May 6, 2003

Mr. Bryce L. Shriver
Senior Vice President and
Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION - NRC INTEGRATED INSPECTION REPORT 50-387/03-02, 50-388/03-02

Dear Mr. Shriver:

On March 29, 2003, the US Nuclear Regulatory Commission (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 April 11, 2003, 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.

This report documents two findings of very low safety significance (Green) that were determined to involve violations of NRC requirements. However, because of the very low safety significance and because the issues were entered into your corrective action program, the NRC is treating these two findings as Non-cited Violations (NCVs), in accordance with Section VI.A.1 of the NRC Enforcement Policy. Violations of very low safety significance identified by PPL are listed in Section 4OA7 of this report. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station.

Since the terrorist attacks on September 11, 2001, the NRC has issued five Orders (dated February 25, 2002, January 7, 2003 and April 29, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over personnel access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25th Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspections are scheduled for completion in CY '03. Additionally, table-top security drills were conducted at several licensees to evaluate

the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY '03, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the USNRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

In accordance with 10CFR2.790 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 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).

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

Enclosure: Inspection Report 50-387/03-02, 50-388/03-02
with Attachment: Supplemental Information

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

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 05000387, 05000388

License Nos.: NPF-14, NPF-22

Report No.: 50-387/2003-02, 50-388/2003-02

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station

Location: 769 Salem Boulevard
Berwick, PA 18603

Dates: December 29, 2002 to March 29, 2003

Inspectors: S. Hansell, Senior Resident Inspector
J. Richmond, Resident Inspector
J. Noggle, Senior Health Physicist
A. Blamey, Senior Operations Engineer
S. Iyer, Reactor Engineer
J. Jang, Senior Health Physicist
T. Burns, Reactor Engineer

Approved by: Mohamed M. Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2003-002, 05000388/2003-002; PPL Susquehanna, LLC; 12/29/2002 - 03/29/2003; Susquehanna Steam Electric Station, Units 1 and 2. Operability Evaluations and Problem Identification and Resolution.

The report covered a 13 week period of inspection by resident inspectors, a regional operations engineer, senior health physicists, and reactor engineers. Two Green non-cited violations (NCV's) were identified. The significance of most findings is 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 may be Green or assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspection Findings

Cornerstone: Barrier Integrity

- **Green.** The inspectors identified a non-cited violation of very low safety significance of Technical Specification 5.4.1, because PPL did not implement their written procedures for the Technical Requirements for Operations (TRO) program. Although operators closed a Unit 2 primary containment isolation valve, they did not de-activate the valve as required by TRO 3.6.4 Condition B when both a primary containment isolation valve (first containment barrier) and a corresponding closed system boundary isolation valve (second containment barrier) were concurrently inoperable.

  This finding is more than minor because operators did not implement the TRO Required Actions for an inoperable component as required by a station procedure, similar to example 2.g in NRC Inspection Manual 0612 Appendix E, "Examples of Minor Issues." This violation is of very low safety significance because the finding did not represent an actual open pathway in the primary containment.

  This finding is related to the Human Performance cross-cutting area because plant operators did not follow procedures to implement TRO Required Actions. (Section 1R15.2)

Cornerstone: Mitigating Systems

- **Green.** The inspectors identified a non-cited violation of very low safety significance of 10 CFR 50 Appendix B Criterion XVI, because PPL did not promptly identify and correct a condition adverse to quality. Specifically, the Unit 2 scram discharge valve vent and drain valve actuators were not properly sized to open the valves under all reactor pressure conditions as required by Emergency Operating Procedure EO-200-113, "Control Rod Insertion" to allow control rods to be inserted during anticipated transient without scram events.

This finding is more than minor because it had greater significance than a similar issue described in NRC Inspection Manual Chapter 0612 Appendix E, "Examples of Minor Issues," Section 4.g. This violation was of very low safety significance because the scram discharge volume vent and drain valve safety function to close in response to a reactor scram was not affected by the problem. In addition, during the period that the scram discharge volume valves were degraded, there was no actual failure to scram event.

This finding was related to the Problem Identification and Resolution cross-cutting area because PPL did not promptly identify and correct a condition adverse to quality regarding the undersized scram discharge volume inboard vent and drain valve actuators. (Section 4OA2.1)

B. Licensee Identified Violations

Violations of very low safety significance, which were identified by PPL have been reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into PPL's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 was operated at or near full power during the inspection period, with exceptions for control rod pattern adjustments, main turbine control valve testing, main condenser waterbox cleaning, and a Technical Specification required shutdown due to inoperable emergency diesel generators (EDGs) on January 19, 2003. The reactor shutdown was stopped at 50% power when the EDG problem was corrected. Plant power was returned to 100% on January 20th.

Unit 2 began the inspection period at full power. On January 24, reactor power dropped below 100% due to the end of operating cycle fuel depletion. Plant power was 84% on March 7, when the Unit was shut down to begin a refueling and maintenance outage.

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

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors reviewed PPL's preparations for cold weather conditions and performed plant walkdowns for selected structures, systems, and components. The walkdowns and reviews were conducted to determine the adequacy of PPL's weather protection activities and system features. The inspectors reviewed and evaluated plant conditions related to the cold weather and PPL's risk assessment. The inspectors compared their observations to PPL's procedures for cold weather protection of the associated systems. The areas, components, and documents included:

Structures, Systems, and Components

- "E" emergency diesel generator (EDG) frozen crankcase vent line;
- "A, B, C, and D" EDG crankcase vent lines and auxiliary equipment.

Procedures and Documents

- NDAP-00-0024, revision 2, "Winter Operation Preparations and Severe Weather Operation"
- NDAP-QA-1902, "Maintenance Rule Risk Assessment and Management Program"
- INPO Operations and Maintenance Reminder, OM&R 422, "Freezing of safety Related Process Piping and Systems Important to Plant Operations."

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments

.1 Partial System Walkdowns (71111.04Q)

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 certain system components were 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:

- Unit 1 "A" standby liquid control system, on January 15, 2003;
- Unit 1 high pressure coolant injection system, on January 27, 2003;
- Unit 1 service water and fuel pool cooling systems after a water hammer occurrence, on January 28, 2003;
- “A,” “B,” and “C” emergency diesel generators (EDGs) after the “D” was declared inoperable due to a loose bolt that connects the diesel governor to the fuel rack linkage, on March 19, 2003.

b. Findings

No findings of significance were identified.

.2 Complete System Walk-down (71111.04S)

a. Inspection Scope

The inspectors performed a complete system walk-down on the “E” emergency diesel generator (EDG) to verify whether the equipment was properly aligned. In addition, the inspectors reviewed the most recent surveillance test data and issues monitored by the system health report, which included condition reports, work orders, and maintenance rule issues. These reviews were conducted to identify discrepancies that would impact system operability. The following documents were included in the review:

- Piping and Instrumentation Diagram M-134 Sheet 5, revision 10, Sheet 6 revision 6;
- Maintenance action requests;
- FSAR Section 8.3.1.4, "Standby Power Supply”;
- TS and TS Bases sections 8.3.1, "AC Sources - Operating”;

- Checklist for equipment alignment for system in normal standby condition when swapped between “B” EDG and “E” EDG.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Routine Plant Area Inspections (71111.05Q)

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 areas and documents reviewed included:

Plant Areas and Fire Zones

- Emergency service water system on January 17, 2003;
- Unit Common Security Control Center, security emergency diesel generator, and electrical power distribution on January 17, 2003;
- Unit 2 high pressure coolant injection system, after maintenance work on March 6, 2003;
- Unit 2 Reactor Building elevation 719 and 749, during control rod drive mechanism (CRDM) change-out, and reactor recirculation system chemical decontamination preparations on March 15;
- Unit 2 outboard main steam isolation valve area during the refuel outage;
- Unit Common refuel floor, during reactor pressure vessel internal inspections and jet pump modification work, on March 26.

Pre-fire Plans Procedures and Documents

- FP-213-238, "Unit 2 HPCI Pump Room"
- FP-013-132, "Common Refuel Floor"
- FP-013-360, "Security Control Center"
- FP-013-200/201, "ESSW Pump House"
- FP-213-253, "Main Steam Pipeway"
- FP-213-248, "Containment Access Area, Elevation 719"
- FP-213-254, "Circulation Space, Elevation 749"
- NDAP-QA-0440, "Control of Transient Combustible & Hazardous Material"
- NDAP-QA-0441, "Fire Protection System Station Control"

- NDAP-QA-0449, "Fire Protection System Program"

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

.1 Internal Flood Protection (71111.06)

a. Inspection Scope

The inspectors reviewed PPL's internal flooding evaluation, flood mitigation procedures, and design features, to verify whether they were consistent with the SSES design requirements and industry standards. The inspectors walked down selected risk significant plant areas to verify whether room flood detectors, watertight doors, sump pumps, and other flood protection design features were adequate and operable. During the walk downs, the inspectors also evaluated whether there were any unidentified or unanalyzed sources of flooding, including holes and un-sealed penetrations in floors and walls, between flood areas, and between common drain systems and sumps and the flood areas. The specific areas included:

- Unit 2 “B” residual heat removal (RHR) room during the heat exchanger draining and eddy current testing.

The inspectors reviewed PPL's preventative maintenance tasks for room flood detectors, flood barriers, and watertight doors to evaluate whether component functionality was routinely verified. In addition, the inspectors reviewed PPL's corrective action program, including system health reports, and interviewed selected system engineers and maintenance personnel to verify whether previous flood related issues had been appropriately identified, evaluated, and resolved. The specific procedures and documents reviewed included:

- FSAR Section 3.4, "Water Level Flood Design”;
- FSAR Section 9.3.3, "Equipment and Floor Drainage System”;
- ON-169-002, "Flooding in the Reactor Building"
- EO-000-104, "Secondary Containment Control"
- Design Basis Document DBD-010, "HELB, MELB, and Internal Flooding"
- Maintenance Rule Basis Document for Plant Leak Detection System-76D

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors observed PPL's inspection, cleaning, and maintenance activities in the field, and reviewed PPL's evaluation of the as-found conditions for the Unit 2 "B" residual heat removal (RHR) heat exchanger (2E205B) during the refuel and maintenance outage. The inspectors' review included the following documents:

- NDAP-QA-0504, "Heat Exchanger Program";
- MT-GM-025, "Heat Exchanger Cleaning and Inspection";
- Specification H-1004, "Heat Exchanger/Condenser Inspection and Condition Assessment";
- Specification M-1453, "Heat Exchanger Tube Plugging";
- Work Order 358486 and ERPM 358490;
- Radiation Work Permit 2003-2112;
- OP-216-001, "RHR Service Water."

The inspectors reviewed PPL's inservice inspection records for the selected heat exchangers to verify whether PPL properly evaluated the results to identify adverse trends and ensure adequate heat transfer capabilities. The inspectors compared their observations against PPL's procedures and specifications to assess whether the heat exchangers were capable of performing their safety function under design basis accident conditions. In addition, the inspectors reviewed the previous inservice inspection records and compared the previous and current heat exchanger as-found conditions and cleaning results against PPL's specifications and acceptance criteria to determine if the current results were consistent with predicted performance trends and with industry practice.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) (71111.08)

a. Inspection Scope

The inspector observed selected samples of in-process nondestructive examination (NDE) activities. Also, the inspector reviewed documentation of additional samples of NDE and repair/replacement activities. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The observations and documentation review was performed to verify activities were performed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements. The inspector reviewed a sample of condition reports initiated as a result of problems identified during ISI examinations. Also, the

inspector evaluated effectiveness in the resolution of problems identified during ISI activities.

The inspector observed manual ultrasonic testing (UT) and magnetic particle (MT) testing activities to verify effectiveness of the examiner and process in identifying degradation of risk significant systems, structures and components and to evaluate the activities for compliance with the requirements of ASME Section XI of the Boiler and Pressure Vessel Code. The inspector examined PPL's evaluation and disposition for continued operation without repair or rework of non-conforming conditions identified during ISI activities by review of the UT examination summary sheet (621030) for the N2B nozzle to vessel weld and the accompanying data sheets.

The inspector observed the UT and MT testing performed on reactor core isolation cooling (RCIC) field weld (FW) 10, a four inch pipe to pipe butt weld and the penetrant testing of residual heat removal (RHR) FW 8, a twenty inch pipe to flued head butt weld. In addition, the inspector performed a documentation review of the UT results of RHR FW 8 and the UT results of the reactor vessel head to flange weld. The inspector also reviewed documentation of the MT test results of the reactor vessel head to flange weld. The inspector also reviewed the radiographs and the examination test results of the head spray nozzle to elbow weld (FW 5, a six inch dissimilar butt weld) and seven pipe to pipe six inch butt welds of the reactor water clean up system (FW's 36, 38, 39, 40, 41, 42 and 49). Also, the inspector interviewed PPL's radiographic personnel responsible for the review and interpretation of the film to assess examiner experience and knowledge of the ASME Code requirements. The inspector reviewed a sample of video recordings of the remote in-vessel visual inspection (IVVI) of the core spray piping base metal, butt welds, spray nozzles and structural supports. The inspector also reviewed the results of the visual examination of the steam dryer base metal and structural welds. This review was conducted to confirm the examiner skill, test equipment, examination technique, and environment (water clarity) enabled the performance of the visual examination of the selected vessel internals. Also, the inspector confirmed that for the radiographs evaluated, the examination was in compliance with the requirements of ASME Section XI.

The inspector reviewed welding activities associated with the replacement and repair of a selected component to verify the activities were performed in accordance with the requirements of ASME Section IX and XI. The inspector reviewed selected portions of work order PCWO 282365 (replacement of "C" fuel pool cooling pump discharge check valve). The inspector reviewed the joint process control instructions, welding instructions, welding procedure specification, welding procedure qualification, NDE requirements and the test results of the completed welds. The inspector reviewed welding procedure specification N-A-IA-MA-11, Rev 8 used to install the replacement discharge check valve (2P211C) on the "C" fuel pool cooling pump. The inspector also reviewed the supporting weld procedure qualification records 02-01 and 7A for compliance with the requirements of ASME Section IX.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On February 24, 2003, the inspectors observed licensed operator performance in the simulator during the operator re-qualification training. The inspectors also evaluated PPL's critique of the operators' performance to identify discrepancies and deficiencies in operator training. The inspectors compared their observations to Technical Specifications, emergency plan implementation, and the use of emergency operating procedures. The inspectors' evaluation focused on the operating crew's satisfactory completion of crew critical tasks. Critical tasks are operational limits placed on key reactor plant and containment parameters that will ensure safety margins are maintained during the simulated malfunctions. The review included a comparison of the simulator's ability to model the actual plant performance. The observed training scenario included:

- OP002-03-03-01, "Seismic Event/ Steam Line Break and Partial MSIV Isolation/ Hydraulic ATWS/ Radioactivity Release"

b. Findings

No findings of significance were identified.

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 history 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 whether the actions were reasonable and appropriate. The following issues were reviewed:

Equipment Issues

- Units 1 and 2 electro-polishing of electrical contacts on January 13-16, 2003;
- Instrumentation and Control technician resistance checks during surveillance tests SI-180-301 and SI-258-303 on January 23, and February 18.

Procedures and Documents

- MT-GE-040, "Agastat Relay Calibration"
- EWR 449789, "Electro-Polishing Electrical Contacts"
- Condition Reports 446726, 211294, 453236, and 444494

b. Findings

No significant observations or findings 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 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 50.65(a)(4) and the recommendations of NUMARC 93-01 Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine whether risk assessments were performed when required and appropriate risk management actions were identified.

The inspectors reviewed scheduled and emergent work activities with licensed operators and work-coordination personnel to verify 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 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 common "B" EDG and "B" ESW maintenance, concurrent with Unit 2 "B" core spray and "B" instrument air maintenance, on January 16-17, 2003;
- Unit 1 main generator stator rectifier cooling water line freeze seal and leak repair, on January 18;
- Unit 2 “A” residual heat removal system outage window, Generic Safety Assessment 049-001, on February 11-13, 2003;
- Unit 2 HPCI planned maintenance with blank flanges installed on emergency service water to turbine building closed cooling water (TBCCW) and reactor building closed cooling water (RBCCW) systems, on March 4, 2003;
- Unit 2 jet pump repair risk assessment, PA-B-NA-004;
- “D” EDG inoperable due to a loose bolt that connected the diesel governor to the fuel rack linkage. Unit 2 was shutdown for a refuel outage and the Division 2

emergency power systems were out of service for planned work, CR 460235, on March 19, 2003.

b. Findings

No findings of significance were identified.

1R14 Non-Routine Plant Evolutions (71111.14)

.1 Units 1 and 2 Technical Specification Required Shutdown due to Inoperable Emergency Diesel Generators

a. Inspection Scope

On January 19, 2003, at 10:11 a.m., Unit 1 initiated a reactor shutdown, as required by Technical Specification (TS) 3.8.1.B, due to an inoperable emergency diesel generator (EDG) for greater than 72 hours. The Unit 1 shutdown was stopped at 3:38 p.m., at approximately 50% reactor power, when the "E" EDG was returned to an operable condition.

On January 16, at 1:06 p.m., the "E" EDG was removed from an operable standby alignment, to perform post maintenance testing on the "B" EDG, following a "B" EDG overhaul. However, the “B” EDG experienced govern load control oscillations during post maintenance testing, and could not be returned to an operable condition.

On January 17, the "E" EDG was substituted for the "B" EDG, to re-establish 4 operable EDGs for Units 1 and 2. However, the "E" EDG tripped on reverse power due to large load swings during the surveillance operability run. PPL determined that the "E" EDG load swings were due to a faulty potentiometer in the electronic governor circuit.

On January 19, following replacement of the electronic governor, the "E" EDG was manually tripped during its post maintenance surveillance run, due to an abnormal lube oil sump high level. PPL determined that the "E" EDG crankcase vent had become blocked with ice on the vent screen, due to the cold weather. The vent screen was replaced by a screen with a larger mesh, to prevent a future icing problem. The "E" EDG completed a surveillance run and was returned to an operable condition.

The inspectors reviewed operating logs, plant procedures, and interviewed plant personnel for this issue to independently determine what occurred and evaluate the initiating cause. The inspectors assessed personnel performance during this event to evaluate whether the operator response was appropriate and in accordance with procedures and training.

Procedures and Documents

- TS 3.8.1 and Basis, “Electrical Power Systems, AC Sources - Operating”
- OP-024-004, "Transfer and Test Mode Operations of E-EDG"
- TP-024-146, “Diesel Generator “B” Restoration"
- Work Orders 445141, 349995
- Condition Reports 445171, 445361, 445379, 445467, 445489, 445499, 445504, 445564, 445656, 446277, 446398, and 446517

b. Findings

No findings of significance were identified.

.2 Unusual Event - Unit 1 Turbine Building Ventilation Radiation Monitor Alarm

a. Inspection Scope

At 8:32 p.m., on January 29, 2003, PPL declared an Unusual Event for a non-routine radioactive gas release from the Unit 1 turbine building ventilation system. PPL activated their Technical Support Center and Emergency Offsite Facility. The release was indicated by a high-high alarm on the iodine channel of the Unit 1 turbine building vent stack radiation monitoring system. PPL concluded that the radioactive gas alarm was caused when the offgas system flow, from the main condenser to the charcoal holdup filters, was momentarily vented into the Unit 1 turbine building. PPL determined that the vent stack radiation monitor erroneously indicated the presence of radioactive iodine due to the presence of nitrogen-13, a short lived radioactive gas (approximately 10 minute half-life) which was a primary constituent in the normal offgas process flow. After PPL verified that no radioactive iodine was released and there were no offsite dose consequences, PPL terminated the Unusual Event at 1:25 a.m., on January 30.

The inspectors reviewed operating logs, plant procedures, and interviewed plant personnel for this event; to independently determine what occurred and evaluate the initiating cause. The review focused on the cause of the offgas system's inadvertent vent into the turbine building, and PPL's actions to identify and correct the condition. For a review of the radiation dose assessment aspects of the event, see Section 4OA3.1 of this report.

The inspectors assessed personnel performance during this event to evaluate whether the operator response was appropriate and in accordance with procedures and training. The following documents were included in the review:

Procedures and Documents

- ON-070-001, "Abnormal Gaseous Radiation Release / CAM Alarms"
- OP-179-002, "Stack Effluent Monitoring Alarm Validation"
- AR-015-001, D04, "Stack Monitoring System Hi-Hi Alarm"
- Emergency Plan Emergency Action Level 15.1.a, "Radiological Effluent"

- Unit 1 Control Room Operator Logs
- Unit 1 Technical Requirements Manual 3.11.2, "Gaseous Effluents"
- Event Notification Report 39546
- Condition Reports 448706 and 382567

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Routine Operability Evaluation Reviews

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 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:

- “E” EDG Electrical governor, on January 18 - 19, 2003;
- “E” EDG fuel oil transfer pump OP-514-E, CR 448092, February 4 - 11, 2003;
- Units 1 and 2 RHR condensate transfer check valves not tested per inservice test program; CR 455822, on March 3, 2003;
- Unit 2 HPCI high vibration on lube oil piping during turbine overspeed test, CR 456983, on March 7, 2003;
- “D” EDG inoperable due to a loose bolt that connected the diesel governor to the fuel rack linkage. The operability determination addressed potential common mode failure concerns for the other four EDGs, CR 460227, on March 19, 2003.

b. Findings

No findings of significance were identified.

.2 Unit 2 Primary Containment Penetration Integrity

a. Inspection Scope

The inspectors reviewed PPL's operability determinations for a primary containment penetration isolation function, associated with the Hydrogen Oxygen (H2O2) Analyzer system. Specifically, the inspectors reviewed PPL's response when both a primary containment isolation valve (PCIV) and a closed system boundary isolation valve were concurrently inoperable. The following documents were included in the review:

Procedures and Documents

- NDAP-QA-0312, "Control of LCOs, TROs, and Safety Function Determination Program"
- Technical Specification (TS) 3.6.1.3 and Bases, "Primary Containment Isolation Valves"
- Technical Requirements Manual (TRM) 3.6.4 and Bases, "Primary Containment Closed System Boundaries"
- Final Safety Analysis Report (FSAR) 6.2.4.3.3.6, "Post-LOCA Atmosphere Sampling Lines"
- Work Orders 419800 and 448068
- Condition Reports 419694, 447967, 448017, and 448182

b. Findings

Introduction

The inspectors identified a non-cited violation of very low safety significance (Green) of Technical Specification 5.4.1, because PPL did not implement their written procedures for the Technical Requirements for Operations (TRO) program (i.e., NDAP-QA-0312). Although operators closed a Unit 2 primary containment isolation valve (PCIV), they did not de-activate the valve as required by TRO 3.6.4 Condition B when both a PCIV (first containment barrier) and a corresponding closed system boundary isolation valve (second containment barrier) were concurrently inoperable. This finding was related to the Human Performance cross-cutting area.

Description

On January 28, 2003, during a Unit 2 post accident sampling system (PASS) surveillance test, two valves concurrently indicated mid-position (e.g., not fully closed) when their hand switches were placed in the closed position. PPL operations declared both valves inoperable, pending further evaluation, rework, or testing.

Specifically, HV-257-42A (PCIV for the H2O2 Analyzer) had dual position indication when the hand switch was placed in the closed position at 11:20 a.m. on January 28. The

operators declared the PCIV inoperable, and entered TS Limiting Condition for Operations (LCO) 3.6.1.3 Condition D. LCO Condition D required the second operable PCIV to be closed and de-activated within 72 hours provided that the closed system boundary was operable. The operators closed HV-257-40A, the second PCIV for the penetration, but did not de-activate that valve.

Coincident with the H2O2 PCIV problem, SV-223-61, a primary containment system boundary isolation valve between H2O2 and PASS, also had dual position indication when the hand switch was placed in the closed position at 11:50 a.m. on January 28. This resulted in a portion of the H2O2 closed system boundary being inoperable. The operators declared the portion of the H2O2 closed system boundary inoperable, but incorrectly used TRM Technical Requirements for Operations (TRO) 3.6.4 Condition A.2, instead of Condition B. Condition A.2 was only applicable when a closed system boundary was inoperable and both associated PCIVs were operable. Condition A.2 required the operator to close and de-activate a PCIV within 4 hours. However, in this instance, TRO 3.6.4 Condition B applied because the closed system boundary was inoperable coincident with an inoperable PCIV. Condition B required the operator to close and de-activate the second PCIV within 1 hour for the affected H2O2 penetration. Although the operators closed HV-257-40A within 1 hour, they did not de-activate the valve. The closed system boundary was declared operable at 1:35 p.m. on January 28, following maintenance on the boundary isolation valve.

Based on the inspector’s interview with the operators, the operators indicated that they had not realized that the inoperable H2O2 PCIV and the inoperable H2O2-PASS system boundary isolation valve were on the same primary containment closed system boundary. The operators thought that the two valves were on different closed system boundaries (e.g., two different and unconnected piping loops). As a result, the operators used the wrong TRO Condition and did not take the required action to de-activate a closed PCIV within 1 hour.

Analysis

This finding is more than minor because operators did not implement the TRO Required Actions for an inoperable component as required by a station procedure, similar to example 2.g in NRC Inspection Manual 0612 Appendix E, "Examples of Minor Issues." Specifically, PPL did not de-activate a closed PCIV within 1 hour as stated in the TRO Required Action for an inoperable closed system boundary concurrent with an inoperable PCIV. This finding affects the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers provide protection against a radiological release. Not de-activating an inoperable closed PCIV had a direct relationship to the cornerstone's objective because the finding affected the cornerstone's barrier performance attribute, in that, the reliability of containment isolation was reduced. Specifically, two degraded components, a PCIV and a closed system boundary valve, simultaneously affected the same containment penetration, which could have reasonably resulted in a containment penetration failing open during a design basis event, due to a single relay failure.

This finding is considered to have very low safety significance (Green) using the SDP for Reactor Inspection Findings for At-Power Situations because the finding did not represent an actual open pathway in the primary containment. In addition, the issue did not represent a degraded radiological or control room barrier.

This finding is related to the Human Performance cross-cutting area because plant operators did not follow procedures to implement TRO Required Actions for an inoperable PCIV coincident with an inoperable closed system boundary.

Enforcement

Technical Specification 5.4.1 required, in part, that written procedures shall be established and implemented as recommended in NRC Regulatory Guide (RG) 1.33 Appendix A. RG 1.33 Appendix A, section 1.d, "Administrative Procedures - Procedure Adherence," required written procedures to specify and control procedure adherence requirements. Administrative procedure NDAP-QA-0312, "Control of LCOs, TROs, and Safety Function Determination Program," Section 6.7.2, stated that the "Unit Supervisor shall ensure that the Required Actions for all LCO/TRO conditions are completed in the specified completion times."

Contrary to the above, on January 28, 2003, when both PCIV HV-257-42A and closed system boundary isolation valve SV-223-61 were concurrently inoperable for one and three-quarters hours, the Unit Supervisor did not de-activate PCIV HV-257-40A within 1 hour, as required by TRO 3.6.4 Condition B. Because this violation is of very low safety significance and PPL entered this finding into their corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 50-388/2003-002-01)**

1R19 Post Maintenance Testing (71111.19)

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's adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated the test acceptance criteria to verify whether the test demonstrated that the tested components satisfied the applicable design and licensing bases and the Technical Specification requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. The post maintenance testing activities reviewed included:

- Unit 2 electrical penetration assembly (EPA) breaker retest on January 13, 2003, WO 271121 and 387510;

- "E" EDG surveillance test; SE-224-E01, "Unit 2 DG "E" substitution surveillance test," after electronic governor circuit card replacement, on January 19, 2003;
- Unit 2 HPCI 92 day flow verification test; SO-252-002; after planned maintenance outage and flow controller replacement, on March 6, 2003;
- "D" EDG surveillance test, SO-024-001, "D" EDG Monthly Operability Test," after replacing loose bolt that connected the diesel governor to the fuel rack linkage, CR 460227, on March 19, 2003;
- Secondary containment operability test after excessive air in leakage was noted for reactor building zone 1and refuel floor zone 3. Procedure TP-270-003, "DCP 401986 Post Modification Testing-Secondary Containment Inleakage Test Zones I and III," on March 20, 2003.

b. Findings

No findings of significance were identified.

1R20 Unit 2 Refueling and Maintenance Outage Activities (71111.20)

.1 Refuel Outage Plan Review

a. Inspection Scope

The inspectors reviewed PPL's risk assessment for the scheduled outage plan to evaluate whether PPL had appropriately considered overall plant risk, industry experience, and previous SSES outage problems. In addition, the inspectors reviewed PPL's ORAM-Sentinel model basis for selected key safety factors. The following documents were included in the review:

- U211RIO Outage Schedule Logic for HPCI, RCIC, MSRVs, Core Spray, and Safety Division-1 Work
- Unit 2 ORAM Risk Profile
- Unit 2 EOOS Risk Profile for Modes 2 and 3
- EWR 383453, "Fuel Pool Time-to-Boil Predictions"
- NDAP-QA-0613, "Outage Implementation and Assessment"
- PSP-22, "ORAM-Sentinel Program"

b. Findings

No findings of significance were identified.

.2 Reactor Plant Shutdown Activities

a. Inspection Scope

The inspectors observed selected portions of operator activities during the plant shutdown, plant cooldown, and residual heat removal system operation in the shutdown cooling mode. The inspectors evaluated whether the activities were performed in accordance with approved procedures and training. The inspectors reviewed computer data and operator logs to spot check whether the cool down rate remained below the Technical Specification limit of 100 °F per hour. The following documents were included in the review:

- GO-200-004, "Plant Shutdown to Minimum Power"
- GO-200-005, "Plant Shutdown to Cold Shutdown"
- GO-200-006, "Cold Shutdown, De-fueled and Refueling"

b. Findings

No findings of significance were identified.

.3 Control of Outage Activities

a. Inspection Scope

Decay Heat Removal: While the service water system was removed from service, PPL used a temporary supplemental decay heat removal (SDHR) system to provide river water cooling directly to the Unit 2 fuel pool cooling heat exchangers. The Unit 1 residual heat removal (RHR) system, in the fuel pool cooling assist mode, provided a backup for the SDHR. The inspectors performed a walk-down of the SDHR system and those portions of Unit 1 RHR system that would be operated in the fuel pool cooling assist mode. The inspectors observed SDHR system operation and reviewed operating logs, operating procedures, and off-normal procedures to verify that activities were performed in accordance with PPL procedures and appropriate design basis documents.

Configuration Management & Risk Management: The inspectors observed selected portions of maintenance activities, equipment and system operations and restoration, and reviewed selected test procedures. The inspectors monitored the availability of reactor coolant makeup water sources to evaluate whether PPL maintained a defense-in-depth commensurate with the outage risk management goals and in accordance with Technical Specification requirements. The inspectors evaluated whether the component configuration management, test control, and post maintenance checks were performed in accordance with NRC requirements and approved PPL procedures. In addition, inspectors reviewed unexpected plant conditions, emergent work, and system configuration control during testing and maintenance activities to evaluate whether PPL appropriately identified, assessed, and managed plant risk during those activities.

Activities

- Jet pump mixer assembly removal, modification, and re-installation, WO 405896 and 446619
- Main steam isolation valve modification work
- Reactor vessel SRM and IRM instrument dry tube inspections and replacements
- Unit 2 secondary containment integrity verification, for incorporation of a new area (Room 610) into Zone-II
- Unit 2 turbine building closed cooling water system temporary tie-in to Unit 1, TP-215-008
- In-vessel Visual Inspection of core support assemblies and jet pump assemblies
- Control rod drive mechanism change out, WO 435023
- Recirculation system chemical decontamination
- 500kV switchyard and T-21 outage, which resulted in a radial feed to T-20
- Foreign material exclusion control around suppression pool
- Main turbine replacement modification
- "A" recirculation pump discharge bypass valve HV-243-F032A repairs

Procedures and Documents

- ME-2RF-102, "Jet Pump Disassembly and Reassembly"
- PL-NF-02-007, "Fuel Assembly Channel Bowing / Scram Friction Evaluation"
- NDAP-QA-0614, "Conduct of Turbine Retrofit"
- OP-249-002, "RHR Shutdown Cooling Operation"
- OP-2RF-001, "Rx Vessel / Cavity Flood-up and Letdown"
- Condition Report 460592, "Fuel Support Assembly Coating of Unknown Origin"
- OP-235-001, "Fuel Pool Cooling and Cleanup System Operation"
- TP-235-011, "Refuel Outage Decay Heat Removal and Tie-in of SDHR Temporary Cooling Equipment"
- OP-011-001, "SDHR (supplemental decay heat removal) System"
- ON-249-001, "Loss of RHR Shutdown Cooling Mode"
- OP-149-003, "Unit 2 RHR in Fuel Pool Cooling Assist Mode"
- GO-200-010, "ECCS / Decay Heat Removal in Mode 4, 5, or De-fueled"
- NDAP-QA-0412, "Leakage Rate Test Program"
- MT-264-012, "Chemical Decontamination of the Reactor Recirculation System"

b. Findings

No findings of significance were identified.

.4 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. The inspectors spot checked fuel assembly movement from the refuel platform to verify whether the locations of fuel assemblies were tracked, from core off-load through core reload. In addition, the inspectors reviewed related reactor vessel maintenance, inspection, and testing activities to evaluate whether the activities were performed in accordance with the Technical Specification requirements and approved procedures. The following activities and documents were observed or reviewed:

Refueling Activities

- New fuel receipt inspection and channeling
- Fuel handling between spent fuel pool and reactor core
- Foreign material exclusion control around fuel pools and reactor cavity
- Refueling interlock surveillance checks on refuel platform
- Refuel floor secondary containment integrity during fuel handling operations
- Highly radioactive discrete particle control on refuel floor

Procedures and Documents

- NDAP-QA-0507, "Conduct of Refuel Floor Operations"
- OP-0RF-008, "Fuel and Blade Guide Handling Activities"
- OP-181-001, "Unit 1 Refueling Platform Operation [on either Unit 1 or Unit 2]"
- ON-081-001, "Fuel Handling Accident"
- ON-081-002, "Refueling Platform Operation Anomaly"
- TP-055-004, "CRD Testing"

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed portions of selected surveillance test activities in the control room and in the field and reviewed the test data results. The inspectors compared the test result 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 observed or reviewed surveillance tests included:

- "E" EDG operability surveillance, SO-024-001, on January 19, 2003;
- TP-013-036, backup diesel fuel pump annual flow test, on February 11 - 12, 2003 (after test failure on December, 2002);
- SE-024-A01, "A" EDG integrated surveillance test, on February 24 - 25, 2003;
- SO-200-011, Unit 2 cooldown surveillance during plant shutdown for the refuel and maintenance outage, on March 8, 2003;
- SE-255-301, scram discharge volume (SDV) ISI immediately after reactor scram, on March 8, 2003.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modification (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 Final Safety Analysis Report (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 the test. The following temporary modifications and documents were included in the review:

Temporary Modifications

- Unit 1 service water supply to Unit 2 TBCCW, during Unit 2 service water outage, on March 26-27

Procedures and Documents

- TP-215-008

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On January 21, the inspectors observed PPL's nuclear emergency response organization (NERO) during an announced emergency preparedness training exercise to evaluate PPL's NERO performance. The simulated emergency included the activation of the operations support center (OSC), technical support center (TSC), and emergency operations facility (EOF). The control room simulator was used for the exercise.

The inspectors observed the conduct of the exercise in the control room simulator and TSC. The inspectors assessed licenced operator and NERO adherence to emergency plan implementation procedures, and their response to simulated degraded plant conditions to identify weaknesses and deficiencies in classification, notification, and protective actions recommendations. In addition, on January 21, the inspectors observed PPL's facility critiques to evaluate PPL's identification of weaknesses and deficiencies. The inspectors compared PPL's identified findings against the inspectors' observations to determine whether PPL adequately identified failures. The inspectors' review included the following documents and procedures.

- Susquehanna Emergency Plan, revision 40
- EP-PS-126, "Control Room Communicator"
- AR-016-001, "Alarm Response Procedure - Administration Building HI Radiation"

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY
Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

The inspectors reviewed the access control program (as required under Plant Technical Specifications and 10 CFR 20.1601) by examining the controls established for exposure significant areas, including postings, barricades and locking controls of access to radiologically significant areas. In-plant areas and activities reviewed included:

- drywell access controls of transient dose rates during chemical decontamination of the recirculation and reactor water cleanup piping systems;
- operating Unit 1 turbine access to high radiation areas;
- Unit 2 turbine replacement activities;
- refueling floor In-vessel visual inspection activities; and
- refueling floor shroud sample extraction activities.

These exposure significant work areas were reviewed with respect to radiation work permit and technical specification requirements.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

.1 ALARA Planning and Controls Pre-outage Review

a. Inspection Scope

A review of the dose estimates and ALARA plans for the March 2003 Unit 2 refueling outage was performed on February 10-11, 2003. The pre-outage ALARA exposure estimate was 165 person-rem. The following seven highest exposure outage work activity plans were selected for review:

Procedures and Documents

- drywell shielding
- chemical decontamination of recirculation and reactor water clean up drywell piping
- turbine building pipe replacement
- control rod drive replacement
- drywell scaffold activities
- inboard main steam isolation valve (MSIV) modifications
- jet pump inlet mixer outlet seal machining

The above work activity plans were evaluated with respect to: the method and accuracy of the exposure estimates, and the planned application of exposure reduction techniques. This review was accomplished utilizing information and criteria contained in applicable radiation work permits and ALARA pre-job reviews, interviews with applicable radiological engineers, and attendance at an ALARA planning meeting for MSIV modifications.

b. Findings

No findings of significance were identified.

.2 ALARA Planning and Controls Outage Inspection

a. Inspection Scope

The inspector reviewed PPL's ALARA performance in accordance with 10 CFR 20.1101(b). Areas reviewed included an evaluation of ALARA planning documents and in-plant observations as were available, for the 5 highest exposure outage tasks: drywell shielding (both temporary and permanent), Unit 2 turbine replacement, reactor vessel nozzle in-service inspection, chemical decontamination of recirculation and reactor water cleanup piping, and under reactor vessel work activities. The specific ALARA job performance observations that were performed were previously listed in Section 2OS1, above. In addition, the following ALARA inspection activities were conducted:

- independent shielding effectiveness radiation surveys were conducted in the drywell prior to chemical decontamination;
- observation of closed circuit television equipment, teledosimetry, and audio communication use in the drywell and refueling floor were conducted with respect to remote health physics work surveillance capability; and
- ALARA mathematical model developed by the radiation protection staff to predict turbine building dose rates based on reactor power and hydrogen injection rates.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Control Program (71122.03)

a. Inspection Scope

The inspectors reviewed the following documents to ensure that PPL met the requirements specified in the licensee's program for the unrestricted release of material from the Radiologically Controlled Area (RCA):

- the most recent calibration results for the radiation monitoring instrumentation (SAM-11), including the (a) alarm setting, (b) response to the alarm, (c) the sensitivity, and (d) alarm failure rate at the setpoint;
- PPL's criteria for the survey and release of potentially contaminated material using gamma spectroscopy (calibrations efficiency for bulk sample analyses);
- the methods used for control, survey, and release from the RCA; and
- associated procedures and records to verify the lower limits of detection for bulk sample analyses.

The review was against criteria contained in 10CFR20, NRC Circular 81-07, NRC Information Notice 85-92, NUREG/CR-5569, Health Position Data Base (Positions 221 and 250), and PPL's procedures.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (71122.03)

a. Inspection Scope

The inspectors reviewed the following documents to evaluate the effectiveness of PPL's Radiological Environmental Monitoring Program (REMP) at the Susquehanna site. The requirements of the REMP are specified in the Improved Technical Specifications (ITS), Technical Requirements Manual (TRM), and Offsite Dose Calculation Manual (ODCM).

- the 2001 REMP Reports;
- selected analytical results for 2002 and 2003 REMP samples;
- the most recent REMP-ODCM (Issued on November 20, 2002) and technical justifications for ODCM changes, including sampling media and locations;
- the 2002 QA Audit (SRC Audit No. 2002-050) for the REMP-ODCM and Meteorological Monitoring Program implementations;
- NUPIC Closeout Audit for the contractor laboratory (year 2002, Teledyne and Browning Engineering);
- 2003 Self-Assessment No. CHM-03-01, Chemistry and REMP;
- the most recent calibration results for all air samplers;
- the most recent calibration results (November 4, 2002) of the meteorological monitoring instruments for wind direction, wind speed, and delta temperatures at 10-meter and 60-meter;
- review of the 2002 meteorological monitoring data recovery statistics;
- review of associated procedures;
- implementation of the environmental thermoluminescent dosimeters (TLDs) program; and
- the Land Use Census procedure and the 2001 and 2002 results.

The inspectors toured and observed the following activities to evaluate the effectiveness of PPL's REMP.

- comparisons between the plant computer 15-minute-average parameters for the wind speed, wind direction, and delta temperature and the instantaneous readings of those parameters at the control room;
- observation for air iodine/particulate and water sampling techniques; and

- walkdown for determining whether all air samplers, milk farms, and 25%TLDs were located as described in the TRM/ODCM (including control and indicator stations) and for determining the equipment material condition.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution (71152)

.1 Unit 2 Scram Discharge Volume Vent and Drain Valve Actuators

a. Inspection Scope

The inspectors reviewed PPL's root cause analysis and associated corrective actions for the Unit 2 scram discharge volume (SDV) inboard vent and drain valve slow opening times. The problems were documented in condition reports (CRs) 52697, 186283, and 425719. The CR's documented that the SDV inboard vent and drain valves did not open for 16, 32 and 34 minutes after the reactor scram signal was reset. During routine surveillance testing the SDV valves opened within 30 seconds after the scram signal was reset. The inspectors reviewed PPL's root cause evaluations associated with the three recent events in 1996, 1999, and 2002. The following documents were included in the review:

Procedures and Documents

- Maintenance Rule Bases Document for control rod drive
- System Health Report for control rod drive
- Condition Reports 52697, 186283, 425719, and 437717

b. Findings

Introduction

The inspectors identified a non-cited violation (NCV) of very low safety significance (Green) of 10 CFR 50 Appendix B Criterion XVI, because PPL did not promptly identify and correct a condition adverse to quality. Specifically, the Unit 2 SDV vent and drain valve actuators were not properly sized to open the valves under all reactor pressure conditions as required by Emergency Operating Procedure EO-200-113, "Control Rod Insertion" to allow control rods to be inserted during anticipated transient without scram (ATWS) events. This finding is related to the Problem Identification and Resolution cross-cutting area.

Description

After two reactor scram events on July 14, 1996, and June 8, 1999, plant operators reset the reactor scram and attempted to re-open the closed SDV vent and drain valves. After the scram, the SDV is pressurized to approximately 1000 psig, normal reactor pressure. The water in the scram discharge volume drains to a sump that is at atmospheric pressure. The SDV valve actuators need to overcome the 1000 pounds per square inch differential (psid) pressure for the vent and drain valves to open. The valves typically open in approximately 30 seconds. On July 1996 and June 1999, the SDV valves opened in 34 minutes and 16 minutes, respectively, from the time the reactor scram was reset.

PPL performed a Level 2 root cause analysis after the 1996 scram to determine the root cause, correct the condition, and prevent recurrence. The root cause evaluation concluded incorrectly that the most probable cause was the failure of solenoid valve SV-247009A. When the scram is reset, SV-247009A is designed to open and supply instrument air to the SDV vent and drain valve actuators, allowing the SDV valves to open. PPL sent the solenoid valve the valve manufacture for analysis and testing. The manufacturer determined that the valve was in good condition and met or exceeded all performance requirements. On October 10, 1998, PPL concluded that the cause of the SDV valve problem was not positively determined for the 1996 scram and closed the report.

On June 8, 1999, after the SDV vent and drain valves did not open as expected after the reactor scram signal was reset, PPL initiated another Level 2 cause analysis to determine the cause, correct the condition, and prevent recurrence. PPL concluded incorrectly that the most probable cause was the failure of solenoid valve SV-247009A. The solenoid valve was refurbished and tested satisfactorily. In addition, the problem was not initially entered into PPL's corrective action program until questioned by an engineer 16 days after the event.

On September 30, 2002, the SDV vent and drain valves opened 32 minutes after the reactor scram was reset. PPL initiated a less detailed Level 3 evaluation to determine the problem and correct the condition. Again, PPL concluded incorrectly that the most probable cause was the failure of solenoid valve SV-247009A. The solenoid valve was replaced and the new valve was tested satisfactorily prior to plant re-start.

In December 2002, during a generic review of air operated valve performance, PPL determined that the Unit 2 SDV vent and drain valve actuators were undersized and did not meet the maximum expected differential pressures anticipated after a reactor scram. Specifically, the valves should be designed to open against a differential pressure of 1250 pounds per square inch differential (psid) pressure. The current valve actuator design will result in the SDV drain valve opening at approximately 835 psid and the vent valve opening at approximately 1057 psid. PPL concluded that the undersized valve actuator for both valves is the root cause for the previous slow opening conditions. The Unit 1 SDV vent and drain valve actuators were sized correctly. PPL plans to upgrade the Unit 2 SDV

vent and drain valve actuators so they can open at expected system pressures. In the interim PPL re-installed the SDV vent and drain valve manual handwheels to allow plant operators to open the valves locally if needed during potential ATWS events.

The undersized actuators and removed handwheel for the vent and drain valves resulted in the inability to drain the SDV during some postulated ATWS events. Emergency operating procedure EO-200-113, “Control Rod Insertion,” provides two of five methods that require the SDV vent and drain valves to open in order to perform control rod insertion during a postulated hydraulic ATWS event. The methods allow the manual initiation of a full reactor scram and insertion of individual control rods into the reactor core to reduce reactor power and prevent core damage. The SDV vent and drain valves’ ATWS mitigation function was unnecessarily degraded from July 14, 1996 until December 2002 when the SDV vent and drain valve handwheels were re-installed. PPL did not promptly identify and correct the cause for the valves slow opening response following the reactor scrams on July 14, 1996, June 8, 1999 and September 30, 2002 until December 2002.

Analysis

This finding is more than minor because it had greater significance than a similar issue described in NRC Inspection Manual Chapter 0612 Appendix E, "Examples of Minor Issues," Section 4.g. PPL did not promptly identify and correct the SDV inboard vent and drain valve’s undersized actuators that would have prevented the operator from resetting a reactor scram during some ATWS conditions to insert control rods to reduce reactor power. Until the SDV valve handwheels were installed in December 2002, the operator’s did not have the capability to open the valves locally to drain the water from the SDV and perform additional manual scrams. This finding affected the Mitigating Systems cornerstone because the finding is associated with the function of the control rods, a mitigating system for ATWS conditions. Traditional enforcement does not apply because the issue did not have any actual safety consequence or potential for impacting the NRC’s regulatory function and was not the result of any willful violation of NRC requirements or PPL procedures.

This finding is considered to have very low safety significance (Green) using the NRC's Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations because the finding did not contribute to a loss of mitigation equipment safety function. In addition, during the period that the SDV valves were degraded, there was no actual failure to scram event.

This finding is related to the Problem Identification and Resolution (PI&R) cross-cutting area because PPL did not promptly identify and correct a condition adverse to quality regarding the undersized SDV inboard vent and drain valve actuators.

Enforcement

10 CFR 50, Appendix B, Criterion XVI, “Corrective Actions,” required in part that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, PPL did not promptly identify and correct a condition adverse to quality that the Unit 2 scram discharge volume vent and drain valve actuators were not sized correctly. The valve actuators were not sized to open the valves under all reactor pressure conditions as required by Emergency Operating Procedure EO-200-113, “Control Rod Insertion.” Specifically, the valves did not open at normal reactor pressure conditions after the reactor scram was reset on July 14, 1996, June 8, 1999, and on September 30, 2002, and PPL did not identify the condition adverse to quality until December 2002. Because this issue was of very low safety significance and PPL entered this finding into their corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. This violation is documented in PPL’s corrective action program as condition reports 425719 and 437717. **(NCV 50-388/2003-002-02)**

PPL has taken actions to re-install manual handwheels on the SDV vent and drain valves and provide procedure direction to operate the valves locally for postulated plant events. In addition, PPL has planned to upgrade the SDV valve actuators.

.2 Occupational Radiation Safety Corrective Action Review

a. Inspection Scope

The inspector reviewed six condition reports relating to occupational radiation safety that were initiated between November 2002 and January 2003, in order to evaluate PPL’s threshold for identifying and effectiveness in resolving problems pertaining to the radiation protection program.

b. Findings

No findings of significance were identified.

.3 REMP and Radioactive Gaseous Effluent Control Program Corrective Action Review

a. Inspection Scope

The inspector reviewed the selected following documents to evaluate the effectiveness of PPL’s problem identification and resolution processes in the areas of REMP and Radioactive Gaseous Effluent Control Program:

- Condition Reports (CRs) for the REMP (CR-338296, CR-304250, CR-423227, CR-425168, CR-428710, CR-430090, CR-430890, and CR-433688);
- Condition Reports for the Meteorological Monitoring Programs (CR-402526, CR-403205, CR-430796, CR-441881, and CR-443066); and

- Condition Report for the unrestricted release of material from the RCA (CR-418111).

b. Findings

No findings of significance were identified.

.4 Inservice Inspection Identification and Resolution Problems

a. Inspection Scope

The inspector reviewed a sample of corrective action reports shown in the attachment, which identified flaws discovered during this and the previous outage. The inspector verified that flaws identified during non-destructive testing were reported, characterized, evaluated and appropriately dispositioned and entered into the corrective action program.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153)

.1 (Closed) LER 50-387/2003-001-00 Unusual Event Declared after Alarm on Unit 1 Turbine Building Ventilation Monitoring System

On January 29, 2003, PPL declared an Unusual Event due to a high alarm on the Unit 1 turbine building vent radiation monitoring system. See Section 1R14.2 of this report for a detailed review of this event.

The inspector evaluated PPL's radiological assessment results to determine whether the results conservatively quantified the noble gas source term for the release. In addition, the inspector verified whether any radioiodine (e.g., I-131) was released. The NRC performed an independent projected dose assessment to the public, for comparison to PPL's results, using the NRC PCDose computer code. The inspector verified whether the projected doses to the public were below the ODCM limits. In specific, the inspector reviewed the following:

- Quantification techniques of the radioactive material released to the environment
- Analytical results of charcoal cartridges, particular filter, and noble gas samples
- Projected dose calculation results to the public

The LER was reviewed by the inspectors and no findings of significance were identified. This event was documented in condition report 448706. This LER is closed.

.2 (Closed) LER 50-387/2002-005-00 Dry Fuel Storage Canister Filled With Incorrect Gas due to Human Error

On July 26, 2002, PPL loaded a Dry Shielded Canister with 52 spent fuel bundles and incorrectly backfilled the canister with argon gas, rather than helium gas as required by the Certificate of Compliance for the NUHOMS-52B dry cask fuel storage system. On January 13, 2003, the NRC issued a Severity Level III Notice of Violation in accordance with NRC Enforcement Policy, NUREG 1600, Supplement VI, "Fuel Cycle and Materials Operations." In our letter transmitting the violation, we indicated that the staff accepted PPL's assessment of the causes for the violation, actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved. This violation was documented in NRC Inspection Report 50-387,388/2002-005, Section 4OA5. The LER was reviewed by the inspectors and no additional findings were noted. This issue was documented in condition report 415339. This LER is closed.

.3 (Closed) LER 50-387/2002-006-00 Unusual Event Declared Due to On-site Explosion on Startup Transformer ST-20

On October 3, 2002, the Unit 2 startup transformer (T-20) failed, which resulted in a loss of one of the two Technical Specification required off-site power sources for both Unit 1 and Unit 2. The Unit 2 reactor was manually shutdown due to the loss of both reactor recirculation pumps. The transformer explosion resulted in the declaration of an Unusual Event, the lowest of four emergency classifications.

The inspectors reviewed the operator actions, plant response, and plant procedures related to the T-20 transformer failure, manual reactor scram, and subsequent Unusual Event declaration. Our assessment was documented in NRC Inspection Report 50-387,388/2002-006, Section 1R14.2. The LER was reviewed by the inspectors and no additional findings were noted. This issue was documented in condition report 426075. This LER is closed.

.4 (Closed) LER 50-387/2002-007-00 Operations Prohibited by Technical Specifications due to Inoperable High Pressure Coolant Injection Check Valve

On September 3, 2002, the Unit 1 high pressure coolant injection (HPCI) system turbine exhaust check valve failed a local leak rate test (LLRT). The LLRT was conducted as part of an on-going investigation for suppression chamber air in-leakage. PPL determined that the check valve, a primary containment isolation valve (PCIV), had been inoperable for 135 days. An internal valve inspection identified tack weld failure of the soft seat retaining ring screws. PPL determined the apparent cause to have been tack weld failure due to steam flow induced vibration. PPL concluded that the weld failures had remained undetected over a several year period because periodic internal inspections were not considered necessary based on good LLRT historical performance. After the valve was repaired and returned to service, the suppression chamber air in-leakage appeared to stop. PPL's corrective actions included internal inspections on the Unit 2 HPCI turbine exhaust check

valve and the Unit 1 and 2 reactor core isolation cooling (RCIC) turbine exhaust check valves, and preventative maintenance tasks for periodic internal inspections. PPL entered this item into their corrective action program as condition reports 421255 and 421476.

This finding was more than minor because it affected the barrier integrity cornerstone objective, to provide reasonable assurance that physical design barriers provide protection against a radiological release. This finding had a direct relationship to the cornerstone's objective because the finding affected the cornerstone's barrier performance attribute, in that, if the redundant PCIV for the penetration did not close, then primary containment integrity would not be ensured. The finding was considered to have very low safety significance (Green) using the NRC's Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations because the finding did not represent an actual open pathway in the primary containment since the redundant isolation valve was not affected. This licensee identified finding involved a violation of Technical Specification 3.6.1.3, "Primary Containment Isolation Valves," and is described in Section O4A7. This LER is closed.

.5 (Closed) LER 50-388/2002-004-00 Unplanned RPS Actuation - Loss of Condenser Vacuum and Reactor Scram

On September 30, 2002, the Unit 2 offgas system tripped, during a maintenance activity. As a result, main condenser vacuum slowly decreased, followed by a main turbine trip and an automatic reactor scram. The inspectors' post-trip event review identified that the Unit 2 scram discharge volume vent and drain valves did not re-open as expected following the scram reset (see this report, section 4OA2.1). No other items of significance were identified. PPL entered this item into their corrective action program as condition reports 425608 and 427396. This LER is closed.

.6 (Closed) LER 50-388/2002-005-00 Operations Prohibited by Technical Specifications due to Inoperable Main Steam Isolation Valve

On October 7, 2002, PPL determined that the Unit 2 “B” inboard main steam isolation valve (MSIVs) closed in 1.92 seconds, faster than the Technical Specification (TS) limit of 3.0 seconds, as specified in TS 3.6.1.3, "Primary Containment Isolation Valves.” PPL determined that an oil leak on the valve control actuator resulted in the fast closure. After the leak was repaired, the “B” MSIV closed within the TS limit during the post maintenance test. No new findings were identified in the inspector’s review. This finding constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC’s Enforcement Manual. PPL entered this finding into their corrective action program as condition report 426803. This LER is closed.

.7 (Closed) LER 50-388/2002-006-00 Operations Prohibited by Technical Specifications due to Inoperable Reactor Core Isolation Cooling Check Valve

On October 30, 2002, the Unit 2 reactor core isolation cooling (RCIC) system turbine exhaust check valve failed a local leak rate test (LLRT). The LLRT was conducted as part of the follow-up corrective actions for the failure of a similar style check valve (see 4OA3.4 above). PPL determined that the check valve had been inoperable for 18 days. PPL determined the apparent cause to have been binding between the disk assembly and the guide ribs. The valve was reworked and returned to service. PPL's corrective actions included preventative maintenance tasks for periodic internal inspections. PPL entered this item into their corrective action program as condition report 430810.

This finding was more than minor because it affected the barrier integrity cornerstone objective, to provide reasonable assurance that physical design barriers provide protection against a radiological release. This finding had a direct relationship to the cornerstone's objective because the finding affected the cornerstone's barrier performance attribute, in that, if the redundant PCIV for the penetration did not close, then primary containment integrity would not be ensured. The finding was considered to have very low safety significance (Green) using the NRC's Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations because the finding did not represent an actual open pathway in the primary containment since the redundant isolation valve was not affected. This licensee identified finding involved a violation of Technical Specification 3.6.1.3, "Primary Containment Isolation Valves," and is described in Section O4A7. This LER is closed.

4OA6 Meetings

.1 Exit Meeting Summary

On April 11, 2003, the resident inspectors presented the inspection results to Mr. B. Shriver, Senior Vice President - Chief Nuclear Officer, and other members of your staff, who acknowledged the findings.

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

.2 Annual Assessment Meeting

On March 31, 2003 the NRC held a meeting the PPL, that was open for public observation, to discuss the results of the NRC’s assessment of PPL’s performance at Susquehanna Steam Electric Station for the period January 1, 2002 through December 31, 2002. The handouts from the meeting are available electronically from the NRC’s document system (ADAMS) under assession number ML030620094.

4OA7 Licensee Identified Violations

The following findings of very low safety significance (green) were identified by PPL and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as Non-cited Violations (NCVs).

.1 HPCI Turbine Exhaust Check Valve

Technical Specification 3.6.1.3, "Primary Containment Isolation Valves," required that a primary containment penetration be isolated within 4 hours, if the associated PCIV was not operable. Contrary to this, on September 3, 2002, PPL determined that a PCIV for the Unit 1 HPCI turbine exhaust had been inoperable for 135 days, and the penetration was not isolated. This was identified in PPL's corrective action program as CRs 421255 and 421476. This finding was only of very low safety significance because it did not represent an actual open pathway in the primary containment since the redundant isolation valve was not affected. (see Section 4OA3.4)

.2 RCIC Turbine Exhaust Check Valve

Technical Specification 3.6.1.3, "Primary Containment Isolation Valves," required that a primary containment penetration be isolated within 4 hours, if the associated PCIV was not operable. Contrary to this, on October 30, 2002, PPL determined that a PCIV for the Unit 2 RCIC turbine exhaust had been inoperable for 18 days, and the penetration was not isolated. This was identified in PPL's corrective action program as CR 430810. This finding was only of very low safety significance because it did not represent an actual open pathway in the primary containment since the redundant isolation valve was not affected. (see Section 4OA3.7)

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINT OF CONTACT

J. DeMarinis, Health Physicist, ALARA
J. Fritzen, Radiological Operations Supervisor - Technical
R. Hock, Radiological Technical Supervisor
J. Jessick, Health Physicist, Instruments
R. Kessler, Health Physicist, ALARA
K. Kiniry, Health Physics Technician
S. Laubach, Health Physics Technician
C. Madara, Health Physicist, ALARA
P. McLean, NP Services Chemical Decontamination Engineer
D. Miller, Chemist
D. Murphy, Health Physics Technician
T. Oldenhage, Chemical Decontamination Project Manager
R. Rodriguez-Gilroy, Health Physicist, ALARA
V. Schuman, Radiological Operations Supervisor
R. Smith, Radiation Protection Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

50-388/2003-002-01	NCV	Unit 2 Primary Containment Penetration Integrity (Section 1R15.2)
50-388/2003-002-02	NCV	Unit 2 Scram Discharge Volume Vent and Drain Valve Actuators Undersized (Section 4OA2.1)

Closed

50-387/2003-001-00	LER	Unusual Event Declared after Alarm on Unit 1 Turbine Building Ventilation Monitoring System (Section 4OA3.1)
50-387/2002-005-00	LER	Dry Fuel Storage Canister Filled With Incorrect Gas Due to Human Error (Section 4OA3.2)
50-387/2002-006-00	LER	Unusual Event Declared Due to Onsite Explosion on Startup Transformer ST-20 (Section 4OA3.3)

50-387/2002-007-00	LER	Operations Prohibited by Technical Specifications Due to Inoperable High Pressure Coolant Injection Check Valve (Section 4OA3.4)
50-388/2002-004-00	LER	Unplanned RPS Actuation - Loss of Condenser Vacuum and Reactor Scram (Section 4OA3.5)
50-388/2002-005-00	LER	Operations Prohibited by Technical Specifications Due to Inoperable Main Steam Isolation Valve (Section 4OA3.6)
50-388/2002-006-00	LER	Operations Prohibited by Technical Specifications Due to Inoperable Reactor Core Isolation Cooling Check Valve (Section 4OA3.7)

Discussed

None

LIST OF DOCUMENT REVIEWED

Not Referenced in the Report

Radiation work permit and ALARA pre-job reviews: 20032315, 22032309, 22032217, 22032353, 22032320, 20032342, 20032005
Condition reports: 445828, 431965, 436426, 443892, 449208, 445417

Radiograph Review

FW 5	Radiograph Butt Weld, 6 inch pipe to elbow, Head Spray

NDT Examination Reports

173800	Pipe to Elbow, 23-O-6, MT and UT
160950	Pipe to Pipe Bend, 10-O-30, UT and PT
158350	Pipe to Pipe Bend, 10-O-23, UT and PT
315670	Pipe to Tee, 23-2TE20-12, MT and UT Initial and after surface grinding
FW 36,38,39,40,41 42 and 49	Pipe to Pipe, Radiograph of 6 inch RWCW butt welds
MT-03-018	Flange to Vessel Head Weld, MT
UT-03-138	Flange to Vessel Head Weld, UT
UT-03-170	Pipe to Flued Head, 20 inch diameter, RHR FW 8, UT
PT-03-021	Pipe to Head Weld, 20 inch diameter, RHR FW 8, Liquid Penetrant
MT-03-046	Pipe to Pipe Butt Weld, RCIC FW 10, MT

NDT Examination Procedures

NDE-LP-001, R 0	Color Contrast Liquid Penetrant Examination
NDE-MT-001, R0	Wet and Dry MT Examination
NDE-UT-002, R2	Manual Ultrasonic Examination of Ferritic Welds
NDE-UT-001, R3	Manual Ultrasonic Examination of Austenitic Pipe Welds for IGSCC
NDE-RT-001, R0	Radiographic Specification for Examination of Welds

In Vessel Remote Visual Examination

VT-3	Visual Examination of Core Spray Spargers, Piping and Supports
VT-3	Steam Dryer Structural Welds and Lifting Lugs

Repair-Replacement Work Order

PCWO 282365	Replacement of Fuel Pool Cooling Pump Discharge Check Valve 2P211C

Flaw Evaluation

UT Report 621030	UT Examination Summary Sheet, N2B Nozzle to Vessel Weld, RPV Recirculation Inlet

Welding Procedure Specification

N-A-IA-MA-11 Gas Tungsten/Shielded Metal Arc of P1 to P1

Drawings/Isometrics

DBA-205-1	RCIC ISI Isometric-Reactor Building
DCA-208-1	RHR ISI Isometric-Reactor Building
DBA-202-2	HPCI ISI Isometric-Reactor Building

Action Request

AR 461408	Jet Pump Hold Down Beam UT Examination
AR 424126	Failure of Steam Dryer Cover Plate

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
ATWS	Anticipated Transient without Scram
CFR	Code of Federal Regulations
CR	Condition Report
CRD	Control Rod Drive
CRDM	Control Rod Drive Mechanism

CY	Calendar Year
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ESW	Emergency Service Water
FSAR	[SSES] Final Safety Analysis Report
FW	Field Weld
HPCI	High Pressure Coolant Injection
ICM	Interim Compensatory Measures
ISI	Inservice Inspection
IVVI	In-Vessel Visual Inspection
LCO	Limiting Condition for Operations
LER	Licensee Event Report
LLRT	Local Leak Rate Test
MSIV	Main Steam Isolation Valves
MT	Magnetic Particle
NCV	Non-cited Violation
NDE	Nondestructive Examination
NERO	emergency response organization
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PASS	Postaccident Sampling System
PCIV	Primary Containment Isolation Valve
PPL	PPL Susquehanna, LLC
PSID	Per Square Inch Differential
QA	Quality Assurance
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
REMP	Radiological Environmental Monitoring Program
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RPS	Reactor Protection System
SDHR	Supplemental Decay Heat Removal
SDP	Significant Determination Process
SDV	Scram Discharge Volume
SSC	Structure, System, or Component
SSES	Susquehanna Steam Electric Station
TB	Turbine Building
TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specifications
TRM	Technical Requirements Manual
TRO	Technical Requirements for Operations
TSC	Technical Support Center
UE	Unusual Event
US	Unit Supervisor
USNRC	United States Nuclear Regulatory Commission
UT	Ultrasonic Testing
WO	Work Order