



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

July 31, 2017

EA-17-089

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 05000387/2017002 AND 05000388/2017002 AND EXERCISE OF  
ENFORCEMENT DISCRETION**

Dear Mr. Rausch:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station (SSES), Units 1 and 2. On July 21, 2017, the NRC inspectors discussed the results of this inspection with Brad Berryman, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of 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.

Separately, a violation involving a failure to set secondary containment during operations with a potential for draining the reactor vessel (OPDRVs) was identified during the Unit 1 refueling outage. Specifically, from March 6, 2017 to March 30, 2017, while all other Technical Specifications (TSs) were met, Susquehanna conducted several OPDRVs without establishing secondary containment operability, which is a violation of TS 3.6.4.1, "Secondary Containment." NRC issued Enforcement Guidance Memorandum (EGM) 11-003, "EGM on Dispositioning Boiling Water Reactor (BWR) Licensee Noncompliance with TS Containment Requirements during Operations with a Potential for Draining the Reactor Vessel," on October 4, 2011, allowing for the exercise of enforcement discretion for such OPDRV-related TS violations, when certain criteria are met. Because the NRC has determined the licensee has met the criteria and the violations occurred during the discretion period described in the EGM, the NRC is exercising enforcement discretion and will not issue enforcement action for these violations. The EGM, which was most recently revised on January 15, 2016, also requires that licensees receiving discretion must submit a license amendment request (LAR) to accept the NRC's generic change to the Standard TS that will allow a graded approach to OPDRV requirements. The LAR must be submitted and accepted for review by December 20, 2017, in order to continue receiving enforcement discretion while the LAR is being reviewed.

T. Rausch

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

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

Sincerely,

/RA/

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

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

Enclosure:  
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05000388/2017002  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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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.: 05000387/2017002 and 05000388/2017002

Licensee: Susquehanna Nuclear, LLC (Susquehanna)

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: April 1, 2017 through June 30, 2017

Inspectors: L. Micewski, Senior Resident Inspector  
T. Daun, Resident Inspector  
J. Furia, Senior Health Physicist  
P. Presby, Senior Reactor Inspector  
D. Werkheiser, Senior Reactor Analyst

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

Enclosure

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## SUMMARY

IR 05000387/2017002 and 05000388/2017002; April 1, 2017 through June 30, 2017; Susquehanna Steam Electric Station Units 1 and 2; Fire Protection and Maintenance Risk Assessments and Emergent Work Control.

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

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of Susquehanna Unit 1 and 2 Operating License Condition 2.C.6, Fire Protection, because Susquehanna did not adequately assess an unannounced fire brigade drill, as required by the fire protection program. Susquehanna entered this issue into the corrective action program (CAP) for resolution as condition report (CR) CR-2017-10767 and is conducting an apparent cause evaluation to determine the most appropriate corrective actions.

The performance deficiency (PD) was more than minor since the deficiency was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and impacted its objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety Significance (Green) in accordance with D.1 of IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." Because the finding involved fire brigade training requirements, the fire brigade demonstrated the ability to meet the required times for fire extinguishment for the fire drill scenarios, and the finding did not significantly affect the fire brigade's ability to respond to a fire, the finding screened as Green. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Self and Independent Assessments, because Susquehanna did not conduct assessments of their activities to assess performance and identify areas of improvement. Specifically, the Susquehanna self-evaluation of fire brigade performance was not of sufficient depth, appropriately objective, or self-critical. [P.6] (Section 1R05)

Green. The inspectors identified a Green, self-revealing, NCV of 10 *Code of Federal Regulations* (CFR) 50.65 (a)(4) because Susquehanna failed to assess and manage the increase in risk for emergent work on the Unit 1 'A' 125 voltage direct current (VDC) battery charger. Susquehanna entered this issue into the CAP as CR-2017-09589. Corrective actions include conducting training on the emergent risk assessment process and reinforcing the expectation that control room staff is notified prior to releasing work.

The PD was more than minor because it adversely impacted the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and the related attribute of equipment performance involving availability and reliability. In addition, it is similar to Example 7.e from IMC 0612, Appendix E, Examples of Minor Issues, which states that the failure to perform an adequate risk assessment when required to do so is more than minor if the overall elevated plant risk would put the plant into a high licensee-established risk category and would require risk management actions under licensee procedures. The inspectors evaluated the significance using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management SDP" and determined that this PD was of very low safety significance (Green). Specifically the PD was associated with risk management actions only and the incremental core damage probability (ICDP) was  $2E-7$  ( $<1E-6$ ) for charger 1D613 out of service for approximately one hour.

This finding had a cross-cutting aspect in the area of Human Performance, Consistent Process because individuals did not implement systematic approach to make decisions to commence work, and did not incorporate appropriate risk insights. [H.13] (Section 1R13)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On April 21, 2017, operators reduced power to approximately 80 percent to clean the condenser water boxes. Following water box cleaning, operators returned the unit to 100 percent on April 24, 2017. On May 17, 2017, operators reduced power to 69 percent to perform power a rod pattern adjustment. Full power was achieved again on May 20, 2017. On June 8, 2017, an automatic reactor scram occurred during maintenance on the main turbine electro-hydraulic control system which resulted in turbine control valves going closed. Operators commenced a reactor startup on June 10, 2017 and returned the unit to full power on 6/13/2017. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period in mode 5 for the 2R18 refueling and maintenance outage. Following the completion of refueling and maintenance activities, operators commenced a reactor startup on April 7, 2017, and achieved full power on April 17, 2017. On May 6, 2017, operators reduced power to approximately 65 percent to perform a rod pattern adjustment. Full power was achieved again on May 7, 2017. The unit remained at or near 100 percent power until June 30, 2017 when operators reduced power to approximately 61 percent to perform a rod sequence exchange and conduct condenser water box cleaning.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 1 sample)

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

a. Inspection Scope

The inspectors reviewed 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 manager, reviewing CRs and open work orders, and walking down portions of the offsite and AC power systems including the 500 kilovolt (kV), 220 kV and T-10 switchyards.

b. Findings

No findings were identified.



## 1R04 Equipment Alignment

### .1 Partial System Walkdowns (71111.04 – 3 samples)

#### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, engineered safeguard system (ESS) channel 'B' 125V direct current (DC) distribution during 1D613 battery charger repair on May 2, 2017
- Unit Common, emergency service water during division 2 testing on May 25, 2017
- Unit Common, 'B' emergency diesel generator (EDG) while 'A' EDG inoperable on June 19, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), TSs, work orders, 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 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 April 5, 2017, the inspectors performed a complete system walkdown of accessible portions of the Unit 2, Automatic Depressurization System (ADS), to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication, and 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 2, main steam pipeway area (fire zone 2-4G) on April 9, 2017
- Unit 1, DC battery and distribution room (fire zones 0-28B-I, 0-28M, 0-28N, 0-28J) on May 2, 2017
- Unit Common, security control center computer room (fire zone 0-83) on May 25, 2017
- Unit Common, central access control area (fire zone 0-23), on June 14, 2017
- Unit 1, lower cable spreading room (fire zone C-300), on June 23, 2017

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on May 1, 2017, that involved a fire in the Unit 1 remote shutdown panel room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Susquehanna personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions, as required. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Susquehanna's fire-fighting strategies.

b. Findings

Introduction. The inspectors identified a Green NCV for the inadequate assessment of fire brigade performance during an unannounced fire drill, as required by the fire protection program. Specifically, Susquehanna did not adequately assess the selection, placement and use of equipment; conformance with established plant fire-fighting procedures; communications between the fire brigade leader and fire brigade; or the effectiveness of the fire alarm.

Description. On May 1, 2017, the inspectors observed an unannounced fire brigade drill involving a simulated fire in the Unit 1 remote shutdown panel room (I-109). The remote shutdown panel room is fire zone 1-2D of the Unit 1 reactor building (fire area R-1B), is controlled as a transient combustible free zone, contains smoke detection but no fire suppression systems, and is enclosed by reinforced concrete with one three-hour fire rated door. The remote shutdown panel room contains division 2 safe shutdown equipment, components, and cabling which could result in either the spurious ADS or safety relief valve actuations or the loss of ADS capability from the control room. The inspectors observed the drill in and around the fire area and noted a number of discrepancies:

- The drill was initiated by the site fire marshal contacting the control room and stating he attempted to enter the remote shutdown panel room via keycard and noticed smoke and flames in the area of the blue storage cabinet and shut the door without entering. He also stated that no electrical equipment was involved, only the cabinet. No smoke detection alarms were given to the control room, as would have been expected for a fire in this area.
- The control room staff took greater than 9 minutes to sound the site fire alarm after the fire was reported. ON-013-001, "Response to Fire," Attachment L states, in part, to sound the fire alarm, concurrently and expeditiously with other actions, upon the confirmation of an actual fire.
- No 1 ½" hose line was laid out to attack the fire as expected by the approved drill scenario and directed by the pre-fire plan FP-113-109, "Remote Shutdown Panel Room (I-109) Access Area (I-102) Fire Zones 1-2B, 1-2D Elevation 670'-0," Revision 5.
- No attempts were made to identify and isolate power to the remote shutdown panel room as expected by the drill guide.
- The site fire marshal (drill controller) held the stairwell door open so the fire brigade leader could communicate with the fire brigade members, and site fire training instructor (drill controller) held the remote shutdown panel room door open so the fire brigade members could attack the fire. The fire brigade did not demonstrate the use of equipment to block open the doors.
- Though the pre-fire plan (FP-113-109) was brought to the location, it was not referenced by the fire brigade leader.

- The search for possible victims was limited to what could be seen from the doorway and the room was not entirely searched as directed by FP-113-109. Additionally, security was not contacted for a list of people who were in the remote shutdown panel room as directed by FP-113-109.
- Post-fire activities were briefly discussed and not carried out as expected by the approved drill guide. No attempt was made to overhaul the fire area, check for extension of the fire, or investigate any damage to equipment in the fire zone as directed by FP-113-109. No attempt was made to ventilate the area utilizing fixed ventilation, which is installed in this room. Once the fire was out, the fire brigade leader directed the two fire brigade members that were still at the command post to retrieve portable smoke ejectors. The drill was secured prior to operating any ventilation equipment.

The inspectors observed the post-drill critique and then reviewed the completed drill evaluation package. None of the discrepancies identified by the inspectors were captured or documented by the Susquehanna drill controllers. TQ-171, Susquehanna Fire Brigade Training Program, Revision 4, section 5.4.14.b states that drill controllers shall document their observations on TQ-171-0102 and observations shall be analyzed by fire protection staff to determine strengths and deficiencies. TQ-171 further states that deficiencies shall have corrective actions assigned to the appropriate organization. The drill controllers graded all areas as satisfactory on the master fire brigade drill critique scoring sheet, TQ-171-0102, with the exception of pre-fire plan use, which was graded as needs improvement with a comment that says "coaching provided." The post-fire drill critique form, TQ-171-0102, provided two comments under areas for improvement, "Better use of pre-plans" and "Get fire brigade leader into scene to assess sooner."

TQ-171, section 5.4.5 states, "Unannounced Fire Brigade Drills are considered a test of fire brigade response to a fire event. Unannounced drills shall as much as possible simulate emergency response." Additionally, section 5.4.3 states, "Drills shall include demonstration by fire brigade to: don protective equipment, operate communication equipment and maintain appropriate communications, operate fire-fighting equipment where practical, use equipment for various situations and types of fires which could reasonably occur in each safety related area, and conform, where possible, to established plant pre-fire plans." TQ-171 and NDAP-QA-0445, Fire Brigade, Revision 19 both state that there will not be any coaching during unannounced drills.

The inspectors determined that the drill critique was an inadequate assessment of the fire brigade response since it did not identify the deficiencies of the fire brigade in fighting the fire, or the drill controllers in evaluating the fire brigade performance. Coaching was provided on numerous occasions by the drill controllers to the fire brigade. The controllers held open doors to facilitate communications between the fire brigade and the fire brigade leader and so the fire brigade could attack the fire. The drill scenario as-written provided a level of information to the fire brigade that was beyond what they could have assessed from their actions. The ability to see into the remote shutdown panel room from the doorway is very limited and the actual source of the fire would not be able to be determined unless entry into the room was made.

The extent of damage to components in the room was provided to the fire brigade without them entering and assessing the damage. Key information that the fire brigade utilized to determine their attack plan was provided to them without demonstration that they knew how or where to obtain the information.

Analysis. The inspectors determined that the inadequate assessment of fire brigade performance was a PD within Susquehanna's ability to foresee and correct. The issue was more than minor since the deficiency was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and impacted its objective of ensuring the availability, reliability, and capability of systems, such as the fire brigade, that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety Significance (Green) in accordance with D.1 of IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." Because the finding involved fire brigade training requirements, the fire brigade demonstrated the ability to meet the required times for fire extinguishment for the fire drill scenarios, and the finding did not significantly affect the fire brigade's ability to respond to a fire, the finding screened to Green. This finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Self and Independent Assessments, in that licensees conduct assessments of their activities to assess performance and identify areas of improvement. Specifically, the Susquehanna self-evaluation of fire brigade performance was not of sufficient depth, appropriately objective, or self-critical (P.6).

Enforcement. The Susquehanna Unit 1 and 2 Operating License Condition 2.C.6, Fire Protection, requires that Susquehanna "shall implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR." Implementing procedure TQ-171, Susquehanna Fire Brigade Training Program, requires that "drill evaluation shall assess the effectiveness of the fire alarm; selection, placement, and use of equipment; use of pre-fire plans; communications between control, fire brigade lead, and fire brigade members. TQ-171, also states that "There will NOT be any coaching during unannounced drills." Contrary to the above, during the unannounced fire drill on May 1, 2017, the fire brigade's performance was not adequately assessed and coaching was provided through various phases of the drill. Because the finding was of very low safety significance, was entered into Susquehanna's CAP as CR-2017-10767, and prompted an apparent cause evaluation, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000387/388; 2017002-01, Inadequate Assessment of Fire Brigade Performance during an Unannounced Drill)**

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the Unit 1 lower cable spreading room. It verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, common drain lines and sumps, and removable flood barriers. It assessed the adequacy of operator actions that Susquehanna had identified as necessary to cope with flooding in this area and also reviewed the CAP to determine if Susquehanna was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on June 6, 2017, which included a main turbine trip due to a load rejection followed by a failure of the control rods to fully insert, an anticipated transient without scram event. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

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

a. Inspection Scope

On April 7 and 8, 2017, the inspectors observed the control room operators perform a planned reactor startup from the Unit 2 refueling outage. Additionally, on June 9, 2017, inspectors observed the control room operators perform a reactor startup following a Unit 1 reactor scram. The inspectors observed the reactivity control briefing to verify that it met the criteria specified in OP-AD-002, "Standards for Shift Operations," Revision 63, OP-AD-300, "Administration of Operations," Revision 21, and OP-AD-338, "Reactivity Manipulations Standards and Communication Requirements," Revision 31. The inspectors observed the crews during the evolutions to verify that procedure use, crew communications, control board component manipulations, and coordination of activities in the control room met established standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)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, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Susquehanna was identifying and properly evaluating performance problems within the scope of the maintenance rule. 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, commercial-grade dedication of 250VDC battery terminal plate (quality control sample) on May 30, 2017
- Unit Common, fuel pool cooling system on June 2, 2017
- Unit 1 and unit 2, 125VDC battery chargers on June 15, 2017

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 2 samples)a. Inspection Scope

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

- Unit 1, 1D613 battery charger inoperable during emergent maintenance on May 2, 2017
- Unit 2, 2V222B emergent failure on June 5, 2017

b. Findings

Introduction. The inspectors identified a Green, self-revealing, non-cited violation (NCV) of 10 CFR 50.65 (a)(4) which requires, in part, that the licensee assess and manage the increase in risk that may result from proposed maintenance activities. Specifically, Susquehanna failed to assess and manage the increase in risk for emergent work on the Unit 1 'A' 125VDC battery charger.

Description. Four Class 1E DC subsystems, identified as channels A, B, C, and D, for each unit provide the control power for associated Class 1E AC power load group channels, 4.16 kV switchgear, 480V load centers, and the standby diesel generator. Also, these DC subsystems provide DC power to the engineered safety feature valve actuation, diesel generator auxiliaries, and plant alarm and indication circuits. Each 125V DC subsystem consists of one load center, one Class 1E and one non-Class 1E distribution panel, one 125V battery bank, and one battery charger. The battery chargers are designed to restore the associated battery bank to full charge while supplying normal system loads.

Unit 1 battery charger 1D613 rectifies 480 VAC power from motor control center 0B516 to supply 125 VDC power to load center 1D612. Motor control center 0B516 is powered from the A ESS bus, receives backup power from the 'A' EDG, and has the ability to be supplied from the Unit 2 'A' ESS bus through an automatic transfer switch.

On May 2, 2017, the Susquehanna control room received a 125V DC system trouble alarm due to low voltage on 125V DC distribution panels 1D614 and 1D615. The operators declared battery charger 1D613 inoperable and entered TS 3.8.4, "DC Sources -Operating." Electrical maintenance placed battery charger 1D613 in equalize mode in accordance with station procedure and restored the charge on the battery.

The battery chargers normally operate in one of two modes: float or equalize, with float mode being the more commonly used. Each battery charger is equipped with two potentiometers – one for equalize mode, and another for float mode. A toggle switch is used to place the charger in either equalize or the float mode.

Initial investigation by electrical maintenance determined that the float potentiometer on the battery charger would need to be replaced. Plans were being developed by the duty team to support installation of a temporary charger and replace the potentiometer. The duty team used the Equipment out of Service (EOOS) software tool to determine the impact on risk. EOOS is a software tool designed to evaluate plant configuration risk during any plant operational event. The output of the software is called the plant risk factor, which is the calculated risk for a specific event or condition divided by the baseline risk.

EOOS software calculated the plant risk factor to be 59.6, which corresponds to the highest tier of risk and has numerous required management actions. Susquehanna procedure NDAP-QA-1902, "Integrated Risk Management," Revision 25 prescribes multiple risk management actions that are required to be taken during this elevated risk condition.



The duty team held a conference call with probabilistic risk assessment (PRA) specialists to discuss overall risk impacts of performing work on the charger. As the licensee believed the EOOS output was incorrect, the PRA specialists began a further analysis of the EOOS coding to ensure that modeling fidelity was not causing an overly conservative result.

Shortly thereafter, before the risk evaluation was complete or risk management actions were in place, the Fix It Now (FIN) team moved forward with placing the temporary charger in service and removing 1D613 from service in preparation to replace the faulty potentiometer. The control room operators became aware of this when an unexpected alarm sounded in the control room. The shift manager directed the FIN team to return the battery charger to service immediately and remove the temporary charger until all risk management actions were in place to support the work.

Restoring the battery charger 1D613 to service returned the calculated risk to the lowest level, for which no risk management actions were required. The operations staff subsequently determined that the battery charger was operable, because it would still be capable of performing all specified safety functions by using the equalizing potentiometer in place of the float potentiometer.

The PRA specialists subsequently developed a configuration-specific risk assessment to represent the unavailability of battery charger 1D613 with a temporary charger installed. This assessment determined that the emergent work would have resulted a plant risk factor of 5.58 during the unavailability of the battery charger 1D613 with the temporary charger installed. While the resultant risk factor was not as high as originally calculated, it was still elevated to a higher category of risk and thus required risk management actions to be in place, such as communicating the risk status to station personnel, considering the combined impact on risk of other scheduled work, and protecting specified plant components as prescribed by NDAP-QA-1902, "Integrated Risk Management," revision 25. The inspectors concluded that the licensee's work management process failed to assess and manage the increase in risk associated with emergent work on battery charger 1D613, as required by 10 CFR 50.65 (a)(4), prior to commencing work.

Susquehanna's investigation determined the suspected causes of the event were that the FIN team lead had a misconception that the inoperable battery charger was also considered unavailable, and therefore taking it out of service did not impact risk, and that the FIN team lead was not proficient with the emergent risk assessment process. The licensee entered this issue into the CAP as CR-2017-09589. Corrective actions include conducting training on the emergent risk assessment process and reinforcing the expectation that control room staff is notified prior to releasing work.

Analysis. Inspectors reviewed the circumstances surrounding this failure to implement risk management activities as required and determined that this constituted a PD that was within Susquehanna's ability to foresee and correct and should have been prevented.

Susquehanna failed to assess and manage the increase in risk for work activities associated with a battery charger in accordance with 10 CFR 50.65 (a)(4). Specifically, on May 2, 2017, workers prematurely removed the Unit 1 'A' 125V DC battery charger 1D613 from service, although evaluation of risk and implementation of risk management activities was incomplete.

The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined the PD was more than minor because it adversely impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and the related attribute of equipment performance involving availability and reliability. Specifically, the failure to identify increases in operational risk and implement risk management actions adversely affected the availability and reliability of those systems relied upon to respond to plant events. In addition, it is similar to Example 7.e from IMC 0612, Appendix E, Examples of Minor Issues, which states that the failure to perform an adequate risk assessment when required to do so is more than minor if the overall elevated plant risk would put the plant into a high licensee-established risk category and would require risk management actions under licensee procedures.

The finding involved the Susquehanna's management of risk in accordance with 50.65(a)(4) therefore, the inspectors evaluated the significance using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management SDP," dated May 19, 2005. The inspectors and a Region I Senior Reactor Analyst used IMC 0609, Appendix K to determine that this PD was of very low safety significance (Green). Specifically the PD was associated with risk management actions only and the ICDP was  $2E-7$  ( $<1E-6$ ) for charger 1D613 out of service for approximately one hour. The Senior Reactor Analyst calculated the ICDP utilizing Systems Analysis Program for Hands-On Integrated Reliability Evaluation, version 8.1.5, with Susquehanna Unit 1 Standardized Plant Analysis Risk Model, version 8.50, for the assumed conditions.

This finding had a cross-cutting aspect in the area of Human Performance, Consistent Process because individuals did not implement systematic approach to make decisions to commence work, and did not incorporate appropriate risk insights. [H.13]

Enforcement. 10 CFR 50.65 (a)(4) requires, in part, that the licensee assess and manage the increase in risk that may result from proposed maintenance activities. On May 2, 2017, Susquehanna Unit 1 'A' 125 VDC battery charger experienced an emergent failure of the float potentiometer. NDAP-QA-1902, "Integrated Risk Management," requires risk management actions for an elevated risk condition. Contrary to the above, Susquehanna did not assess or manage the increase in risk that resulted from proposed maintenance activities. Specifically, on May 2, 2017, operators removed Unit 1 'A' 125 VDC battery charger from service for approximately one hour prior to assessing risk or implementing any risk management actions. Following an alarm in the control room, Susquehanna took immediate action to restore the battery charger to an available configuration. Because this violation was of very low safety significance (Green), and Susquehanna has entered this PD into the CAP as CR-2017-04957, the NRC is treating this as an NCV in accordance with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000387/2017002-02; Failure to Assess and Manage Risk Associated with Emergent Work)**

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)a. Inspection Scope

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

- Unit Common, zone 3 secondary containment with airlock door 813 and hatch 1 open on April 12, 2017
- Unit 2, seismic scaffold clearance deviations in safety-related areas on April 14, 2017
- Unit Common, 'E' EDG turbocharger lubrication oil pressure low out-of-specification on April 25, 2017
- Unit 1, 1D613 battery charger operability determination for use of equalize potentiometer in place of the float potentiometer following failure of the float potentiometer on May 2, 2017
- Unit 2, high lubrication oil level on reactor core isolation cooling on May 26, 2017
- Unit 2, 'A' residual heat removal service water pump not developing differential pressure to meet flow verification acceptance criteria on June 30, 2017

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

b. Findings

No findings were identified.

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

The inspectors evaluated a modification to the Unit 2 high pressure coolant injection (HPCI) turbine steam drain piping implemented by engineering change package 1775703, "FAC Piping – Replace Unit 2 HPCI Carbon Steel Turbine Steam Drain Shown on SPDBD207-1 and SPDBD214-2." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change including replacement of carbon steel piping susceptible to flow-accelerated corrosion with new alloy steel piping. The inspectors also reviewed nondestructive testing records and corrective action documents generated during the course of the work to verify the modification was adequately installed and tested.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Unit 2, 'A' 125VDC Battery Replacement on March 18, 2017
- Unit 2, ADS/main steam relief valve following replacement on March 28, 2017
- Unit 2, reactor pressure vessel leak check on April 2, 2017
- Unit 2, HPCI following outage on April 12, 2017
- Unit 1, 'B' residual heat removal (RHR) valves following breaker inspection on May 3, 2017
- Unit 2, NFJ01 jet pump flow indicator transmitter replacement on May 4, 2017
- Unit 1, HV151F-06B valve stroke after stem nut replacement on June 5, 2017

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 Unit 2 maintenance and refueling outage 2R18, which was conducted March 4 through May 9, 2017. 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 TSs when taking EOOS
- 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 TS 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 refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

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

- Unit 2, primary containment 10-year Integrated Leakage Rate Test on April 4, 2017
- Unit 2, 24-month surveillance of standby liquid control loop 'A' on April 6, 2017
- Unit 1, weekly surveillance of battery 1D610 electrical parameters on May 2, 2017
- Unit Common, 24-month EDG 'C' integrated surveillance test on May 9, 2017
- Unit 2, quarterly standby liquid control flow verification in-service test on May 17, 2017

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06 – 1 sample).1 Emergency Preparedness Drill Observationa. Inspection Scope

The inspectors evaluated the conduct of a routine Susquehanna emergency drill on June 6, 2017 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Susquehanna staff in order to evaluate Susquehanna's critique and to verify whether the Susquehanna staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

**Cornerstone: Public Radiation Safety (PS)**2RS7 Radiological Environmental Monitoring Program (71124.07 – 3 samples)a. Inspection Scope

The inspectors reviewed the Radiological Environmental Monitoring Program (REMP) to validate the effectiveness of the radioactive gaseous and liquid effluent release program and implementation of the Groundwater Protection Initiative (GPI). The inspectors used the requirements in 10 CFR 20, 40 CFR 190, 10 CFR 50 Appendix I, and the site's TSs, Offsite Dose Calculation Manual (ODCM), Nuclear Energy Institute 07-07, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: Susquehanna 2015 and 2016 annual radiological environmental and effluent monitoring reports, REMP program audits; ODCM changes, land use census, UFSAR, and inter-laboratory comparison program results.

Site Inspection (1 sample)

The inspectors walked down various thermoluminescent dosimeter and air and water sampling locations and reviewed associated calibration and maintenance records. The inspectors observed the sampling of various environmental media as specified in the ODCM and reviewed any anomalous environmental sampling events including assessment of any positive radioactivity results. The inspectors reviewed any changes to the ODCM. The inspectors verified the operability and calibration of the meteorological tower instruments and meteorological data readouts.

The inspectors reviewed environmental sample laboratory analysis results, laboratory instrument measurement detection sensitivities; and results of the laboratory quality control program audit, and the inter- and intra-laboratory comparison program results. The inspectors reviewed the groundwater monitoring program as it applies to selected potential leaking structures, systems, and components, and 10 CFR 50.75(g) records of leaks, spills, and remediation since the previous inspection.

GPI Implementation (1 sample)

The inspectors reviewed: groundwater monitoring results; changes to the GPI program since the last inspection; anomalous results or missed groundwater samples; leakage or spill events including entries made into the decommissioning files (10 CFR 50.75(g)); evaluations of surface water discharges; and Susquehanna's evaluation of any positive groundwater sample results including appropriate stakeholder notifications and effluent reporting requirements.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the REMP were identified at an appropriate threshold and properly addressed in Susquehanna's CAP.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

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

a. Inspection Scope

The inspectors reviewed Susquehanna's submittal for the reactor coolant system specific activity and reactor coolant system leak rate performance indicators for both Unit 1 and Unit 2 for the period of April 1, 2016, through March 31, 2017. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed reactor coolant system sample analysis and control room logs of daily measurements of reactor coolant system leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the reactor coolant system identified leakage rate.

b. Inspection 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 Susquehanna entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Susquehanna performed an evaluation in accordance with 10 CFR Part 21.

#### b. Findings

No findings were identified.

### .2 Semi-Annual Trend Review

#### a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues documented by Susquehanna in trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Susquehanna’s CAP database for the first and second quarters of 2017 to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC’s daily CR review (Section 4OA2.1). The inspectors reviewed the most recent trend report for the period of January 1 to April 30, 2017, conducted under LS-125-1009, “Station Trending Manual,” Revision 2, to verify that Susquehanna personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

#### b. Findings and Observations

No findings were identified.

Risk Assessment and Management. The inspectors identified a trend of inadequate assessment and management of plant risk. Examples include:

- A maintenance team lead was not proficient with the emergent risk assessment process, resulting in the maintenance team swapping out an installed battery charger with a temporary charger prior to evaluation of risk or implementation of risk management actions. This resulted in a finding, which is documented in section 1R13 of this report.



- During the period of this review, the inspectors identified that two work activities had been scheduled concurrently, which elevated the plant risk from Green to Yellow. Procedure NDAP-QA-1902, "Integrated Risk Management," states, in part, "If a combination of individual activities causes a Yellow PRA Risk, evaluate reasonable schedule changes in an attempt to prevent a Yellow PRA Risk." When challenged by the inspectors, the station rescheduled the activities to different times, which resulted in plant risk remaining Green during both activities.
- During the Unit 2 refueling outage, the inspectors identified an example of work proceeding despite intended risk management actions not being taken. During work on an automatic transfer switch associated with an EDG, the station planned to post the other three EDGs as protected equipment. The inspectors noted that the protected equipment clearance order was issued, however the protected equipment signs were not hung, and the clearance order showed as "in process" in the software management system. In spite of this, the work was already in progress. When challenged by the inspectors, the station took appropriate actions to post the protected equipment, as originally planned.

Inspectors noted that, following a reactor scram caused by a transient initiated inadvertently during maintenance (see Section 4OA3 of this report) the station has a heightened sensitivity to risk.

Human Performance Errors. Inspectors continued to note an adverse trend in the number of human performance errors and events. Significant examples of human performance errors and events include:

- While adjusting the Unit 1 main turbine electrohydraulic control system power supply, a maintenance technician's tool inadvertently made contact with a grounded screw, causing a short to ground, which initiated a transient that resulted in a reactor scram. This is also addressed in section 4OA3 of this report.
- When the potentiometer failed on a 125 VDC battery charger, a maintenance team lead had a misconception that the inoperable battery charger was also considered unavailable, and also was not proficient with the emergent risk assessment process. This resulted in the maintenance team swapping out the installed battery charger with a temporary charger before the station could evaluate risk or take risk management actions. This resulted in a finding, and additional details are included in section 1R13 of this report.
- During the Unit 2 refueling outage, an operator failed to use a procedure as written, which caused a brief, unplanned drain of the reactor pressure vessel to the suppression pool. The inspectors assessed this event as minor, because the estimated time to drain the reactor cavity to the reactor pressure vessel (RPV) flange was greater than the EGM criteria of 24 hours, as detailed in section 4OA3 of this report.
- During the Unit 2 refueling outage, operators failed to implement procedures during restoration from electrical breaker work, which resulted in a containment fan trip and associated loss of safety function of secondary containment. The inspectors documented this as a finding in section 4OA3 of integrated inspection report 05000387; 388/2017001 (ML 17130A896).

Susquehanna also recognized this trend in the January – April 2017 Performance Assessment Report, which noted an increase in human performance error trend codes applied during the first trimester of 2017, as compared to the past 5 quarters. Susquehanna initiated CR-2017-10901 to evaluate five recent events that occurred in the month of May 2017 for a common cause. During the subsequent analysis, two additional human performance events occurred, and the data from the resulting prompt investigations was also included in the common cause analysis. Susquehanna's analysis determined that the common flawed defenses were questioning attitude, procedure use and adherence, and verification practices. Since these are already key elements of Susquehanna's "Focus on Five" communication strategy, which is emphasized to the station on pamphlets, posters, and emails, the station intends to continue to communicate using the "Focus on Five" theme. Also, a revision of the station Plan for Excellence is in process. This revision will include changes to the Safety and Human Performance Focus Area to drive improved behaviors in these areas.

.3 Annual Sample: Follow Up of a Green NCV for Failure to Implement Procedures for Controlling the HPCI System

a. Inspection Scope

The inspectors performed an in-depth review of Susquehanna's evaluation and corrective actions associated with failing to implement procedures for controlling the HPCI system, where operators inappropriately overrode HPCI system automatic initiation prior to inserting a manual scram on May 13, 2016. Specifically, the inspectors reviewed the CRs related to this event, including the apparent cause evaluation conducted under CR-2016-12854 and actions taken by Susquehanna to address causal factors to prevent recurrence.

The inspectors assessed Susquehanna's evaluation, extent of condition review, completed and proposed corrective actions, and the prioritization and timeliness of actions to evaluate whether the corrective actions were appropriate. The inspectors interviewed licensed operators, operations managers, and training staff and reviewed Susquehanna's evaluation of the issue and corrective actions taken to ensure that Susquehanna implemented corrective actions commensurate with the significance of the issue.

b. Findings and Observations

No findings were identified.

The inspectors determined that Susquehanna's evaluation and extent of condition review were thorough, and the causes were appropriately identified. The inspectors also determined that the corrective actions were reasonable and would address the causes of the issue.

Susquehanna's evaluation determined the Unit Supervisor inappropriately directed use of the emergency operating procedure hard card to override HPCI auto initiation without specific emergency operating procedure direction and that less-than-adequate teamwork existed which caused less-than-adequate communication, individuals to not stay in assigned role, and less-than-adequate oversight. The inspectors found that Susquehanna had implemented appropriate corrective actions which effectively reinforced expectations for procedural compliance and teamwork to prevent recurrence.

The inspectors noted that the guidance in OP-252, "HPCI System," which allows inhibiting HPCI initiation following conditions where an automatic initiation has occurred, is an abbreviated version of similar guidance provided in OP-AD-300, "Administration of Operations," and, as such, could potentially result in confusion or misunderstanding. Susquehanna generated CR-2017-10367 to enhance this procedural guidance. The inspectors concluded that Susquehanna's evaluation of the issue and the completed and planned corrective actions were appropriate and thorough.

.4 Annual Sample: Corrective Actions Related to Degraded Security Equipment

a. Inspection Scope

The inspectors performed an in-depth review of Susquehanna's evaluation and corrective actions associated with degraded security equipment. Due to the sensitive nature, the scope of this inspection was included in NRC inspection report 387/388 2017403.

b. Findings and Observations

No findings were identified.

Due to their sensitive nature, inspectors documented observations in NRC inspection report 387/388 2017403.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 10 samples)

.1 Plant Events

a. Inspection Scope

For the plant event 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. 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 1, reactor scram due to transient initiated by an inadvertent loss of main turbine electrohydraulic control system control power due to a maintenance error.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000388/2017-002-00: Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 3

From March 6 through March 30, 2017, Susquehanna performed OPDRVs without establishing secondary containment integrity. An OPDRV is an activity that could result in the draining or siphoning of the RPV water level below the top of fuel, without crediting the use of mitigating measures to terminate the uncovering of fuel. TS 3.6.4.1, "Secondary Containment" requires that secondary containment be operable, and is applicable during OPDRVs. The required action for this specification if secondary containment is inoperable in this condition of applicability is to initiate actions to suspend OPDRVs immediately. Therefore, failing to maintain secondary containment operability during OPDRVs without initiating actions to suspend the operation was considered a condition prohibited by TSs as defined by 10 CFR 50.73(a)(2)(i)(B). As reported in LER 05000387/2016-006, Susquehanna conducted the following OPDRVs during the period of secondary containment inoperability:

- Recirculation system flushes and maintenance;
- RHR system flushes and maintenance;
- Hydraulic control unit and control rod drive system maintenance;
- Local power range monitor replacements;
- Control rod drive mechanism replacements;
- Reactor water cleanup system chemical cleaning and hot spot flushes;
- RPV letdown; and
- Hot spot and RPV bottom head drain flushes.

NRC EGM 11-03, "EGM on Dispositioning BWR Licensee Noncompliance With TS Containment Requirements During Operations With A Potential For Draining The Reactor Vessel," Revision 3, provides, in part, for the exercise of enforcement discretion only if the licensee demonstrates that it has met four specific criteria during an OPDRV activity. The inspectors' assessments of Susquehanna's implementation of these four criteria during the local power range monitor replacement activity are described below:

- 1) The inspectors observed that, as required by the EGM, the OPDRV activities were logged in the control room narrative logs and that the log entries appropriately documented actions being taken to ensure water inventory was maintained and defense-in-depth criteria were in place.
- 2) The inspectors noted that the reactor vessel water level was maintained above the RHR high water level setpoint of 22 feet. The inspectors also noted that at least one safety-related pump was the standby source of makeup designated in the control room narrative logs for the evolutions. Susquehanna logged that the worst case estimated time to drain the reactor cavity to the RPV flange was greater than the EGM criteria of 24 hours.
- 3) The inspectors verified that the OPDRVs were not conducted in Mode 4 and that Susquehanna maintained secondary containment operability for the refueling floor while moving irradiated fuel during OPDRVs. The inspectors noted that Susquehanna had contingency plans in place for isolating the potential leakage paths, should difficulty arise during various maintenance activities. Additionally, the inspectors verified that two independent means of measuring RPV water level (one alarming) were available for identifying the onset of loss of inventory events.

- 4) Inspectors verified that all other TSs were met during OPDRVs with secondary containment inoperable.

TS 3.6.4.1 is applicable during OPDRVs and requires that secondary containment be operable. TS 3.6.4.1, action C.3, requires operators to initiate actions to suspend OPDRVs immediately upon discovery that secondary containment is inoperable. Contrary to the above, between March 6, 2017 through March 30, 2017, Susquehanna did not maintain secondary containment operable while performing OPDRVs. Because the violation was identified during the discretion period described in EGM 11-003, the NRC is exercising enforcement discretion in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy and, therefore, will not issue enforcement action for this violation. In accordance with EGM 11-003, in order to continue to receive enforcement discretion, an LAR must be submitted and accepted for review within 12 months of the NRC staff's publication of the generic change, which occurred on December 20, 2016. The inspectors observed that Susquehanna is tracking the need to submit a LAR as AR-2015-01733 and has plans to submit the LAR in September 2017. This LER is closed.

### .3 Licensee Event Reports (LERs) Associated with Simultaneous Opening of Secondary Containment Doors due to Personnel Errors

The following LERs and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and potential generic issues. The inspectors did not identify any new issues during the review of the LERs. In each of the cases, Susquehanna personnel accessed a secondary containment airlock without obeying the posted requirement contrary to Step 4.3.1 of NDAP-QA-0321, "Secondary Containment Integrity Control," which states that personnel accessing secondary containment are responsible for obeying posted requirements for proper operation of airlocks. The posted sign at each airlock states that personnel shall not access the airlock if the red light is lit, indicating the second door is being accessed. In most cases, when the airlock door was opened the redundant door was already opened for personnel transit. In one case, the second door was propped open for ongoing work.

At the time of each event, TS 3.6.4.1, "Secondary Containment Control," required one door in each airlock be closed at all times to maintain secondary containment operability. Since in each of these cases both doors were opened simultaneously, secondary containment was rendered inoperable, but returned to an operable condition promptly when personnel restored at least one of the doors to their closed configuration. Because secondary containment represents a single train, Susquehanna reported these events to the NRC as required by 10 CFR 50.73(a)(2)(v) as a condition that could have prevented fulfillment of the safety function.

On April 20, 2017, the NRC approved a revision to both Unit 1 and Unit 2 TS bases (Agency-wide Documents Access and Management System Accession Nos. ML17118A075 and 17118A076, respectively). The TS bases now state that brief, inadvertent, simultaneous opening of the inner and outer secondary containment doors for personnel entry and exit is allowed.

In each case, Susquehanna evaluated the event and determined that the ability of the standby gas treatment system to draw down secondary containment was not challenged due to the short duration of the inoperability and therefore determined that none of the events represented safety system functional failures under the NRC performance indicator. Inspectors determined that the failure to implement the requirements of station

procedures was a performance deficiency. However, because they did not have an adverse impact on the ability of the secondary containment to protect the public from the spread of radionuclide releases caused by accidents or events, inspectors determined that each performance deficiency was of minor safety significance. These LERs are closed.

(Closed) LER 05000387(388)/2016-017-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error During Security Response

On October 29, 2016, a security officer responding to alarms located at the security portal associated with an airlock failed to verify the airlock indicator lights prior to entering the airlock. Both airlock doors were briefly opened at the same time. This was documented as CR-2016-24574.

(Closed) LER 05000387(388)/2016-022-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On October 4, 2016, a security officer responding to an alarm opened one airlock door while the other door was propped open for ongoing work. This was documented as CR-2016-22511.

(Closed) LER 05000387(388)/2016-023-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error

On September 26, 2016, an escorted individual who was part of a group transiting through the airlock to the refuel floor failed to wait until all individuals were in the airlock and the entry door was closed before opening the exit door. This was documented in CR-2016-21924.

(Closed) LER 05000387(388)/2016-025-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On November 30, 2016, an employee opened an airlock door to enter the Unit 1 airlock from the turbine building while an employee inside the airlock had the airlock door to the reactor building open. This was documented in CR-2016-26483.

(Closed) LER 05000387(388)/2017-001-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On January 17, 2017, a group consisting of employees and visitors were exiting the Unit 1 reactor building airlock when an individual in the group opened the airlock door to the turbine building prior to the airlock door to the reactor building being fully closed. This was documented in CR-2017-01242.

(Closed) LER 05000387(388)/2017-002-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On February 17, 2017, when three employees were transiting the 818' airlock, an individual in the group opened the door to exit the airlock prior to the airlock door the group had used to enter the airlock being fully closed. This was documented in CR-2017-03515.

(Closed) LER 05000387(388)/2017-003-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On March 2, 2017, when two employees were transporting a cart of materials through an airlock on Unit 2 elevation 779', they failed to ensure the airlock door to the reactor building was fully closed prior to opening the airlock door to the turbine building. This was documented in CR-2017-04381.

(Closed) LER 05000388(387)/2017-004-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors

On March 2, 2017, when three employees were entering the Unit 2 airlock on elevation 676' using the door from the reactor building side, one of them opened the airlock door to the turbine building prior to the airlock door to the reactor building being fully closed. This was documented in CR-2017-04361.

40A6 Meetings, Including Exit

On July 21, 2017, the inspectors presented the inspection results to Brad Berryman, Site Vice President, and other members of the Susquehanna staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

T. Rausch, President and Chief Nuclear Officer  
 B. Berryman, Site Vice President  
 D. Jones, Plant Manager  
 D. Ambrose, Design Engineering Manager  
 B. Bridge, Radiation Protection Manager  
 K. Cimorelli, Director Strategic Planning  
 B. Franssen, Support General Manager  
 J. Jennings, Nuclear Support General Manager  
 M. Krick, Regulatory Affairs Senior Engineer  
 D. Lamarca, Operations Manager  
 B. Mangan, Applied Ecoscience  
 T. Mangan, Applied Ecoscience  
 C. Manges, Regulatory Affairs Senior Engineer  
 M. Murphy, Station Engineering Manager  
 N. Pagliaro, Regulatory Assurance  
 W. Reppa, Engineering General Manager  
 C. Saxton, Senior Environmental Scientist  
 P. Scanlan, Maintenance Manager  
 J. Willis, Assistant Operations Manager - Shift  
 L. Zwolinski, Applied Ecoscience

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Opened/Closed

05000387/388;2017002-01	NCV	Inadequate Assessment of Fire Brigade Performance during an Unannounced Drill (Section 1R05)
05000387;2017002-02	NCV	Failure to Assess and Manage Risk Associated with Emergent Work (Section 1R13)

Closed

05000388/2017-002-00	LER	Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 3 (Section 4OA3)
05000387(388)/2016-017-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error During Security Response (Section 4OA3)
05000387(388)/2016-022-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)



05000387(388)/2016-023-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error (Section 4OA3)
05000387(388)/2016-025-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)
05000387(388)/2017-001-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)
05000387(388)/2017-002-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)
05000387(388)/2017-003-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)
05000388(387)/2017-004-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors (Section 4OA3)

### LIST OF DOCUMENTS REVIEWED

#### **Section 1R01: Adverse Weather Protection**

##### Procedures

NDAP-00-1913, Seasonal Readiness, Revision 8

##### Condition Reports (\*NRC identified)

CR-2017-01828      CR-2017-08313      CR-2017-08957      CR-2017-09448  
CR-2017-09619

##### Drawings

E-1, Unit 1 & 2 Single Line Diagram Station, Sheet 1A, Revision 9

E-1, Unit 1 & 2 Single Line Diagram Station, Sheet 1, Revision 38

##### Miscellaneous

NDAP-00-1913, Summer Preparation Checklist, Attachment G, Revision 7

Certification of 2017 Summer Readiness, May 15, 2017, Revision 0

#### **Section 1R04: Equipment Alignment**

##### Procedures

OP-102-001, 125V C System, Revision 25

##### Condition Reports (\*NRC identified)

CR-2017-04360      CR-2017-04661      CR-2017-05347

Drawings

E-11, Unit 1 & Common Single Line Meter and Relay Diagram 125 & 250 VDC System, Sheet 1, Revision 19  
E-9, Common Single Line Meter & Relay Diagram 480V Motor Control Center 0B526, Sheet 41, Revision 21  
E-8, Unit 1 Single Line Meter & Relay Diagram 480V Load Centers 1B210, 1B220, 1B230 and 1B240, Sheet 4, Revision 19  
E-26, Unit 1 Schematic Meter & Relay Diagram 125V DC System, Sheet 1, Revision 38  
M-111, Common P&ID Emergency Service Water System, Sheet 1, Revision 50  
M-2126, Unit 2 P&ID Containment Instrument Gas, Sheet 1, Revision 34  
M1-B21-102, ADS, Sheet 4, Revision 19  
M1-B21-102, ADS, Sheet 5, Revision 10  
M1-B21-102, ADS, Sheet 6, Revision 9  
M1-B21-102, ADS, Sheet 7, Revision 12  
M1-B21-102, ADS, Sheet 8, Revision 12  
M1-B21-102, ADS, Sheet 9, Revision 17  
M1-B21-102, ADS, Sheet 1, Revision 20  
M1-B21-102, ADS, Sheet 2, Revision 17  
E-180, Unit 1 Block Diagram SRV Flow Monitoring System, Sheet 7, Revision 9  
KSV-36-10, Control Diagram, Sheet 2, Revision 5  
M30-150, Common Standby Generator Set Control Diagram, Sheet 1, Revision 9  
M-134, Common P&ID A-D Diesel Auxiliaries Starting Air Systems, Sheet 3, Revision 20  
M-134, Common P&ID A-D Diesel Auxiliaries Starting Air Systems, Sheet 2, Revision 19  
M-134, Common P&ID A-D Diesel Auxiliaries Fuel Oil, Lube Oil, Air Intake & Exhaust and Jacket Water Cooling Systems, Sheet 1, Revision 51  
M-182, Unit 1, Unit 2 & Common P&ID Diesel Gen & ESSW Pumphouse Air Flow Diagram, Sheet 1, Revision 9

**Section 1R05: Fire Protection**

Procedures

NDAP-QA-0449, Fire Protection Program, Revision 16  
AR-SP-002, Simplex Fire Protection Fire Detection Alarm Priority 2, Revision 35  
OP-013-002, Fire/Smoke Detection and Alarm System, Revision 53  
ON-013-001, Response to Fire, Revision 46  
NDAP-QA-0445, Fire Brigade, Revision 19  
TQ-171, Susquehanna Fire Brigade Training Program, Revision 4

Condition Reports (\*NRC identified)

CR-2017-10767\*      CR-2017-13120\*

Drawings

M-178, Unit 1 P&ID Control Structure Air Flow Diagram, Sheet 2, Revision 4  
C-1721, Unit 1 Reactor Building Fire Protection Plan Elevation 670'-0", Sheet 3, Revision 7  
C-1721, Unit 1 Reactor Building Fire Detector Location Plan Elevation 670'-0" to 683'-0", Sheet 4, Revision 8

Miscellaneous

FP-213-253, Main Steam Pipeway Area (II-411) Recirculation Fan Room (II-709) Fire Zone 2-4G Elevation 719'-1", Revision 5  
 FP-013-169, Equipment and Battery Rooms Unit 1 East Side (C-604, 602, 603, 608) Fire Zones 0-28B-I, 0-28M, 0-28N, 0-28J Elevation 771'-0", Revision 4 FP-013-134, Central Access Control Area Chem Lab, Offices, and Locker Rooms Fire Zone 0-22A, 0-23, 0-22C Elevation 676'-0", ^86'-6", Revision 6  
 Fire Brigade Quarterly Drill, Incendiary Fire- Remote Shutdown, Scenario #31 TQ-171-0101, Fire Brigade Drill Summary, Revision 0  
 FP-113-109, Remote Shutdown Panel Room (I-109) Access Area (I-102) Fire Zones 1-2B, 1-2D Elevation 670'-0", Revision 5

**Section 1R06: Flood Protection Measures**Drawings

C-1750, Unit 1 and 2 Control Structure Fire Protection Plan of El. 714'-0", Sheet 3, Revision 4  
 P-21-5, Drainage Central Control Building Area 21 Plan of Elevation 714'0", Revision 7

Miscellaneous

EC-FLOD-0001, Internal Flooding Evaluations for Moderate Energy Pipe Cracks and Sprinkler system Actuators, Revision 3

**Section 1R11: Licensed Operator Regualification Program**Procedures

GO-200-002, Plant Startup, Heatup and Power Operation, Revision 93  
 ON-SCRAM-101, Reactor Scram, Revision 5

Condition Reports (\*NRC identified)

CR-2017-08013  
 CR-2017-08058

Drawings

M-175, Unit 1 P&ID Reactor Bldg. Air Flow Diagram Zone 3, Sheet 1, Revision 34  
 M-175, Unit 1 P&ID Reactor Bldg. Air Flow Diagram Zone 3, Sheet 2, Revision 9  
 M-176, Unit 1 P&ID Air Flow Diagram Zone 1 Reactor Building, Sheet 1, Revision 31  
 VC-175, Common P&ID HVAC Control Diagram Reactor Building Standby Gas Treatment System, Sheet 3, Revision 34

Miscellaneous

Unit 2, Cycle 19, Startup Control Rod Sequence A2, March 24, 2017

**Section 1R12: Maintenance Effectiveness**Maintenance Orders/Work Orders

1783426	1783992	1792769	1836301	1836315	18780AA
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Drawings

M-6691, Terminal Plates Type "L" Switch Gear Cells, Revision 4

Miscellaneous

EDU-BAS-001, C & D Battery Terminal Plate, Dedication Document File No. R42-13-E,  
January 2, 2000  
SSES Receipt Inspection Report No. 248021 for terminal Plate for 250V Battery Bank,  
November 17, 2016

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

NDAP-QA-1902, Integrated Risk Management, Revision 25  
NDAP-QA-1902, Integrated Risk Management, Revision 26

Condition Reports (\*NRC identified)

CR-2017-09517  
CR-2017-09589  
CR-2017-10124  
CR-2016-10174

Action Requests

AR-2017-09647  
AR-2017-09687

Maintenance Orders/Work Orders

2084091

Miscellaneous

NDAP-QA-1902-10, Risk Management Challenge Board, Attachment M, Revision 1  
NDAP-QA-1902-1, Risk Screening Worksheet, Attachment C, Revision 12  
High Risk Activity Plan for Week of May 1, 2017  
Risk Management Action Summary Report for WO 208491, May 2, 2017

**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

OP-102-001, 125V DC System, Revision 25  
NDAP-QA-0409, Door, Floor Plug and Hatch Control, Revision 16  
NDAP-QA-0302, System Status and Equipment Control, Revision 35  
MT-AD-504, Scaffold Erection, Review and Inspection, Revision 30

Condition Reports (\*NRC identified)

CR-1091573	CR-745248	CR-745462	CR-2014-25714
CR-2017-07890	CR-2017-08333	CR-2017-08373*	CR-2017-08436*
CR-2017-084444*	CR-2017-08448	CR-2017-08449	CR-2017-08454*
CR-2017-08507	CR-2017-08547	CR-2017-08995	CR-2017-09150*
CR-2017-10225	CR-2017-10343	CR-2017-11235	CR-2017-12297

Action Requests

AR-1091868	AR-1097246	AR-346000	AR-2017-09588
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Maintenance Orders/Work Orders

1974578

Drawings

FF61604, Unit 1&2 DG/E Lube Oil Schematic, Sheet 3, Revision 10  
E119A-8, 30 Thyristor Control-Led Constant Potential Battery Charger, Sheet 801, Revision 9  
E119A-9, Wiring Diagram, Sheet 901, Revision 12  
VC-2175, Unit 2 P&ID HVAC Control Diagram Reactor Building Zone 3, Sheet 1, Revision 18  
M-2125, Unit 2 P&ID Instrument Air Reactor Building, Sheet 8, Revision 23  
C-1804, Unit 1 & 2 Physical Clearance Criteria, Sheet 1, Revision 4

Miscellaneous

IOM 749-1, Instruction Manual for Engine Generator Exciter Voltage Regulator Air Compressor Skids (Not Safety-Related) and Air Receiver Skids, Revision 0  
ACT-01-CR-2014-25714, Prompt Operability Determination Form, Revision 1  
ACT-01-CR-2017-12297, Prompt Operability Determination Form, Revision 1  
IOM-202, Battery Charger, Power Conversion Products  
Clearance 34-001-1974578-1  
DBD009, "Design Basis Document for ESW, RHRSW, and Ultimate Heat Sink," Revision 3  
Calculation EC-PUPC-20400, "EPU Task Report T0400 – Containment System Response," Revision 5

**Section 1R18: Plant Modifications**

Condition Reports (\*NRC identified)

CR-2017-06964

Action Requests

AR-2015-00369  
AR-2015-06792

Maintenance Orders/Work Orders

1812456

Miscellaneous

EC 1775703, FAC Piping Replace Unit 2 HPCI Carbon Steel Turbine Drain Shown on SPDBD207-1 and SPDBB214-2, June 20, 2014  
BOP-UT-17-027, UT Thickness Examination, Pipe Bend Ovality Check, March 25, 2017  
BOP-UT-17-184, Liquid Penetrant Examination, HPCI Drain FAC Piping, March 27, 2017

**Section 1R19: Post-Maintenance Testing**

Procedures

SE-200-002, ASME Class I Boundary System Leakage Test (Special, Infrequent, or Complex Test/Evolution), Revision 26  
SO-149-B05, Quarterly RHR Loop B Valve Exercising, Revision 19  
SE-159-400, RHR/Core Spray/HPCI/RCIC Component Post-Maintenance Close System Testing, Revision 5  
SE-149-400, RHR System Leakage Quantification Test, Revision 13  
NDAP-QA-0480, ASME Section XI System and Component Pressure Testing, Revision 9  
NDAP-QA-0425, Check Valve Conditioning Monitoring Program, Revision 1  
PSP-29, Post Maintenance Testing Matrix, Revision 21  
SO-252-005, 24 Month HPCI Flow Verification, Revision 27  
SO-252-002, Quarterly HPCI Flow Verification, Revision 72  
SE-283-006, Main Steam Safety/Relief Valve Inservice Testing, Revision 7  
OT-283-001, MSRV Remote Actuation Following Maintenance, Revision 4

SO-283-002, 24 Month ADS Valve Manual Actuation, Revision 16  
 SO-283-001, 24 Month Division 1 ADS Logic System Functional Test, Revision 0  
 SO-283-005, 24 Month Division 2 ADS Logic System Functional Failure Test, Revision 1

Condition Reports (\*NRC identified)

CR-2017-07470	CR-2017-07496	CR-2017-07501	CR-2017-07516
CR-2017-07426	CR-2017-09158	CR-2017-09503	

Action Requests

AR-1252140  
 AR-2017-09601

Maintenance Orders/Work Orders

1878041	1898230	1898231	1899177	1902494	1903282
1904729	2044612	2072891	2082849		

Miscellaneous

EC-VALV-1155, Design Report of 24 Inch – 900lb Tilting Disk Check Valve for Class 1 Nuclear, Revision 2

**Section 1R20: Refueling and Other Outage Activities**

Procedures

SM-250-201, Closure Testing of RCIC Keepfill Valve at Refueling, Revision 0  
 GO-200-010, ECCS/Decay Heat Removal in Mode 4, 5, or Defueled, Revision 29  
 GO-200-006, Cold Shutdown, Defueled and Refueling, Revision 57  
 OP-059-001, Primary Containment Closeout Inspection, Revision 2  
 NDAP-QA-0309, Primary Containment Access and Control, Revision 36  
 GO-200-004, Plant Shutdown to Minimum Power, Revision 74  
 GO-200-002, Plant Startup, Heatup and Power Operation, Revision 93

Condition Reports (\*NRC identified)

CR-2017-02719	CR-2017-04247	CR-2017-04305	CR-2017-04318
CR-2017-04551	CR-2017-04554	CR-2017-04556	CR-2017-04562
CR-2017-04563	CR-2017-04691	CR-2017-04965	CR-2017-04999
CR-2017-05035	CR-2017-05379	CR-2017-05394	CR-2017-05533
CR-2017-05541	CR-2107-05546	CR-2107-05574	CR-2017-05575
CR-2017-05637	CR-2017-05638	CR-2017-05650	CR-2017-05651
CR-2017-05679	CR-2017-05680	CR-2017-05692	CR-2017-05860
CR-2017-06057	CR-2017-06191	CR-2017-06202	CR-2017-06237
CR-2017-06245	CR-2017-06263	CR-2017-06265	CR-2017-06332
CR-2017-06341	CR-2017-06380	CR-2017-06388	CR-2017-06638*
CR-2017-06764*	CR-2017-06704	CR-2017-07318	CR-2017-07500
CR-2017-07514	CR-2017-07523	CR-2017-07855	CR-2017-07871
CR-2017-07685	CR-2017-07840		

Action Requests

AR-2017-06564

Miscellaneous

MT-083-012, MSIV Diagnostic Testing, Revision 8

**Section 1R22: Surveillance Testing**Procedures

SO-253-00A, 24 Month SBLC Operability (LOOP A), Revision 6  
 SO-024-C01, Diesel Generator C integrated Surveillance Test, Revision 0  
 SUS-ISTPLN-200.0, SSES Unit 2 IST Program Plan, Revision 10  
 SO-253-004, Quarterly SBLC Flow Verification, Revision 41  
 SM-102-001, 125 Volt DC Station Batteries Weekly, Monthly and Quarterly Electrical Parameter Checks, Unit 1 and Diesel Generator E, Revision 21  
 SE-100-003, Primary Containment Integrated leakage Rate Test (ILRT) (Special, Infrequent or Complex Test/Evolution), Revision 11

Condition Reports (\*NRC identified)

CR-2017-06435      CR-2017-07840      CR-2017-09515

**Section 1EP6: Drill Evaluation**Condition Reports (\*NRC identified)

CR-2017-11532      CR-2017-11535      CR-2017-11536      CR-2017-11558  
 CR-2017-11559      CR-2017-11583      CR-2017-11688      CR-2017-11876

Miscellaneous

EP Drill Report, Emergency Preparedness White Team, June 6, 2017

**Section 2RS7: Radiological Environmental Monitoring Program**Condition Reports (\*NRC identified)

CR-2016-01762      CR-2016-05154      CR-2016-08182      CR-2016-10029  
 CR-2016-12994      CR-2016-15155      CR-2016-19232      CR-2016-19516  
 CR-2016-20116      CR-2016-21191      CR-2016-23788      CR-2016-25743  
 CR-2016-26400      CR-2016-27274      CR-2016-27432

Meteorological Work Orders

2033042      2038275      2038276      2038281      2038604      2038605  
 2038613      2038614      2038606      2043995      2043996      2044012  
 2044013      2044014      2044015      2044016      2044017      2308283

Certificates of Calibration from Laboratory Services for Gas Meters

2026887; 6024079; 14414239; 1557886715578872; 17341980; 17341981

Miscellaneous

2016 Radiological Environmental Operating Report  
 2015 Radiological Environmental Operating Report  
 Offsite Dose Calculation Manual, Revision 18  
 Audit AR-2015-01378, Chemistry and Effluents Audit Report  
 2016 Land Use Census  
 Groundwater Monitoring Program Quarterly Reports for: 1<sup>st</sup>, 2<sup>d</sup>, 3<sup>d</sup>, 4<sup>th</sup> quarter 2016; and  
 1<sup>st</sup>, 2<sup>d</sup> quarter 2017

**Section 4OA1: Performance Indicator Verification**Action Requests

AR-2016-09086	AR-2016-11914	AR-2016-14016	AR-2016-16358
AR-2016-18202	AR-2016-20334	AR-2016-22574	AR-2016-24814
Ar-2016-26603	AR-2017-00328	AR-2017-02357	AR-2017-04228
DI-2016-12349	DI-2017-00584		

**Section 4OA2: Problem Identification and Resolution**Procedures

NDAP-QA-0340, Protected Equipment Program, Revision 31

NDAP-QA-1902, Integrated Risk Management, Revision 25

NDAP-QA-1902, Integrated Risk Management, Revision 27

Action Requests

DI-2016-22544      DI-2017-00314

Condition Reports (\*NRC identified)

CR-2013-013136	CR-2016-012854	CR-2016-013118	CR-2016-22544
CR-2017-10089	CR-2017-010367	CR-2017-06453	CR-2017-04369
CR-2017-10583	CR-2017-10901		

Miscellaneous

OP-AD-300, Administration of Operations, Revision 21

OP-252-001, HPCI System, Revision 61

4Q2016 Performance Assessment report, dated February 2, 2017

January – April 2017 Performance Assessment report, dated June 30, 2017

Protected Equipment Clearance Order 'A' Emergency Diesel Generator, dated March 27, 2017

Protected Equipment Clearance Order 'B' Emergency Diesel Generator, dated March 27, 2017

Protected Equipment Clearance Order 'D' Emergency Diesel Generator, dated March 27, 2017

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**Condition Reports (\*NRC identified)

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

Miscellaneous

NDAP-00-2002, Attachment C, For Cause or Post Event Testing Determination Form  
Susquehanna Nuclear, LLC, Revision 20

Prompt Investigation Form CR-2017-11564/CR-2017-11607

Unit 1, Startup PORC Agenda, June 9, 2017

SCRAM 01-17-01 Event Summary



**LIST OF ACRONYMS**

AC	alternating current
ADS	automatic depressurization system
BWR	boiling water reactor
CAP	corrective action program
CFR	<i>Code of Federal Regulations</i>
CR	condition report
DC	direct current
EDG	emergency diesel generator
EGM	enforcement guidance memorandum
EOOS	equipment out of service
ESS	engineered safeguard system
FIN	fix it now
GPI	groundwater protection initiative
HPCI	high pressure coolant injection
ICDP	incremental core damage probability
IMC	Inspection Manual chapter
LAR	license amendment request
LER	licensee event report
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
ODCM	off-site dose calculation manual
OPDRV	operations with a potential for draining the reactor vessel
PD	performance deficiency
PRA	probabilistic risk assessment
REMP	radiological environmental monitoring program
RHR	residual heat removal
RPV	reactor pressure vessel
SDP	significance determination process
SSES	Susquehanna Steam Electric Station
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VDC	voltage direct current