UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., Suite 100
KING OF PRUSSIA, PA 19406-2713

November 7, 2017

Mr. Timothy S. Rausch
President and Chief Nuclear Officer
Susquehanna Nuclear, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – INTEGRATED INSPECTION REPORT 05000387/2017003 AND 05000388/2017003

Dear Mr. Rausch:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station (SSES), Units 1 and 2. On October 13, 2017, the NRC inspectors discussed the results of this inspection with Brad Berryman, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. One of these findings involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Susquehanna. In addition, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator, Region I, and the NRC Resident Inspector at Susquehanna.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and the NRC's Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-387 and 50-388
License Nos. NPF-14 and NPF-22

Enclosure:
Inspection Report 05000387/2017003 and 05000388/2017003
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REGION I

Docket Nos.:	50-387 and 50-388
License Nos.:	NPF-14 and NPF-22
Report No.:	05000387/2017003 and 05000388/2017003
Licensee:	Susquehanna Nuclear, LLC (Susquehanna)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	July 1, 2017 through September 30, 2017
Inspectors:	L. Micewski, Senior Resident Inspector T. Daun, Resident Inspector P. Ott, Operations Engineer
Approved By:	Daniel L. Schroeder, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

IR 05000387/2017003 and 05000388/2017003; July 1, 2017 through September 30, 2017; Susquehanna Steam Electric Station Units 1 and 2; Operability Determinations and Functionality Assessments and Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified one non-cited violation (NCV) and one finding (FIN), both of which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Initiating Events

- Green. The inspectors identified a self-revealing finding of very low safety significance (Green) because Susquehanna did not ensure that a work package was prepared to the detail necessary based on task difficulty in accordance with administrative procedure, NDAP-QA-0502, Revision 51. Specifically, on June 8, 2017, maintenance workers inadvertently shorted the Unit 1 main electro-hydraulic control (EHC) logic power supply to ground while working in a cabinet with little space to manipulate tools, resulting in a reactor scram.

  This finding is more than minor because it is associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, Susquehanna did not ensure measures were in place to prevent an adverse impact on the EHC control system during power supply voltage adjustment. This resulted in a rapid rise in reactor pressure and neutron flux, and subsequent automatic reactor scram. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated October 7, 2016, and Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because while the performance deficiency caused a reactor scram, it did not result in the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because the station failed to recognize and plan for the possibility of mistakes and inherent risk even while expecting successful outcomes. Specifically, individuals at various organizational levels did not ensure measures were in place to prepare maintenance technicians to perform a task on the EHC system that involved manipulating tools in a small space with tight clearances. [H.12] (Section 4OA3)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a finding of very low safety significance (Green), an associated NCV of 10CFR50 Appendix B, Criterion III, "Design Control," and a resultant violation of technical specification (TS) 3.6.1.3, Primary Containment Isolation Valves (PCIVs), when the reactor building closed cooling water (RBCCW) outboard isolation supply valve, HV21314, was found with a pull apart terminal block unseated within the motor control center (MCC), resulting in the loss of function for the valve to close given an initiation signal. Based on questions from inspectors, it was discovered that the terminal block was not installed in accordance with its dynamic qualification report. Immediate corrective actions included correctly seating the terminal block and performing an engineering evaluation to validate that the configuration conformed to the dynamic qualification report.

  The finding was more than minor because it was associated with the design control attribute of the reactor safety – barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the RBCCW outboard PCIV was inoperable for more than four years. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibit 3 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, inspectors determined the significance to be of very low safety significance (Green) since the finding did not represent an actual open pathway in the containment isolation system and was not associated with hydrogen recombiners. The finding had a cross-cutting aspect in the area of Human Performance, Documentation, because Susquehanna did not maintain complete, accurate, and up-to-date documentation. Specifically, Susquehanna was not able to make a clear determination of the acceptability of the as-left configuration of the terminal block until the issue was discussed with the vendor to determine that the configuration was not in accordance with the dynamic qualification of the 480VAC MCC buckets. [H.7]
  (Section 1R15)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On August 11, 2017, operators reduced power to approximately 63 percent to perform a rod sequence exchange. Operators returned the unit to 100 percent on August 13, 2017. On September 8, 2017, operators reduced power to 75 percent to perform a rod pattern adjustment. Operators returned the unit to 100 percent on September 9, 2017. On September 11, 2017, a reactor recirculation pump tripped, and the ensuing plant transient resulted in a power reduction to 27 percent. Following troubleshooting and a modification to the recirculation pump electrical protection relay, operators returned the unit to 100 percent power on September 15, 2017. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period during a planned transient in which operators reduced power to approximately 61 percent to perform a rod sequence exchange and conduct condenser water box cleaning. Operators returned the unit to 100 percent power on July 3, 2017. On September 22, 2017, operators reduced power to approximately 69 percent to perform a rod sequence exchange. Operators returned the unit to 100 percent power on September 24, 2017, and remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2, division 1 residual heat removal swing bus while division 2 was out of service for maintenance on July 31, 2017
- Unit Common, ‘E’ emergency diesel generator (EDG) while substituted for ‘B’ EDG during overhaul of ‘B’ EDG on August 11, 2017
- Unit 2, division 2 core spray during division 1 maintenance on September 6, 2017
- Unit Common, ‘B’ loop emergency service water (ESW) while ‘A’ Loop ESW out of service during replacement of Agastat timers on September 19, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), TSs, work orders, condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system’s performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies.

The inspectors also reviewed whether Susquehanna staff had properly identified equipment issues and entered them into the corrective action program (CAP) for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

From the period of September 14, 2017, through September 22, 2017 the inspectors performed a complete system walkdown of accessible portions of the Unit 1 and Unit 2 125VDC and 250VDC systems to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. For identified degradation the inspectors confirmed the degradation was appropriately managed by the applicable aging management program. Additionally, the inspectors reviewed a sample of related CRs and work orders to ensure Susquehanna appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Susquehanna controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit Common, lower cable spreading rooms (fire zones 0-25E and 0-25A) on August 7, 2017
- Unit Common, ‘E’ EDG building (fire zone 0-41E) on August 11, 2017

- Unit 2, 4.16 kV switchgear rooms (fire zones 2-4C and 2-4D) on September 6, 2017
- Unit 2, standby liquid control system area (fire zone 2-5A-N) on September 20, 2017
- Unit 2, 'B' core spray pump room (fire zone 2-1A) on September 26, 2017

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the Unit 1, reactor building elevation 683' on July 27, 2017. The inspectors verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. The inspectors assessed the adequacy of operator actions that Susquehanna had identified as necessary to cope with flooding in this area and also reviewed the CAP to determine if Susquehanna was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 'B' EDG lubrication oil cooler heat exchanger readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Susquehanna's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors reviewed the results of the 'B' EDG lubrication oil cooler heat exchanger inspection. The inspectors reviewed operational data of heat exchanger performance prior to the inspection and observed performance following cleaning activities. The inspectors reviewed pictures of the as-found and as-left conditions. The inspectors verified that Susquehanna initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 1, 2017, which included seismic events that resulted in a loss of offsite power, a loss of coolant accident, and the failure of select components to automatically start as required. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

On September 11, 2017 the inspectors observed the control room operators respond to a trip of the Unit 1 ‘A’ reactor recirculation pump (RRP). The inspectors observed the reactivity control briefing to verify that it met the criteria specified in OP-AD-002, “Standards for Shift Operations,” Revision 63, OP-AD-300, “Administration of Operations,” Revision 20, and OP-AD-338, “Reactivity Manipulations Standards and Communication Requirements,” Revision 31. The inspectors observed the crew following the RRP trip to verify that procedure use, crew communications, control board component manipulations, and coordination of activities in the control room met established standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)

a. Inspection Scope

The inspectors reviewed the sample listed below to assess the effectiveness of maintenance activities on structure, system, and component performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Susquehanna was identifying and properly evaluating performance problems within the scope of the maintenance rule. The inspectors verified that the structure, system, or component was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified

that the (a)(2) performance criteria established by Susquehanna staff was reasonable. As applicable, for structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components to (a)(2). Additionally, the inspectors ensured that Susquehanna staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Unit Common, control rod drive system on September 15, 2017

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Susquehanna performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Susquehanna personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Susquehanna performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 1, station risk during 'D' EDG integrated surveillance with 'A' control rod drive pump non-functional, blue max diesel generator non-functional, and 1B reactor building chiller non-functional on July 10, 2017
- Unit 1, yellow risk during calibration of drywell pressure instruments on July 25, 2017
- Unit 1, station risk during activities involving 'B' EDG testing and repairs on August 24, 2017
- Unit 2, station risk during work on division 2 core spray pump room coolers and calibration of reactor vessel water level instrumentation on September 6, 2017
- Unit 1, emergent work control associated with 'A' RRP trip on September 11, 2017
- Unit Common, yellow risk during ESW maintenance on September 19, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Unit Common, 'D' EDG shaft driven fuel oil pump leak on July 12, 2017
- Unit 2, loss of indication for primary containment isolation valve HV21314 on July 19, 2017
- Unit Common, corrosion of ESW piping supports on September 8, 2017

The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Susquehanna's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds, the inspectors determined whether the measures in place would function, as intended, and were properly controlled by Susquehanna.

b. Findings

Introduction. Inspectors identified a finding of very low safety significance (Green), an associated NCV of 10CFR50 Appendix B, Criterion III, "Design Control," and a resultant violation of TS 3.6.1.3, PCIVs, when the RBCCW outboard (OB) isolation supply valve, HV21314, was found with a pull apart terminal block unseated within the MCC, resulting in the loss of function for the valve to close given an initiation signal. Based on questions from inspectors, it was discovered that the terminal block was not installed in accordance with its dynamic qualification report.

Description. PCIVs are designed to isolate the primary containment automatically within a specific time limit to ensure that the release of radioactive material to the environment will be consistent with the assumptions used in the analysis for a design basis accident. The RBCCW system has two lines that penetrate the primary containment from the reactor building, a supply and a return line. Each RBCCW line is designed with two PCIVs in series to ensure that no credible single failure can result in the loss of isolation capability.

On July 19, 2017, the reactor operator noticed that the common open indication for the two OB RBCCW PCIVs was extinguished. The reactor operator changed the bulb with a known good bulb and had the field operator verify the local position indication as well as the breaker. The field operator found normal indication for OB RBCCW return, HV21313, but no indication for HV21314. HV21314 was verified open locally and the breaker (2B236092) for the motor operator was verified closed. This was documented in CR-2017-13441.

Operations requested maintenance to investigate the loss of valve position indication. Upon maintenance investigation of the breaker, the top terminal block was found loose and easy to remove. Post event investigation by the station determined that HV21314 would not have closed if called upon from July 16, 2017 until corrected on July 19, 2017. The decision was made to snap the block back into place and re-tighten the mounting screws to a value of "hand tight plus an additional quarter of a turn." NRC inspectors questioned the seismic qualification of the terminal block as well as the torque requirements for the mounting screws. The station determined that no torque requirement existed for mounting screws and that "hand tight plus an additional quarter of a turn" was the appropriate configuration for the terminal block hardware. The breaker was closed and the proper position indication for HV21314 was restored in the control room and at the local panel.

Upon investigation by the resident inspectors, it was discovered that the torque specification for the mounting hardware for the terminal block was contained within a vendor-specified drawing (FF62160/628) as well as Susquehanna's implementing procedures for the installation of 480VAC MCC cubicles (MT-GE-051). On July 19, 2017, NRC inspectors again questioned the station on the seismic qualification of the current configuration of the terminal block and whether it conformed to the seismic qualification test report for the 480VAC MCC cubicles. This was documented in CR-2017-13502. On July 20, 2017, engineering staff initiated CR-2017-13559 after discussion with the vendor to document that the terminal block screws were not torqued in accordance with their dynamic qualification report.

A prompt operability determination was initiated and ultimately determined that "hand tight plus an additional quarter of a turn" exceeded the minimum torque requirements of the vendor test record. The station also initiated an evaluation under CR-2017-13559 and subsequently determined that when the MCC bucket was installed in 2013 under work order 1297248, the terminal block was not properly seated at that time. While torque data was provided in the work package, no clear guidance was provided to ensure the terminal block was seated properly or to specifically direct the mounting hardware to be torqued in accordance with the vendor specifications. Unit 2 was not in a mode of applicability for the PCIV to be operable until start-up following the refueling outage on May 28, 2013 when Unit 2 was transitioned from Mode 4 to Mode 2.

Corrective actions included performing an engineering analysis to qualify the current configuration of the terminal block and training all the electricians on the required configuration of the terminal block as directed by the vendor drawing. Long-term corrective actions include a revision to the implementing procedures for MCC buckets to ensure terminal blocks are properly seated during maintenance.

Analysis. Inspectors determined that not installing the terminal block in accordance with the configuration specified in the dynamic qualification test report was a performance deficiency. Specifically, in April 2013, guidance was not provided in the work package when replacing 2B236092 480VAC MCC breaker bucket to ensure that the terminal block was properly installed in the dynamically-qualified configuration. Inspectors determined that this performance deficiency was within Susquehanna's ability to foresee and correct and should have been prevented.

Inspectors determined that the finding was more than minor because it was associated with the design control attribute of the reactor safety – barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that

physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the RBCCW OB PCIV was not properly installed in the dynamically-qualified configuration, and was therefore inoperable, for more than four years. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibit 3 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, inspectors determined the significance to be of very low safety significance (Green) since the finding did not represent an actual open pathway in the containment isolation system and was not associated with hydrogen recombiners.

The finding had a cross-cutting aspect in the area of Human Performance, Documentation, because Susquehanna did not maintain complete, accurate, and up-to-date documentation. Specifically, Susquehanna was not able to make a clear determination of the acceptability of the as-left configuration of the terminal block until the issue was discussed with the vendor to determine that the configuration was not in accordance with the dynamic qualification of the 480VAC MCC buckets (H.7).

Enforcement. 10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that "measures be established to assure that regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, measures were not correctly translated into procedures and instructions for 480VAC MCC buckets to ensure they maintained their seismic design requirements as determined by their dynamic qualification test report. This also resulted in a violation of TS 3.6.1.3 for the RBCCW OB supply PCIV, HV21314, which was inoperable from May 28, 2013 through July 19, 2017 which exceeded the allowed outage time for HV21314 of four hours to close the RBCCW inboard supply PCIV, HV21346 or shutdown to Mode 4 within 40 hours. Because this violation was of very low safety significance (Green), and Susquehanna has entered this performance deficiency into the CAP as CR-2017-13441, CR-2017-13502, CR-2017-13559, and CR-2017-16676, the NRC is treating this as a NCV in accordance with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387 and 388/2017003-01; RBCCW PCIV Design Control Issue)**

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Unit 1, design change to bypass the differential overcurrent (K15A) relay on the 'A' RRP on September 14, 2017

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors evaluated a replacement of the load center 2X210 transformer implemented by engineering change package 186356, "2X210 ESS Load Center Transformer Replacement." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including dynamic and environmental qualifications.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 2, HV21314 following terminal block repairs on July 19, 2017
- Unit Common, 'A' standby gas treatment following deluge system test on August 10, 2017
- Unit Common, 'B' EDG following 5 year overhaul on August 25, 2017
- Unit Common, division 2 standby gas treatment fan flow controller FIC-07551B following corrective maintenance on August 29, 2017
- Unit 1, 'A' core spray/low-pressure coolant injection following replacement of low pressure permissive Barton instrument on September 6, 2017
- Unit 1, restart of 'A' RRP following trip and jumpering of K15A relay on September 14, 2017
- Unit Common, 'C' ESW following Agastat relay replacement on September 19, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 3 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied TSs, the UFSAR, and Susquehanna procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Unit Common, comprehensive ESW flow verification, 'B' loop on August 16, 2017 (In-service test)
- Unit Common, 24 month control structure ventilation system operability test, Division 2 on August 28, 2017
- Unit 1, high-pressure coolant injection comprehensive flow surveillance on August 30, 2017 (in-service test)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine Susquehanna emergency drill on August 1, 2017 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Susquehanna staff in order to evaluate Susquehanna's critique and to verify whether the Susquehanna staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Susquehanna's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of July 1, 2016, through June 30, 2017. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Susquehanna's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, CRs, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (6 samples)

a. Inspection Scope

The inspectors reviewed Susquehanna's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2016, through June 30, 2017:

- Unit 1 Emergency AC Power System
- Unit 2 Emergency AC Power System
- Unit 1 High Pressure Injection System
- Unit 2 High Pressure Injection System
- Unit 1 Heat Removal System
- Unit 2 Heat Removal System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Susquehanna's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (PI&R) (71152 – 1 sample)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Susquehanna entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and nonconformances, Susquehanna performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Annual Sample: Follow Up on an Observation Identified in Last Year's Biennial PI&R Inspection Report Regarding Simulator Fidelity Issues Not Appropriately Classified as Condition Reports

a. Inspection Scope

The inspectors performed an in-depth review of Susquehanna's corrective actions associated with an observation that some simulator fidelity issues were not being appropriately classified as CRs. The biennial PI&R inspection team noted a number of simulator modeling differences from actual plant response identified during post transient reviews of plant events were not documented as CRs, as required by station procedures. The team had identified six specific simulator action requests (ARs) or computer system problem reports that also required classification as a CR in accordance with TQ-301, "Simulator Configuration Management." Susquehanna documented the team's observations in CR-2016-16801.

The inspectors assessed Susquehanna's response to CR-2016-16801, reviewed all outstanding simulator ARs/computer system problem reports from a simulator fidelity and operator training perspective, reviewed simulator testing, interviewed licensed operators and training staff, and reviewed all CRs written by the operations training department since August 2013.

This follow-up review focused on performance attributes associated with both PI&R and simulator fidelity, specifically whether Susquehanna was effectively identifying and correcting simulator deficiencies, and if permanent corrective actions required significant time to implement, whether the need for compensatory actions was evaluated. To perform this review, the inspectors reviewed 82 simulator deficiency ARs that had been placed on hold awaiting completion of the Simulator Software Replacement Project. The inspectors selected 15 to review in more depth to ensure these did not result in negative operator training.

b. Findings and Observations

No findings were identified.

The inspectors determined that Susquehanna effectively identifies simulator deficiencies and prioritizes them in accordance with their procedures. The inspectors also determined, based on interviews with licensed operators, training observations, and a detailed review of a sample of 15 simulator ARs, that simulator fidelity is being met and operators are being trained effectively.

However, the inspectors did find that Susquehanna's initial assessment and response to the biennial PI&R inspection team's observations was very limited and was a missed opportunity to better understand the backlog of simulator ARs that were on hold awaiting completion of the Simulator Software Replacement Project. Susquehanna had been relying on the completion of the software upgrade to fix a large number of simulator deficiencies, but the project continued to experience delays. The originally scheduled completion date was December 2015, but as of August 2017, the project had still not been completed and the backlog contained 82 ARs targeted to be fixed by the software upgrade project. The completed CR focused only on the six ARs specifically identified by the NRC, and missed an opportunity to recognize the project delays and perform a review of the backlog to determine whether any interim compensatory actions should be taken. In August 2017, Susquehanna completed a focused area self-assessment that identified the scope of the current simulator deficiencies and initiated some corrective actions. These included a review and re-prioritization of the backlog to initiate action to fix some of the deficiencies that have been on hold and was documented in CR-2017-14370.

During the inspectors' review of Susquehanna's original response to CR-2016-16801, the inspectors noted that training needs assessments had not been completed for all the identified deficiencies in the backlog. Susquehanna's procedure TQ-301, "Simulator Configuration Management," states, in part, "A training needs assessment shall be performed for each identified deviation or noticeable difference." Of these 82 ARs, only 10 had a documented training needs assessments completed. Of a total of 10 training needs assessments completed, six of them were completed because of the PI&R team's observation in July 2016. Susquehanna has written CR-2017-15550 to document this observation. Although the inspectors' independent detailed review of 15 simulator ARs did not find any that had the potential to cause negative operator training, a training needs assessment would document that and also assist the Simulator Oversight Committee in prioritizing open simulator ARs.

In conclusion, the inspectors' review of outstanding simulator ARs did not identify any issues that were adversely impacting the ability to train operators and determined the simulator met 10CFR50.46 requirements. The inspectors concluded that adequate progress is being made to complete the Simulator Software Replacement Project and that the most recent focused area self-assessment actions should ensure continued compliance with 10CFR50.46. With respect to PI&R, the inspectors reviewed 325 CRs generated from the operations training department since August 2013 and found that 52 were related to the simulator. Based on this review, and on the latest written guidance in TQ-301, Susquehanna is generating CRs related to simulator issues at the appropriate level.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 7 samples)

.1 LERs associated with automatic reactor protection system trip

a. Inspection Scope

(Closed) LER 05000387; 388/2017-05-00 and 05000387/2017-005-01: Automatic Reactor Protection System Trip on High Neutron Flux

On June 8, 2017, the Unit 1 reactor automatically scrammed due to a loss of Main Turbine - EHC logic power, which caused a high neutron flux and subsequent reactor protection system trip. The loss of EHC logic power occurred when a technician inadvertently contacted a grounding screw with a test lead that was still in contact with the power supply, shorting it to ground.

The event was reported in accordance with 10CFR 50.72(b)(2) and (b)(3) in event notification 52795. Corrective action was taken to validate that the electrical transient did not damage the EHC logic, and to revise the integrated risk management procedure. The inspectors reviewed the event for accuracy, the appropriateness of corrective actions, violations of requirements, and potential generic issues. These LERs are closed.

b. Findings

Introduction. The inspectors identified a self-revealing Green finding (FIN) for Susquehanna's failure to ensure a work package was prepared to the detail necessary based on task difficulty as required by NDAP-QA-0502, "Work Order Process," Revision 51. Specifically, on June 8, 2017, maintenance workers inadvertently shorted the Unit 1 main EHC logic power supply to ground while working in a cabinet with little space to manipulate tools, resulting in a reactor scram.

Description. The EHC system functions to control and protect the main turbine during plant startup, power operation, and plant shutdown. Hydraulic fluid is used to regulate the position of main turbine stop valves, control valves, and bypass valves during normal operation, and also causes rapid closure of these valves under abnormal or emergency conditions. A logic control portion of the system provides commands to the hydraulic portion of the system, which repositions the turbine valves by either passing or blocking the hydraulic fluid, as necessary. Under normal operation, EHC logic control maintains the speed of the main turbine, and prevents overspeed, by comparing desired speed with a reference speed circuit. The logic control can also quickly shut off steam to the turbine under emergency conditions when it senses abnormal operating parameters.

On June 8, 2017, technicians were restoring from a maintenance activity to adjust the 30 VDC power supply voltage to the EHC logic control. While removing a test lead, a tool inadvertently contacted a grounding screw that is located approximately one quarter inch from the test connection lug. This resulted in a minor arc flash as the 30 VDC shorted to ground, and the EHC system circuitry saw a voltage change toward 0 VDC. The voltage transient resulted in temporary saturation of the pressure regulator output and caused the turbine bypass valve fast open logic to actuate, as well as closure of the turbine control valves. Once the control valves closed beyond the capacity of the bypass valves, reactor pressure increased.

This pressure transient caused reactor power to increase and resulted in the reactor protection system inserting an automatic scram due to high neutron flux. This was the expected reactor protection system response.

The preplanned EHC work involved manipulating tools in a small space inside the cabinet, which had tight clearances. Station procedure NDAP-QA-0502 states, in part, "Work packages shall be prepared to detail necessary to perform work activities based on task difficulty and worker familiarity," however the package prepared for the work did not provide sufficient detail to allow the technicians to adequately prepare for the work, including guidance on selection of tools, layout inside the cabinet, or appropriate electrical component protection or insulation.

Analysis. The inspectors determined that the failure to ensure work packages were prepared to the detail necessary to perform work activities based on task difficulty in accordance with NDAP-QA-0502 was a performance deficiency that was reasonably within Susquehanna's ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, Susquehanna did not ensure measures were in place to prevent an adverse impact on the EHC control system during power supply voltage adjustment. This resulted in an unintentional ground which caused a rapid rise in reactor pressure and neutron flux, and subsequent automatic reactor scram. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated October 7, 2016, and Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because while the performance deficiency caused a reactor scram, it did not result in the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

The finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because the station failed to recognize and plan for the possibility of mistakes and inherent risk even while expecting successful outcomes. Specifically, multiple individuals at various organizational levels did not ensure measures were in place to prepare maintenance technicians to perform a task on the EHC system that involved manipulating tools in a small space with tight clearances [H.12].

Enforcement. This finding occurred because Susquehanna did not ensure that a work package was prepared to the detail necessary based on task difficulty in accordance with administrative procedure, NDAP-QA-0502, Revision 51. Specifically, the inspectors determined that Susquehanna did not ensure the tight clearances inside a Main Turbine Electro-Hydraulic Control cabinet were adequately identified and planned for prior to releasing the work package. This resulted in an inadvertent shorting of the EHC power supply to ground and a subsequent Unit 1 reactor scram. Because procedure NDAP-QA-0502 is not required by Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, and the work being performed was not on a safety-related system, this finding does not involve enforcement action because no violation of a regulatory requirement was identified. The issue was entered into Susquehanna's CAP as CRs 2017-11564 and 2017-11607. Because this finding does not involve a violation and is of very low safety or security significance, it is identified as a FIN. **(FIN 05000387/2017003-01, Failure to Prepare Work Packages with Necessary Detail Results in Automatic Reactor Scram**).

.2 (Closed) LER 05000387/2016-011-00 and 05000387/2016-011-01: Primary Containment Isolation Valve Failures Due to Mechanical Binding

On March 17 and 19, 2016, two safety-related check valves would not properly close during surveillance testing. After investigation, the direct cause of the event was determined to be interference between the hinge arm and internal seat ring that was preventing the valves from closing. The apparent cause of this event was determined to be a material deficiency introduced at the time of manufacture. A causal factor of less than adequate receipt inspection was identified. Completed corrective actions included rework of the valves. An extent of condition evaluation determined the equivalent valves on Unit 2 were not affected. The enforcement aspects of these LERs are discussed in section 1R12 of inspection report 05000387/2016002 and 05000388/2016002 (ML16225A000). The inspectors reviewed these LERs, Susquehanna's evaluation and associated corrective actions, and did not identify any additional issues. These LERs are closed.

.3 (Closed) LER 05000388/2016-004-00 and 05000388/2016-004-01: Unit 2 Experienced an Electrical Transient Resulting in a Manual Scram

On May 12, 2016, Unit 2 experienced an electrical transient resulting in a loss of 2B246 Reactor Building Engineered Safeguard System Division 480 volt MCC and 2Y246 208/120 Volt Alternate Current Instrument Panel. With the loss of the Reactor Building Engineered Safeguard System Division 480 volt MCC, several drywell cooling fans were lost leading to an increase in drywell pressure. Unit 2 was manually scrammed and all rods inserted as expected. Reactor water level lowered to -27 inches and was immediately restored by normal feedwater level control. Level 3 (+13 inch) primary containment isolation system isolations occurred, along with an initiation of the reactor core isolation cooling system. The direct cause of the transient was found to be a phase to ground short between a cable and a protruding screw in MCC bucket 2B246091, Drywell Area Unit Cooler 2V411B Breaker. The apparent cause is that the vendor did not comply with Specification E1116, Revision 3 for this order of buckets. Immediate corrective actions included the repair of 2B246, which has been completed. A review of a sampling of 480 VAC MCC breaker buckets from various purchase orders were inspected to determine the extent of condition. The extent of condition was used to identify the purchase orders affected, and repairs were completed on these MCC buckets that did not comply with the specification.

The enforcement aspects of these LERs are discussed in sections 4OA2.1.c(3) and 4OA2.1.c(4) of inspection report 05000387/2016008 and 05000388/2016008 (ML16246A291) and 4OA3.1.b of inspection report 05000387/2016002 and 05000388/2016002 (ML16225A000). The LERs were reviewed for accuracy, the appropriateness of corrective actions, historical equipment operating experience, violations of requirements, and generic issues. No additional findings were identified. These LERs are closed.

.4 (Closed) LER 05000388/2017-008-00: Primary Containment Isolation Valve Failure Due to Loose Terminal Block

a. Inspection Scope

On July 19, 2017, while performing a control room panel walk down, Operations observed indication for PCIV HV21313 and HV21314 extinguished. Investigation of the condition concluded that the isolation circuit for HV21314 was affected and the valve would not close if called upon to do so. The investigation identified a loose terminal block. The block was securely snapped back into the seat and the mounting screw was tightened. The enforcement aspects of this LER are discussed in section 1R15 of this inspection report. The LER was reviewed for accuracy, the appropriateness of corrective actions, historical equipment operating experience, violations of requirements, and generic issues. This LER is closed based upon the enforcement aspects contained in section 1R15 of this inspection report and the following minor violation.

b. Findings and Observations

Inspectors identified a minor violation of 10 CFR 50.73 (a)(2)(i)(B) for Susquehanna staff not submitting an accurate approximate time of occurrence for a condition prohibited by TSs as required by 10 CFR 50.73 (b)(2)(i)(C) in LER 388/2017-008. Specifically, Susquehanna reported that the condition existed from July 16, 2017 through July 19, 2017 but inspectors assessed that Susquehanna first entered a mode of applicability on May 28, 2013 and thus the PCIV was not installed in the dynamically-qualified configuration, and was therefore inoperable, from May 28, 2013 through July 19, 2017 as described in section 1R15 of this inspection report.

This issue was screened as a minor traditional enforcement violation in accordance with section 6.9.d of the Enforcement policy since inspectors determined that while the period of inoperability for the PCIV was not accurately reported, the increased period of inoperability would not increase the inspection scope of a regularly scheduled inspection. The failure to comply with 10 CFR 50.73 (a)(2)(i)(B) constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. Susquehanna has entered this into their CAP as CR-2017-16676.

4OA6 Meetings, Including Exit

On October 13, 2017, the inspectors presented the inspection results to Brad Berryman, Site Vice President, and other members of the Susquehanna staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel
T. Rausch, President and Chief Nuclear Officer
B. Berryman, Site Vice President
D. Jones, Plant Manager
B. Bridge, Manager – Radiation Protection
K. Cimorelli, Director Strategic Planning & Improvement
B. Franssen, Nuclear GM - Support
J. Goodbred, Manager – Nuclear Training
C. Hess, Shift Manager - Training
C. Hostrich, Simulator Lead
J. Jennings, Manager – Regulatory Affairs/Performance Improvement
D. LaMarca, Manger – Nuclear Operations
J. Lubinsky, Manager – Design Engineering
M. Murphy, Manager – Station Engineering
B. Reppa, Nuclear GM - Engineering
D. Rogers, Operations Training Manager
P. Scanlan, Manger – Nuclear Maintenance
M. Sivaraman, AOM - Shift
J. Tripoli, Manager - Nuclear Oversight

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000387/2017003-01	FIN	Failure to Prepare Work Packages with Necessary Detail Results in Automatic Reactor Scram (Section 4OA3)
05000387 and 388/2017003-01	NCV	RBCCW PCIV Design Control Issue (Section 1R15)

Closed

05000387 and 388/2017-005-00 and 05000387 and 388/ 2017-005-01	LER	Automatic Reactor Protection System Trip on High Neutron Flux (Section 4OA3)
05000387/2016-011-00 and 05000387/2016-011-01	LER	Primary Containment Isolation Valve Failures Due to Mechanical Binding (Section 4OA3)
05000388/2016-004-00 and 05000388/2016-004-01	LER	Unit 2 Experienced an Electrical Transient Resulting in a Manual Scram (Section 4OA3)
05000388/2017-008-00	LER	Primary Containment Isolation Valve Failure Due to Loose Terminal Block (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures
SO-054-A08, Comprehensive ESW Flow Verification Loop 'A', Revision 7

Condition Reports (*NRC identified)

CR-2015-19390	CR-2017-04512	CR-2017-05090	CR-2017-05196
CR-2017-12530	CR-2017-13465	CR-2017-14697	CR-2017-14698
CR-2017-14707			

Drawings
E105952, Unit 2 CS, Revision 29
M-2151, Unit 2 P&ID RHR, Sheet 1, Revision 63
E-8, Unit 2 Single Line Meter & Relay Diagram 480 Volt Load Centers 2B210A, 2B220B, 2B230C and 2B240D, Sheet 8, Revision 21
E-153, Unit 2 Schematic Block Diagram Isolation Swing Bus MG Set No 1&2, Sheet105, Revision 14
M-111, Unit 1 P&ID Emergency Service Water System 'B' Loop, Sheet 3, Revision 25
M-111, Common P&ID Emergency Service Water System, Sheet 1, Revision 50
E106216, Emergency Service Water System 'A' Loop, Sheet 2, Revision 53
E106217, RHR Service Water System, Sheet 1, Revision 54
E162640, Emergency Service Water System 'B' Loop, Sheet 2, Revision 9

Section 1R05: Fire Protection

Procedures
NDAP-QA-0440, Control of Transient Combustible/Hazardous Materials, Revision 20
SE-213-007, 24 Month Inspection of Unit 2 Fire Barriers, Revision 12

Condition Reports (*NRC identified)
607477
CR-2016-21581

Maintenance Orders/Work Orders
1910555

Miscellaneous
FP-013-146, Unit 2 Lower Cable Spreading Room (C-301) Fire Zone 0-25A Elevation 714'-0", Revision 5
FP-013-150, Unit 1 Lower Cable Spreading Room (C-300) Fire Zone 0-25E Elevation 714'-0", Revision 6
FP-013-150, 'E' Diesel Generator Building Fire Zone 0-41E Elevation 656'-6", 675'-6" 708'-0", Revision 7
FP-213-250, Switchgear Rooms (II-406, II-407) Fire Zones 2-4C, 2-4D Elevation 719'-1", Revision 7
FP-213-254, Circulation Space (II-500), Fuel Pool Heat Exchanger Room (II-514), Chiller Room (II-512), SBLC System Area (II-513), RPS MG Set Room (II-511), Sample Station (II-508) Fire Zone 2-5A-N, 2-5A-S, 2-5A-W, 2-5H Elevation 749'1" and 762'-10", Revision 8
FP-213-236, CS Pump Room (II-10) Fire Zone 2-1A Elevation 645'0", Revision 6

Section 1R06: Flood Protection Measures

Condition Reports (*NRC identified)
CR-2016-20472

Action Requests
AR-2016-26655

Maintenance Orders/Work Orders
2034495

Drawings
C-2727, Unit 1 Reactor Building Station Flood Barrier Plan of El. 683'-0", Sheet 1, Revision 2

Miscellaneous
EC-012-0500, Surface Area of Steel in Unit 1 Wetwell, Revision 0
EC-FLOD-0001, Internal Flooding Evaluations for Moderate Energy Pipe Cracks and Sprinkler System Actuations, Revision 3

Section 1R07: Heat Sink Performance

Procedures
MT-GM-078, SSES Heat Exchanger Tube Plugging, Revision 8
MT-GM-025, Heat Exchanger- Cleaning and Inspection, Revision 22

Condition Reports (*NRC identified)
CR-2017-14826
CR-2017-14870

Maintenance Orders/Work Orders
2018621

Drawings
M-111, Common P&ID Emergency Service Water System, Revision 50

Section 1R11: Licensed Operator Requalification Program

Procedures
ON-PWR-201, Reactor Power, Revision 4
ON-RECIRC-201, Reactor Recirculation Malfunction, Revision 2
OP-AD-300, Administration of Operations, Revision 23
SO-100-007, Single Recirculation System B Loop, Revision 80
OP-155-001, Control Rod Drive Hydraulic System (Reactivity Impact), Revision 73
ON-NATPHENOM-001, Severe Weather/Natural Phenomena, Revision 5
ON-000-010, Security Event, Revision 42
EO-000-113, Level/Power Control, Revision 18
EO-000-103, Primary Containment Control, Revision 19
ON-TBCCW-101, Loss of Turbine Building Closed Cooling Water, Revision 3
EO-000-114, RPV Flooding (Non-ATWS), Revision 12
EO-000-102, RPV Control, Revision 17

Action Requests
AR-2017-16094

Section 1R12: Maintenance Effectiveness

Condition Reports (*NRC identified)
CR-2017-00449
CR-2017-10804

Miscellaneous
EACE for CR-2016-27613, Revision 2

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
NDAP-QA-1902, Integrated Risk Management, Revision 27
PSP-26, Online and Shutdown Nuclear Risk Assessment Program, Revision 20
SI-280-305, Quarterly Calibration of Reactor Vessel Water Level Channels LIS-B21-2N024A, B, C, D, Revision 32

Condition Reports (*NRC identified)
CR-2017-12990
CR-2017-13005

Maintenance Orders/Work Orders
2106482

Miscellaneous
Unit 1 EOOS Risk Evaluation for July 10, 2017
Unit 1 EOOS Risk Evaluation for July 25, 2017
Unit 1 EOOS Risk Evaluation for August 24, 2017
Unit 2 EOOS Risk Evaluation for September 5, 2017
Work Order 2095235 Risk management Summary, September 5, 2017
Protected Equipment Clearance Order, Unit 2 Division 2 CS, September 5, 2017

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
MT-GE-051, Initial Inspection, Testing, and Installation of NLI 480VAC MCC Cubicles, Revision 14

Condition Reports (*NRC identified)
CR-2017-10847 CR-2017-13061 CR-2017-13441 CR-2017-13502*
CR-2017-13559*

Action Requests
AR-249-001
AR-2016-24644

Maintenance Orders/Work Orders
1297248
2101546

Drawings
E-185, Schematic Diagram Bypass Indication System (BOP) Unit 2, Sheet 27, Revision 6
07114178-WD-43, Wiring Diagram for 18" Size 1 FVR Cubicle PPL Breaker No. 2B236092, D2-2 MOD, Sheet 1, Revision 0
07114178-BM-43, Bill of Materials for 18" Size 1 FVR Cubicle PPL Breaker No. 2B236092, D2 2, Sheet 1, Revision 1
07114178-LD-43, Layout Drawing for 18" Size 1 FVR Cubicle PPL Breaker No. 2B236092, D2 2, Sheet 1, Revision 1
E-147, Unit 2 Schematic Diagram RBCCW Containment Isolation Mov, Sheet 10, Revision 19
E-147, Unit 2 Schematic Diagram RBCCW Containment Isolation Mov, Sheet 9, Revision 17
FF62160, Mounting Hardware and Electrical Torque Table, Sheet 628, Revision 3

Miscellaneous
DBD006, Class 1E AC Electrical, Revision 4
Operability Assessment for CR-2017-10847, Corrosion Identified on Supports in ESW Valve Vault VA012
Specification 8856-M-423, Specification for Determining the Operability of Piping Systems for Susquehanna Units 1 & 2, Revision 0
EC-PIPE-14812, Spray Pond Freezing Fix-Calculation for New Pipe Supports, Revision 0
EC-PIPE-15434, Piping Stress and Support Evaluation, Revision 0
PPL Calculation Sheet, Pipe-Support Qualification Adjustments and Re-Evaluations, October 30, 2016

Section 1R18: Plant Modifications

Action Requests
AR-2016-12032 AR-2016-12036 AR-2016-12037 AR-2017-16447

Maintenance Orders/Work Orders
2044939

Drawings
E107153, Single Line Meter and Relay Diagram 13.8kv Unit Auxiliary Power System Unit 1, Sheet 1, Revision 16
E109-39, Unit 1 Connection Diagram Medium Voltage Switchgear Safeguards, Sheet 23, Revision 10
M1-B31-270, Connection Diagram, Sheet 1, Revision 10
M1-B31-275, Reactor Recirc Pump and MG Set, Sheet 2, Revision 10
M1-B31-275, Reactor Recirc Pump and MG Set, Sheet 9, Revision 13
M1-B31-275, Reactor Recirc Pump and MG Set, Sheet 18, Revision 13
M1-B31-275, Reactor Recirc Pump and MG Set, Sheet 20, Revision 10

Miscellaneous
EC 1865356
ABB Inc., Report Number 1-LUB-DS88717S, 750 kVA VPE Ventilated Dry Type Transformer, Seismic Certification Report for Class 1E Electrical Equipment, Revision 6
EC-SOPC-0795, Reactor Recirc Gen Unit 1 & 2, Revision 0
EC-SOPC-0793, Variable Frequency MG Set, Revision 4
TDC2115008, Defeat the Phase Differential Overcurrent Trip for the 'A' Recirc Pump Motor and MG Set, Revision 0

Relay Setting Change Notice 179-1230
Relay Setting Change Notice 79-1228
2115008 Design Change Package, Bypass the K15A on the RX Recirc MG Set and Pump Motor Circuit, Revision 0
Design Basis Document for Reactor Recirculation System DBD044, Revision 4
NDI-QA-14.1.3, Short Circuit Protection for 480 Penetrations
Work Instruction DCP 82-857A

Section 1R19: Post-Maintenance Testing

Procedures
SO-070-A01, Monthly Standby Gas Treatment Train 'A', Revision 4
SO-113-023, 18 Month Functional Test and Visual Inspection of Deluge Systems DS-115 and DS-116, Revision 14
SO-024-B03, DG B Overspeed Test, Revision 0
SO-024-001B, Monthly Diesel Generator 'B' Operability Test, Revision 27
SM-023-001, 10 Year Diesel Fuel Oil Storage Tank Cleaning Surveillance, Revision 8
OT-024-146, Diesel Generator 'B' Restoration, Revision 1
MT-024-024, Diesel Engine Analysis and Load Balancing, Revision 17
SO-30-002B, 24 Month Control Structure Ventilation System Operability Test, Division 2, Revision 2
NDAP-QA-0321, Secondary Containment Integrity Control, Revision 14
SI-180-301, Quarterly Calibration of Reactor Vessel Pressure Channels PIS-B21-1N021A, B, C, D and PS-B21-1N021E, G (CS System and LPCI Permissive) Reactor Pressure Greater than Setting (420 PSIG), Revision 30
SO-054-A08, Comprehensive ESW Flow Verification Loop A, Revision 9

Condition Reports (*NRC identified)

CR-2017-13441	CR-2017-13502*	CR-2017-14699	CR-2017-14745
CR-2017-15294	CR-2017-15299	CR-2017-15346	CR-2017-15354
CR-2017-15357	CR-2017-15365	CR-2017-15475	

Action Requests
AR-2017-13474

Maintenance Orders/Work Orders

2016086	2084069	2094603	2110842	2110853	2110855

Miscellaneous
EC-080-1006, CS RHR/LPCI Reactor Low Pressure Permissive Pressure Indicating Switch Setpoint Unit 1, Revision 1
IOM 311-3, Tab 15
E1798-12, SES Work Instructions

Section 1R22: Surveillance Testing

Procedures
SO-054-B08, Comprehensive ESW Flow Verification Loop B, Revision 7
SO-054-B03, Quarterly ESW Flow Verification Loop B, Revision 19
SO-030-002B, 24 Month Control Structure Ventilation System Operability Test, Division 2, Revision 1
SO-030-002B, 24 Month Control Structure Ventilation System Operability Test, Division 2, Revision 2
SE-030-002B, 24 Month Control Structure Ventilation System Operability Test, Division 2, Revision 3
SO-152-006, HPCI Injection Comprehensive Flow Verification, Revision 23
SO-159-010, Suppression Chamber Average Water Temperature Verification, Revision 16

Maintenance Orders/Work Orders
1743763

Drawings
M-156, Unit 1 HPCI Lubricating and Control Oil P&ID, Sheet 2, Revision 9
M-156, Unit 1 P&ID HPCI Turbine Pump, Sheet 1, Revision 38
M-155, Unit 1 P&ID HPCI, Sheet 1, Revision 59

Miscellaneous
EC-052-0523, HPCI Surveillance Test Acceptance Criteria for High Pressure Test, Revision 1

Section 1EP6: Drill Evaluation

Condition Reports (*NRC identified)

CR-2017-14118	CR-2017-14145	CR-2017-14211	CR-2017-14221
CR-2017-14224	CR-2017-14311		

Section 4OA1: Performance Indicator Verification

Action Requests

AR-2015-33002	AR-2016-13169	AR-2016-16204	AR-2016-18145
AR-2016-20281	AR-2016-22349	AR-2016-24728	AR-2016-26536
AR-2016-27128	AR-2017-00068		

Condition Reports (*NRC identified)

CR-2016-12700	CR-2016-15545	CR-2016-17048	CR-2016-26628
CR-2017-06221			

Miscellaneous

DI-2016-00540	DI-2016-25418	DI-2016-25420	DI-2016-25423
DI-2016-26774	DI-2016-27382	DI-2017-00413	DI-2017-00588

Section 4OA2: Problem Identification and Resolution

Procedures
TQ-301, Simulator Configuration Management, Revision 4
TQ-301-0102, SSES Simulator Training Needs Assessment, Revision 2
TQ-301-0301, Simulator CSPR Prioritization Maintenance, Modification, and Enhancements, Revision 2

Condition Reports (*NRC identified)

CR-2016-16801	CR-2016-18950	CR-2016-19409	CR-2017-14370
CR-2017-15549	CR-2017-15550		

Action Requests

AR-1736116	AR-1745627	AR-1753464	AR-2014-37189
AR-2015-19723	AR-2015-29069	AR-2105-29129	AR-2015-29111
AR-2016-21998	AR-2016-23030	AR-2017-04269	

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Procedures

MI-AD-043, Maintenance Standards, Revision 49

Condition Reports (*NRC identified)

CR-2017-11564	CR-2017-11567	CR-2017-11568	CR-2017-11571
CR-2017-11573	CR-2017-11574	CR-2017-11581	CR-2017-11585
CR-2017-11607	CR-2017-11613	CR-2017-11625	CR-2017-11631
CR-2017-11636	CR-2017-11638	CR-2017-11659	

Maintenance Orders/Work Orders

2091875

Miscellaneous

NDAP-00-2002, Attachment C, For Cause or Post Event Testing Determination Form
Susquehanna Nuclear, LLC, Revision 20
Prompt Investigation Form CR-2017-11564/CR-2017-11607
Unit 1, Startup PORC Agenda, June 9, 2017
SCRAM 01-17-01 Event Summary
NDAP-00-0032

LIST OF ACRONYMS

AR	action request
CAP	corrective action program
CFR	*Code of Federal Regulations*
CR	condition report
CS	core spray
EDG	emergency diesel generator
EHC	electro-hydraulic control
ESW	emergency service water
IMC	Inspection Manual chapter
LER	licensee event report
MCC	motor control center
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
OB	outboard
PCIV	primary containment isolation valve
RBCCW	reactor building closed cooling water
RRP	reactor recirculation pump
SDP	significance determination process
TS	technical specification
UFSAR	Updated Final Safety Analysis Report