July 30, 2009

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT MODIFICATIONS TEAM INSPECTION REPORT 05000387/2009006 AND 05000388/2009006

Dear Mr. Rausch:

On June 19, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Susquehanna Steam Electric Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on June 19, 2009, with Mr. Richard Pagodin and other members of your staff.

The 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. In conducting the inspection, the team reviewed selected procedures, calculations and records, observed activities, and interviewed station personnel.

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

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

Sincerely,

/RA/

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No: 50-387; 50-388
License No: NPF-14, NPF-22

Enclosure: Inspection Report 05000387/2009006 and 05000388/2009006
w/Attachment: Supplemental Information

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DATE	07/28/09		07/29/09		07/30/09			

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REGION I

Docket No:	50-387; 50-388
License No:	NPF-14, NPF-22
Report No:	05000387/2009006 and 05000388/2009006
Licensee:	PPL Susquehanna, LLC (PPL)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	June 1, 2009 through June 19, 2009
Inspectors:	Amar Patel, Hope Creek Resident Inspector, Division of Reactor Projects (DRP), Team Leader F. Arner, Senior Reactor Inspector, Division of Reactor Safety (DRS) M. Balazik, Reactor Inspector, DRS M. Orr, Reactor Inspector (in-training), DRS
Approved by:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000387/2009006 and 05000388/2009006; 06/01/2009 - 06/19/2009; Susquehanna Steam Electric Station, Units 1 and 2; Engineering Specialist Plant Modifications Inspection.

The report covers a two week inspection of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by one resident inspector, two region based engineering inspectors, and one inspector in-training. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Rev. 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IP 71111.17)

.1 Evaluations of Changes, Tests, or Experiments (26 samples)

a. Inspection Scope

The team reviewed seven safety evaluations to determine whether the changes to the facility or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), had been reviewed and documented in accordance with 10 CFR 50.59 requirements. In addition, the team evaluated whether Pennsylvania Power and Light (PPL) had been required to obtain NRC approval prior to implementing the change. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, technical specifications (TS), and plant drawings, to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, “Guidelines for 10 CFR 50.59 Evaluations,” as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed a sample of nineteen 10 CFR 50.59 screenings and applicability determinations for which PPL had concluded that no safety evaluation was required. These reviews were performed to assess whether PPL's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample of issues inspected that had been screened out by PPL included design changes, calculations, procedure changes, and setpoint changes.

The team reviewed all the safety evaluations PPL had performed during the time period covered by this inspection (i.e., since the last modifications inspection). The screenings and applicability determinations were selected based on the risk significance of the associated structures, systems, and components (SSCs).

In addition, the team compared PPL's administrative procedures, used to control the screening, preparation, review, and approval of safety evaluations, to the guidance in NEI 96-07 to determine whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations, screenings, and applicability determinations are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Permanent Plant Modifications (9 samples)

.2.1 Main Steam Isolation Valve High Flow Isolation Setpoint Change, Unit 2

a. Inspection Scope

The team reviewed a modification associated with the implementation of the extended power uprate (EPU) amendment at Susquehanna Unit 2. Specifically, the team reviewed the engineering change (EC) package that replaced the sixteen main steam line (MSL) flow indicating switches with switches that have a higher upper range capability and an increased high flow isolation setpoint consistent with approved EPU values. The EPU increased MSL flow which resulted in a proportionally higher differential pressure drop across the MSL flow elements. The team performed the review to verify that the design and licensing bases was not degraded by the modification, in particular, the capability to detect a break of the MSL and isolate the steamline consistent with accident analyses assumptions.

The team reviewed the bases for the calculation associated with the high steam flow setpoint and the testing associated with the modification to ensure they were consistent with the design inputs, licensing bases and design requirements. The team also reviewed the 10 CFR 50.59 screen associated with the modification as described in section 1R17.1 of this report. This review specifically focused on the adequacy of PPL's determination that there was no adverse affect on any accident analyses previously evaluated. The team performed a walkdown of the installed components to confirm the installation was in accordance with the design documentation and that the flow indication readings were within the normal expected bands identified in the operational channel check procedures. Additionally, the team performed interviews with PPL staff regarding the design, installation and testing of the new switches. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.2 High Pressure Coolant Injection (HPCI) System Acceptance Criteria for Gas Intrusion

a. Inspection Scope

The team reviewed the PPL analysis, EC-052-1056, that established the maximum acceptable volume of gas within the HPCI discharge piping which would not affect system operability. The calculation evaluated the potential for water hammer loads within the system given an assumed air void to ensure any potential waterhammer pressures would be below the maximum design pressure for HPCI system piping.

The team reviewed the design inputs and assumptions to determine whether conservative inputs were used to model the impact of a potential air void on system operation. This review included HPCI pump head versus flowrate for both the booster pump and main pump to ensure appropriate parameters were modeled in PPL's

analysis. The team also reviewed the actual HPCI system initiation data from a 2003 injection event which was used to establish pump startup time assumed in the analysis to evaluate the adequacy of the analysis. Additionally, the HPCI pump discharge check valve loss coefficient, calculated moment of inertia and assumed flow area were reviewed to ensure conservative inputs were used consistent with the actual valve characteristics in the field. The team reviewed the output of the analysis with respect to piping loads to ensure that peak loads were found to be within the system pipe loading operability criterion. The team reviewed applicable drawings to confirm assumptions within the analysis. Additionally, the team reviewed the peak water hammer pressures developed for the maximum acceptable gas void to ensure they remained below the maximum pressure for the HPCI system discharge piping during a system initiation. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.3 Diesel Generator Fuel Oil Storage Tanks A, B, C, D, and E Level Element Replacements

a. Inspection Scope

The team reviewed a modification that replaced the A, B, C, D and E emergency diesel generator (EDG) fuel oil storage tank level elements. The modification was implemented because the previous level elements were obsolete and needed replacement. The level element is designed to provide fuel oil storage tank level at the EDG local panels. The team performed this review to verify that the design bases, licensing bases and fuel oil storage tank level of the EDGs had not been degraded by the modification. Additionally, the 10 CFR 50.59 screen associated with this modification was reviewed as described in section 1R17.1 of this report.

The team assessed the modification to ensure it was consistent with assumptions in the design and licensing bases. The review included verifying drawings, calculations, calibration instrumentation sheets and calibration procedures were properly updated. Additionally, post-modification testing data was reviewed to verify the EDG fuel oil storage tank levels. The team performed a walkdown of the EDG panels that indicate fuel oil storage tank levels to assess operation of the level elements. Additionally, the team performed interviews with PPL staff regarding the design, installation and testing of the new level elements. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.4 EPU Upgrades for Electro-Hydraulic Control (EHC) System, Units 1 & 2

a. Inspection Scope

The team reviewed the design changes required for the EHC system as a result of the increased reactor power levels associated with the EPU implementation. The EHC system modifications, EC-618888 (Unit 1) and EC-674911 (Unit 2), required the power load unbalance logic and load set meter to be calibrated to the EPU load profile. In addition, the EPU resulted in a revised flow to lift characteristic for the turbine control valves and installation of a second set of steam line resonance compensator (SLRC) boards to attenuate any third harmonic steam line resonance frequency.

The team reviewed the design change package to verify that the modification was consistent with the plant design and licensing bases. The design changes were reviewed to ensure procedures were revised as appropriate to reflect the control system revisions. The completed Unit 1 EPU pressure regulator testing was reviewed to ensure post modification testing verified key design assumptions. The team also reviewed the acceptance criteria within the test procedure to ensure consistency with design requirements for system operation. Additionally, the team reviewed an EHC design analysis report for both Unit 1 and 2 to ensure key testing and control system changes identified had been appropriately evaluated. The team also reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.5 Increase of Reactor Feedpump Low Suction Pressure Alarm and Trip Setpoints, Unit 2

a. Inspection Scope

The team reviewed the design changes required for the reactor feedwater pump (RFP) low suction pressure switches as a result of the increased reactor power levels and flowrate associated with the EPU implementation. The modification, EC-674942, increased the setpoint for the switches that trip the pump on low suction pressure. The design change also increased the time delays between sequential RFP trips due to low suction pressure. These changes were required because net positive suction head (NPSH) calculations indicated that the previous setpoint was too low to assure adequate NPSH under all EPU operating conditions.

The team reviewed PPL's analyses associated with modeling the performance of the condensate and feedwater systems during a transient condition such as a trip of condensate pumps or a reactor feedpump. The team reviewed the proposed setpoint changes and time delay settings to verify adequate NPSH protection was provided by the revised settings. This review was performed to verify that the settings provided adequate protection for the pumps from cavitation and prevented tripping all three RFPs simultaneously. The team reviewed the associated 10 CFR 50.59 screen associated

with the modification as described in section 1R17.1 of this report, to ensure there was no adverse effect on any accident analysis. The team verified drawings and procedures had been updated with revised design information and that adequate post-modification testing had been performed. Additionally, the team performed a walkdown of the switches in the field to verify consistency with design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.6 Standby Liquid Control Modification for EPU, Unit 2

a. Inspection Scope

The team reviewed a modification that revised the analysis of the standby liquid control (SLC) boron enrichment associated with EPU on Unit 2. In 2007, PPL performed a modification to the SLC system for single pump operation and the use of enriched sodium pentaborate solution to support EPU. Specifically, the boron in the solution was enriched from 20% to a minimum of 88% to ensure suppression pool temperature was maintained below its design limit during an anticipated transient without scram (ATWS) and that the requirements of 10 CFR 50.62 were met. The modification also included the reduction in SLC flow rate from 82.4 gpm (two pumps operating) to 40.0 gpm (one pump operating) during normal system initiation and operation. The review was performed to verify that the design bases, licensing bases and performance capability of the SLC system had not been degraded by the modification.

The team reviewed the modification to ensure it was consistent with the design and licensing bases. The team reviewed calculations and other technical evaluations to assess whether the modification was consistent with assumptions in the design and licensing bases related to the operation of the SLC system. In particular, the team reviewed SLC tank high and low alarm setpoints, the low temperature alarm setpoints, the net positive suction head calculation for the SLC pumps, and the SLC accumulator settings to ensure design documents were revised to reflect the modification. Also, the team reviewed the post-modification testing to ensure the SLC system was operating correctly. In addition, the team observed performance of the quarterly SLC flow verification surveillance to verify test documentation has been updated and results reflected the design and licensing bases. The team verified that Technical Specifications (TS) and the Updated Final Safety Analysis Report (UFSAR) were properly updated with revised design information. Finally, the team conducted interviews with engineering staff and performed a system walkdown to determine if the SLC system would function in accordance with the design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.7 Installation of Manual Isolation Valves in Ultimate Heat Sink (UHS) Spray Pond Bypass Piping

a. Inspection Scope

The team reviewed a modification which installed a manual isolation valve in series with the motor operated isolation valves in each UHS spray pond network bypass piping line. The modification was implemented to account for the UHS higher heat load due to the EPU conditions that result in a higher maximum temperature for long term cooling requirements. The installed manual isolation valves provide isolation capability of the bypass piping in each spray pond network in the event of the failure of motor operated valves to ensure the design temperature of the spray pond is not exceeded during long term cooling. The team verified that the design bases, licensing bases and performance capability of the UHS had not been degraded by the modification. Additionally, the 10 CFR 50.59 screen associated with this modification was reviewed as described in section 1R17.1 of this report.

The team conducted this review to verify that the design bases, licensing bases and performance capability of the spray network had not been degraded by the modification. The team verified that drawings, calculations, and procedures were properly updated with revised design information and operating guidance. The team evaluated post-modification testing, which included leak rate testing and valve operation with the remote manual operator, to verify that the valve and spray network would successfully perform their functions. The team performed a walkdown of the readily accessible portions of the modification, including the storage area of the manual operator, to ensure the required time critical operator actions were reasonable and achievable. In addition, the team interviewed the design and system engineering staff to determine if the spray pond network would function in accordance with the design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.8 Timing Sequence Modification of the HPCI Suction Valves from the Suppression Pool and Condensate Storage Tank (CST), Unit 1

a. Inspection Scope

The team reviewed a modification that revised the sequence of operation of the HPCI suppression pool and condensate storage tank suction valves when low CST level is reached. Specifically, the modification changed the operation of the HPCI suction valves from series to parallel operation. The modification was implemented as a final corrective action to address a vortexing concern discovered in 2005 by decreasing the stroke time sequence of the HPCI suction valves during transfer to the suppression pool from the CST. The team performed this review to verify that the design bases, licensing bases and performance capability of the HPCI system had not been degraded by the modification.

The team assessed whether the modification was consistent with assumptions in the design and licensing bases. The team reviewed selected drawings, surveillance procedures, training plans, and the UFSAR to determine whether they were properly updated with revised design information. Additionally, post-modification test data was reviewed to verify proper sequencing and operation of the HPCI suction valves. The team confirmed that CST level remained above the vortex limit during the transfer process accounting for degraded voltage stroke time of the suction valves and that there was no impact on the HPCI pump net positive suction head (NPSH). Finally, the team conducted interviews with engineering staff to determine if the HPCI system would function in accordance with the design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.9 Calculation for CST Water Level for HPCI Suction Transfer, Units 1 and 2

a. Inspection Scope

The team reviewed calculation EC-052-1055 that developed and evaluated the initial CST level required to maintain adequate HPCI and RCIC pump suction conditions in the event of an automatic suction transfer from the CST to the suppression pool due to low CST level. The calculation was performed to support final corrective actions to address a HPCI vortexing concern in the CST that was discovered in 2005. The review was performed to verify that the design bases and performance capability of the HPCI and RCIC system had not been degraded by the conclusion of the calculation. The calculation concluded that a minimum CST transfer level of 40.5 inches would maintain adequate HPCI and RCIC pump suction conditions during suction transfer from the CST to the suppression pool.

The team assessed the validation method of vortex formation and vortex breaker data to ensure vortex formation did not occur in the CST during transfer. The team verified that the CST automatic transfer process setpoint (43.5 inches) was above the calculated level (40.5 inches) required to maintain adequate pump suction conditions. The team also verified that the calibration procedures were revised with the setpoint changes to ensure HPCI system operability. Design assumptions, methodologies, and inputs into the calculation were reviewed to evaluate whether they were technically appropriate, conservative, and consistent with the UFSAR. Specifically, the team ensured the suction valve stroke times were adjusted for degraded voltage conditions. Finally, the team discussed the calculation and design basis with reactor engineers to assess the adequacy and conclusion of the calculation. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team reviewed a sample of condition reports associated with 10 CFR 50.59 and plant modification issues to determine that PPL was appropriately identifying, characterizing, and correcting problems associated with these areas and whether the planned or completed corrective actions were appropriate. The condition reports reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

The team presented the inspection results to Mr. Richard Pagodin and other members of PPL's staff at an exit meeting on June 19, 2009. The team verified that this report does not contain proprietary information.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Pagodin	General Manager – Nuclear Engineering
W. Meltzer	Supervising Engineer
C. Hoffman	Acting Manger – Nuclear Regulator Affairs
J. Welch	Technology Specialist
P. Engel	Senior Engineer
M. Adelizzi	Senior Engineer
P. Brady	Supervising Engineer
R. Centenaro	Senior Engineer
M. Chaiko	Senior Staff Engineer/Scientist
D. Filchner	Senior Engineer
E. Heller	Unit Supervisor SSES off shift
T. Wales	Senior Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

10 CFR 50.59 Evaluations

SE 00002, Install NUMAC Power Range Neutron Monitor System and APRM RBM Technical Specifications (ARTS)/Maximum Extended Load Line Limit Analysis to Unit 2 Via DCP 660419, Rev. 0

SE 00005, Removal of Post Maintenance MSIV Leakage Rate Acceptance Criteria from TS Bases, Rev. 0

SE 00009, Change to FSAR Table 3.6-1 Note 1, Rev. 0

SE 00010, EC 978361-RHR Heat Exchanger Design Flow and Fouling Factor Reduction to Support EOP's, Rev. 0

E-01-29, LDCN 3912, LRW Demineralizer Effluent Conductivity, dated 7/26/2006

E-01-43, Cathodic Protection System to Provide Protection Against Corrosion to ESW/RHRESW Pipe Surface Left Exposed by Unrepaired Damaged Pipe Protective Wrapping, Rev. 0

E-01-45, Use of Refueling Platforms as Work Platforms with RMCS Refueling Interlocks Defeated, Rev. 0

10 CFR 50.59 Screened-out Evaluations

SD 00004, EPU Increase RFP Low Suction Pressure Alarm & Trip Setpoints, Rev. 0
SD 00006, EPU- Increase MSIV High Flow Isolation Setpoint and Switch Replacement Unit 2, Rev. 0
SD 00036, TRM Section 3.8.6, Emergency Switchgear Room Cooling Changes, Rev. 0
SD 00081, Diesel Fuel Oil System, Rev. 0
SD 00163, Clarification of TSB 3.1.7 for Units 1 and 2 due to SLC Submittal, Rev. 0
SD 00205, Replace Diesel Fuel Oil Tanks A/B/C/D/E Level Elements, Rev. 3
SD 00231, Response to Station Blackout, Rev. 0
SD 00238, Clarify Declaration of an Offsite Power Source Inoperable, Rev. 0
SD 00269, Upgrade Tech Spec Bases TS 3.7.1 for Correct Spray Pond Volume, Rev. 0
SD 00299, Operation of Both Loops of RHR in Drywell Sprays, Rev. 0
SD 00344, Provide Bases for Long Term Nitrogen Supply to ADS Surveillances 3.5.3.1 and 3.5.3.2, Rev. 0
SD 00517, Control of ECCS Room Floor Drains, Rev. 0
SD 00583, Disable SLC Tank Hi/Low Level Alarm Function from LISHL 14812, Rev. 0
SD 00597, Defining Core Spray Operating Limits for Emergency Conditions, Rev. 0
SD 01-2057, RHR Containment Cooling, Rev. 0
SD 01-2122, Operability Follow-up Request 668320 Compensatory Measures, Rev. 0
SD 01-2319, EPU Upgrades for EHC System Units 1 and 2, Rev. 0
SD 01-2375, Ultimate Heat Sink Modification, Rev. 1
SD 00425, Rev. to ES-1(2)34-001, Restoring Drywell Cooling with a LOCA Signal Present, Rev. 0

Completed Surveillance Tests

C5266-01, Standby Liquid Control Storage Tank Level Instrument Calibration, performed on 03/14/07
C5267-01, Standby Liquid Control Tank Temp Heater Control Instrument Calibration, performed on 03/29/07
C5268-01, Standby Liquid Control Tank HI/Low Temp Alarm Calibration, performed on 03/14/07
C7202-01, Standby Liquid Control Heat Trace Instrument Calibration, performed on 03/15/07
SE-152-001, 2-Year Functional Test, HPCI, performed on 08/28/08
SE-252-001, 2-Year Functional Test, HPCI, performed on 08/26/08
SE-259-046, LLRT of Containment Instrument Gas Penetration Number X-41 and Check Valve Operability Test, performed on 4/17/2009
SE-283-202, Main Steam Relief Valve (SRV) Accumulator Check Valve Exercise Test – Non ADS Valves, performed on 4/25/2009
SO-024-001B, Monthly Diesel Generator 'B' Operability Test, performed on 5/26/2009
SO-253-004, Quarterly SBLC Flow Verification, performed on 02/11/09
TP-054-100, DCP 686806 Post-Modification Testing, performed on 06/15/07
TP-193-041, EPU EHC Pressure Regulator, performed on 05/7/2008
TP-253-012, ECO 690270 (Unit 2 Boron Enrichment) Post-Modification Test, performed on 03/26/07

Modification Packages

EC-618888, Unit 1 EPU Upgrades for EHC System, Rev. 0
EC-674911, Unit 2 EPU Upgrades for EHC System, Rev. 0
EC-674914, EPU-Increase MSIV High Flow Isolation Setpoint & Switch Replacement-Unit 2, Rev. 0
EC-674942, Increase RFP Low Suction Pressure Alarm & Trip Setpoints, Rev. 0
EC-686806, Ultimate Heat Sink Modifications, Rev. 3
EC-690270, Standby Liquid Control Boron Enrichment Upgrade, Rev. 0
EC-823975, Change Unit 1 HPCI Automatic Suction Transfer Logic from CST to Suppression Pool, Rev. 0
EC-829274, Replace Diesel Fuel Oil Tank A, B, C, D, and E Level Elements, dated 6/30/2008
DCP-93-3070, HPCI Pump Suction Auto-Transfer to Suppression Pool Logic Elimination, Rev. 1
EC-052-1055, CST Water Level for HPCI Suction Transfer, Rev. 1
EC-052-1056, HPCI System Acceptance Criteria for Gas Intrusion, Rev. 0

Calculations & Analysis

3159-71(1)-2, Standby Liquid Control Pump NPSH Test Report, dated 07/15/71
EC-004-0535, Relay Setting Calculation for Core Spray Pumps, Rev. 0
EC-016-1002, Ultimate Heat Sink-Minimum Heat Transfer Design Basis Analysis, Rev. 14
EC-037-1001, HPCI and RCIC Automatic Suction Transfer Setpoint and Technical Specification Allowance, Rev. 3
EC-044-1019, Condensate/Feedwater Flow Analysis Model – Hydraulic Model Prepared to Evaluate Post-EPU Condensate/FW System Pressure and Flows, Rev. 0
EC-044-1032, Condensate Pump Trip Transient Analysis for EPU, Rev. 1
EC-045-0500, Determine the Setpoint for RFP Low Suction Pressure Trip to Protect RFPs From Cavitation during Low Suction Pressure Transients, Rev. 0
EC-051-0539, Study Regarding the Core Spray Pump NPSH Available with One or Two Pumps Operating at Runout Conditions, Rev. 3
EC-052-1018, Technical Basis Elimination of HPCI Auto Suction Transfer High Level, Rev. 3
EC-052-1023, Establishment of the HPCI Room EQ Conditions Under Loss of Barometric Condenser, Rev. 1
EC-052-1055, CST Water Level for HPCI Suction Transfer, Rev. 1
EC-053-0503, Standby Liquid Control System NPSH Determination, Rev. 3
EC-053-0505, Calculated Required Heater Output for New SBLC concentration, Rev. 1
EC-053-0509, Setpoint Calculation for LSHL-C41-2N600, Rev. 1
EC-053-0511, Setpoint Calculation for TSHL24810, Rev. 1
EC-053-0513, Setpoint Calculation for TSHL24810, TSHLC412N003, TICC412R002, Rev. 1
EC-053-0515, Setpoint Calculation for LISHL-24812, Rev. 2
EC-053-1001, Determination of Design Basis and Pressure Requirements for SLC Accumulators, Rev. 3
EC-083-0502, ADS Accumulator Sizing, Rev. 5
EC-083-0505, ADS Accumulator Minimum Pressure Requirement for One Actuation at Drywell Pressure of 48.6 psig, Rev. 1
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Drawings
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E106217, Sht. 2, Common P&ID RHR Service Water System, IDCN 14 & 15
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FF126510, Process Diagram Core Spray System, Rev. 4
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SO-100-008, Weekly Surveillance Operating Log, Rev. 23
SO-152-004, Quarterly HPCI Valve Exercising, Rev. 28
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DBD004, Design Basis Document for High Pressure Coolant Injection, Rev. 4
DBD042, Design Basis Document for Standby Liquid Control System, Rev. 3
EC-052-1018, Applicability Determination for Auto Suction Transfer Mod, Rev. 3
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PCAF 2008-4196, Procedure Change Process for 24 Month HPCI System and Logic functional Test, dated 08/19/08
PPL 50.59 Resource Manual, Rev. 4
TM-OP-052-ST, Systems Training Student Text High Pressure Coolant Injection System, Rev. 3
Unit 1- 15RIO Appendix J Leakage Summary
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Unit 2 -14RIO Appendix J Leakage Summary

LIST OF ACRONYMS

ADAMS	NRC Document System
ATWS	Anticipated Transient Without Scram
CFR	Code of Federal Regulations
COLR	Core Operating Limit Report
CST	Condensate Storage Tank
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EHC	Electro-Hydraulic Control
EPU	Extended Power Uprate
GPM	Gallons per Minute
HPCI	High Pressure Coolant Injection
NPSH	Net Positive Suction Head
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LOCA	Loss-of-Coolant Accident
MSL	Main Steamline
MSIV	Main Steam Isolation Valve
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PPL	Pennsylvania Power and Light
RCIC	Reactor Core Isolation Cooling
RTP	Rated Thermal Power
SLC	Standby Liquid Control
SSC	Structures, Systems and Components
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report