



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 10, 2015

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 05000387/2015002 AND 05000388/2015002**

Dear Mr. Rausch:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station (SSES) Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 16, 2015 with Mr. Jon Franke, Site Vice President, and other members of your staff.

NRC Inspectors examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

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

If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at SSES. In addition, if you disagree with the cross-cutting aspect assigned to any finding you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at SSES.

In accordance with 10 CFR 2.390 of the NRCs "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's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Fred L. Bower, III, 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 05000387/2015002
and 05000388/2015002
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-387 and 50-388

License Nos.: NPF-14 and NPF-22

Report No.: 05000387/2015002 and 05000388/2015002

Licensee: Susquehanna Nuclear, LLC (Susquehanna)

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: April 1, 2015 through June 31, 2015

Inspectors: J. Greives, Senior Resident Inspector
T. Daun, Resident Inspector
B. Smith, Resident Inspector
H. Gray, Senior Reactor Inspector
J. Kulp, Senior Reactor Inspector
N. Graneto, Operations Engineer
C. Graves, Health Physicist
A. Turilin, Reactor Inspector

Approved By: Fred L. Bower, III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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SUMMARY

IR 05000387/2015002 and 05000388/2015002; April 1, 2015 to June 30, 2015; Susquehanna Steam Electric Station, Units 1 and 2; Operability Determinations and Functionality Assessments, Radiological Hazard Assessment and Exposure Controls, Radioactive Gaseous and Liquid Effluent Treatment, Problem Identification and Resolution, 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. Inspectors identified five findings of very low safety significance (Green), which were NCVs. 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 NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Initiating Events

Green: A self-revealing finding of very low safety significance (Green) and associated NCV of SSES Unit 2 TS 5.4.1, "Procedures," was identified because Susquehanna incorrectly implemented procedures for operation of the auxiliary steam and main turbine steam sealing systems. Specifically, on April 10, 2015, while Unit 2 was being shut down for a RFO, operators secured main turbine steam seals resulting in degraded main condenser vacuum. The degraded main condenser vacuum resulted in a main turbine trip, which caused an automatic reactor scram from approximately 37% power. Susquehanna restored main condenser vacuum by reestablishing steam seals, performed off-normal and emergency operating procedures to stabilize the plant post-scram and entered the issue into the corrective action program (CAP) as CR-2015-09890.

The finding was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, not understanding the impact of securing auxiliary steam to the main turbine steam seals resulted in the degradation of main condenser vacuum, automatic trip of the main turbine and associated reactor scram. The inspectors evaluated the finding in accordance with IMC 0609, Appendix A "The SDP for Findings At-Power," Exhibit 1, for the Initiating Events cornerstone, dated June 19, 2012. The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment. Specifically, though a reactor scram occurred, operators were able to restore main condenser vacuum prior to MSIV closure and the main condenser and reactor feed pumps remained functional during the event. This finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because Susquehanna did not implement appropriate error reduction tools. Specifically, operators did not effectively implement human error prevention tools (e.g. pre-job briefing, stop-think-act-review) in accordance with station processes. [H.12] (Section 4OA3)

Cornerstones: Initiating Events and Mitigating Systems

Green: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 26.205, "Work Hours," because Susquehanna did not ensure that the working hours of licensed operators were maintained within regulatory limits. Specifically, numerous instances of violations were identified in the operations department in which individuals exceeded the required work hour limits while performing duties subject to work hour controls. In review of the issue, the inspectors identified that Susquehanna inappropriately excluded some work hours performing non-covered work from the total accumulated work hours, which allowed individuals to perform covered work while in excess of the work hour limits without meeting the requirements for applying a waiver. Susquehanna entered the issue into the CAP as CR-2015-15708 and initiated action to evaluate the extent of the matter and communicate the issue with the operations department, reinforce the standards for work hour tracking with station personnel, and ensure work hours are appropriately tracked.

The inspectors determined that the finding was more than minor because Susquehanna inadequately implemented the requirements of 10 CFR 26.205 and NDAP-QA-0025 routinely. Therefore, if the performance deficiency were left uncorrected, the continued process of not including all hours accumulated toward work hour limits and allowing workers to exceed work hour limits, had the potential to lead to a more significant safety concern. The finding was also similar to IMC 0612, Appendix E, "Examples of Minor Issues," Example 9.a. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibits 1 and 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because no transients, loss of function of a mitigating system, or mismanagement of reactivity occurred as a result of licensed operators performing covered work while not in compliance with the work hour limits specified in 10 CFR 26.205. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because Susquehanna did not identify the issues completely, accurately, and in a timely manner. Specifically, Susquehanna identified violations of work hour limits on multiple occasions but the CRs were not in sufficient detail to ensure they were appropriately prioritized and assigned for resolution. Individuals did not recognize that work performed doing non-covered work was to be counted as hours accumulated towards the work hour limitations and thus discounted the violations as erroneous. [P.1] (Section 4OA2)

Cornerstone: Barrier Integrity

Green: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when Susquehanna staff did not assess component operability following identification of a potentially non-conforming condition. Specifically, Susquehanna did not assess for operability a potential non-conforming condition associated with inadequate testing of the primary containment airlock inboard equalizing valve which was identified during the review of industry operating experience. Susquehanna's corrective actions to restore compliance included entering this issue in their CAP as CR-2015-15187, performing a prompt operability determination of the Unit 1 primary containment airlock inboard equalizing valve, including completion of the requirements in SR 3.0.3 for a missed surveillance, and performing testing on the Unit 2 valve which adequately demonstrated that the PCIV was operable prior to entering into a mode of TS applicability.

The inspectors determined that the finding was more than minor because it was associated with the SSC and Barrier performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that the physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, inadequate actions to evaluate the impact of the condition adverse to quality on the operability of the Unit 1 PCIV resulted in a reasonable doubt of operability of the barrier. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent an actual open pathway in the physical integrity of reactor containment and heat removal components or involve the actual reduction in function of hydrogen igniters in containment. This finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because Susquehanna did not perform a thorough review of the work and planned activity but rather relied on past successes and assumed conditions. Specifically, the control room staff did not assess the condition for operability believing that it was similar to previous CRs documenting a review of operating experience. [H.12] (Section 1R15)

Green: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," because Susquehanna did not ensure representative samples were obtained from Engineered Safety Feature (ESF) filter ventilation systems and did not establish written test procedures. Specifically, subsequent to refilling charcoal test canisters for the activated charcoal absorber of both trains of the SBT System, new charcoal was added to the activated charcoal absorber which was not exposed to the same service conditions as the bulk of the absorber section as required by TS 5.5.7, "Ventilation Filter Testing Program," and written test procedures were not established for this activity. As corrective action for the identified issue, Susquehanna replaced the charcoal in the 'A' and 'B' trains of SBT and the 'A' and 'B' trains of CREOASS activated charcoal absorber beds and test canisters between January and February 2015 and initiated condition reports CR-2014-39116 and CR-2015-01443.

The inspectors determined that the finding was more than minor because it was associated with the Procedure Quality Attribute of the Barrier Integrity Cornerstone and it adversely affected the cornerstone objective to provide reasonable assurance that physical barriers protect the public from radionuclide releases caused by accidents or events. Specifically, since 2001, work instructions did not prevent the contamination of test canisters with charcoal that was not representative of the in-service conditions of the adsorber bed and the introduction of new charcoal into the test canisters likely provided better results during periodic surveillance testing which were not representative of actual conditions. 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, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the control room and SBT system. This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because the activities for sampling the activated charcoal beds were not governed by comprehensive, high-quality programs, processes, and procedures nor were the design documentation, procedures, and work packages complete, thorough and accurate. [H.7] (Section 2RS6)

Cornerstone: Occupational/Public Radiation Safety

Green: A self-revealing finding of very low safety significance (Green) and associated NCV of SSES Unit 2 TS 5.7.1 was identified because Susquehanna did not comply with a radiological posting barrier and other protective measures for HRA entry. Specifically, on October 10, 2014, two workers entered the turbine building roof, a posted HRA, but the workers were not on the proper RWP and were not briefed on the radiological conditions prior to entry. Upon receiving a dose rate alarm, the workers exited the HRA and reported the issue to radiation protection personnel. Susquehanna entered the issue into the CAP as condition report CR-2014-31911.

The inspectors determined that Susquehanna's inadequate adherence to a high radiation area (HRA) posting, which requires a HRA RWP and a radiological briefing prior to entry, was a performance deficiency that was within Susquehanna's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it adversely affected the human performance attribute of the Occupational Radiation Safety cornerstone objective. Specifically, the individual violated the RWP and briefing requirements designed to protect the worker from unnecessary radiation exposure. The issue was also similar to example 6.h in IMC 0612, Appendix E. Using IMC 0609, Appendix C, "Occupational Radiation Safety SDP," dated August 19, 2008, the finding was determined to be of very low safety significance (Green) because it did not involve: (1) as low as is reasonably achievable (ALARA) occupational collective exposure planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a cross-cutting aspect of Human Performance, Challenge the Unknown, because the workers did not stop when faced with uncertain conditions. Specifically, the workers did not use a questioning attitude during the pre-job brief or when they encountered the HRA posting on the access to the turbine building roof. [H.11] (Section 2RS1)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On April 3, 2015, operators reduced power to approximately 64 percent to perform a rod sequence exchange and scram time testing. Following the maintenance, operators returned the unit to 100 percent on April 5, 2015. On May 15, 2015, operators reduced power to 83 percent to perform planned cleaning of the main condenser water boxes and power was restored to 100 percent on May 18, 2015. On June 30, 2015, the last day of the inspection period, operators performed an unplanned power reduction to 61 percent in accordance with off-normal procedures due to an unexpected isolation of extraction steam to the '5C' feedwater heater.

Unit 2 began the inspection period at 100 percent power and operated at full power until April 10, 2015, when operators commenced a reactor shutdown for a planned refueling outage (2R17). During the planned shutdown, main condenser vacuum degraded unexpectedly resulting in an automatic trip of the main turbine and unplanned automatic scram from approximately 37 percent power. Following the completion of the maintenance activities, operators commenced a reactor startup on May 23, 2015. Power was restored to 100 percent on May 31, 2015. The unit 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

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Susquehanna's procedures affecting these areas and the communications protocols between the transmission system operator and Susquehanna. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether Susquehanna established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system engineer, reviewing condition reports (CRs) and open work orders, and walking down portions of the offsite and AC power systems including the 500 kilovolt (kV), 230 kV, and T-10 switchyards.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Susquehanna's preparations for a severe thunderstorm and tornado watch on June 8, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency diesel generators to ensure system availability and the main, auxiliary, and offsite power transformers to ensure that transient material was controlled to limit the likelihood of a high wind generated missile. The inspectors verified that operator actions defined in Susquehanna's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

No findings were identified.

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, 'A' core spray (CS) during operations with the potential to drain the reactor vessel on April 23, 2015
- Unit 2, 'A' residual heat removal (RHR) following restoration from a system outage window on May 15, 2015
- Unit 2, 'A' residual heat removal service water (RHRSW) during 'B' RHRSW maintenance on June 16, 2015
- Common, 'A' SBT during 'B' SBT system outage window on June 17, 2015

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), technical specifications (TSs), work orders (WOs), 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

On May 1 and 2, 2015, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 and Unit 2 spent fuel pool cooling systems, to verify the existing equipment lineup was correct. This sample was selected because the Unit 2 reactor was in mode 5 with decay heat removal for the reactor vessel being performed via the Unit 1 and Unit 2 spent fuel pool and spent fuel pool heat exchangers because both trains of the RHR system were secured for maintenance. 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 also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. 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. 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 1, reactor building 683' (fire zones 1-3B-N, S, W) on April 21, 2015
- Unit 2, fuel pool cooling rooms (fire zone 2-5A-N) on May 1, 2015
- Unit 2, reactor building 683' (fire zones 2-3B-N, S, W) on May 4, 2015
- Common, 'A' engineered safeguards service water pumphouse (fire zone 0-51) on June 19, 2015
- Common, 'D' emergency diesel generator (EDG) room (fire zone 0-41D) on June 26, 2015

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if Susquehanna identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused on Unit 1, elevation 719', which included the 'A' and 'B' emergency switchgear and control rod drive hydraulic control unit areas to verify 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.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the Unit 2 'B' RHR/RHRSW heat exchanger on May 4, 2015, to determine its 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. The inspectors observed actual performance tests for the heat exchanger and reviewed the results of previous inspections of the 'B' RHR/RHRSW heat exchanger and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and 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.

1R08 In-service Inspection (71111.08 - 1 sample)

a. Inspection Scope

From April 20 to 25, 2015, the inspectors conducted an inspection and review of Susquehanna's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary, risk significant piping

and components, and containment systems during the SSES Unit 2, 17th refueling outage (2R17). The sample selection for this inspection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation would result in a significant increase in risk. The inspectors observed in-process nondestructive examinations (NDE), reviewed documentation, and interviewed Susquehanna and contractor personnel to verify that the NDE activities performed as part of the fourth interval, first period, of the SSES ISI program were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2007 Edition through 2008 Addenda.

Nondestructive Examination and Welding Activities (IMC Section 02.01)

The inspectors performed direct observation of NDE activities in process and reviewed documentation of NDEs listed below. Activities included review of ultrasonic testing (UT), radiography (RT), penetrant testing (PT), visual examination (VT), and eddy current testing (ECT).

The inspectors reviewed certifications of the NDE technicians performing the examinations and verified that the inspections were performed in accordance with approved NDE procedures and industry guidance. The inspectors verified that the test results were reviewed and evaluated by certified Level III NDE personnel, and that the parameters used in the tests were in accordance with the limitations, precautions and prerequisites specified in the test procedure.

ASME Code Required Examinations

- The inspectors reviewed the documentation of the completed UT and observed a calibration demonstration for the procedure, PDI-UT-5, used to examine the 3 inch diameter bolting that provides the recirculation pump pressure boundary.
- For RT of 3 inch diameter replacement piping, the inspectors reviewed radiographic test procedure NDE-RT-001 and examined radiographs for welds, including FW 56 on pipe segment DBB-222-1, and noted proper documentation that included review by the ANII, the ASME Section XI Code Inspector. The radiographic testing practices were discussed with the respective Level III examiner.
- Freeze seals were used during 2R17 to accomplish repair work on control rod drive mechanism piping. The inspectors reviewed the PT procedure and observed its application on the post freeze seal examination on a segment of the control rod drive mechanism piping.
- The inspectors observed the functional testing of a 50,000 lb. capacity pipe snubber, M40227, Mark number MSL200-H009B, as conducted per procedure Spec M-1090, Rev 13, on the snubber hydraulic test stand. The test controls and test result documentation were reviewed.
- The PT indications from December 2014 in Unit 1, and the 2RFO17 Unit 2 identified recirculation pump seal cartridge flange to small diameter piping leaks were reviewed. The inspectors reviewed CR-2014-37848 and its evaluation for the U1 leak, and the CRs initiated for the U2 leak. The evaluations for both leaks and the

planned work in progress for the U2 leak investigation including metallurgical cross sectioning were discussed with the responsible Systems and Materials Engineers. As the extent of cold pull in the U2 pipe leak area appeared to be a factor to that leakage cause, the inspectors evaluated the plant controls on minimizing cold spring during pipe installation.

- The inspectors reviewed the implementation of the Flow Accelerated Corrosion (FAC) Program per procedure NEPM-QA-1172 with the FAC Program Manager, and reviewed the UT data sheets for components 2-GFD-202-2-2010-E and 16-DBD-205-1-1010-T.

Other Augmented or Industry Initiative Examinations

The inspectors reviewed the scope and method of feedwater heater tube and condenser tube examination by the ECT method. The acquisition of ECT data was observed and the process and controls for data evaluation were reviewed with the ECT data analysts. The acceptance criteria and procedural requirements to track or plug tubes with identified tube degradation were reviewed.

The inspectors sampled the remote VT video records of reactor vessel internals including the jet pumps and steam dryer as done under water inside the reactor vessel for the jet pumps during in-vessel visual inspection (IVVI) activities, and of the steam dryer on the head stand. The inspection scope included portions of the jet pump wedges, slip joints and steam dryers. The inspectors reviewed the applicable parts of the IVVI procedure, observation of a sample of digital video records, the analysis process for the observations, and documentation of indications. For the steam dryer IVVI, the inspection scope, comparisons of current indications to those previously observed and the documentation process were inspected. The inspectors verified that the activities were performed in accordance with applicable examination procedures and industry guidance.

The computer based automated UT examination records of the core shroud horizontal welds H1, H2, H3 and H4 as examined by the UT procedure NDE-UT-029 (GEH-UT-503) were reviewed and the process for comparison of the current indications to those previously identified was reviewed. The process for obtaining the UT data was reviewed at the UT acquisition station on the refuel floor elevation.

Identification and Resolution of Problems (IMC Section 02.05)

The inspectors reviewed a sample of SSES plant corrective action reports, which identified NDE indications, deficiencies, and other non-conforming conditions since the previous refueling outage (RFO) and during the current outage. The inspectors verified that non-conforming conditions were properly identified, characterized, evaluated, and that corrective actions were identified and entered into the CAP for resolution.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 2 samples).1 Quarterly Review of Licensed Operator Requalification Testing and Traininga. Inspection Scope

The inspectors observed licensed operator simulator training during an annual requalification exam on June 19, 2015, which included reactor scram due to a main generator lockout and unisolable reactor coolant system leak outside of primary containment. 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 unit supervisor. 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 Rooma. Inspection Scope

The inspectors observed reactor startup from the 2R17 on May 23, 2015. The inspectors observed pre-shift briefings and reactivity control briefings to verify that the briefings met the criteria specified in OP-AD-002, "Standards for Shift Operations," Revision 57, OP-AD-004, "Operations Standards for Error and Event Prevention," Revision 38, OP-AD-300, "Administration of Operations," Revision 2, and OP-AD-338, "Reactivity Manipulations Standards and Communications Requirements," Revision 27. Additionally, the inspectors observed crew performance to verify that procedure use, crew communications, and coordination of activities between work groups met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component performance and reliability. The inspectors reviewed system health reports, corrective action program 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. For each sample selected, 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 2, turbine building closed cooling water

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 2, 'A' loss of offsite power/ loss-of-coolant accident (LOOP/LOCA) testing on May 5, 2015
- Common, 'A' emergency service water (ESW) inoperable due to leak on May 8, 2015
- Unit 2, reactor pressure vessel leak test on May 19, 2015
- Unit 2, common RHR work window on May 2, 2015
- Unit 2, yellow risk during 'B' RHRSW valve maintenance on June 16, 2015
- Unit 2, yellow risk during 'A' RHRSW valve maintenance on June 23, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Unit 2, 'B' RHR snubber operability testing following a water hammer event on April 24, 2015
- Unit 1, jet pump 12 degraded differential pressure on April 29, 2015
- Unit 1, missed performance of local leak rate testing on primary containment airlock inboard equalizing valve on May 21, 2015
- Unit 1, drywell sump monitoring system anomalies on June 10, 2015
- Common, concrete degradation of missile protection barrier for 'A' through 'D' EDGs' exhaust plenum on June, 24, 2015

The inspectors selected these issues based on the risk significance of the associated components and systems. 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. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Susquehanna. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when Susquehanna staff did not assess component operability following identification of a potentially non-conforming condition. Specifically, Susquehanna did not assess for operability a potential non-conforming condition associated with inadequate testing of the primary containment airlock inboard equalizing valve which was identified during the review of industry operating experience. Susquehanna entered this issue in their CAP as CR-2015-15187, assessed the non-conforming condition to provide reasonable assurance of operability of the primary containment isolation valves (PCIVs) and performed testing on the Unit 2 valve which adequately demonstrated operability.

Description. The primary containment airlock is part of the primary containment which is tested in accordance with 10 CFR 50, Appendix J, "Primary Reactor Containment Testing for Water-Cooled Power Reactors." The airlock is equipped with an inner door and outer door which function to allow access to the primary containment while maintaining primary containment integrity. In accordance with Appendix J, this airlock is tested via a Type B test. Additionally, there are equalizing valves for the inner and outer doors which serve as primary containment isolation valves (PCIVs) and must be tested via a Type C test. TS 5.5.12 specifies a primary containment leakage rate testing program which demonstrates the operability of primary containment required by TSs 3.6.1.1, "Primary Containment," 3.6.1.2, "Primary Containment Airlock," and 3.6.1.3, "PCIVs." The conditions of applicability identified in the TSs are Modes 1, 2 and 3.

On May 21, 2015, following a review of industry operating experience, Susquehanna identified that the primary containment inner door equalizing valve had not been tested in accordance with regulatory requirements. Specifically, the valve is a PCIV and is required to be tested in accordance with 10 CFR 50, Appendix J. NDAP-QA-0412,

“Leakage Rate Testing Program,” revision 19, provides the administrative controls for implementation of the Appendix J program at Susquehanna. Step 5.1.3.c(10) of NDAP-QA-0412 requires that the test pressure be applied in the accident direction unless specifically exempted by UFSAR section 6.2.6.3. This valve was not specifically exempted by UFSAR section 6.2.6.3, and Susquehanna identified that testing was being performed in the non-accident direction by pressurizing in-between the inner and outer boundaries of the airlock as part of the Type B airlock test. Condition report CR-2015-15105 was generated to document this condition adverse to quality. In particular, since Unit 2 was in Mode 4 at the time of identification, the CR documented that testing needed to be accomplished on Unit 2 prior to startup entering Mode 2 to ensure regulatory compliance.

NDAP-QA-0703, “Operability Determinations and Functionality Assessments,” Revision 25, states that if a component is found in a potentially degraded or non-conforming condition, then documentation of an initial operability screening (IOS) is required. The IOS is defined by the procedure as the determination of operability (operable or inoperable) of non-conforming or degraded structures, systems and components (SSCs) and requires that the basis of the determination be documented in the condition report. The procedure defines a non-conforming condition as a condition in which a SSC does not meet the current licensing basis or in which quality has been reduced because of factors such as improper design, testing, construction or modification. Inspectors determined that CR-2015-15105 documented a non-conforming condition because it described a condition in which the PCIVs had not been tested as required by TSs and 10 CFR 50, Appendix J and therefore determined that an IOS was required.

The inspectors reviewed Susquehanna’s actions to address the potential non-conforming condition. In particular, the inspectors reviewed Susquehanna’s assessment of the potential impact of the condition adverse to quality on the operability of the Unit 1 and 2 primary containments. The inspectors reviewed the operability determination for the CR which stated that it described “a methodology change to performing testing for airlock components” and determined that it had no potential impact on system operability. Therefore, the IOS was marked as ‘N/A.’ The inspectors determined that this was incorrect because the CR and attached operating experience identified a non-conforming condition in that the PCIVs had never been tested in accordance with Appendix J and plant TSs. Susquehanna entered the inspectors’ concern into the CAP as condition report CR-2015-15187 and performed a prompt operability determination on the original CR. The prompt operability determination (POD) concluded that appropriate testing had not been performed on the Unit 1 and 2 valves on a 24 month periodicity as required by plant TSs. However, the POD identified that the valve was successfully tested in the accident direction during the previous integrated leak rate test on Unit 1 in 2006. Therefore, in accordance with NDAP-QA-0703, Susquehanna determined it was appropriate to apply the requirements of TS surveillance requirement (SR) 3.0.3 for a missed surveillance. Consequently, Susquehanna performed a risk assessment to allow delaying performance of the test on Unit 1 until the next reasonable opportunity. The inspectors concluded that Susquehanna appropriately applied SR 3.0.3 for the Unit 1 PCIV. Additionally, Susquehanna executed testing on the Unit 2 valve prior to entering Mode 2 to establish operability of that PCIV. Inspectors determined that the completed testing on Unit 2 was reasonable and ensured plant TSs were met prior to entering a mode of applicability.

Analysis. The inspectors concluded that not performing an IOS as required by plant procedures upon identification of a potentially non-conforming condition was a performance deficiency within Susquehanna's ability to foresee and correct, and should have been prevented. Specifically, despite identifying a non-conforming condition on May 21, 2015, associated with testing of the primary containment airlock inboard equalizing valve, Susquehanna did not perform an IOS to ensure there was reasonable assurance of operability of the components. The inspectors determined that the finding was more than minor because it was associated with the SSC and Barrier performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that the physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, inadequate actions to evaluate the impact of the condition adverse to quality on the operability of the Unit 1 PCIV resulted in a reasonable doubt of operability of the barrier. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent an actual open pathway in the physical integrity of reactor containment and heat removal components or involve the actual reduction in function of hydrogen igniters in containment.

This finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because Susquehanna did not perform a thorough review of the work and planned activity but rather relied on past successes and assumed conditions. Specifically, the control room staff did not assess the condition for operability believing that it was similar to previous CRs documenting a review of operating experience. [H.12]

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by instructions, procedures, or drawings and shall be accomplished in accordance with these instructions, procedures, or drawings. NDAP-QA-0703, "Operability Assessments and Requests for Enforcement Discretion," Revision 25, states, in part, that if a component is found in a potentially degraded or non-conforming condition, then documentation of an initial operability screening (IOS) is required. Contrary to this, Susquehanna did not perform an IOS after identifying a non-conforming condition, associated with inadequate previous testing of the primary containment inboard equalizing valve. Susquehanna's corrective actions to restore compliance included performing a prompt operability determination of the Unit 1 primary containment airlock inboard equalizing valve, including completion of the requirements in SR 3.0.3 for a missed surveillance on May 25, 2015, and performing testing on the Unit 2 valve which adequately demonstrated that the PCIV was operable prior to entering into a mode of TS applicability. Because this violation was of very low safety significance (Green), and Susquehanna entered this performance deficiency into the CAP as CR-2015-15187, this finding is being treated as an NCV in accordance with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000387;388/2015002-01 Failure to Assess a Non-conforming Condition for Its Impact on Component Operability)**

1R18 Plant Modifications (71111.18 – 1 sample).1 Permanent Modificationsa. Inspection Scope

The inspectors evaluated a modification to the 'E' EDG building superstructure walls after installation of the 4KV flex generator electrical tap boxes 0CB5122A, 0CB5122B, 0CB5122C, and 0CB5122D, and their associated missile hardened enclosures on the exterior face of the 'E' EDG building west wall per engineering change EC1719084. 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.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure 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 points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 2, HV251F024A dynamic diagnostic test after valve repack on May 7, 2015
- Unit 2, 'C' RHR motor replacement on May 11, 2015
- Unit 2, reactor core isolation cooling overspeed test on May 14, 2015
- Unit 2, reactor building zone 2 / outdoor differential pressure transmitter replacement on May 17, 2015
- Unit 2, reactor pressure vessel leak test on May 19, 2015
- Unit 2, 'B' reactor recirculation pump and motor replacement on May 19, 2015

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the 17th Unit 2 maintenance and refueling outage (RFO) 2R17, which was conducted April 11 through May 25, 2015. The inspectors reviewed Susquehanna's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable TS when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by TSs
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to RFO activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 8 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs 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:

- Common, quarterly 'A' ESW flow verification (SO-054-A03) on April 8, 2015 (IST)
- Unit 2, 'B' RHR leak quantification (SE-249-202) on April 25, 2015
- Unit 2, 'D' main steam isolation valve on May 8, 2015 (CIV)
- Unit 2, 'B' RHR logic system functional testing on May 14, 2015
- Unit 2, 'A' RHR test and suppression pool spray line local leak rate testing (SE-259-075) on May 4, 2015 (CIV)
- Unit 2, 'B' primary containment isolation system testing on May 21, 2015
- Unit 2, primary containment airlock inboard equalizing valve local leak rate testing on May 23, 2015
- Unit 2, high pressure coolant injection low pressure and normal operating pressure testing on May 24, 2015

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

The inspectors reviewed Susquehanna's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, applicable Regulatory Guides (RGs), and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the performance indicators for the occupational exposure cornerstone, radiation protection (RP) program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

Radiological Hazard Assessment

The inspectors reviewed recent plant radiation surveys and any changes to plant operations since the last inspection to identify any new radiological hazards for onsite workers or members of the public.

Instructions to Workers

The inspectors observed several containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements. The inspectors reviewed several occurrences where a worker's electronic personal dosimeter alarmed. The inspectors reviewed Susquehanna's evaluation of the incidents,

documentation in the CAP, and whether compensatory dose evaluations were conducted, when appropriate.

Contamination and Radioactive Material Control

The inspectors observed the monitoring of potentially contaminated material leaving the radiological control area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material.

Radiological Hazards Control and Work Coverage

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walk-downs and observation of radiological work activities. The inspectors assessed whether posted surveys, radiation work permits (RWPs), worker radiological briefings, the use of continuous air monitoring and dosimetry monitoring were consistent with the present conditions.

Risk-Significant High Radiation Areas (HRA) and Very High Radiation Area (VHRA) Controls

The inspectors reviewed the controls and procedures for HRAs, VHRAs, and radiological transient areas in the plant.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

Introduction. A self-revealing finding of very low safety significance (Green) and associated NCV of SSES Unit 2 TS 5.7.1 was identified because Susquehanna did not comply with a radiological posting barrier and other protective measures for HRA entry. Specifically, on October 10, 2014, two workers entered the turbine building roof, a posted HRA, but the workers were not on the proper RWP and were not briefed on the radiological conditions prior to entry.

Description. On October 10, 2014, two workers obtained a radiological briefing for work order 1777404 to inspect the heat trace of the reactor building and turbine building down spouts. During the briefing the workers stated they needed to enter the control structure roof, a posted radiation area, but did not mention that they must gain access to the turbine building roof, a posted HRA. The workers showed the radiation protection personnel a work area drawing which contained the control structure and reactor building roofs, both areas that were posted as radiation areas. Consequently, the radiation protection technician did not brief the workers for entrance on to the turbine building roof. The radiation protection technician verified that the workers were logged on RWP 2014-0002, activity 1, which had limits of 20 milli-rem (mrem) for dose and 80 mrem/hour (hr) for dose rate, and did not allow access to HRAs.

The workers proceeded to the turbine building roof and conducted work for approximately 40 minutes until one of the workers received a dose rate alarm. The workers immediately stopped work and notified radiation protection. Radiation protection personnel subsequently took steps to investigate the alarm and determined that the workers had not been properly briefed on the radiological conditions of the HRA and entered the area on the wrong RWP. The access door to the turbine building roof was posted as a HRA and the workers did not question whether they had been appropriately briefed to enter this area.

TS 5.7.1.b requires that activities in a HRA with dose rates less than or equal to 1.0 rem/hr at 30 centimeters from the source, shall be controlled by means of an RWP that includes specification of radiation protection equipment and control measures. TS 5.7.1.e requires that for individuals not qualified in radiation procedures or escorted by such a person, entry into an HRA may only be done after radiological conditions in the work area have been evaluated and personnel are briefed on these conditions.

Susquehanna procedure NDAP-QA-0626, "Radiologically Controlled Area Access and RWP System," Revision 36, implements these requirements. Steps 5.4.5 and 5.4.6 and Attachment Q, "High Radiation/Locked High Radiation/VHRA Briefing Checklist," requires, in part, a radiological briefing from Radiation Protection prior to entering the HRA that includes a discussion of the required RWP, area radiation levels, and electronic dosimeter dose alarm and dose rate alarm settings. The inspectors determined that these requirements were not met. Susquehanna entered the issue into the CAP as condition report CR-2014-31911.

Analysis. The inspectors determined that Susquehanna's inadequate adherence to a HRA posting, which requires a HRA RWP and a radiological briefing prior to entry, was a performance deficiency that was within Susquehanna's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it adversely affected the human performance attribute of the Occupational Radiation Safety cornerstone objective. Specifically, the individual violated the RWP and briefing requirements designed to protect the worker from unnecessary radiation exposure. The issue was also similar to example 6.h in IMC 0612, Appendix E. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and IMC 0609, Appendix C, "Occupational Radiation Safety SDP," dated August 19, 2008, the inspectors determined that the finding was of very low safety significance (Green) because it did not involve: (1) as low as is reasonably achievable (ALARA) occupational collective exposure planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.

This finding has a cross-cutting aspect of Human Performance, Challenge the Unknown, because the workers did not stop when faced with uncertain conditions. Specifically, the workers did not use a questioning attitude during the pre-job brief or when they encountered the HRA posting on the access to the turbine building roof. [H.11]

Enforcement. SSES Unit 2 TS 5.7.1.e requires, in part, that entrance to a HRA only be made by personnel who have been previously briefed on the dose rates in the work area. Section 5.4 and Attachment Q of Susquehanna procedure NDAP-QA-0626, "Radiologically Controlled Area Access and RWP System," implements these requirements. Contrary to this, on October 10, 2014, two workers entered the turbine building roof, a posted HRA, without being briefed on the dose rates in the area and

without being on the proper RWP. Susquehanna's actions to restore compliance included entering the issue into the CAP and the workers exiting the HRA upon receiving a dose rate alarm and reporting the issue to radiation protection personnel. Because this violation was of very low safety significance (Green), and Susquehanna entered this performance deficiency into the CAP as CR-2014-31911, this violation is being treated as an NCV consistent with section 2.3.2.a of the NRC Enforcement Policy.

(NCV05000387;388/2015002-02, Entry into a High Radiation Area without Radiological Briefing)

2RS2 Occupational ALARA Planning and Controls

a. Inspection Scope

The inspectors assessed Susquehanna's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted a review of Susquehanna's collective dose history and trends; ongoing and planned radiological work activities; radiological source term history and trends; and ALARA dose estimating and tracking procedures.

Radiological Work Planning

The inspectors selected the following radiological work activities based on exposure significance for review:

- RWP 20152001, reactor pressure vessel disassembly and refuel floor support activities
- RWP 20152001, fuel moves and in-vessel activities including support activities
- RWP 20152031, reactor pressure vessel reassembly and cavity and equipment pit decontamination including support activities
- RWP 20152118, noble metals injection modifications in the radiological controlled area

For each of these activities, the inspectors reviewed: ALARA work activity evaluations; exposure estimates; exposure reduction requirements; results achieved (dose rate reductions, actual dose); person-hour estimates and results achieved; and post-job reviews that were conducted to identify lessons learned.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the current annual collective dose estimate; basis methodology; and measures to track, trend, and reduce occupational doses for ongoing work activities.

Source Term Reduction and Control

The inspectors reviewed the current plant radiological source term and historical trend, plans for plant source term reduction, and contingency plans for changes in the source term as the result of changes in plant fuel performance or changes in plant primary chemistry.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, RG 8.15, RG 8.25, NUREG-0041, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls and respiratory protection equipment staged for emergency use. The inspectors also reviewed respiratory protection program procedures and current performance indicators for unintended internal exposure incidents.

Engineering Controls

The inspectors reviewed operability and use of both permanent and temporary ventilation systems, and the adequacy of airborne radioactivity radiation monitoring in the plant based on location, sensitivity, and alarm set-points.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by Susquehanna's CAP.

b. Findings

No findings were identified

2RS4 Occupational Dose Assessment

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: radiation protection program audits; National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry testing reports; and procedures associated with dosimetry operations.

External Dosimetry

The inspectors reviewed: dosimetry NVLAP accreditation; onsite storage of dosimeters; the use of "correction factors" to align electronic personal dosimeter (EPD) results with NVLAP dosimetry results; dosimetry occurrence reports; and CAP documents for adverse trends related to external dosimetry.

Internal Dosimetry

The inspectors reviewed: internal dosimetry procedures; whole body counter measurement sensitivity and use; adequacy of the program for whole body count monitoring of plant radionuclides; adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection; and internal dose assessments for any actual internal exposures.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

a. Inspection Scope

The inspectors reviewed the treatment, monitoring, and control of radioactive gaseous and liquid effluents. The inspectors used the requirements in 10 CFR 20, 10 CFR 50, Appendix I; TSs; Offsite Dose Calculation Manual; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Air Cleaning Systems

The inspectors reviewed radioactive effluent discharge system surveillance test results based on TS acceptance criteria.

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," because Susquehanna did not ensure representative samples were obtained from Engineered Safety Feature (ESF) filter ventilation systems and did not establish written test procedures. Specifically, subsequent to refilling charcoal test canisters for the activated charcoal absorber of both trains of the SBGT System, new charcoal was added to the activated charcoal absorber which was not exposed to the same service conditions as the bulk of the absorber section as required by TS 5.5.7, "Ventilation Filter Testing Program," and written test procedures were not established for this activity.

Description. TS 5.5.7, "Ventilation Filter Testing Program," requires the ventilation filter test program establish the required testing of ESF filter ventilation systems. TS 5.5.7.c also requires that the test program include laboratory testing of the charcoal absorber section in accordance with Section C.6.b of Regulatory Guide 1.52, Revision 2. Regulatory Guide 1.52, Revision 2, requires the efficiency of the activated carbon absorber section be determined by laboratory testing of representative samples of the activated carbon exposed simultaneously to the same service conditions as the absorber section.

In the 1990s, Susquehanna removed charcoal from the activated charcoal absorber bed of the 'A' and 'B' trains of SBGT and the 'A' and 'B' trains of control room emergency outside air supply system (CREOASS) under work orders S23466, S43675, H70530 and H70601, respectively, in order to refill the test canisters for reinstallation into their test locations. The work order for the 'B' train of SBGT and 'A' and 'B' trains of CREOASS documented that the technicians replaced the removed charcoal from the adsorber section with new charcoal. The work order for the 'B' train of SBGT did not specify whether new charcoal was added. After the test canisters had been depleted from periodic testing, Susquehanna again removed charcoal from activated charcoal absorber bed of each ventilation filter train in order to refill the test canisters for reinstallation into their test locations to allow for continued periodic testing. These replacements were completed in 2001, 2004, 2007 and 2010 for the 'A' and 'B' SBGT trains and 'A' and 'B' CREOASS trains under work orders 208275, 541924, 886715, and 1185652, respectively.

The inspectors reviewed the work orders and determined no quality measures were taken to ensure the charcoal placed into the test canisters did not contain any of the new charcoal that had been added previously and therefore did not provide assurance that the test canisters contained samples that were representative of the activated charcoal in the adsorber section of each ventilation filter train. The inspectors determined that the lack of quality work procedures and work packages used to remove charcoal, refill sample canisters, and replace charcoal in the activated charcoal absorber beds resulted in a high likelihood of contamination of sample canisters with new charcoal that was not exposed simultaneously to the same service conditions as the bulk of the absorber section.

Susquehanna replaced all the charcoal in the 'A' and 'B' trains of SBGT and the 'A' and 'B' trains of CREOASS activated charcoal absorber beds and test canisters between January and February, 2015. Susquehanna took samples from each system prior to replacement to verify the as-found condition of the charcoal beds. The laboratory sample results from all the activated charcoal absorber beds indicated a negative trend over previous surveillance tests with the exception of the 'B' SBGT system. While all the sample results resulted in operable activated charcoal absorber beds, a significant increase in penetration percentage (i.e. degraded margin to the TS allowed limit) was observed. The inspectors determined the sample results from previous analysis demonstrating significantly less penetration percentage (i.e. significantly more margin to the TS allowed limit) were likely due to the use of sample canisters that previously contained some of the new charcoal that had been added during test canister refilling.

As corrective action for the identified issue, Susquehanna replaced the charcoal in the 'A' and 'B' trains of SBGT and the 'A' and 'B' trains of CREOASS activated charcoal absorber beds and test canisters between January and February 2015 and initiated condition reports CR-2014-39116 and CR-2015-01443.

Analysis. The inspectors determined that not ensuring representative samples were obtained from ESF filter ventilation systems and establish written test procedures was a performance deficiency that was within Susquehanna's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it was associated with the Procedure Quality Attribute of the Barrier Integrity Cornerstone and it adversely affected the cornerstone objective to provide reasonable assurance that physical barriers protect the public from radionuclide releases caused by accidents or events. Specifically, since 2001, work instructions did not prevent the contamination of test canisters with charcoal that was not representative of the in-service conditions of the adsorber bed and the introduction of new charcoal into the test canisters likely provided better results during periodic surveillance testing which were not representative of actual conditions. 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, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the control room and SBGT system.

This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because the activities for sampling the activated charcoal beds were not governed by comprehensive, high-quality programs, processes, and procedures nor were the design documentation, procedures, and work packages complete, thorough and accurate. [H.7]

Enforcement. 10 CFR 50, Appendix B, Criterion XI, "Test Control," requires a test program be established to assure that all testing required to demonstrate that systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. SSES Unit1 and Unit 2 TS 5.5.7.c, "Charcoal Filter Testing Program," requires that the test program include laboratory testing of the charcoal absorber section in accordance with Section C.6.b of Regulatory Guide 1.52, Revision 2. Regulatory Guide 1.52, Revision 2, requires the efficiency of the activated carbon absorber section be determined by laboratory testing

of representative samples of the activated carbon exposed simultaneously to the same service conditions as the absorber section. Contrary to the above, from 2001 through 2015, Susquehanna did not assure that all testing required to demonstrate that systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Specifically, Susquehanna did not perform testing in accordance with written test procedures and did not ensure that work instructions implemented a test program to provide assurance that the SBGT and CREOASS activated charcoal absorbers met the acceptance criteria of TS 5.5.7.c because the charcoal canisters were potentially contaminated with new charcoal that was not representative of the overall service life of the charcoal absorber. Susquehanna's corrective actions to restore compliance included replacing the charcoal in the 'A' and 'B' trains of SBGT and the 'A' and 'B' trains of CREOASS activated charcoal absorber beds and test canisters between January and February 2015. Because this finding was determined to be of low safety significance (Green) and was entered into Susquehanna's CAP (CR-2014-39116 and CR-2015-01443), this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV05000387;388/2015002-03, Incorrect Implementation of the Ventilation Filter Testing Program)**

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 5 samples)

.1 Reactor Coolant System (RCS) Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed Susquehanna's submittal for the RCS specific activity and RCS leak rate performance indicators for both Unit 1 and Unit 2 for the period of April 1, 2014, through March 31, 2015. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

b. Inspection Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed Susquehanna's submittal for the occupational radiological occurrences performance indicator for the period of April 1, 2014, through March 31, 2015. The inspectors used performance indicator definitions and guidance contained in the Nuclear Energy Institute Document 99-02, Revision 7, to determine the accuracy of the performance indicator data reported. The inspectors reviewed electronic personal

dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized performance indicator occurrences. The inspectors conducted walk-downs of various Locked HRA and VHRA entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 samples)

.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 that Susquehanna entered issues into the corrective action program 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 corrective action program and periodically attended condition report screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Susquehanna performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Annual Sample: Problem Identification and Resolution Activities Related to Fatigue Rule and Behavioral Observation Program Compliance

a. Inspection Scope

In accordance with Inspection Procedure 71152, Identification and Resolution of Problems, one sample was reviewed to evaluate problem identification and corrective actions associated with the fatigue rule and behavior observation program (BOP). The inspectors reviewed CRs and action requests (ARs) related to BOP, fatigue hour tracking, and safety culture related to managing fatigue from May 20, 2014 to May 20, 2015. The inspectors conducted interviews with members of the security force, operations, maintenance and other plant staff on these three subjects. The inspectors reviewed procedures and policies associated with BOP and fatigue rule programs.

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 26.205, “Work Hours,” because Susquehanna did not ensure that the work hours of licensed operators were maintained within regulatory

limits. Specifically, numerous instances of violations were identified in the operations department in which individuals exceeded the required work hour limits while performing duties subject to work hour controls. In review of the issue, the inspectors identified that Susquehanna inappropriately excluded some non-covered work hours from the total accumulated work hours, which allowed individuals to perform covered work while in excess of the work hour limits without meeting the waiver requirements specified in 10 CFR 26.207.

Description. The inspectors reviewed Susquehanna's annual evaluation of the effectiveness of the control of 2014 work hours for operations department individuals who are subject to 10 CFR 26.205 (CR-2014-36027). During this evaluation, Susquehanna identified 27 separate violations of the working hour limits specified in 10 CFR 26, Subpart I, Managing Fatigue, and NDAP-QA-0025, "Working Hour Limits for Station Staff," Revision 16. The CR asserted that 20 of the violations were received while doing non-covered work and therefore were not actual violations. The CR was screened as a Level 4, "correct," with a single action to communicate the results of the evaluation to operations department personnel.

The inspectors reviewed the 20 violations that occurred while doing non-covered work and determined that Susquehanna's conclusion was incorrect. Specifically, the operations department was discounting hours performing non-covered work from the total hours worked and were therefore not assessing all hours worked toward their work hour limits. NDAP-QA-0025, "Working Hour Limits for Station Staff," is Susquehanna's implementing procedure for 10 CFR 26, Subpart I. NDAP-QA-0025, Section 5.2, "Working Hour Limits for Covered Workers," states, in part, "all hours worked, (i.e., both risk significant and non-risk significant work), shall be counted as hours accumulated towards the work hour limitations. Any deviations from the limits require prior approval by the Operations Shift Manager, Security Shift Supervisor, or Site Senior Level Manager and are granted only under certain circumstances, and only if compensatory measures are taken to ensure tasks are properly performed." The inspectors determined that by not calculating total work hours correctly, Susquehanna had not considered or applied the requirements to waive the 10 CFR 26.205 work hour limits as specified in 10 CFR 26.207, "Waivers and Exceptions."

In review of the documented issues, the inspectors identified instances in which non-covered work hours such as training or meetings were performed within the cycle and was not counted as hours accumulated toward the work hour limitations. In these instances individuals exceeded work hour limits and covered work was performed without prior approval or compensatory measures taken to ensure tasks were properly performed. The inspectors also identified that the evaluation did not fully evaluate the effectiveness of the application of the waiver process. CR-2014-09224 documented three instances in which Susquehanna issued fatigue waivers for individuals to attend an unscheduled meeting. The inspectors reviewed the waivers and determined Susquehanna used the waiver process to remove the hours worked attending the meeting from being counted as hours accumulated toward the work hour limitations. Two of the three individuals later exceeded work hour limits over the next few days as a result and covered work was performed without prior approval or compensatory measures taken to ensure tasks were properly performed as required by NDAP-QA-0025 and 10 CFR 26.207, "Waivers and Exceptions."

Finally, the inspectors also reviewed CR-2015-10018 which documented that 5 operators violated the fatigue rule on April 11, 2015, to allow performance of a post event investigation. The CR stated that the violations did not occur while doing covered work so they were not counted as "true violations." The inspectors reviewed the work history and accumulated hours for the individuals involved and determined that all five individuals exceeded work hour limitations over the next few days without prior approval or compensatory measures taken to ensure tasks were properly performed.

Susquehanna entered the issue into the CAP as CR-2015-15708 and initiated action to evaluate the extent of the condition and communicate the issue with the operations department, reinforce the standards for work hour tracking with station personnel, and ensure work hours are appropriately tracked. The inspectors considered whether this issue was licensee identified because Susquehanna had generated CRs to document that the computer tracking software had identified violations of the fatigue rule, but determined that the issue was more appropriately characterized as NRC-identified because inspectors added significant value by identifying that Susquehanna had incorrectly calculated total hours worked for licensed operators on multiple occasions and therefore had incorrectly classified each of the issues as not violations of the 10 CFR 26.205 limits.

Analysis. The inspectors determined that Susquehanna's failure to ensure that the calculated hours for individuals subject to work hour controls included all time performing duties was a performance deficiency that was within Susquehanna's ability to foresee and correct and should have been prevented. Specifically, the inspectors identified numerous instances in which non-risk significant (i.e. non-covered) work hours such as training or meetings were performed within the cycle and were not counted as hours accumulated toward the work hour limitations. This allowed operators to perform covered work in excess of the work hour limits without conducting required waivers. The inspectors determined that the finding was more than minor because Susquehanna inadequately implemented the requirements of 10 CFR 26.205 and NDAP-QA-0025 routinely. Therefore, if the performance deficiency were left uncorrected, the continued process of not including all hours accumulated toward work hour limits and allowing workers to exceed work hour limits, had the potential to lead to a more significant safety concern. The finding was also similar to IMC 0612, Appendix E, "Examples of Minor Issues," Example 9.a. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibits 1 and 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because no transients, loss of function of a mitigating system, or mismanagement of reactivity occurred as a result of licensed operators performing covered work while not in compliance with the work hour limits specified in 10 CFR 26.205.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because Susquehanna did not identify the issues completely, accurately, and in a timely manner. Specifically, Susquehanna identified violations of work hour limits on multiple occasions but the CRs were not in sufficient detail to ensure they were appropriately prioritized and assigned for resolution. Individuals did not recognize that work performed doing non-covered work was to be counted as hours accumulated towards the work hour limitations and thus discounted the violations as erroneous. [P.1]

Enforcement. 10 CFR 26.205 states, in part, that a licensee shall calculate the work hours of individuals who are subject to this section as the amount of time the individuals perform duties for the licensee. NDAP-QA-0025, "Working Hour Limits for Station Staff," implements these requirements and states that all hours worked shall be counted as hours accumulated towards the work hour limitations. Additionally, it states that any deviations from the limits require prior approval by the Operations Shift Manager, Security Shift Supervisor or Site Senior Level Manager and are to be granted only under certain circumstances, and only if compensatory measures are taken to ensure tasks are properly performed. Contrary to the above, on multiple instances from February 2014 through April 2015 not all hours worked were counted as hours accumulated towards the work hour limitations which allowed individuals to exceed the work hour limits specified in 10 CFR 26.205 without prior approval by appropriate managers or compensatory measures being taken. Susquehanna's corrective actions to restore compliance included initiating action to evaluate the extent of the condition, communicating the issue with the operations department, reinforcing the standards for work hour tracking with station personnel, and ensuring work hours are appropriately tracked. Because this violation was of very low safety significance (Green), and Susquehanna entered this performance deficiency into the CAP (CR-2015-15708), this finding is being treated as an NCV in accordance with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV05000387;388/2015002-04, Multiple Violations of Work Hour Limitations by Licensed Operators)**

c. Observation(s)

The inspectors noted that Susquehanna's application of the CAP as it applied to deficiencies identified regarding implementation of the fatigue rule program was inconsistent across departments. The annual audit of the fitness for duty program performed for 2014, as required by Susquehanna's implementing procedure NDAP-QA-0025, "Working Hour Limits for Station Staff," Revision 16, identified violations of the program for exceeding working hour limits in three departments. The inspectors noted inconsistent implementation of the CAP between the three departments to resolve the identified deficiencies.

- Security – CR-2015-01496 identified a violation of work hours for one security officer. This CR was screened as a condition adverse to quality (CAQ), a work group evaluation was performed and reasonable corrective actions were implemented.
- Radiation Protection – A non-CAP action request (AR) AR-2014-03624 identified three violations in the radiation protection department for the first quarter of 2014. NDAP-QA-0025, section 5.2.3 requires a CR to be generated for violations of work hour limits which was not performed for these three violations. Since no CR was generated no actions were taken to evaluate these violations and no corrective actions were implemented. Inspectors assessed the failure to generate CRs for identified fatigue rule violations and determined it to be of minor safety significance because this department had previously generated CRs for similar events and this was not a routine occurrence.
- Operations – CR-2015-00730 identified 27 violations of work hours in the operations department. This CR was screened as a CAQ-plus, no evaluation was performed and no corrective actions were taken.

The inspectors noted the disparity in the screening and handling of Susquehanna's identified violations of the work hours program. Susquehanna considered this observation when assessing the finding and associated violation documented above performed an extent of condition review of all department's compliance with NDAP-QA-0025.

.3 Annual Sample: Corrective Actions for NCV 05000387;388/2014009-02: Failure to Conduct Timely Initial Operability Determinations

a. Inspection Scope

The inspectors performed an in-depth review of Susquehanna's evaluation and corrective actions associated with the subject NCV. The NCV was documented because Susquehanna did not perform and document immediate operability determinations consistent with procedure NDAP-QA-0703, "Operability Assessment and Requests for Enforcement Discretion," Revision 24. The subject NCV was entered into the CAP as CR-2014-25076. Susquehanna performed an apparent cause evaluation (ACE) to identify the cause of the violation and identify corrective actions. The inspectors reviewed the evaluation and its associated corrective actions and effectiveness reviews.

Susquehanna determined that the cause of the programmatic issue was that the time requirements for completing initial operability determinations were overly restrictive and not in line with industry standards. The primary corrective actions intended to address the cause included a major revision to NDAP-QA-0703 and operability determination training to the operations department. The inspectors reviewed the procedure changes to NDAP-QA-0703 to determine if the requirements of the procedure were aligned with IMC 0326, "Operability Determinations and Functionality Assessments for Conditions Adverse to Quality or Safety," dated January 31, 2014, and evaluated whether these changes would ensure operability determinations were completed in a timely manner. The inspectors also reviewed Susquehanna's change management plan and training to roll out the procedural changes to the staff. Finally, the inspectors performed a review of operability determinations and functionality assessments completed during the weeks of April 27 and June 8 to independently assess Susquehanna's actions.

b. Findings and Observations

No findings were identified.

The inspectors identified weaknesses in some of Susquehanna's key corrective actions. The NCV documented that immediate operability determinations were untimely because either: 1) operations department personnel were slow to assess CRs for operability once they were made aware of the conditions via the CR process; or, 2) personnel did not promptly inform operations of potentially degraded or non-conforming conditions. Corrective actions were reasonable in regards to the specific issues which involved delays in assessing conditions for operability by operations department personnel. However, Susquehanna did not sufficiently address the documented issues in which CRs were being held outside of the control room for extended periods of time, delaying the assessment and documentation of system operability or functionality. Specifically, during an independent sampling of CRs during the weeks of April 27 and June 8, the

inspectors noted several CRs that were not reviewed for operability in a reasonable period of time following identification of the issue due to the CRs not being processed to the control room in a timely manner. The inspectors reviewed the corrective actions for the subject NCV to determine which were intended to correct this portion of the NCV and noted the following:

- Section 5.1.1 of NDAP-QA-0703 requires the control room be immediately notified upon discovery of a potential or suspected degraded or nonconforming condition. Section 5.2.1 then requires the initial operability screening to be complete within 24 hours of the control room becoming aware of the condition. The inspectors determined that the changes to NDAP-QA-0703 that were made as corrective actions for the subject NCV affected all personnel on-site by requiring that the control room be immediately notified upon discovery of a potential degraded or nonconforming condition. The inspectors reviewed AR-2015-19471 which required a change management plan to implement the revised NDAP-QA-0703. The inspectors identified that the change management plan had not yet been developed, and the action had been extended eight times from the original due date of August 29, 2014, until August 21, 2015. Despite this, the changes to NDAP-QA-0703 were made and implemented in January 2015. The inspectors concluded that implementation of a change management plan may have provided Susquehanna an opportunity to reinforce the standard to all station personnel.
- An interim effectiveness review (ACT-05-CR-2014-25076) determined whether actions had been effective at addressing the documented issues regarding untimely immediate operability determinations. The effectiveness review looked at 40 randomly selected CRs to assess the timeliness of operability determinations and established an acceptable level of no more than 5% of operability/functionality assessments documented outside of the timeliness requirements of NDAP-QA-0703. The interim effectiveness review was closed out with the conclusion that all 40 operability/functionality assessments were conducted within the timelines required. The inspectors reviewed the 40 CRs, looking at the time the CRs were initiated until the time the main control room completed the operability determination and determined that 3 CRs (7.5%) were not assessed for operability/functionality within 24 hours. The interim effectiveness review only evaluated the operability/functionality review from the time the CR made it to the control room until the assessment was complete. This evaluation method neglected to include the time the CRs are in “initiate” and “supervisory review” status. Therefore, the inspectors concluded that the effectiveness review did not fully evaluate the effectiveness of corrective actions with regards to timely processing of CRs to the control room.

Overall, the inspectors concluded that Susquehanna had not adequately addressed the behaviors of station personnel outside the Operations Department to ensure that the personnel consistently implement their responsibilities in NDAP-QA-0703 to immediately notify the control room upon discovery of a potentially degraded or nonconforming condition. The inspectors noted that this observation was considered by the Corrective Action Review Board (CARB) when evaluating the final effectiveness review of the ACE. As a result, the CARB concluded that the success criteria were too narrow and did not encompass the time from when the CR is initiated to when the operability/functionality assessment is complete. Based on this, the CARB determined that the ACE was ineffective and generated CR-2015-16998 to evaluate changes to the ACE action plan. The inspectors considered whether this constituted an inadequate correction of the

subject NCV. No finding was identified because 1) the majority of CRs were reviewed for operability in a timely manner, and 2) inspectors did not identify any CRs that were not reviewed in timely manner in which there was a reasonable doubt of operability of the SSC.

.4 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Susquehanna outside of the corrective action program, such as trend reports, performance indicators, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed Susquehanna's corrective action program database for the first and second quarters of 2015 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC's daily condition report review (Section 4OA2.1). The inspectors observed Screening Team and Management Review Committee (MRC) meetings conducted in accordance with LS-120, "Issue Identification and Screening Process," Revision 5, and NDAP-00-0780, "Management Review Committee," Revision 8, respectively, during the week of June 15, 2015. The inspectors reviewed the Susquehanna quarterly performance assessment report for the first quarter of 2015, conducted under LS-125-1009, "Station Trending Manual," revision 0, to verify that Susquehanna personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

a. Findings and Observations

No findings were identified.

Fire Protection Program Related Events. The inspectors identified a trend in fire protection program related events for the period of January 2015 through June 2015. Inspectors documented two violations of NRC requirements in the last two quarterly integrated inspection reports. Specifically, inspectors identified in October 2014 that the station had not implemented fire risk management actions when hot work was allowed in an area of the plant that had a higher risk due to out of service fire protection equipment (05000387;388/2014005-01, ML15043A095). Additionally, inspectors identified in February 2015 that the station had not controlled transient combustible materials in accordance with the station fire program (05000387/2015001-02, ML15133A253). In follow-up to the documented issues, the inspectors identified that there has been a significant increase in the number of CRs written to document events related to the fire protection program. Specifically, the inspectors noted that since February 2015, Susquehanna generated an average of 52 CRs per month related to the fire protection program. In comparison, Susquehanna generated an average of approximately 30 CRs per month over the previous 13 months, which represented a 73% increase in identified fire protection program events. The inspectors reviewed the CRs that were generated recently and determined that several were similar to the events documented in the two

NCVs. The inspectors noted that the station is in the process of establishing a site Fire Marshall position to improve ownership and accountability of the fire protection program.

CR Screening Process. Susquehanna revised LS-120, "Issue Identification and Screening Process", several times in the last twelve months to include updated industry guidance intended to ensure resources are efficiently utilized on items that are required to be resolved through the CAP. Specifically, revision 1 to LS-120 incorporated a new classification level of "condition adverse to quality-plus" (CAQ-Plus). This level was intended to ensure that only appropriate items remain in the CAP. This level includes items that meet the definition of a CAQ or significant CAQ (SCAQ) per the stations operational quality assurance program and other items of regulatory importance and risk significance. Inspectors noted the following items while observing the CR screening as they pertained to recent revisions:

- CRs that documented non-compliances with administrative requirements of quality procedures were screened as not adverse to quality, and therefore removed from the CAP, based on no actual event occurring with regard to plant equipment. The inspectors determined that in some cases this may be inconsistent with LS-120 requirements because the CRs represented non-compliances with regulatory requirements that required correction within the station's CAP (CR-2015-17345, CR-2015-17355, CR-2015-16926).
- Some CRs were assigned an evaluation level first and were then assigned risk values that corresponded to the assigned level. This is inconsistent with LS-120 which describes the sequence for screening CRs as assigning risk values first based on the actual or potential risk of the event and then assigning an evaluation level based on the assigned risk and degree of uncertainty. The inspectors noted that it was not apparent that degree of uncertainty, as described in LS-120, Attachment D, "Guidance for Determining Evaluation Type," was referenced when screening CRs during the screening and MRC meetings that were observed.
- When changes were made to the Screening Team's recommendation by MRC, feedback to the screening team did not include the basis for the changes. The inspectors noted that this prevented the screening team from understanding management's basis for changing the recommendation as a learning tool.

The inspectors evaluated the issues in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issues of concern were of minor significance because inspectors did not identify any conditions adverse to quality that were not appropriately corrected or scheduled for correction in a reasonable period of time as a result of the failure to implement the CR screening process appropriately. Consequently, the issues were not subject to enforcement action in accordance with the NRC's Enforcement Policy.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples).1 Plant Eventsa. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Susquehanna made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Susquehanna's follow-up actions related to the events to assure that Susquehanna implemented appropriate corrective actions commensurate with their safety significance.

- Unit 2, reactor scram due to a loss of condenser vacuum on April 10, 2015 (Event Number: 50973)

b. Findings

Introduction. A self-revealing finding of very low safety significance (Green) and associated NCV of SSES Unit 2 TS 5.4.1, "Procedures," was identified because Susquehanna incorrectly implemented procedures for operation of the auxiliary steam and main turbine steam sealing systems. Specifically, on April 10, 2015, while Unit 2 was being shut down for 2R17, operators secured main turbine steam seals resulting in degraded main condenser vacuum. The degraded main condenser vacuum resulted in a main turbine trip, which caused an automatic reactor scram from approximately 37% power.

Description. When performing a reactor plant shutdown, step 5.3 of procedure GO-200-004, "Plant Shutdown to Minimum Power," directs placing an auxiliary boiler in service in accordance with OP-027-002, "Aux Boiler System." The auxiliary boiler is needed to provide an auxiliary source of steam to the main turbine steam seals when reactor power has been reduced to the point where main steam is no longer adequate to provide the sealing steam. The steam seals on the main turbine serve to minimize air intrusion into the condenser, acting as a seal to maintain condenser vacuum. Step 5.8 of GO-200-004 directs placing the main turbine steam seals on auxiliary steam in accordance with OP-292-002, "Steam Seal System."

On April 10, 2015, in support of the planned Unit 2 reactor shut down for RFO 2R17, these two steps were being performed concurrently as allowed by GO-200-004. Specifically, two groups of operators were briefed and dispatched to startup the auxiliary boilers in accordance with OP-027-002. Step 5.5.4 of OP-027-002 directs placing a temporary load on the auxiliary boiler when there will be an anticipated delay for loading the boiler of greater than 30 minutes. Since the auxiliary boilers are common to both Units 1 and 2, they can supply auxiliary steam to either unit and OP-027-001 allows operators discretion in selecting which unit to establish as the temporary load. Establishing temporary loads consists of aligning a dump path for auxiliary steam flow from the auxiliary boilers via the auxiliary steam system header to the main condenser

by opening the auxiliary boiler steam supply valve to the main turbine steam seal header, valve 121008 or 221008, for Units 1 or 2, respectively. In this case, a group of operators chose to align the auxiliary boilers to Unit 2 by opening valve 221008, which was the unit that was being prepared for plant shutdown for a 2R17.

With auxiliary boiler steam now available to supply Unit 2 steam seals, a second group of operators transferred the seal steam supply from reactor steam to auxiliary boiler steam in accordance with OP-292-001. Step 2.3.3 of OP-292-001 requires valve 221008 to be opened, which had already been completed by the first group of operators when they established Unit 2 as the temporary load for the auxiliary boilers. Upon completion of this task, which established the steam seals as a permanent load for the auxiliary boilers, the first group of operators resumed performance of OP-027-001 at step 5.5.4.c to secure the temporary load for the auxiliary boiler steam. Step 5.5.4.c directed closure of valve 221008 to remove the temporary load. In this case, because operators had chosen to align the temporary load to Unit 2, it was no longer temporary and the step should have been annotated not applicable in accordance with station procedures. When operators closed valve 221008, they secured the steam supply to the main turbine seals. As a result, air in-leakage was allowed into the main condenser which degraded vacuum to the point that a main turbine trip and associated reactor scram occurred.

Susquehanna's investigation into the cause of the degradation of vacuum revealed that the operators did not understand the impact of closing valve 221008 because they did not understand that the steam seal header became a necessary and permanent auxiliary steam load when the second group of operators secured normal reactor steam to the steam seals. Susquehanna concluded that operators were required to annotate the step to close the valve as not applicable based on plant conditions. Step 5.2.2 of NDAP-QA-0029, "Procedure and Work Instruction Use and Adherence," Revision 25, states that personnel must understand the impact before performing a procedural step for performance of a continuous use document. Additionally, Susquehanna determined that the critical brief for the two evolutions was inadequate because it did not establish which unit would be established as the temporary auxiliary boiler steam load. During previous plant shutdowns, operators had designated the non-outage unit as the temporary load to avoid confusion during the evolution. This was not recognized on this occasion and therefore the decision was left up to the discretion of the operators in the field.

Susquehanna restored main condenser vacuum by reestablishing steam seals, performed off-normal and emergency operating procedures to stabilize the plant post-scram, and entered the issue into the CAP as CR-2015-09890.

Analysis. The inspectors determined that operators inadequate understanding of the impact of performing a procedure step prior to its performance was a performance deficiency that was within Susquehanna's ability to foresee and correct, and should have been prevented. The finding was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, not understanding the impact of securing auxiliary steam to the main turbine steam seals resulted in the degradation of main condenser vacuum, automatic trip of the main turbine and associated reactor scram. The inspectors evaluated the finding in accordance with

IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 1, for the Initiating Events cornerstone, dated June 19, 2012. The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment. Specifically, though a reactor scram occurred, operators were able to restore main condenser vacuum prior to MSIV closure and the main condenser and reactor feed pumps remained functional during the event.

This finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because Susquehanna did not implement appropriate error reduction tools. Specifically, operators did not effectively implement human error prevention tools (e.g. pre-job briefing, stop-think-act-review) in accordance with station processes. [H.12]

Enforcement. SSES Unit 2 TS 5.4.1, "Procedures," requires that written procedures be implemented for activities recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Appendix A, Revision 2. RG 1.33 requires, in part, procedures for plant shutdown to hot standby and administrative procedures governing procedure adherence. GO-200-004 "Plant Shutdown to Minimum Power," provides procedural direction for shutdown of the plant. GO-200-002 directs startup of the auxiliary boilers in accordance with OP-027-002, "Aux Boiler System," and placing the main turbine steam seals on auxiliary steam in accordance with OP-292-002, "Steam Seal System." These three procedures are all designated as continuous use. NDAP-QA-0029, "Procedure and Work Instruction Use and Adherence," provides administrative controls for procedure adherence. Step 5.2.2 of NDAP-QA-0029 states that personnel must understand the impact before performing a procedural step for performance of a continuous use document.

Contrary to the above, on April 10, 2015, operators did not understand the impact of closing the Unit 2 auxiliary steam supply valve to the main turbine steam seal header (221008), when performing step 5.5.4.c of OP-027-002. Specifically, the valve was required to be opened after the steam seals were transferred to auxiliary steam in accordance with OP-292-002 and operators were required to annotate the step to close the valve as not applicable based on plant conditions. Closing the valve removed the steam supply to the main turbine steam seals, allowing air in-leakage into the main condenser which degraded vacuum to the point that a main turbine trip and associated reactor scram occurred. Susquehanna's corrective actions to restore compliance included restoring main condenser vacuum by reestablishing steam seals and performing off-normal and emergency operating procedures to stabilize the plant post-scram. Because this violation was of very low safety significance (Green), and Susquehanna entered this performance deficiency into the CAP as CR-2015-09890, this finding is being treated as an NCV in accordance with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000388/2015002-05, Loss of Main Condenser Vacuum When Transitioning Steam Seals to Auxiliary Steam)**

.2 (Closed) Licensee Event Report (LER) 05000388/2015-003-00: Automatic Reactor Scram Caused by Main Turbine Trip Due to Loss of Main Condenser Vacuum

On April 10, 2015, while Unit 2 was being shut down for a RFO, operators secured main turbine steam seals resulting in degraded main condenser vacuum. The degraded main condenser vacuum resulted in a main turbine trip, which caused an automatic reactor scram from approximately 37% power. All systems responded appropriately as a result of the scram.

The scram was reported in accordance with 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A) in event notification (EN) 50973. It was also reported as a LER in accordance with 10 CFR 50.73(a)(2)(iv)(A). Susquehanna determined the root cause of the event was a human performance error in that operators did not understand and anticipate the impact of component operation during auxiliary boiler startup. The inspectors reviewed this LER to determine if Susquehanna's evaluations and associated corrective actions were appropriate. The inspectors also assessed the accuracy of the LER, the timeliness of corrective actions, whether violations of requirements occurred, and if potential generic issues existed. The enforcement aspects of this issue are discussed in Section 4OA3.1 of this report. This LER is closed.

.3 (Closed) Licensee Event Report (LER) 05000387(388)/2015-001-00: Inoperability of the 'B' Emergency Diesel Generator due to Fuel Oil Leakage

During a routine surveillance test on March 2, 2015, the 'B' EDG was declared inoperable due to fuel oil leakage from the fuel oil drain line crossover piping. The EDG was declared inoperable because it was not known if the EDG would have been able to meet its mission time due to the risk of fire from the leaking fuel oil. A prompt operability determination that was performed when the leak was originally identified on January 31, 2015, did not bound the increased leak rate observed on March 2, 2015. The leaking drain line piping was replaced and the 'B' EDG was restored to operable on March 3, 2015. Because of the initial identification of leakage on January 31, 2015, Susquehanna considered that there was firm evidence to indicate that the condition existed prior to the time of discovery and therefore determined that the condition was reportable under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS 3.8.1. Susquehanna determined that the direct cause of the fuel oil leakage was due to vibration induced fretting of the piping when the fuel oil drain line rubbed against its metal clamp during normal engine operation. The underlying cause of the fretting was determined to be an inadequate design of the support clamp.

The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The inspectors considered that the inadequate design of the clamp, which caused the vibration induced fretting, represented a potential violation of regulatory requirements. However, the inspectors determined that the enforcement aspects of this issue which were documented in Section 1R15 of inspection report 05000387(388)/2015001 (ML15133A253) adequately described the condition and resultant inoperability and therefore no additional violations of regulatory requirements were identified. This LER is closed.

4OA6 Meetings, Including Exit

On July 16, 2015, the inspectors presented the inspection results to Mr. Jon Franke, 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

J. Franke, Site Vice President
 B. Franssen, Plant Manager
 K. Cimorelli, General Manager- Operations
 R. Day, ISI Program Owner
 D. Deretz, Performance Improvement Manager
 J. Dougherty, Operations CAP Coordinator
 K. Dyer, Supervisor- Corrective Action and Assessment
 M. Dziedzic, Site Level III and IWE/IWL Program Owner
 L. Fuller, System Engineer Reactor Recirculation,
 J. Grisewood, Nuclear Regulatory Affairs Manager
 F. Habib, Materials Engineer
 J. Jennings, Supervisor- Nuclear Regulatory Affairs
 D. Jones, Operations Manager
 T. Kupetz, Senior Engineer, ISI
 K. Lore, Security Shift Commander
 C. Manges, Nuclear Regulatory Affairs
 M. Masteller, Manager, Nuclear Security
 B. O' Rourke, Licensing Engineer
 S. Peterkin, Radiation Protection Manager
 P. Scanlan, Station Engineering Manager
 A. Schrad, System Engineer
 M. Swartzwood, Heat Exchanger ECT
 R. Vasquez, Jet Pumps, Engineering
 R. Whiteknight, FAC Program Owner
 D. Yapple, System Engineer

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

05000387;388/2015002-01	NCV	Failure to Assess a Non-Conforming Condition for its Impact on Component Operability (Section 1R15)
05000387;388/2015002-02	NCV	Entry into a High Radiation Area without Radiological Briefing (Section 2RS1)
05000387;388/2015002-03	NCV	Incorrect Implementation of the Ventilation Filter Testing Program (Section 2RS6)

05000387;388/2015002-04	NCV	Multiple Violations of Work Hour Limitations by Licensed Operators (Section 4OA2)
05000388/2015002-05	NCV	Loss of Main Condenser Vacuum When Transitioning Steam Seals to Auxiliary Steam (Section 4OA3)
<u>Closed</u>		
05000388/2015-003-00	LER	Automatic Reactor Scram Caused by Main Turbine Trip Due to Loss of Main Condenser Vacuum (Section 4OA3)
05000387;388/2015-001-00	LER	Inoperability of the 'B' Emergency Diesel Generator due to Fuel Oil Leakage (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

NDAP-00-0030, Severe Weather Natural Disaster Preparation, Revision 8
 ON-NATPHENOM-001, Severe Weather/ Natural Phenomena, Revision 14
 GO-200-014, Unit 2 Hot Weather Operation, Revision 7
 GO-100-014, Unit 1 Hot Water Operation, Revision 11
 NDAP-00-1913, Seasonal Readiness, Revision 3
 PSP-32, Nuclear Plant Interface Agreement and Procedures between PPL EU and PPL Susquehanna, LLC, Revision 9

Condition Reports

CR-2015-16607 CR-2015-17611 CR-2014-36614 DI-2014-30693

Drawings

E-1, Unit 1 & 2 Single Line Diagram Station, Sheet 1A, Revision 7
 E-1, Unit 1 & 2 Single Line Diagram Station, Sheet 1, Revision 37

Miscellaneous

TM-OP-004X-ST, Introduction to SSES Electrical Plant Distribution, Revision 5

Section 1R04: Equipment Alignment

Procedures

OP-251-001, CS System, Revision 34
 OP-216-001, RHR Service Water, Revision 39
 MT-AD-504, Scaffold Erection, Review and Inspection, Revision 25

Condition Reports (*NRC identified)

CR-2015-12772* CR-2015-12804* CR-2015-12823* CR-2015-17554*

Maintenance Orders/Work Orders

1888716

Drawings

M-2152, Unit 2 P&ID CS, Sheet 1, Revision 28
M-2110, Unit 2 P&ID Service Water, Sheet 1, Revision 45
M-2153, Unit 2 P&ID Fuel Pool Cooling and Clean-up, Sheet 1, Revision 33
M-110, Unit 1 P&ID Service Water, Sheet 1, Revision 45
M-2153, Unit 2 P&ID Fuel Pool Cooling and Clean-up, Sheet 2, Revision 8
M-153, Unit 1 P&ID Fuel Pool Cooling and Clean-up, Sheet 2, Revision 14
M-153, Unit 1 P&ID Fuel Pool Cooling and Clean-up, Sheet 1, Revision 42
M-2112, Unit 2, P&ID RHR Service Water System, Sheet 1, Revision 31
M-2151, Unit 2 P&ID RHR, Sheet 1, Revision 60
M-2151, Unit 2 P&ID RHR, Sheet 2, Revision 45
M-2151, Unit 2 P&ID RHR, Sheet 3, Revision 25

Miscellaneous

SSSES Spent Fuel Pool Cooling PLI-72367, September 9, 1992
CL-216-0014, Library Checklist, Unit 2 RHRSW System B, revision 10
TM-OP-016-ST, RHR Service Water, Revision 10
TM-OP-070-ST, SBTG System, Revision 7
M-175, Reactor Building Air Flow Diagram Zone III, Sheet 2, Revision 9
VC-175, P&ID HVAC Control Diagram Reactor Building SBTG System, Sheet 3, Revision 34

Section 1R05: Fire Protection

Procedures

FP-113-111, Pre-Fire-Plan, Equipment Removal Area (I-200, I-201) Fire Zones 1-3B-N,S,W
Elevation 683'-0", Revision 5
FP-213-254, Pre-Fire-Plan, Circulation Space (II-500), Fuel Pool Heat Exchanger Room (II-514)
Chiller Room (II-512), Standby Liquid Control System Area (II-513), RPS MG Set Room
(II-511), Sample Station (II-508) Fire Zones 2-5A-N, 2-5A-S, 2-5 A-W, 2-5H Elevation
749'1", Revision 8
FP-013-200, Pre-Fire-Plan, ESSW Pump House Loop "A" Pump Room (E-1) Fire Zone 0-51
Elevation 685'-6", Revision 4
FP-013-198, Pre-Fire-Plan, "DG Bay 'D', Fire Zone 0-41D, Elevation 677', 660' and 710',
Revision 4

Condition Reports

CR-2015-13184

Maintenance Orders/Work Orders

1878641 1857650 1876063

Drawings

C-1730, Unit 2 Reactor Building Fire Zone Plan Elevation 683'-0", Sheet 1, Revision 17
C-1728, Unit 2 Reactor Building Fire Zone Plan Elevation 645'-0", Sheet 1, Revision 8
C-1729, Unit 2 Reactor Building Fire Zone Plan Elevation 670'-0", Sheet 1, Revision 10

- C-1732, Unit 2 Reactor Building Fire Detector Location Plan Elevation 749'-1" to 779'-1', Sheet 4, Revision 8
- C-1759, ESSW Pumphouse Fire Zone Plan Elevation 685'-6", Sheet 1, Revision 5
- C-1759, ESSW Pumphouse Fire Doors and Fire Dampers Elevation 685'-6", Sheet 2, Revision 4
- C-1759, ESSW Pumphouse Fire Protection Plan Elevation 685'-6", Sheet 3, Revision 5
- C-1759, ESSW Pumphouse Fire Detector Location Plan Elevation 685'-6" to Roof, Sheet 4, Revision 4
- C-1760, ESSW Pumphouse Fire Zone Plan Section A-A, Sheet 1, Revision 2

Miscellaneous

SSES-FPRR, Revision 18

Section 1R06: Flood Protection Measures

Procedures

NDAP-QA-0409, Door, Floor Plug and Hatch Control, Revision 14

Drawings

- M-161, Common P&ID Liquid Radwaste Collection, Sheet 2, Revision 37
- C-2728, Unit 1 Reactor Building Station Flood Barrier Plan of El. 719'-0", Sheet 1, Revision 2
- C-2736, Unit 2 Reactor Building Station Flood Barrier Plan of El. 719'-0", Sheet 1, Revision 2

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- EC-FLOD-0001, Internal Flooding Evaluations for Moderate Energy Pipe Cracks and Sprinkler system Actuations, Revision 3
- EC-012-1016, Determination of Reactor Building Door Sill Clearances, Revision 0
- EC-RISK-0539, Internal Flooding Analysis for PRA, Revision 3
- EC-FLOD-1001, Evaluation of Response to INPO ER 11-1, Recommendations 3 & 4 for Station Flooding, Revision 2

Section 1R07: Heat Sink Performance

Condition Reports (*NRC identified)

CR-2015-13088 CR-2015-09054* CR-2015-09055* CR-2015-09057*

Maintenance Orders/Work Orders

1739914 1591900

Section 1R08: In-service Inspection

Procedures

- NEPM-QA-1172, Guidelines for FAC Program Activities, Revision 8
- NDE-UT-008, Vendor Originated Procedure PDI Generic Procedure for Straight Beam Ultrasonic Examination of Bolts and Studs (GE ID #GEH-PDI-UT-5 Rev 6.1), Revision 5
- GEH-PDI-UT-5, PDI Generic Procedure for Straight Beam Ultrasonic Examination of Bolts and Studs, Revision 6.1
- NDE-VT-011, Test Procedure Mechanical and Hydraulic Snubbers, Revision 2
- NDE-VT-005, Underwater VT of RPV Internals, Revision 10
- NDE-RT-001, Radiographic Testing, Revision 4
- NDE-UT-029 (GEH-UT-503, Rev 15), Automatic UT examination of Core Shroud Assembly Welds

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CR-2015-04050	CR-2015-10137	CR-2015-10102	CR-2015-10883
CR-2015-10946	CR-2015-10137	CR-2015-10102	CR-2015-10883
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1892664	1772982	1772366
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 2F-1437, Outline Reactor Recirculating Pump, Revision H
 DCA-202-1, Isometric – Reactor Bldg. Reactor Water Clean-up – Unit 2, Revision 3
 M-199, Piping Class Sheets, Line Index and Standards for the SSES Units 1 and 2, Sheet A,
 dated August 30, 2012

Miscellaneous

BWRVIP-41, BWR Vessel and Internals Project, BWR Jet Pump Assembly Inspection and Flaw
 Evaluation Guidelines, Revision 3
 INR 2RI017, Indication Notification Report IVVI 15-06 Jet Pump AVS, Revision 2
 INR 2RI017, Indication Notification Report IVVI 15-03 Jet Pumps 11-20 Set Screws AS2 and
 AS2, Revision 2
 INR 2RI017, Indication Notification Report IVVI 15-05 Jet Pumps 11-20 Aux Wedges,
 Revision 2
 INR 2RI017, Indication Notification Report IVVI 15-04 Jet Pumps Slip Joint Clamps 11 thru 20,
 Revision 1
 INR 2RI017, Indication Notification Report IVVI 15-01 Jet Pumps Slip 11-20 WD-1, Revision 3
 BOP-PT-14-373, 1A Reactor Recirculation Pump Seal Line NDE Report, dated December 14,
 2014
 BOP-PT-15-093, Connect #2 Vendor Pipe to Union and Pipe to Seal, dated April 17, 2015
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 Map, dated April 22, 2015
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 Plugged) Map, dated April 22, 2015
 GE SIL No. 629, Inlet-mixer wedge damage in BWR jet pump assemblies, dated July 11, 2000
 GE RICSIL No. 078, Jet pump restrainer bracket set screw gaps, dated June 3, 1996
 FAC-U2-15A-022, FAC Examination, 90-Degree Elbow, dated April 22, 2015
 FAC-U2-15A-035, FAC Examination, Tee Fitting, dated April 21, 2015
 Function Test Results, Snubber 312-00808-011, dated April 20, 2015
 LER 387/2014-011-00, Degraded Condition Due to Reactor Coolant Pressure Boundary
 Leakage Caused by and Inadequate Weld, dated February 11, 2015
 MM042, Lesson Plan: Piping Systems, dated January 24, 2013
 MM035, Lesson Plan: Fasteners and Torqueing Guidelines, dated April 12, 2011
 H-1005, Eddy Current Examination Services on Nuclear Plant Heat Exchangers, Revision 6
 ASME Section XI Code Case N-578-1, Risk Informed Requirements for Class 1, 2, or 3 Piping,
 Method B
 ASME Section XI Code Case N-716-1, Alternative Classification and Examination Requirements

Section 1R11: Licensed Operator Requalification ProgramProcedures

OP-AD-300, Administration of Operations, Revision 2
 OP-AD-002, Standards for Shift Operations, Revision 57
 OP-AD-004, Operations Standards for Error and Event Prevention, Revision 38
 OP-AD-338, Reactivity Manipulations Standards and Communication Requirements, Revision 27
 GO-200-002, Plant Startup, Heatup and Power Operation, Revision 84
 OP-AD-300, Administration of Operations, Revision 4
 OP-155-001, Control Rod Hydraulic System, Revision 63
 ON-AUXBUS-101, Loss of Undervoltage Condition on 13kv Bus 11A or 11B, Revision 0
 ON-SW-101, Loss of Service Water, Revision 0
 ON-CRD-101, Control Rod Malfunction, Revision 1
 ON-SCRAM-101, Reactor Scram, Revision 0
 EO-100-102, RPV Control, Revision 8
 EO-100-103, Primary Containment Control, Revision 9
 EO-100-104, Secondary Containment Control, Revision 9
 EO-100-105, Radioactivity Release Control, Revision 6
 EO-100-112, Rapid Depressurization, Revision 7
 EO-100-113, Level/Power Control, Revision 8

Section 1R12: Maintenance EffectivenessProcedures

ON-215-001, Loss of Turbine Building Closed Cooling Water, Revision 24
 NSEP-AD-0413D, Maintenance Rule- Performance Monitoring, Revision 2
 NSEP-AD-0413E, Maintenance Rule-Dispositioning Between (A)(1) and (A)(2), Revision 1
 NDAP-QA-0413, Implementation of the Maintenance Rule, Revision 13

Condition Reports (*NRC identified)

CR-2014-22946	CR-2015-01930	CR-2015-06998	CR-2014-11738
CR-2014-08504	CR-2015-17423*	CR-2015-07952	

Drawings

E162643, SSES Unit 2 PI&D Turbine Building Closed Cooling Water, Sheet 1, Revision 38

Miscellaneous

System Health Scorecard, System # 215 TBCCW Revision 5, September 15, 2014
 Maintenance Rule Basis Document – System 215, Turbine Building Closed Cooling Water ACE for CR-2015-01437, Revision 0
 Engineering System Health Scorecard, Revision 7, March 31, 2015
 CR-2015-01437, Why chart
 Unit 2, SPC B Unavailability

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

OI-013-002, Fire Risk Management, Revision 3
 NDAP-QA-0320, Special Infrequent or Complex Test/Evolutions, Revision 18

SE-224-107, Unit 2 Division I Diesel Generator LOCA Loop test Special, Infrequent or Complex Test/Evolution, Revision 21
 SE-200-002, ASME Class I Boundary System Leakage Test, Revision 26
 OT-235-002, Refuel Outage Decay Heat Removal Capability Determination and Monitoring, Revision 0
 NDAP-QA-0340, Protected Equipment Program, Revision 26
 PSP-26, Online and Shutdown Nuclear Risk Assessment Program, Revision 15
 NDAP-QA-1904, Low Power and Shutdown Risk Management Program, Revision 4
 NDAP-QA-1902, Integrated Risk Management, Revision 20
 NDAP-QA-0340, Protected Equipment Program, Revision 26

Condition Reports (*NRC identified)

CR-2015-10661	CR-2015-13133	CR-2015-14794	CR-2015-12374*
CR-2015-11284*	CR-2015-10324	CR-2015-17355*	CR-2015-17345*
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1828774					

Miscellaneous

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 PA-2-NA-003, Shutdown Risk Model Modules, Revision 2
 EC-RISK-1148, Unit 2 Shutdown Risk Assessment Model, Revision 6
 Scheduler's Evaluation for PPL Susquehanna Unit 1
 Scheduler's Evaluation for PPL Susquehanna Unit 2
 Protected Equipment Clearance Order Coversheet, RHRSW Div. 1 week of June 15, 2015
 Risk Management Action Summary Report, RHR HX RHRSW Inlet Valve HV-21210B, June 15, 2015
 Risk Report for June 23, 2015

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

NEIM-00-1160, Snubber Functional Testing and Data Review Program, Revision 15
 MT-AD-509, Control of Minor Maintenance Activities, Revision 19
 NDAP-QA-0500, Conduct of Maintenance, Revision 26
 SP-00-302, Confined Space Procedure, Revision 17

Condition Reports (*NRC identified)

CR-2014-18969	CR-2014-02605	CR-2014-22005	CR-2015-11767
CR-2015-08674	CR-2015-12163	CR-1746612	CR-2015-14868
CR-2015-14877	CR-2015-14012	CR-2015-10898	CR-2015-12908
CR-2015-15105	CR-2015-15105	CR-1604923	CR-2015-17837
CR-2015-17906	CR-2015-17901	CR-2015-18488*	

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AR-2015-15236	AR-1592572		

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Drawings

M-161, Common P&ID, Liquid Radwaste Collection, Sheet 1, Revision 47
M-161, Common P&ID, Liquid Radwaste Collection, Sheet 2, Revision 37
M-161, Common P&ID, Liquid Radwaste Collection, Sheet 3, Revision 19
E105688, SSES Diesel Generator Building Plans & Section at EL 737'-1 1/12" Areas 43 & 44,
Sheet 1, Revision 5
E105053, SSES Diesel Generator Building Stairs and Sections, Sheet 4, Revision 10
E105053, SSES Diesel Generator Building Elevations & Precast Panel Schedule, Sheet 2,
Revision 6

Miscellaneous

Snubber Program Plan, Third ISI 10-Year Inspection Interval
ASME OM CODE- 1998
Letter from MPR Associates Inc. Engineers, dated March 13, 2014
SO-100-007, Performance Data Sheet, Recirculation System Dual Loop, Revision 71
SO-100-06, Shiftly Surveillance Operating Logs, Revision 104
Hot Box 15-19
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ACT-01-CR-2015-10898
ACT-01-CR-2015-15105
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Section 1R18: Plant ModificationsAction Requests

AR-2015-08619	AR-2015-08652	AR-2015-11336
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Engineering Calculations

EC-STRU-2091, Design of Missile Hardened Enclosure for Tap Boxes at West Wall of E Diesel
Generator Building EII 675'-6", Revision 0
EC-STRU-1919, Diesel Generator "E" Building Superstructure Walls, Revision 5
EC-STRU-1929, CONC, STEL Diesel Generator "E" Building, Revision 1

Section 1R19: Post-Maintenance TestingProcedures

TP-249-073, Initial Start and Run-in of New or Repaired RHR Pump Motor, Revision 4
SO-249-A02, Quarterly RHR System Flow Verification Division 1, Revision 22
PSP-29, Post Maintenance Testing Matrix, Revision 20
TP-250-004, RCIC Turbine Overspeed Trip Testing with Auxiliary Steam, Revision 24
SE-200-02, ASME Class I Boundary System Leakage Test, Revision 26
TP-264-048, Test of 2B Reactor Recirc Pump 2P401B Replacement Motor, Revision 7
TP-264-040, Jet Pump Recirc Loop Baseline Data Acquisition, Revision 3
TP-264-044, Reactor Recirc System Startup and Power Ascension Performance Monitoring,
Revision 0

Condition Reports

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CR-2015-13501	CR-2015-13374	CR-2015-13627	CR-2015-14886
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Maintenance Orders/Work Orders

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1670591	1719854	1412622	1712364	1847482	1847229
1802727	1820451	1791441			

Drawings

E106680, Common P&ID HVAC Control Diagram Reactor Building SGBT System, Sheet 3,
Revision 34

Miscellaneous

RTPM 1752348

Section 1R20: Refueling and Other Outage ActivitiesProcedures

GO-100-004, Plant Shutdown to Minimum Power, Revision 73
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LIST OF ACRONYMS

ACE	Apparent Cause Evaluation
ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
BOP	behavior observation program
CAP	corrective action program
CARB	Corrective Action Review Board
CAQ	condition adverse to quality
CFR	Code of Federal Regulations
CR	condition report
CS	core spray
DRS	Division of Reactor Safety
ECT	eddy current testing
EG	Regulatory Guide
ESF	Engineered Safety Feature
ESW	emergency service water
FAC	flow accelerated corrosion
FSAR	final safety analysis report
HRA	high radiation area
IMC	Inspection Manual chapter
ISI	in-service inspection
IVVI	in-vessel visual inspection
MSIV	main steam isolation valve
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
NDE	nondestructive examination
NVLAP	National Voluntary Laboratory Accreditation Program
PT	penetrant testing
RFO	refueling outage
RHR	residual heat removal
RHRSW	residual heat removal service water
RWP	radiation work permit
SBGT	standby gas treatment
SDP	significance determination process
SSC	structure, system, or component
SSES	Susquehanna Steam Electric Station
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
UT	ultrasonic testing
VHRA	very high radiation area
VT	visual examination