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

November 4, 2016

Mr. Timothy S. Rausch
President and Chief Nuclear Officer
Susquehanna Nuclear, LLC
769 Salem Blvd - NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – INTEGRATED INSPECTION REPORT 05000387/2016003 AND 05000388/2016003 AND REPORT NO. 07200028/2016001 INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

Dear Mr. Rausch:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station (SSES), Units 1 and 2. On October 14, 2016, the NRC inspectors discussed the results of this inspection with Kevin Cimorelli, Operations General Manager 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 violation (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

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 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 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; 50-388 and 72-28
License Nos. NPF-14 and NPF-22

Enclosure:
Inspection Report 05000387/2016003; 05000388/2016003
and 07200028/2016001 w/Attachment: Supplementary Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-387, 50-388 and 72-28
License Nos.:	NPF-14 and NPF-22
Report No.:	05000387/2016003; 05000388/2016003 and 07200028/2016001
Licensee:	Susquehanna Nuclear, LLC (Susquehanna)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	July 1, 2016 through September 30, 2016
Inspectors:	J. Greives, Senior Resident Inspector T. Daun, Resident Inspector J. Heinly, Senior Resident Inspector N. Embert, Operations Engineer J. Furia, Senior Health Physicist O. Bailey, Health Physicist J. Nicholson, Senior Health Physicist
Approved By:	Daniel L. Schroeder, Chief Reactor Projects Branch 4 Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY

IR 05000387/2016003, 05000388/2016003, 07200028/2016001; July 1, 2016 through September 30, 2016; Susquehanna Steam Electric Station, Units 1 and 2; Flood Protection Measures 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 regional inspectors. The inspectors identified two non-cited violations (NCVs), both of which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Susquehanna did not ensure that work instructions to breach a flood barrier appropriately incorporated design requirements for internal flooding so that equipment necessary to achieve and maintain safe shutdown would not be impacted. From August 30, 2016 to September 2, 2016, work instructions directed a breach of a flood barrier that was credited to provide assurance that equipment necessary for safe shutdown of the plant was protected against the effects of medium energy line breaks and, therefore, were not appropriate to the circumstances. Susquehanna entered this issue into their corrective action program (CAP) as condition report CR-2016-20472 and CR-2016-20859 and revised the work instructions to require a worker remain in the vicinity of the penetration to ensure that flooding could be secured prior to impacting equipment necessary to reach and maintain safe shutdown.

  This finding is more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, had the breach been completed, it could have allowed a medium energy line break in one flooding area to communicate with another area, potentially impacting equipment necessary to achieve and maintain safe shutdown. The inspectors evaluated the finding using IMC 0609, Appendix A, Exhibit 2, "Mitigating System Screening Questions," and determined the finding to be of very low safety significance (Green) because the PD was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent actual loss of a safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect of Human Performance, Work Management because Susquehanna did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Implementation of Susquehanna's work planning process did not ensure that the maintenance incorporated all requirements for protection against internal flooding and did not ensure that job site conditions were consistent with assumptions in engineering analyses. [H.5]. (Section 1R06)

- Green. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) because Susquehanna did not assess and manage the increase in risk from online maintenance activities. From September 11 to 16, 2016, there were multiple affected areas that the fire protection engineer or designee did not walk down to inspect for fire impairments resulting in deficiencies not being corrected prior to releasing work and no fire watch was established for the impairments. Susquehanna removed the combustible materials from the areas or stationed a fire watch, and entered these issues into their CAP as CR-2016-21125, CR-2016-21423, CR-2016-21616, and CR-2016-21741.

  This finding is more than minor because it adversely impacted the protection against external factors attribute of the Mitigating Systems cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, not implementing the required risk management actions (RMAs) for the only available safe shutdown pathway placed the station in a much higher risk condition in the event of an internal fire. The inspectors evaluated the finding in accordance with IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." Since the performance deficiency was related to maintenance activities affecting structure, system, and components needed for fire mitigation, Appendix K directed the significance to be determined by an internal NRC management review using risk insights. IMC 0609, Appendix F, Attachment 1 "Fire Protection Significance Determination Process Phase 1 Worksheet," was used to develop this risk insight. Based on the nature and quantity of combustible materials in the areas, combined with the relatively short duration of which the fire risk was unmitigated, inspectors determined that it was of very low safety significance (Green). The finding was determined to have a cross-cutting aspect in the area of Human Performance, Avoid Complacency, in that, individuals did not plan for latent issues and inherent risk, even while expecting successful outcomes. Specifically, combustible materials were not appropriately controlled as required by OI-013-002, "Fire Risk Management," Revision 10, because in some cases they were assumed to be exempt from the program requirement or staff did not tour the areas because they assumed there were no combustible materials present based on past experience. [H.12] (Section 1R13)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On July 29, 2016, operators reduced power to approximately 58 percent, performed a control rod sequence exchange and returned the unit to 100 percent on July 31, 2016. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On July 1, 2016 operators reduced power to approximately 66 percent, performed a control rod sequence exchange and returned the unit to 100 percent on July 2, 2016. On August 11, 2016, operators reduced power to approximately 60 percent in response to a loss of extraction steam to the 2B feedwater heater string. Following repairs, operators returned the unit to 100 percent on August 12, 2016. On September 16, 2016, operators reduced power to approximately 65 percent and performed scram time testing and a control rod sequence exchange. Operators returned the unit to 100 percent power on September 17, 2016. On September 30, 2016, operators commenced a shutdown for a planned turbine maintenance outage.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, high-pressure coolant injection (HPCI) during reactor core isolation coolant (RCIC) testing on July 20, 2016 and July 22, 2016
- Common, motor-driven and backup diesel-driven fire pumps (DDFPs) while DDFP out of service for maintenance on August 17, 2016
- Common, ‘C’ emergency diesel generator following restoration from 5-year overhaul on August 18, 2016
- Unit 2, ‘A’ emergency service water (ESW) during ‘B’ loop piping replacement on September 13, 2016

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

b. Findings

No findings were identified.

1R05 Fire Protection

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

a. Inspection Scope

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

- Unit 1, residual heat removal (RHR) 'A' pump room (fire zone 1-1F) on September 12, 2016
- Unit 1, heat exchanger and pump room (fire zone 1-3A) on September 12, 2016
- Unit 2, RHR 'A' pump room (fire zone 2-1F) on September 13, 2016
- Unit 1, standby liquid control systems area (fire zone 1-5A-S) on September 13, 2016
- Unit 2, equipment access area (fire zone 2-3C-W) on September 16, 2016

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 July 19, 2016, that involved a fire in the upper switchgear room of the Unit 1 Turbine Building. 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

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors' review focused on the Unit 2, reactor building elevation 683' on September 5, 2016. It verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. 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

Introduction. Inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Susquehanna did not ensure that work instructions to breach a flood barrier appropriately incorporated design requirements for internal flooding so that equipment necessary to achieve and maintain safe shutdown would not be impacted.

Description. The design basis for internal flooding at Susquehanna is a single postulated medium energy line break (MELB), in conjunction with a safe shutdown earthquake, plus an additional single failure. EC-FLOD-0500 documents the consequences of a MELB in the equipment area on elevation 683' of the Unit 2 reactor building and demonstrates that equipment necessary for safe shutdown will not be impacted by this design basis flooding event. In part, this calculation establishes the wall separating the equipment area (rooms II-202/204/205) and its adjacent area (room II-200) as a flood barrier.

During a review of in-progress work associated with work order 1923353, which installed a new 16-inch penetration in the wall between room II-200 and rooms II-202/204/205 on elevation 683' of the reactor building, inspectors identified that the station had not adequately captured requirements to ensure minimum equipment remained available to respond to a MELB. This wall is identified as a flood barrier on drawing C-2735, "Unit 2 Reactor Building Station Flood Barrier Plan of Elevation 683'-0"," Revision 2. In that drawing, the internal flood height of room II-200 is identified as 2', while the internal flood height of rooms II-202/204/205 is identified as 1'. In review of the work order, inspectors noted that two engineering actions were assigned to 1) confirm system operability during the maintenance (AR-2016-15386) and 2) assess the risk associated with the modification (AR-2016-10677).

Both actions were closed stating, in part, that the planned penetration would be limited by an open door which was previously analyzed in EC-012-6083, “Opening of Door 203 (204).” The Inspectors reviewed the calculation and noted differences between that activity and the one documented in work order 1923353. The calculation assumed that the room would be continually occupied while the doors were opened. Therefore, the calculation concluded that “for a pipe crack which would cause internal flooding the door would be closed and the configuration of the plant would be as currently analyzed.” Inspectors determined that this was inconsistent with the current work order because the core bore would open a 16-inch diameter hole in the flood barrier that could not be restored to its design configuration.

Inspectors noted that the work order required materials staged to temporarily seal the hole in accordance with MT-GM-083, “Work Plan Preparation Breach and Reseal,” in the event of a pipe break. Section 5.5 of MT-GM-083 allows breaching watertight barriers provided certain requirements are met. In part, it provides an acceptable temporary barrier for an opening of up to 100 square inches. Inspectors noted that the material staged was the same method designated in the procedures, but the opening was approximately 200 square inches. Inspectors also noted that nothing in the work order required personnel to remain in the vicinity of the penetration when it was not sealed, as required by MT-GM-083.

Susquehanna entered the inspectors’ concerns into the CAP as CR-2016-20472 and restrained the work order pending resolution. At the time, the core bore was only partially completed such that it remained sufficient as a flooding barrier. Susquehanna reassessed the work and determined that the internal flood of concern for rooms II-202/204/205 is a MELB from the RHR system while in suppression pool cooling. In this case, Susquehanna determined that no equipment necessary to achieve and maintain safe shutdown would be impacted assuming approximately 1000 gpm of drainage from floor drains in both areas.

Inspectors walked down rooms II-202/204/205 and identified that 5 of 8 floor drains had their foreign material screens removed, which would have allowed debris to potentially block multiple drain headers and also identified debris in the area of each drain. This condition was contrary to the station housekeeping requirements of NDAP-QA-0503, “General Housekeeping, Transient Material, and Internal Cleanliness,” Revision 40. Inspectors determined that had these drains been blocked, insufficient outflow would exist to protect equipment required for safe shutdown if the leak were not promptly isolated.

Susquehanna also revised the work instructions to require a worker remain in the vicinity of the penetration if an RHR pump were in-service to ensure any leaks were promptly communicated to the control room. Inspectors determined that this action was reasonable and ensured that equipment necessary to reach and maintain safe shutdown would not be impacted if a MELB were to occur.

Analysis. Failure to ensure that work instructions to breach a flood barrier adequately incorporated design requirements for internal flooding was a performance deficiency (PD) that was within Susquehanna’s ability to foresee and correct and should have been prevented. Specifically, Susquehanna’s review of the work assumed that the breach could be restored to its design configuration upon identification of a break, but the work order did not provide sufficient instructions to reasonably ensure that this would be the case. The finding is more than minor because if left uncorrected, the PD had the potential to lead to a more significant safety concern.

Specifically, had the breach been completed, it could have allowed a MELB in one flooding area to communicate with another area, potentially impacting equipment necessary to achieve and maintain safe shutdown.

In accordance with Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the PD was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent actual loss of a safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk-significant due to a seismic, external flooding, or severe weather initiating event. This finding had a cross-cutting aspect in the area of Human Performance, Work Management because Susquehanna did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority (H.5). Specifically, implementation of Susquehanna's work planning process did not ensure that the maintenance incorporated all requirements for protection against internal flooding and did not ensure that job site conditions were consistent with assumptions in engineering analyses.

Enforcement. 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances. Contrary to the above, from August 30, 2016 to September 2, 2016, Susquehanna did not ensure that appropriate design requirements to protect systems from the effects of internal flooding were incorporated into the work instructions. These work instructions directed a breach of a flood barrier that was credited to provide assurance that equipment necessary for safe shutdown of the plant was protected against the effects of MELBs and, therefore, were not appropriate to the circumstances. To restore compliance, Susquehanna revised the work instructions to require a worker remain in the vicinity of the penetration to ensure that flooding could be secured prior to impacting equipment necessary to reach and maintain safe shutdown. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into Susquehanna's CAP as CR-2016-20472 and 2016-20859, this violation is being treated as a NCV consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000388/2016003-01, Inadequate Work Instructions for Breaching Internal Flood Barrier)**

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 29, 2016, which included a reactor scram in response to rising plant radiation levels with failure of a main steam line to isolate. 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 technical specification action statements entered by the crew. 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.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system and component (SSC) 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 SSC 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 SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs 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, instrument air (compressors, service air to instrument air cross tie valve) on July 14, 2016
- Common, commercial dedication of Heim joints for safety related automatic transfer switches for the Unit 1 and Unit 2 swing bus, on September 27, 2016

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

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

- Unit 2, pre-outage installation of hardened containment ventilation system on August 22, 2016
- Unit 2, 'B' loop ESW piping replacement on September 13, 2016
- Unit 1, 'B' residual heat removal service water (RHRSW) system outage window (SOW) (elevated risk), September 11, 2016 – September 16, 2016
- Unit 2, emergent work control during reactor water clean-up through wall leak on September 19, 2016
- Common, division 1 ESW SOW, September 19, 2016 – September 21, 2016

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) because Susquehanna did not assess and manage the increase in risk from online maintenance activities. Specifically, on September 12, 2016, inspectors identified multiple examples where Susquehanna did not implement the procedural requirements of OI-013-002, "Fire Risk Management," Revision 10, such that adequate RMAs were performed.

Description. NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" Rev 4A, which is endorsed by Regulatory Guide 1.160, specifies in part, that licensees assess and manage fire risk as part of their maintenance rule (a)(4) work management process. Susquehanna committed to the requirements of NUMARC 93-01 and developed EC-RISK-1163, Maintenance Rule (a)(4) Fire Risk Management Program Bases. Requirements of the calculation are implemented by OI-013-002. Fire RMAs are intended to increase awareness of plant personnel to the increased fire risk when components which are credited for safe shutdown are removed from service.

On September 11, 2016, Susquehanna implemented RMAs in accordance with OI-013-002 for a Unit 1, division 2, RHRSW SOW scheduled for 105 hours. The 1B RHRSW pump is a division 2 safe shutdown component which is utilized in safe shutdown paths 2 and 3.

All safe shutdown paths transfer heat from the vessel to the suppression pool via safety-relief valves. Path 1 and 3 use RHR in suppression pool cooling mode to remove decay heat from the suppression pool. Path 2 uses suppression pool cooling until reactor pressure is less than 98 psig when shutdown cooling can be entered. The RHRSW system removes decay heat from the RHR heat exchangers and transfers it to the spray pond. Two RHRSW pumps are required per division. Path 1 uses division 1 RHRSW pumps, 1A and 2A, while path 3 uses division 2 RHRSW pumps, 1B and 2B.

OI-013-002 requires RMAs be implemented for the opposite (unaffected) division safe shutdown path if an in-scope primary system is scheduled to be out of service for greater than 60 hours. In part, OI-013-002 directs the fire protection engineer or other designee to perform a walk down of the affected zones to inspect for transient combustibles, hot work, and other fire hazards no greater than 72 hours before the scheduled work. OI-013-002, section 5.1.7.b directs all impairments identified be corrected prior to releasing work (preferred) or a fire watch be established for any impairments that are not corrected. ZWO 2020740 was generated to establish hourly fire watch tours through zones with either inoperable detection or for the presence of combustible materials.

During the week of September 12, 2016, the inspectors assessed the implementation of the RMAs associated with the 1B RHRSW SOW. The inspectors identified multiple deficiencies in the implementation of the RMAs related to the control of combustible materials in risk significant fire zones. Specifically the inspectors toured the transient combustible free areas identified in Attachment D of OI-013-002 and identified combustible materials in multiple areas that did not have an hourly fire watch established. Susquehanna confirmed these deficiencies, established a fire watch where required, and entered the issue into their CAP as CR-2016-21125, CR-2016-21423, CR-2016-21616, and CR-2016-21741.

Inspectors also noted CR-2016-20917 and CR-2016-20953, which were generated by plant operators that identified combustible material in areas identified in Attachment D of OI-013-002 of the reactor buildings. The combustibles identified included items such as kneeling pads, harnesses, canvas bags, plastic bags and other miscellaneous combustibles. Resolution of the CRs indicated that the combustible material was verified to be less than 10 pounds of approved incidental material, and therefore was not considered transient combustible material per NDAP-QA-0440, Control of Transient Combustible Hazardous Materials. Inspectors noted that NDAP-QA-0440 defines incidental materials as “materials necessary for, or supporting, the safe operation of the plant”. Inspectors determined that the material identified did not meet this definition of incidental material and therefore was subject to the requirements of OI-013-002.

Analysis. Not implementing adequate RMAs in accordance with station procedures is a PD which was reasonably within Susquehanna’s ability to foresee and correct, and should have been prevented. Specifically, multiple examples of inadequate implementation of RMAs during an extended outage window for a system which is credited for safe shutdown were identified. The inspectors determined that this PD was more than minor because it adversely impacted the protection against external factors attribute of the Mitigating Systems cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, not implementing the required RMAs for the only available safe shutdown pathway placed the station in a higher risk condition in the event of an internal fire. The inspectors evaluated the finding in accordance with IMC 0609, Appendix K, “Maintenance Risk Assessment and Risk Management Significance Determination Process,” dated May 19, 2005. Since the PD was related to maintenance activities affecting SSCs needed for fire mitigation, Appendix K directed the significance to be determined by an internal NRC management review using risk insights. In consultation with a regional senior reactor analyst, inspectors used IMC 0609, Appendix F, Attachment 1 “Fire Protection Significance Determination Process Phase 1 Worksheet,” dated September 20, 2013 to develop this risk insight. Based on the nature and quantity of combustible materials in the areas, combined with the relatively short duration of which the fire risk was unmitigated, inspectors determined that it was of very low safety significance. (Green)

The finding was determined to have a cross-cutting aspect in the area of Human Performance, Avoid Complacency, in that, individuals did not plan for latent issues and inherent risk, even while expecting successful outcomes. Specifically, combustible materials were not appropriately controlled as required by OI-013-002 because in some cases they were assumed to be exempt from the program requirement or staff did not tour the areas because they assumed there were no combustible materials present based on past experience. [H.12]

Enforcement. 10 CFR 50.65(a)(4) states, in part, that "before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." OI-013-002, "Fire Risk Management," Revision 10, implements the requirements of 10 CFR 50.65(a)(4) at the station for fire risk. OI-013-002, section 5.1.7.a requires current fire impairments be determined for planned work scheduled on any primary system, in part, by the fire protection engineer or designee performing walk down of affected zones to inspect for transient combustibles, hot work, and other fire hazards. OI-013-002, section 5.1.7.b requires, in part, any deficiencies be corrected or an hourly fire watch be established for areas that include required safe shutdown equipment.

Contrary to the above, from September 11 to 16, 2016, there were multiple affected areas that the fire protection engineer or designee did not walk down to inspect for fire impairments resulting in deficiencies not being corrected or fire watched being established prior to releasing work. To restore compliance, Susquehanna either removed the combustible materials or established a fire watch in the affected areas. Because of the very low safety significance of this finding and because the finding was entered into Susquehanna's CAP as CRs 2016-21125, 2016-21423, 2016-21616, and 2016-21741, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000387; 388/2016003-02, Risk Management Actions Not Adequately Implemented)**

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 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 1, Review of compliance with pressure and temperature limits during reactor pressure vessel system leakage test on July 26, 2016
- Common, operator workarounds (OWAs) on July 29, 2016
- Unit 1, failure of scram discharge volume vent valve to stroke closed on August 4, 2016
- Unit 2, HPCI control valve slow stroke time on August 26, 2016
- Unit 2, failure of swing bus automatic transfer switch (2ATS219) on September 21, 2016
- Common, ESW relay settings for 50/51 instantaneous overcurrent relays on September 22, 2016
- Common, breach identified in secondary containment ventilation on September 27, 2016

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

Based on the review of OWAs, the inspectors verified that Susquehanna identified OWAs at an appropriate threshold and addressed them in a manner that effectively managed OWA-related adverse effects on operators and SSCs.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests (PMTs) 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.

- Common, DDFP replacement on August 12, 2016
- Common, 'C' emergency diesel generator following 5 year overhaul on August 18, 2016
- Unit 1, 'B' RHRSW pump following pump replacement on September 15, 2016
- Unit 1, 1V418A, control rod drive area fan 'A', PMT following repairs on September 20, 2016
- Unit 2, PMT of 2ATS219 on September 22, 2016
- Common, 'C' ESW pump and motor replacement on September 22, 2016

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 2 samples)

a. Inspection Scope

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

- Unit 1, RCIC functional test at remote shutdown panel on July 20, 2016
- Common, control room floor cooling performance test on August 17, 2016

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine Susquehanna emergency drill on August 2, 2016 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the 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

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06) (6 samples)

a. Inspection Scope

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

Inspection Planning

The inspectors conducted in-office reviews of the Susquehanna 2014 and 2015 annual radioactive effluent and environmental reports, radioactive effluent program documents, UFSAR, ODCM, and applicable event reports.

Walkdowns and Observations (1 sample)

The inspectors walked down the gaseous and liquid radioactive effluent monitoring and filtered ventilation systems to assess the material condition and verify proper alignment according to plant design. The inspectors also observed potential unmonitored release points and reviewed radiation monitoring system surveillance records and the routine processing and discharge of gaseous and liquid radioactive wastes.

Calibration and Testing Program (1 sample)

The inspectors reviewed gaseous and liquid effluent monitor instrument calibration, functional test results, and alarm set-points based on National Institute of Standards and Technology calibration traceability and ODCM specifications.

Sampling and Analyses (1 sample)

The inspectors reviewed radioactive effluent sampling activities, representative sampling requirements, compensatory measures taken during effluent discharges with inoperable effluent radiation monitoring instrumentation, the use of compensatory radioactive effluent sampling, and the results of the inter-laboratory and intra-laboratory comparison program including scaling of hard-to-detect isotopes.

Instrumentation and Equipment (1 sample)

The inspectors reviewed the methodology used to determine the radioactive effluent stack and vent flow rates to verify that the flow rates were consistent with TS/ODCM and UFSAR values. The inspectors reviewed radioactive effluent discharge system surveillance test results based on TS acceptance criteria. The inspectors verified that high-range effluent monitors used in emergency operating procedures are calibrated and operable and have post-accident effluent sampling capability.

Dose Calculations (1 sample)

The inspectors reviewed changes in reported dose values from the previous annual radioactive effluent release reports, several liquid and gaseous radioactive waste discharge permits, the scaling method for hard-to-detect radionuclides, ODCM changes, land use census changes, public dose calculations (monthly, quarterly, annual), and records of abnormal gaseous or liquid radioactive releases.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the radioactive effluent monitoring and control program 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 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Susquehanna's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of July 1, 2015, through June 30, 2016. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in

Nuclear Energy Institute (NEI) Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73."

The inspectors reviewed Susquehanna’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, CRs, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (6 samples)

a. Inspection Scope

The inspectors reviewed Susquehanna’s submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2015, through June 30, 2016:

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

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

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.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.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 23 samples)

.1 Licensee Event Reports (LERs) Associated with Simultaneous Opening of Secondary Containment Doors due to Personnel Errors (8 samples)

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 each case, when the airlock door was opened the redundant door was already opened for personnel transit.

TS 3.6.4.1, "Secondary Containment Control," requires 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 immediately 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 loss of safety system function.

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 PD. 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 PD was of minor safety significance. These LERs are closed.

(Closed) LER 05000387; 388/2016-001-00: Secondary Containment Declared Inoperable Due to an Airlock Doors Open Due to Random Occurrence.

On February 22, 2016, personnel leaving the Unit 1 reactor building opened an airlock door when they discovered two other employees entering the airlock from the opposite side. This was documented as CR-2016-04402.

(Closed) LER 05000387; 388/2016-002-00: Secondary Containment Declared Inoperable Due to an Airlock Doors Open Due to Random Occurrence.

On March 2, 2016, personnel leaving the Unit 2 reactor building opened an airlock door when they discovered other employees entering the airlock from the opposite side. This was documented as CR-2016-05300.

(Closed) LER 05000387; 388/2016-005-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error.

On March 15, 2016, a Susquehanna employee was entering the Unit 2 reactor building to complete fire watch rounds while other individuals were following the fire watch employee through the airlock. The fire watch employee 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-2016-06600.

(Closed) LER 05000387; 388/2016-010-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Medical Emergency.

On April 6, 2016, a medical emergency on the refuel floor required having both doors open at the same time for multiple airlocks along the travel path required to move the affected individual to a location outside the reactor building to allow transport to a local hospital by ambulance. The Control Room declared Secondary Containment inoperable and entered the applicable Technical Specification (TS) 3.6.4.1 condition for Unit 1 and Unit 2 during the time when both doors in a required airlock were open. This was documented in CR-2016-09283.

(Closed) LER 05000387; 388/2016-013-00: Secondary Containment Declared Inoperable Due to Simultaneous Opening of Double Airlock Doors.

On April 12, 2016, a Susquehanna employee was in the process of exiting the Unit 1 reactor building via a double door airlock leading to the Unit 1 turbine building. While opening the Reactor Building side door, employees from the Turbine Building side entered the airlock. The airlock air horn alarm activated as designed since both doors were simultaneously opened. The individual did not observe the airlock indication light prior to entry, which is designed to indicate red while the airlock is being utilized. This was documented in CR-2016-09931.

(Closed) LER 05000387; 388/2016-014-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error.

On April 13, 2016, a worker attempting to enter the Unit 1 reactor building opened the inner airlock door without ensuring the outer door from the Unit 1 turbine building was closed behind him. This was documented in CR-2016-10055.

(Closed) LER 05000387; 388/2016-015-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error.

On April 22, 2016, an operator was entering a Unit 1 reactor building access door and noticed another worker entering the airlock door behind him with a cart. The nuclear plant operator stated that he was trying to be helpful and opened the reactor building side (inner) door. The nuclear plant operator stated that they did not notice that the turbine building side (outer) door was still open. Both doors were open at the same time for approximately one second. This was documented in CR-2016-10944.

(Closed) LER 05000387; 388/2016-021-00: Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error.

On June 22, 2016, an engineer passing through a Unit 1 reactor building airlock inadvertently unlatched an outside airlock door, resulting in an airlock alarm indicating both doors were open simultaneously. This was documented in CR-2016-15584.

.2 LERs Associated with Inoperable Secondary Containment due to Malfunctions of Normal Non-Safety Related Ventilation (9 samples)

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, an operational error or equipment malfunction in the normal non-safety related ventilation system caused secondary containment differential pressure (DP) to drop below 0.25 inches of vacuum water column (WC).

TS 3.6.4.1, "Secondary Containment Control," requires secondary containment DP to be greater than of 0.25 inches of vacuum water gauge (WG) when secondary containment is required to be operable. Since in each of these cases DP was noted outside the TS required value, secondary containment was rendered inoperable. 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 loss of safety system function.

In each case, Susquehanna promptly restored secondary containment DP to within the TS limit with the normal reactor building ventilation systems. Additionally, Susquehanna evaluated the events and determined that the ability of the safety-related standby gas treatment system, which is used during accident conditions to establish and maintain secondary containment DP, was not challenged due to the failure of the non-safety related ventilation system. Specifically, Susquehanna's secondary containment drawdown analysis, EC-070-0526, assumes that secondary containment DP is initially at 0.00 inches of vacuum WC. For each case, inspectors reviewed Susquehanna's evaluations to identify if any performance deficiencies caused the inoperability of secondary containment. 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 any PD identified was of minor safety significance. These LERs are closed.

(Closed) LER 05000387; 388/2015-003-01: Secondary Containment Inoperability Due to Failure to Meet Technical Specification Surveillance Requirement 3.6.4.1.1

On April 21, 2015, the normal, non-safety related reactor building ventilation system was unable to maintain a negative pressure in zone 3 of secondary containment, resulting in entry into Limiting Condition of Operation 3.6.4.1, Condition A, for failure to meet Surveillance Requirement 3.6.4.1.1 on Units 1 and 2. This event was caused by a unique equipment line up that was unable to compensate for the effects of high winds to maintain DP in secondary containment. The apparent cause was determined to be inadequate risk assessment of the testing that was being conducted that required the abnormal ventilation alignment. This was documented as CR-2015-11377.

(Closed) LER 05000387; 388/2015-012-00: Loss of Secondary Containment Differential Pressure Due to Icing of the Intake Supply Plenum Screens.

On December 6, 2015, the unit 1 reactor building DP lowered to less than 0.25 inch WC when the intake supply plenum screens were found to be iced over. The icing was the result of freezing fog, causing the loss of the normal, non-safety related zone I ventilation system. Susquehanna identified that the direct cause of the event was due to environmental conditions that resulted in ice formation on the inlet dampers and plenum screens. However, they determined the apparent cause was less than adequate procedure guidance to monitor for and respond to abnormal environmental conditions that could impact secondary containment DP. This was documented as CR-2015-32243.
(Closed) LER 05000387/2015-013-00 and 05000387/2015-013-01: Loss of Differential Pressure in Zone I of Secondary Containment Due to Solenoid Valve Failure.

On December 6, 2015, operations personnel received alarms in the control room indicating that Unit 1 reactor building DP fell below the TS required limit of 0.25 inches WC when the running exhaust fan associated with the normal, non-safety related ventilation system tripped. Susquehanna determined the direct cause of the event was a failure of a solenoid valve in the exhaust fan subsystem and determined the apparent cause was an issue with vendor parts quality. This was documented as CR-2015-32249.

(Closed) LER 05000387; 388/2016-003-00: Unit 2 Zone 3 HVAC Unable to Maintain Zone 3 Differential Pressure Greater Than 0.25 in wg.

On March 8, 2016, secondary containment Zone III ventilation DP lowered to 0.16" inch of vacuum WG when securing Unit 1 Zone III ventilation for a routine preventative maintenance activity. Susquehanna determined the apparent cause was less than adequate design of the outside air dampers such that the upper and lower sets of dampers could become misaligned. This was documented as CR-2016-05709.

(Closed) LER 05000387; 388/2016-012-00: Secondary Containment Declared Inoperable due to Loss of Differential Pressure as a Result of a Solenoid Failure.

On March 29, 2016, secondary containment zone 2 ventilation DP was not maintained above the TS required vacuum of 0.25 inches WC due to closure of reactor building exhaust fan discharge damper and subsequent trip of the reactor building exhaust fan. Susquehanna determined that the damper closure was the result of a solenoid valve failure as a result of a combination of poor design and inadequate preventive maintenance. This was documented as CR-2016-08365.

(Closed) LER 05000388; 387/2015-010-00 and 05000388; 387/2015-010-01: Loss of Differential Pressure in Zone II of Secondary Containment.

On November 12, 2015, the reactor building zone II normal, non-safety related ventilation system was unable to maintain a negative pressure in secondary containment. Susquehanna determined the direct cause of this event was a change of air flow in the unit 2 reactor building exhaust stack and further determined that the apparent cause was a parts defect within a controller used to maintain proper DP. This was documented as CR-2015-30746.

(Closed) LER 05000388; 387/2016-003-00: Secondary Containment Inoperability due to Failure to Meet Surveillance Requirement 3.6.4.1.1.

On April 19, 2016, secondary containment became inoperable because reactor building zone 2 DP was below the required TS limit of 0.25 inches WC. Susquehanna determined the cause of this event was less than adequate operating procedure instructions for fan swaps in the normal, non-safety related reactor building heating, ventilation and air conditioning systems. This was documented as CR-2016-10669.

.3 LERs Associated with Inoperable Secondary Containment due to Door Malfunctions (4 samples)

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, when personnel accessed one of the two doors in a secondary containment airlock, an equipment deficiency with the redundant door resulted in both doors being opened simultaneously.

TS 3.6.4.1, "Secondary Containment Control," requires 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 immediately 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 loss of safety system function.

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. For each case, inspectors reviewed Susquehanna's evaluations to identify if any performance deficiencies caused the inoperability of secondary containment. 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 any PD identified was of minor safety significance. These LERs are closed.

(Closed) LER 05000387; 388/2015-011-00: Secondary Containment Declared Inoperable Due to an Airlock Door that Had Not Been Properly Latched.

On December 1, 2015, a group of plant employees entering the Unit 2 reactor building airlock and verified with the green light lit that the airlock was safe to access in accordance with station procedures. The airlock light provides indications that the redundant door is closed. Upon opening the door, the red light came on and the buzzer alarmed, indicating the other door was open. In reviewing the occurrence, Susquehanna determined that the redundant door was not properly latched closed when it was last accessed, and when personnel attempted to enter the airlock, the pressure forced the second door open. The event was caused by a human performance error when the last individual traversing through the door failed to ensure it was properly latched. This was documented as CR-2015-32106.

(Closed) LER 05000387; 388/2016-004-00: Momentary Loss of Secondary Containment due to Both Airlock Doors on Elevation 779 of the Unit 2 Reactor Building being Opened at the Same Time.

On March 14, 2016, an individual attempted to enter a Unit 2 reactor building airlock, when the second airlock door opened due to a change in air pressure created when the first door was opened. This resulted in both doors being opened simultaneously. Susquehanna inspected the malfunctioning door and identified that the strike plate on the door was not maintaining the door latched. This was documented as CR-2016-06398.

(Closed) LER 05000388; 387/2016-001-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors Due to Degraded Latch Mechanism.

On March 29, 2016, two individuals attempted to enter a Unit 2 reactor building airlock. While attempting to exit the airlock and secondary containment through the second door, the first airlock door opened due to a change in air pressure created when the other door was opened. This resulted in both doors being opened simultaneously. Susquehanna inspected the malfunctioning door and identified that the latch mechanism was not maintaining the door latched. This was documented as CR-2016-08366.

(Closed) LER 05000388; 387/2016-002-00: Secondary Containment Breach due to Simultaneous Opening of Airlock Doors Due to Degraded Latch Mechanism

On March 29, 2016, a Susquehanna employee leaving the Unit 2 turbine building entered a secondary containment airlock. Prior to opening the airlock door, the employee verified a green light was present, indicating the opposite airlock door was closed. The employee entered the airlock and the airlock alarm was heard. At this time, a rush of air was observed from the reactor building side of the airlock, forcing the second airlock door open. The cause of this event was determined to be normal wear of the door latch. This was documented as CR-2016-08376.

.4 (Closed) LER 05000388/2016-005-00: Unit 2 HPCI Manually Overridden Prior to a Manual Scram During a Plant Transient.

On May 13, 2016, operators manually overrode the HPCI system immediately prior to inserting a manual scram. This action was not in accordance with station procedures which allow overriding the HPCI system under the cognizance of a Unit Supervisor or Shift Supervisor only if: 1) it is directed by an emergency operating procedure, 2) the system is not operating correctly as confirmed by at least two independent indications, or 3) adequate core cooling has been assured by at least two independent indications. Since this human performance error resulted in the inoperability of a single train system, Susquehanna reported it as an event that could have prevented fulfillment of a safety function, as required by 10 CFR 50.73(a)(2)(v).

Susquehanna entered the issue into the CAP as CR-2016-12854. Susquehanna's evaluation of the event determined the senior operator made a decision to prematurely override HPCI without procedural guidance to do so and weaknesses in teamwork and oversight prevented the mistake from being corrected by the rest of the crew. Immediate corrective actions included remediation of the individuals involved and communicating expectations with the remaining operators. The LER and associated evaluations were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. The enforcement aspects of this issue were documented in Section 4OA3 of IR 05000387; 388/2016002 (ML16225A000). This LER is closed.

.5 (Closed) LER 05000387; 388/2015-014-01: 'A' Control Structure Chiller Discovered Inoperable Beyond Technical Specification Limit Due to Refrigerant Overcharge.

On December 10, 2015, Susquehanna discovered the 'A' Control Structure Chiller (0K112A) had failed to meet its acceptance criteria in relation to the quantity of cooling provided during scheduled surveillance of the chiller. The 0K112A chiller is one of two chillers in the Control Structure Chilled Water System, which provides chilled water to the cooling coils located in the Control Room, Control Structure, Computer Room, and Unit 1 Emergency Switchgear Room cooling air handling units.

The chiller failure resulted in a condition prohibited by TS 3.7.4 for the inoperability of one control room floor cooling subsystem for greater than 30 days and could have prevented the fulfillment of a safety function of an SSC needed to provide chilled water to the cooling coils located in the Control Room, Control Structure, Computer Room, and Unit 1 Emergency Switchgear Room cooling air handling units. The 'A' control structure chiller was determined to have been inoperable from January 9, 2014 until December 10, 2015, a period of 23 months. Inspectors reviewed and closed Revision 0 to the LER in IR 05000387; 388/2016008 (ML16246A291) and subsequently identified that the duration of the inoperability was longer than was reported in the LER. Susquehanna revised the LER on August 10, 2016. Inspectors reviewed revision 1 to the LER and its associated revision to the evaluation. This LER is closed.

4OA5 Other Activities

.1 Operation of an Independent Spent Fuel Storage Installation (ISFSI) at Operating Plants (IP 60855 and 60855.1)

a. Inspection Scope

The inspectors observed and evaluated Susquehanna's loading of the first of seven canisters associated with Susquehanna's current ISFSI dry cask campaign. The inspectors verified compliance with the Certificate of Compliance, TS, regulations, and licensee procedures. The inspectors also reviewed Susquehanna's activities related to long-term operation and monitoring of the ISFSI.

The inspectors observed and evaluated Susquehanna's cask processing operations including: loading of fuel into the dry shielded canister (DSC), installation of the shield plug, heavy load movement of the transfer cask and loaded DSC from the spent fuel pool to the refuel floor equipment pit area, decontamination and surveying, vacuum drying, helium backfilling, welding operations, non-destructive examinations (dye penetrant tests), helium leak testing, and movement of the loaded transfer vehicle to the ISFSI pad. During performance of these activities, the inspectors evaluated Susquehanna's adherence to site procedures, supervisory oversight, and communication and coordination between the personnel involved.

The inspectors reviewed radiation protection procedures and radiation work permits associated with the ISFSI loading campaign. The inspectors also reviewed the As-Low-As-Reasonably-Achievable goals (for 2015 and 2016), as well as the actual dose received for the 2015 cask loading to assess the adequacy of Susquehanna's radiological controls and to ensure that radiation worker doses were as low as is reasonably achievable, and that project dose goals could be achieved.

The inspectors reviewed radiological survey records from the current and previous loading campaigns to confirm that dose rate levels measured on the cask were consistent with values specified in the TS.

The inspectors reviewed Susquehanna's program associated with fuel characterization and selection for storage. The inspectors reviewed the cask fuel selection package for DSC-92 to verify that Susquehanna was loading fuel in accordance with the Certificate of Compliance, TS, and site procedures. In addition, the inspectors independently verified the cask loading of selected fuel bundles via review of the digital recordings.

The inspectors reviewed Susquehanna's 10 CFR 72.48 screenings to verify that Susquehanna had appropriately considered the conditions under which they may make changes without prior NRC approval. There were no revisions to the 10 CRF 72.212 report since the last dry cask storage inspection in 2014. The inspectors also reviewed corrective action reports, audit reports, and self-assessments that were generated since Susquehanna's last loading campaign to ensure that issues were being properly identified, prioritized, and evaluated commensurate with their safety significance.

The inspectors performed a walk-down of the heavy haul path and toured the ISFSI pad to assess the material condition of the pad and the loaded horizontal storage modules, and verified that Susquehanna appropriately performed surveillances in accordance with TS requirements. The inspectors verified that transient combustibles were not being stored on the ISFSI pad or in the vicinity of the loaded casks.

Environmental reports were reviewed to verify that areas around the ISFSI site boundary were within the limits specified in 10 CFR Part 20 and 10 CFR 72.104. The inspectors confirmed that vehicle entry onto the ISFSI pad was controlled in accordance with Susquehanna's procedures.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 14, 2016, the inspectors presented the inspection results to Kevin Cimorelli, Operations General Manager, 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

B. Franssen, Plant Manager
J. Ady, Cask Load Lead, AREVA
D. Baker, ALARA Specialist
T. Bannon, Supervisor- Project Management and Support
R. Beacham, Welder, AREVA
K. Cimorelli, General Manager, Operations
M. Cook, Welder, AREVA
M. Craig, Quality Control Supervisor
D. Deretz, Manager, Performance Improvement
T. Dolan, Project Manager
C. Fisher, Site Fire Marshal
D. Fisher, RP Site Services
J. Geddings, Shift Manager, AREVA
K. Harms, Senior RP Technician
F. Hickey, Plant Chemist
J. Hirt, Supervisor, Reactor Engineering
C. Hoffman, Manager, Nuclear Fuel
S. Hribik, Maintenance Foreman
J. Jennings, Manager, Regulatory Affairs
C. Jones, Cask Load Lead, AREVA
D. Jones, General Manager, Maintenance
D. Karchner, Refuel Floor Manager
M. Krick, Senior Engineer
D. LaMarca, Operations Manager
S. Lazar, Reactor Engineer
D. Lock, Manager, Programs Engineering
J. Lindsey, Rad Protection, 1st Line Supervisor
D. Marinos, Unit Supervisor, SRO
T. McAndrew, Refuel Floor Supervisor
T. McCarthy, Senior Engineer
T. Middleton, Unit Supervisor, SRO
J. Mirilovich, Refuel Floor Shift Manager
A. Nestico, Refuel Floor Shift Manager
S. Non, Fuel Mover, AREVA
E. Otruba, Radiation Operations Supervisor
K. Pogonowski, Shift Manager, AREVA
K. Royko, Reactor Engineer
Y. Schrader, Radiation Technician
E. Simpson, Fuel Handler, AREVA
B. Specht, NDE Specialist
F. Watkins, RP Site Services
W. WeinFurter, Cask Load Supervisor, AREVA
J. Willis, Assistant Operations Manager, Shift
J. Yost, Senior Nuclear Plant Specialist

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000388/2016003-01	NCV	Inadequate Work Instructions for Breaching Internal Flood Barrier (Section 1R06)
05000387;388/2016003-02	NCV	Risk Management Actions Not Adequately Implemented (Section 1R13)

Closed

05000387;388/2016-001-00	LER	Secondary Containment Declared Inoperable Due to an Airlock Doors Open Due to Random Occurrence (Section 4OA3)
05000387;388/2016-002-00	LER	Secondary Containment Declared Inoperable Due to an Airlock Doors Open Due to Random Occurrence (Section 4OA3)
05000387;388/2016-005-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Human Performance Error (Section 4OA3)
05000387;388/2016-010-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to Medical Emergency (Section 4OA3)
05000387;388/2016-013-00	LER	Secondary Containment Declared Inoperable Due to Simultaneous Opening of Double Airlock Doors (Section 4OA3)
05000387;388/2016-014-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error (Section 4OA3)
05000387;388/2016-015-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error (Section 4OA3)
05000387;388/2016-021-00	LER	Secondary Containment Declared Inoperable Due to Airlock Doors Open Due to a Human Performance Error (Section 4OA3)
05000387;388/2015-003-01	LER	Secondary Containment Inoperability Due to Failure to Meet Technical Specification Surveillance Requirement 3.6.4.1.1 (Section 4OA3)
05000387;388/2015-012-00	LER	Loss of Secondary Containment Differential Pressure Due to Icing of the Intake Supply Plenum Screens (Section 4OA3)

05000387/2015-013-00 and 05000387/2015-013-01	LER	Loss of Differential Pressure in Zone I of Secondary Containment Due to Solenoid Valve Failure (Section 4OA3)
05000387; 388/2016-003-00	LER	Unit 2 Zone 3 HVAC Unable to Maintain Zone 3 Differential Pressure Greater Than 0.25 in wg (Section 4OA3)
05000387; 388/2016-012-00	LER	Secondary Containment Declared Inoperable due to Loss of Differential Pressure as a Result of a Solenoid Failure (Section 4OA3)
05000388; 387/2015-010-00 and 05000388;387/2015-010-01	LER	Loss of Differential Pressure in Zone II of Secondary Containment (Section 4OA3)
05000388; 387/2016-003-00	LER	Secondary Containment Inoperability due to Failure to Meet Surveillance Requirement 3.6.4.1.1 (Section 4OA3)
05000387; 388/2015-011-00	LER	Secondary Containment Declared Inoperable Due to an Airlock Door that Had Not Been Properly Latched (Section 4OA3)
05000387; 388/2016-004-00	LER	Momentary Loss of Secondary Containment due to Both Airlock Doors on Elevation 779 of the Unit 2 Reactor Building being Opened at the Same Time (Section 4OA3)
05000388; 387/2016-001-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors Due to Degraded Latch Mechanism (Section 4OA3)
05000388; 387/2016-002-00	LER	Secondary Containment Breach due to Simultaneous Opening of Airlock Doors Due to Degraded Latch Mechanism (Section 4OA3)
05000388/2016-005-00	LER	Unit 2 HPCI Manually Overridden Prior to a Manual Scram During a Plant Transient (Section 4OA3)
05000387; 388/2015-014-01	LER	'A' Control Structure Chiller Discovered Inoperable Beyond Technical Specification Limit Due to Refrigerant Overcharge (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures
OP-152-001, HPCI (Reactivity Impact), Revision 62
OP-024-001, Diesel Generators, Revision 82

Condition Reports (*NRC identified)
CR-2016-19595* CR-2016-19603* CR-2016-21269

Drawings
M-155, SES Unit 1 P&ID High Pressure Coolant Injection, Sheet 1, Revision 57
M-156, HPCI Turbine-Pump, Sheet 1, Revision 32
M-122, P&ID Fire Protection Reactor Bldg. Standby DG, River Intake Structure, Service and Admin. Bldg. & Circ. Water Pumphouse, Sheet 3, Revision 66
M-122, P&ID Backup Fire Protection System, Sheet 6, Revision 23
M-122, P&ID Fire Protection Fire Pumphouse North & South Gatehouse & Security Control Center Building, Sheet 1, Revision 57
M-2111, Unit 2 P&ID ESW System 'A' Loop, Revision 46
M-111, Common P&ID ESW System, Revision 50

Miscellaneous
TM-OP-024-ST, Emergency Diesel Generators A-D, Revision 13

Section 1R05: Fire Protection

Procedures
NSEI-AD-145, SFPF Responsibilities in the Fire Brigade Program, Revision 17
NDAP-QA-0445, Fire Brigade, Revision 17
TQ-171, Susquehanna Fire Brigade Training Program, Revision 3

Condition Reports (*NRC identified)
CR-2016-20917 CR-2016-20953 CR-2016-20956 CR-2016-21125*
CR-2016-21150 CR-2016-21423*

Drawings
C-1728, Unit 2 Reactor Building Fire Zone Plan Elevation 645'-0", Sheet 1, Revision 8
C-1722, Unit 1 Reactor Building Fire Zone Plan Elevation 683'-0", Sheet 1, Revision 13
C-1720, Unit 1 Reactor Building Fire Zone Plan Elevation 645'-0", Sheet 1, Revision 7
C-1730, Unit 2 Reactor Building Fire Zone Plan Elevation 683'-0", Sheet 1, Revision 17
C-1724, Unit 1 reactor Building Fire Zone Plan Elevation 749'-1", Sheet 1, Revision 11

Miscellaneous
FP-213-241, RHR Pump Room "A" (11-14) Fire Zone 2-1F Elevation 645'-0", Revision 6
FP-213-247, Equipment Access Area (II-202, 204, 205) Fire Zones 2-3C-N, 2-3C-W, 2-3C-S Elevation 683'-0", Revision 5
FP-113-119, Circulation Space (I-500) and Adjacent Rooms (I-511, 517, 514, 508, 513) Fire Zones 1-5A-N,S,W; 1-5H Elevation 749'-1", Revision 6
FP-113-110, RBCCW Heat Exchanger and Pump Area (I-203) Fire Zone 1-3A Elevation 683'-0", Revision 4
FP-113-106, RHR Pump Room "A" (I-14) Fire Zone 1-1F Elevation 645'-0", Revision 5
Scenario #43, Fire Brigade Quarterly Drill, Revision 0
FP-113-231, Upper Switchgear Room (I-301) Fire Zone 1-34A Elevation 714'-0", Revision 3

Section 1R06: Flood Protection Measures

Procedures
ON-4KV-201, Loss of 4KV Bus, Revision 1
MT-GM-083, Work Plan Preparation for Penetration Breach and Reseal, Revision 9

Condition Reports (*NRC identified)
CR-2016-20472 CR-2016-20859 CR-2016-21954

Maintenance Orders/Work Orders
1923353 2010490

Action Requests
AR-2016-10677 AR-2016-15386

Drawings
C-2735, Unit 2 Reactor Building Station Flood Barrier Plan of El. 683'-0", Sheet 1, Revision 2

Miscellaneous
RIS 01-009: Control of Hazard Barriers
NRC Regulatory Issue Summary 2013-05, NRC Position on the Relationship between General Design Criteria and Technical Specification Operability
EC-FLOD-0500, Evaluate Maximum Flood Depth in Reactor Building Piping/Penetration Room on Elevation 683', Revision 4
EC-012-6083, Opening of Door 203(204), Revision 0
EC-FLOD-0001, Internal Flooding Evaluations for Moderate Energy Pipe Cracks and Sprinkler system Actuations, Revision 3

Section 1R11: Licensed Operator Requalification Program

Procedures
ON-147-001, Loss of Feedwater Heating Extraction Steam, Revision 29
ON-PWR-101, Reactor Power, Revision 2
ON-RECIRC-101, Reactor Recirculation Malfunction, Revision 1
ON-179-001, Increasing Off-Gas MSL Rad Levels, Revision 17
EO-000-102, RPV Control, Revision 14
EO-000-103, Primary Containment Control, Revision 17
EO-000-104, Secondary Containment Control, Revision 15
EO-000-112, Rapid Depressurization, Revision 8
EP-RM-004, EAL Classification Bases, Revision 9

Section 1R12: Maintenance Effectiveness

Procedures
NEPM-QA-0300, Dedication of Commercial Grade Items and Services, Revision 2

Condition Reports (*NRC identified)

CR-2015-22996	CR-2015-23163	CR-2015-24025	CR-2015-28492
CR-2015-29413	CR-2015-29434	CR-2015-30257	CR-2016-02081
CR-2016-15331	CR-2016-17045	CR-2016-17049	CR-2016-21703

Action Requests
AR-2016-17058 AR-2016-21691

Maintenance Orders/Work Orders
1560488 2009685

Miscellaneous
EC-018-0502, Service/Instrument Air Cross-tie PCV-12560 & PCV-22560 Field Setpoint Range Determination, Revision 1
Maintenance Rule Basis Document- System 18, System Number: 18 Instrument Air, May 16, 2016
EC-1499612, Revision 0

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
MFP-QA-5250, Control Structure PLRT and Reactor Building NLR Boundary Breaches and Penetration Seals, Revision 14
MT-GM-083, Work Plan Preparation for Penetration Breach and Reseal, Revision 9
OI-013-002, Fire Risk Management, Revision 10
NDAP-QA-1106, Flow Accelerated Corrosion Program, Revision 5

Condition Reports (*NRC identified)

CR-2016-20924	CR-2016-20936	CR-2016-20938	CR-2016-21122*
CR-2016-21164	CR-2016-21581	CR-2016-21616	CR-2016-21681
CR-2016-21741*	CR-2016-21766	CR-2016-21767	CR-2016-21770

Maintenance Orders/Work Orders

1907494	1923356	1936966	1998847	2000271	2010803
2017362	2020740	2021168	2022439	2022642	2002655

Drawings
C-1721, Unit 1 Reactor Building Fire Zone Plan Elevation 670'-0", Sheet 1, Revision 10
C-1761, Common Diesel Generator Building Fire Zone Plan Elevation 660-'0", Sheet 1, Revision 3
C-1759, Common ESSW Pumphouse Fire Zone Plan Elevation 685'-6", Sheet 1, Revision 4
C-1754, Units 1 & 2 Control Structure Fire Zone Plan Elevation 771'-0", Sheet 1, Revision 11
C-1753, Units 1 & 2 Control Structure Fire Zone Plan Elevation 754'-0", Sheet 1, Revision 10
C-1752, Units 1 & 2 Control Structure Fire Zone Plan Elevation 741'-1", Sheet 1, Revision 9
C-1751, Units 1 & 2 Control Structure Fire Zone Plan Elevation 729'-1", Sheet 1, Revision 9
C-1732, Unit 2 Reactor Building Fire Zone Plan Elevation 749'-1", Sheet 1, Revision 15
C-1731, Unit 2 Reactor Building Fire Zone Plan Elevation 719'-1", Sheet 1, Revision 15

C-1729, Unit 2 Reactor Building Fire Zone Plan Elevation 670'-0", Sheet 1, Revision 10
C-1723, Unit 1 Reactor Building Fire Zone Plan Elevation 719'-1", Sheet 1, Revision 12
M-2144, Unit 2 P&ID Reactor Water Clean-up, Sheet 1, Revision 49
M-2144, Unit 2 P&ID Reactor Water Clean-up, Sheet 2, Revision 13

Miscellaneous
EC-070-1001, Secondary Containment Pressure Boundary- Equivalent Leakage through Penetrations, Revision 20
Protected Equipment Clearance Order, 16-001 -2B RHRSW Pump, September 12, 2016
Maintenance Rule Basis Document System 61, RWCU Reactor Water Cleanup

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
OI-AD-096, Operator Challenges, Revision 18
SO-070-011, 24 Month Secondary Containment Drawdown and Inleakage Surveillance Test Zones I, II and III, Revision 1

Condition Reports (*NRC identified)

CR-2015-09864	CR-2015-25603	CR-2015-29412	CR-2016-11965
CR-2016-18466	CR-2016-18835*	CR-2016-19700	CR-2016-21589*
CR-2016-21656	CR-2016-21662	CR-2016-21756*	CR-2016-22038
CR-2016-22044	CR-2016-22076	CR-2016-22201	CR-2016-22212

Action Requests

AR-2016-18612	AR-2016-18627

Maintenance Orders/Work Orders

1489699	1644339	1837784	1855502	1863850	1898367
1899016	1977216	1992141	2014584		

Miscellaneous
EC-062-0573, Study to support the bases section of TS 3.4.10 "RCS Pressure and Temperature Limits", Revision 1
General Electric SIL No. 430, Reactor Pressure Vessel Temperature Monitoring, Category 4
General Electric SIL No. 251, BWR vessel bottom head coolant temperature measurement (AID 46-79), Category 1, Supplement 1
General Electric SIL No. 251, Category 1, Control of RPV Bottom Head Temperatures
Susquehanna Unit 1, TS bases B3.4.10, Revision 2
Susquehanna Unit 1, TS bases B3.4.10, Revision 3
Susquehanna Unit 1, TS 3.4.10, Revision 3, Amendment 178
Clearance: 37-002-1932244-0
SSES-FSAR, Significant Input Parameters to the Loss-of-Coolant Accident Analysis, Table 6.3-2B, Unit 1 and Unit 2
EC-FUEL-1452, Data Supplied to SPC for the Plant Parameters Document, Revision 16
Relay Setting Change Notice, No. 1055
EC-SOPC-0605, Relay Setting Calculation for Emergency Service Water Pumps, Revision 1
GEH-1753, Time Overcurrent Relays Type IAC
GEK-86054C, Type IAC Time Overcurrent Relays, Type IAC66B

Section 1R19: Post-Maintenance Testing

Procedures
TP-013-032, Fire Protection Isolation Valve 1PI-145 and 2PI-131 Cleanliness Flush, Revision 0
TP-013-066, EC 1544685 Partial 2 Initial Field Acceptance Testing, Revision 0
SO-160-001, Quarterly LOCA Test of Drywell Area Unit Cooler/Fans, Revision 17
TP-024-147, Diesel Generator C Restoration, Revision 9
SO-024-001C, Monthly Diesel Generator 'C' Operability Test, Revision 26
TP-054-103, Initial Start and Run-In of New or Repaired C ESW Pump Motor, Revision 0
SO-054-A03, Quarterly ESW Flow Verification LOOP A, Revision 14

Condition Reports (*NRC identified)

CR-2016-19305	CR-2016-19309	CR-2016-19388	CR-2016-19389
CR-2016-19472	CR-2016-19539	CR-2016-19551	CR-2016-20966
CR-2016-21650	CR-2016-21693	CR-2016-21722	

Action Requests (*NRC identified)
AR-2016-19677*

Maintenance Orders/Work Orders

1593390	1770726	1808063	1914835	1966636	1971026
2002132	2004830	2008157	2017508	2025437	

Section 1R22: Surveillance Testing

Procedures
SO-150-016, RCIC Functional Test at Remote Shutdown Panel (1C201A), Revision 0
SE-030-014B, 24 Month B Control Room Floor Cooling Performance Test, Revision 10

Condition Reports (*NRC identified)

CR-2016-17408	CR-2016-19351	CR-2016-19417

Maintenance Orders/Work Orders
1863762

Drawings
M-150, SES Unit 1 P&ID RCIC Turbine- Pump, Sheet 1, Revision 35
M-149, SES Unit 1 P&ID RCIC, Sheet 1, Revision 53

Section 1EP6: Drill Evaluation

Procedures
EP-PS-001, Emergency Planning Forms and Supplementary Instructions, Revision 11
EP-RM-004, EAL Classification Bases, Revision 9
EP-104, SSES Drill and Exercise Program, Revision 7

Condition Reports (*NRC identified)

CR-2016-18340	CR-2016-18446	CR-2016-18454	CR-2016-18488

Action Requests

AR-2016-18404	AR-2016-18405	AR-2016-18424	AR-2016-18455
AR-2016-18458	AR-2016-18518	AR-2016-18587	

Miscellaneous
Emergency Plan, Revision 59
DI-2016-18364

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Condition Reports

CR-2016-02441	CR-2016-06580	CR-2016-06807	CR-2016-06940
CR-2016-07327	CR-2016-07589	CR-2016-08859	CR-2016-09378
CR-2016-09383	CR-2016-09478	CR-2016-11395	CR-2016-12711
CR-2016-14191	CR-2016-14524	CR-2016-15072	CR-2016-15715
CR-2016-19317	CR-2016-19501	CR-2016-19541	CR-2016-20040

Monitor/Meter Calibrations
Calibration – Liquid Radwaste Effluent Flow Monitor Channel SI-069-307
Quarterly Functional Test – Liquid Radwaste Effluent Flow Monitor SI-069-207
Discharge Flow Monitor Calibration SI-141-301
Calibration – Cooling Tower Discharge Flow Monitor Channel SI-241-301
Quarterly Functional Test – Cooling Tower Discharge Flow and Total Site Blowdown Flow I-SI-041-201
Calibration – Reactor Building Vent Purge Noble Gas Monitor SI-179-335
Quarterly Functional Test – Reactor Building Vent Effluent Flow Monitor SI-179-235
Calibration – Reactor Building Vent Purge Noble Gas Monitor SI-279-335
Quarterly Functional Test – Reactor Building Vent Effluent Flow Monitor SI-279-235
Calibration – Turbine Building Vent Effluent Flow Rate Monitor SI-179-334
Quarterly Functional Test – Turbine Building Vent Effluent Flow Rate Monitor SI-179-234
Calibration – Turbine Building Vent Effluent Flow Rate Monitor SI-279-334
Quarterly Functional Test – Turbine Building Vent Effluent Flow Rate Monitor SI-279-234
Calibration – SGTS Stack Flow and Sampler Flow Rate Monitor SI-079-337
Quarterly Functional Test – SGTS Effluent and Sampler Flow Rate Monitor SI-079-237
LRW Discharge Radiation Monitor Calibration SC-069-011
SW Effluent Radiation Monitor Calibration SC-111-102
RHR SW Radiation Monitor Loop A Calibration SC-116-102
RHR SW Radiation Monitor Loop B Calibration SC-116-103
RHR SW Radiation Monitor Loop A Calibration SC-216-102
RHR SW Radiation Monitor Loop B Calibration SC-216-103
Turbine Building Vent Radiation Monitor Low range Noble Gas Calibration SC-133-115
Turbine Building Vent Radiation Monitor Accident Channel Calibration SC-133-116
Reactor Building Vent Radiation Monitor Low Range Noble Gas Calibration SC-134-107
Reactor Building Vent Radiation Monitor Accident Channel Calibration SC-134-108
Reactor Building Vent Radiation Monitor Low Range Noble Gas Calibration SC-234-107
Reactor Building Vent Radiation Monitor Accident Channel Calibration SC-234-108
SBGT Vent Radiation Monitor Low Range Noble Gas Calibration SC-070-007
Turbine Building Vent Radiation Monitor Low range Noble Gas Calibration SC-233-115
Turbine Building Vent Radiation Monitor Accident Channel Calibration SC-233-116

Gaseous Effluents Permits
U-1 Reactor Building Iodine and Particulate Activity, 8/9/16
U-2 Turbine Building Iodine and Particulate Activity, 8/7/16
U-1 Turbine Building Vent Tritium and Noble Gas Activity, 8/11/16
U-1 Turbine Building Vent Tritium and Noble Gas Activity, 8/25/16
U-2 Reactor Building Vent Tritium and Noble Gas Grab Sample, 7/5/16

Liquid Effluent Permits
Tank ABST, 8/8/16
Tank CDST, 8/7/16
Tank EFST, 8/6/16
Tank EDST, 8/4/16
Tank LDST, 8/8/16

Quality Assurance
Eckert & Ziegler Radiochemistry Cross-Check Program Reports 1st Quarter 2015 thru 2nd Quarter 2016
Nuclear Oversight Audit AR-2015-01378, Chemistry and Effluents Audit Report

HEPA/DOP Testing
SGTS HEPA Filter and Charcoal Adsordber Inplace Leak Tests SE-070-A09 & SE-070-B09
Reactor Building HEPA and Charcoal Filter Efficiency Tests SM-134-Z1B & SM-134-Z3B
"A" CREOASS HEPA Filter and Charcoal Adsorber In-Place Leak Test SE-030-A09
"B" CREOASS Filter Testing SE-030-B09
CS Radiochemistry Lab HEPA and Charcoal Filter Efficiency Tests SE-030-140 & SE-030-137
CS Sample Room HEPA and Charcoal Filter Efficiency Test SE-030-134
CS Decon Area HEPA and Charcoal Filter Efficiency Test SE-030-143
Turbine Building HEPA and Charcoal Filter Efficiency Tests SE-133-B01 & SE-233-A01

Miscellaneous
2014 and 2015 SSES Radioactive Effluent Release Reports
SSES Offsite Dose Calculation Manual

Section 4OA1: Performance Indicator Verification

Condition Reports (*NRC identified)

CR-2015-09719	CR-2015-20925	CR-2015-21022	CR-2016-04213
CR-2016-06600	CR-2016-07101	CR-2016-07103	CR-2016-07658
CR-2016-08222	CR-2016-08366	CR-2016-08376	CR-2016-09174
CR-2016-09931	CR-2016-10205	CR-2016-12700	CR-2016-12702
CR-2016-15545	CR-2016-15550*	CR-2016-17048	CR-2016-17355
CR-2016-20325			

Action Requests

AR-2015-14484	AR-2015-32005	AR-2015-33538	AR-2015-33617
AR-2015-33630	AR-2016-06412	AR-2016-06416	AR-2016-08925
AR-2016-09734	AR-2016-10568	AR-2016-11621	AR-2016-09400
AR-2016-11621	AR-2016-16478	AR-2016-13037	AR-2016-13055
AR-2016-13169	AR-2016-14273		

Maintenance Orders/Work Orders
1891390

Miscellaneous
DI-2014-34899
DI-2014-34904
DI-2015-00441
DI-2015-30636
DI-2015-30641
DI-2016-00540

EC-RISK-1165, MSPI Basis Document JUL12R1 Model Data Input, Revision 0
SSES-PSA-006, Susquehanna Human Reliability Analysis Notebook, Revision 1
MSPI Derivation Report, SES Unit 1, MSPI High Pressure Injection System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI High Pressure Injection System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI High Pressure Injection System, Performance Limit Exceeded, July 2016
MSPI Derivation Report, SES Unit 2, MSPI High Pressure Injection System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 2, MSPI High Pressure Injection System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Heat Removal System, Performance Limit Exceeded, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Heat Removal System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Heat Removal System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Heat Removal System, Performance Limit Exceeded, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Heat Removal System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Heat Removal System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Emergency AC Power System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Emergency AC Power System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 1, MSPI Emergency AC Power System, Performance Limit Exceeded, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Emergency AC Power System, Unavailability Index, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Emergency AC Power System, Unreliability Index, July 2016
MSPI Derivation Report, SES Unit 2, MSPI Emergency AC Power System, Performance Limit Exceeded, July 2016
NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7

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

Condition Reports (*NRC identified)

CR-2015-11377	CR-2015-30746	CR-2015-32106	CR-2015-32443
CR-2015-32449	CR-2016-04402	CR-2016-05709	CR-2016-06398
CR-2016-06600	CR-2016-08365	CR-2016-08366	CR-2016-08376
CR-2016-10669	CR-2016-09931	CR-2016-10055	CR-2016-10944
CR-2016-15584			

Section 4OA5: Other Activities

Procedures
HP-TP-205, Dosimeter Handling and Control, Revision 19
ME-ORF-023, Dry Fuel Storage – 61BT(H) Dry Shielded Canister, Revision 35
ME-ORF-179, Dry Fuel Storage Equipment List and Reference Information, Revision 16
MSLT-DSC-AREVA, Helium Mass Spectrometer Leak Test Procedure, Revision 0
NDE-PT-001, Color Contrast Liquid Penetrant Examination, Revision 05
NDE-PT-003, Color Contrast Liquid Penetrant Examination, High Temperature, Revision 02
RE-081-043, Selection and Monitoring of Fuel for Dry Storage, Revision 9
SPM 5.6.2, RK1 Eagle Model 101-TRB Hydrogen Monitor Operation Procedure, Revision 2
SPM 9.2, NUHOMS 61BTH Type 1 or Type 2 DSC Closure Procedure, Revision 1

Condition Reports (*NRC identified)

CR-2015-22473	CR-2015-26753	CR-2015-23109	CR-2015-23159
CR-2016-19647	CR-2016-19901	CR-2016-20175	CR-2016-20175

Design and Licensing Basis Documents
72.48 Screens, October 1, 2014 – August 2, 2016
50.59 SD 01271 Addition of 61BTH DSC for use at SSES
50.59 AD 02706 SSES Weld Remediation Procedure
50.59 AD 02651 Dry Fuel Storage Horizontal Storage Modules (HSMs) Installation (Phase 9) at SSES ISFSI
72.48 SD 00091 Dry Fuel Storage Horizontal Storage Modules (HSMs) Installation (Phase 9) at SSES ISFSI
72.48 SD 00093 SSES Weld Remediation of DFS Canister
Certificate of Compliance (CoC) 72-1004, Certificate No. 1004, Revision 10
Technical Bulletin 2014-001, Hairline Cracking on NUHOMS HSM-H Outlet Vent Covers
Technical Bulletin 2015-001, Corrosion of Cross Members on HSM Door Lift Beam
Technical Bulletin 2016-001, Siphon and Vent Block in NUHOMS Dry Shielded Canisters
Technical Bulletin 2014-002, Nine Mile Point Fabrication Weld Indications
Updated Final Safety Analysis Report (UFSAR) for the Standardized NUHOMS Horizontal Modular Storage System for Irradiated Nuclear Fuel

Completed Surveillance and Functional Testing
2012 ISFSI Structural Monitoring Inspection T2000 (ERPM 1286228)
AREVA Dry Fuel Storage Crew Qualification Matrix
G0014-01, Inspect 1H213 Crane for Proper Operation, June 2016
M8672-01, 0S292 Dry Fuel Storage Transfer Cask Lifting Yoke (DFS) July 2016
M1040-01, Perform Inspection Reactor Building Crane 1H213, June 2016
MT-GM-014, Attachment C, Annual Wire Rope Sling Inspection Checklist, August 2016, Revision 21
MT-GM-014, Attachment D, Annual Synthetic Round Sling Inspection Checklist, August 2016, Revision 21
MT-GM-014, Attachment I, Synthetic Sling Inspection Data Sheet, August 2016, Revision 21
NDAP-QA-0019-4, Attachment K, Supplemental Personnel Training Equivalency Determinations, Revision 1
Fuel Management Audit, Nuclear Oversight Internal Audit Report 1689860
RIR Nos. 21797, 248448, 248449, 248450, 248451, 248452, 248453, Dry Shielded Canister and Associated Assembly receipt inspections
SO-100-007, Daily Surveillance Operating Logs, selected 2015 and 2016 days, Revision 74
Selected survey meter instrument calibration records

Miscellaneous

DI-2016-03677, Develop implementation strategy for the DFS Aging Management Plan (AMP) LR No. 721004-1388, Revision 0

2016 Dry Fuel Storage (DFS) Campaign, Preparation, Support and Commitment to a Successful DFS Campaign

Various completed Form 314s, Area Survey Map

ALARA Pre-Job Review, RWP Number 2016-0200 Dry Fuel Storage Activities

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CAP	corrective action program
CFR	Code of Federal Regulations
CR	condition report
DDFP	diesel-driven fire pump
DP	differential pressure
DSC	dry shielded canister
ESW	emergency service water
HPCI	high-pressure coolant injection
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
LER	licensee event report
MELB	medium energy line break
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	off-site dose calculation manual
OWA	operator workaround
PD	performance deficiency
PMT	post-maintenance test
RCIC	reactor core isolation coolant
RHR	residual heat removal
RHRSW	residual heat removal service water
RMA	risk management action
SOW	system outage window
SSC	structure, system and component
TS	technical specifications
UFSAR	Updated Final Safety Analysis Report
WC	water column
WG	water gauge