Testing. This issue is discussed in sections 1R22.2 and 4OA4.1 of this inspection report. This LER is Closed.

4OA4 Cross Cutting Issues

.1 Human Performance Problems

a. Inspection Scope

The inspectors reviewed Licensee Event Report 50-387/00-001-00 (discussed in section 1R22.2) to assess human performance and problem identification.

b. Issues and Findings

In February 2000, PPL System Engineering determined that the Unit 1 and Unit 2 Hydrogen/Oxygen Analyzer (H2O2) Systems were primary containment closed system boundaries. As a result of that determination, System Engineering identified that leakage rate testing required by 10 CFR 50 Appendix J, "Primary Containment Leakage Testing," had not been performed on the Unit 1 or Unit 2 H2O2 Systems since initial plant startup (mid 1980). PPL's investigation into this issue determined that prior reviews by PPL (i.e., Systems, Design, and Modifications Engineering groups) did not adequately evaluate leakage rate testing requirements for the H2O2 systems. PPL concluded, in part, that the prior reviews had been incomplete in that not all regulatory requirements had been considered.

Performance deficiencies in communications and coordination between engineering work groups had allowed this issue to remain unidentified for an extended period of time. Specifically, the group that was knowledgeable of the leakage rate testing program requirements did not understand the H2O2 primary containment isolation valve design configuration and the groups that were knowledgeable of the primary containment

isolation valve configuration design did not understand leakage rate testing program requirements. PPL had multiple opportunities to identify this issue in the past. Specifically:

August 1996	General Physics Engineering Study GP-R-66196010, "SSES Containment Leakage Review," described an "apparent discrepancy" with regulatory requirements, in that leakage rate testing required by 10 CFR 50 Appendix J, was not being performed on the H2O2 systems. In September 1996, PPL incorrectly concluded that this issue was not a regulatory compliance item and characterized it as a "concern" regarding a simple "leakage accounting issue."
February 1997	PPL reviewed NRC Information Notice 96-013, "Potential Containment Leak Paths through Hydrogen Analyzers," (IERP 96-028) and evaluated post maintenance and leakage testing requirements on the H2O2 systems. PPL incorrectly concluded that no change in test methodology was required.
October 1997	During review of an H2O2 primary containment isolation valve indication design issue (CR 97-3620), PPL identified that both valves in each penetration were powered from the same power source. At that time, PPL only considered the indication aspects of the design issue.
November 1998	During PPL's evaluation and corrective actions for CR 97-3805, PPL did not consider all of the effects when they identified that the H2O2 primary containment isolation valves had a common power supply and did not satisfy the single failure criteria of the applicable design requirements.
April 1999	Safety Evaluation NL-98118 (FSAR revision for H2O2 primary containment isolation valves) to resolve the design issues identified in CR 97-3805, was disapproved by PORC. PORC recommended additional clarification for the H2O2 primary containment isolation valve design basis.

Section 1R22.2 discusses our evaluation of the missed leakage rate tests.

4OA5 Other

.1 Maintenance Implementation (62700)

a. Inspection Scope

The inspectors reviewed selected condition reports from July 1998 to June 2000, that documented equipment problems and test failures identified during the performance of surveillance tests, to assess repetitive system and equipment problems. The inspectors interviewed maintenance and system engineers responsible for the selected systems, and reviewed System Health Reports, Maintenance Rule Basis Documents, and maintenance rule corrective action Follow-up Plans associated with the selected systems to assess the effectiveness and breadth of corrective actions for selected systems with identified repetitive problems. Additionally, the inspectors reviewed the trend of delays in returning equipment to service, the equipment unavailability, and the methods of risk evaluation by use of the "Sentinel" system. These reviews were performed in conjunction with the reviews of condition reports and other documentation of system performances. The specific documents that were reviewed are listed in Documents Reviewed section of this report. The selected systems were:

- Emergency Diesel Generator System
- Reactor Building Heating, Ventilation, and Air Conditioning System, including the Secondary Containment Isolation Subsystem
- Reactor Protection System, including the Alternate Rod Insertion Subsystem and the Scram Discharge Volume Subsystem
- Primary Containment, including Feedwater and Main Steam Isolation Valves
- Reactor Instrumentation (non-nuclear instruments)
- Containment Atmosphere Control System, including Hydrogen-Oxygen Analyzers
- High Pressure Coolant Injection
- Service Water System
- 125 VDC System
- Turbine Building Closed Cooling Water System

b. Issues and Findings

Secondary Containment Isolation Damper Failures

Condition Report 200173, dated September 1999, documented a surveillance test failure which was caused when secondary containment isolation damper HD-27524A failed to stroke. The inspectors identified that system engineering had not included the condition report in the evaluation of system performance or effectiveness of preventive maintenance, as required by NDAP-QA-0413, "SSES Maintenance Rule Program." When this failure was evaluated, PPL concluded that the reliability of the secondary containment isolation dampers had decreased below an acceptable level. PPL documented this issue in Condition Report 271070, and changed the system to a maintenance rule category (a)(1).

This finding is discussed in detail, in Section 1R12 of this report, as a second example of a failure to implement effective preventive maintenance, as required by 10 CFR 50.65, the Maintenance Rule.

Monitoring of Reliability Performance Criteria

The inspectors observed that system engineers used several different informal methods to gather the performance data which was used to evaluate the effectiveness of system preventive maintenance. The inspectors identified several condition reports that documented problems identified during surveillance testing which had not been included in the reliability performance monitoring of various systems. PPL documented in Condition Reports 266822, 269976, and 270933 that the lack of a common or formal method to identify and collect system reliability data had contributed to PPL's failure to recognize a decrease in the performance of the secondary containment isolation dampers.

Monitoring of Availability Performance Criteria

During the substitution of one emergency diesel generator (EDG) for a second EDG, there is a period of time, during the breaker and switching evolutions, when neither EDG can perform the function of providing electrical power to the emergency electrical buses. The inspectors identified that PPL had not included the transfer-time as unavailability time during the assessment of the EDG's availability performance. In addition, PPL had not evaluated the impact of excluding the swap-time from the performance assessment. The Maintenance Rule, section (a)(2) requires that both the reliability and availability be considered when evaluating system performance. PPL entered this issue into the corrective action program as condition report 271151.

Methods of Risk Evaluation of Safety Significant Equipment, and Equipment Unavailability/Reliability of other Selected Systems

No findings were identified.

.2 Performance Indicator Data Collecting and Reporting Process (TI 2515/144)

a. Inspection Scope

The inspectors reviewed the PPL’s Performance Indicator data collecting and reporting process to determined if the data collecting and reporting methods for current Performance Indicator data are consistent with the guidance contained in Nuclear Energy Institute document 99-02, Revision 0, "Regulatory Assessment Performance Indicator Guideline" for the following indicators:

- Unplanned Scrams per 7000 Critical Hours
- Scrams With Loss of Normal Heat Removal
- Unplanned Power Changes per 7000 Critical Hours

b. Issues and Findings

There were no findings identified.

.3 Inadequate Control of Worker Overtime (71707)

a. Inspection Scope

The inspectors reviewed PPL administrative overtime controls, as well as the hours worked by plant personnel for a twelve week period from February 11, 1999 to May 5, 1999. That period included the 1999 Unit 2 refueling outage. Specifically, the inspectors reviewed the total hours that individuals worked in a "rolling" seven day period. The results of this review were then compared to Technical Specifications requirements.

b. Inspection Findings

The inspectors identified numerous instances when the time worked by plant personnel exceeded 72 hours in a seven day period from February 11, 1999 to May 5, 1999. The inspectors determined that NDAP-QA-0025, "Working Hour Limits for Station Staff," contained appropriate controls to meet the Technical Specification requirements for control of worker overtime.

Technical Specifications 5.2.2.e, "Administrative Controls - Unit Staff," required, in part, that an individual should not be permitted to work more than 72 hours in any seven day period and that any deviation shall be authorized in advance by plant management. Contrary to this, PPL did not adequately control the use of overtime in accordance with Technical Specifications and PPL procedure. Specifically, from February 11, 1999 to May 5, 1999, several plant personnel worked in excess of 72 hours in a seven day period and PPL did not pre-approve the overtime deviations. The safety significance of this violation was very low because there were no issues that were linked to personnel fatigue. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). This violation is documented in PPL's corrective action program as condition report 239797. **(NCV 05000387,388/2000005-03)**

.4 (Closed) URI 05000387,388/2000004-04 Maintenance Rule Monitoring of the Turbine Building Closed Cooling Water System. This issue is discussed in section 1R12 of this inspection report. This Unresolved Item is Closed.

4OA6 Meetings

.1 Exit Meeting Summary

On July 14, 2000, a regional senior reactor engineering presented the results of the maintenance implementation initiative inspection to Mr. R. Ceravolo and other members of your staff who acknowledged the findings.

On July 21, 2000, a regional health physics specialist presented the results of the health physics baseline inspection on access control and ALARA to Mr. R. Ceravolo and other members of your staff who acknowledged the findings.

On August 18, 2000, the resident inspectors presented the inspection results to Mr. B. Shriver and other members of your staff who acknowledged the findings.

The inspectors asked PPL whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

DOCUMENTS REVIEWED

(not listed in the body of the inspection report)

CR 069965	Unit 1 and 2 Main Steam Isolation Valves Unacceptable Performance
CR 183518	ARI Block Valve SV-247102 Dual Indication during SO-255-006
CR 192005	Unit 1 Primary Containment System Unacceptable Performance
CR 195325	HD-27524B Failed Stroke Time during SO-234-001
CR 200713	HD-27524A Failed Stroke Time during SO-234-001
CR 208184	HV-20943A3 Failed to Stroke during SO-054-005
CR 244465	HV-141F032A Failed Leakage Testing during SE-159-026
CR 244549	Valve 141F039A Failed Leakage Testing during SE-159-026
CR 96-1811	SE-124-DO, LOOP test of ESS Bus 1A204/D/GD
CR 216980	The 'A' CRD Pump discharge check valve malfunction.
CR 231662	H2O2/PASS system is an extension of primary containment.
CR 232477	Single failure of the Post Accident Sampling System pressure boundary could result in the loss of both divisions of Hydrogen/Oxygen Analyzers
CR 233653	Technical Specification Basis Section B3.6.1.3 inaccurate
CR 236755	Unrecognized color in ORAM-SENTINAL Color.
CR 259787	SENTINAL status report information added to the station status report.
CR 96-2000	System Trouble alarm on Control Room Panel 2C651
CR 216980	'A' CRD pump discharge Ck. Valve 146014A is not providing reqd isolation
EC-RISK-0528	Risk Significant Systems, Structures, and Components for the Maintenance Rule and Generic Letter 89-10 Components
EC-RISK-1054	SSC Availability Performance Criteria for the Maintenance Rule
EC-RISK-1060	Acceptable Number of Failures for Risk Significant SSCs in the Maintenance Rule
NDAP-QA-0413	SSES Maintenance Rule Program
PLI-0085652	Maintenance Rule Expert Panel Meeting Minutes 1998-0603
Station Status Rpt	Friday, July 14, 2000
1Q/2000 Perf. Sum	Susquehanna Unit 1
Summary Of SSC	Scoping for Units 1 and 2
SE-159-180	LLRT of H2O2 and PASS Panels and Associated Piping
SE-259-180	LLRT of H2O2 and PASS Panels and Associated Piping
GP-R-66196010	General Physics Engineering Study, "SSES Containment Leakage Review," dated August 27, 1996
EC-059-1023	PPL Disposition of Findings Identified in the General Physics Containment Leakage Review, dated January 29, 1997
LDCN 3171	TS 3.6.1.3 and TS Basis 3.6.1.3 Change Request, dated July 3, 2000

Technical Specifications Basis Section B3.6.1.3
SSES Maintenance Rule Basis Document - System 59
SSES FSAR Sections 6.2.4.3.3.6, 6.2.4.3.6, Table 6.2-12, Table 6.2-22
NUREG 800, "Standard Review Plan," section 6.2.4 paragraph II.3.e
NRC Safety Evaluation Report Section 6.2.4

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000387,388/2000005-01	NCV	Failure to Demonstrate Adequate System Performance as Required by the Maintenance Rule (section 1R12)
05000387,388/2000005-02	NCV	Missed Surveillance Testing on the Hydrogen/Oxygen Analyzer Systems (section 1R22.2)
05000387,388/2000005-03	NCV	Inadequate Control of Worker Overtime (section 4OA5.3)

Closed

05000387/2000-001-00	LER	Inadequate System Design Documentation Leads to Missed 10 CFR 50 Appendix J Testing (section 4OA3.2)
05000387,388/2000004-01	URI	Maintenance Rule Monitoring of the Turbine Building Closed Cooling Water System (section 4OA5.4)

LIST OF ACRONYMS USED

ALARA	As-Low-As-Reasonably-Achievable
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
FR	Federal Register
FSAR	[SSES] Final Safety Analysis Report
H2O2	Hydrogen/Oxygen Analyzer
HP	Health Physics
LER	Licensee Event Report
MR	Maintenance Rule
MRFF	Maintenance Rule Functional Failure
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PASS	Post Accident Sampling System
PPL	PPL Susquehanna, LLC
PRA	probabilistic risk assessment
QA	Quality Assurance
SDP	[NRC] Significance Determination Process
SSC	Structure, System, or Component
SSES	Susquehanna Steam Electric Station
TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specification
URI	Unresolved Item
WO	Work Order

ATTACHMENT 1

NRC's REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.