Susquehanna 1 – Quarterly Plant Inspection Findings

2Q/2017 – Plant Inspection Findings

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Initiating Events

Significance: G Dec 31, 2016
Identified By: NRC
Item Type: FIN Finding
Auxiliary Bus Load Shed when a Daisy Chained Neutral was Interrupted during Maintenance
A finding of very low safety significance (Green) for failure to develop an adequate work plan for replacement of a voltage potential indicating light on a breaker on the Unit 2 'B' auxiliary bus was self-revealed when the Unit 2 'B' reactor recirculation pump (RRP) tripped, along with other non-safety related loads on November 14, 2016, resulting in a rapid unplanned power change and transition to single loop operation. Specifically, operations and maintenance personnel did not recognize that disconnecting the neutral wires from the light socket would interrupt power to all of the degraded voltage relays for the auxiliary bus. Therefore, the relays de-energized when the maintenance was performed, tripping all the breakers on the bus. Susquehanna's immediate corrective actions included stabilizing the plant, entering single loop operations, and entering the issue into their corrective action program (CAP). Additionally, Susquehanna performed a maintenance department stand down to communicate immediate lessons learned from the event while a more thorough causal analysis was conducted. The performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, implementation of work instructions resulted in the trip of the Unit 2 'B' RRP, 'B' and 'D' circulating water (CW) pumps, 'B' and 'D' condensate pumps, and the 'B' service water (SW) pump, which caused an automatic trip of the 'C' reactor feed pump and runback of the 'A' RRP, resulting in a rapid power reduction to 32 percent rated thermal power (RTP). The inspectors evaluated the finding in accordance with IMC 0609, Appendix A "The SDP for Findings At-Power," dated June 19, 2012, Exhibit 1 for the Initiating Events cornerstone and determined the finding was of very low safety significance (Green) because it did not cause a reactor trip. This finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Management because Susquehanna did not implement a process of planning work activities such that nuclear safety is the overriding priority, including the identification and management of risk commensurate with the work. Specifically, Susquehanna

did not recognize the risk of interrupting a daisy chained neutral when planning a minor maintenance work order and did not recognize the impact of the work activity in the field.
Inspection Report# : 2016004 *(pdf)*

Significance: G Jul 22, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Promptly Identify and Correct a Condition Adverse to Quality on Vital 480 VAC MCCs (4OA2.1.c (4))
The inspectors documented a self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to identify and correct a condition adverse to quality. Specifically, in October and December 2006 and July 2009, Susquehanna did not identify a non-conforming condition with the design and performance requirements of several 480 volt motor control center (MCC) breaker assemblies during receipt inspections. These non-conforming breaker assemblies were installed in vital 480 VAC applications and subsequently led to a phase to ground short and loss of a 480 volt safety-related motor control center on May 12, 2016. Susquehanna entered this issue into their CAP, conducted an apparent cause evaluation, replaced the damaged breaker assembly, and is conducting an extent of cause review for other susceptible breaker assemblies. The finding was more than minor because it was associated with the Design Control attribute of the Initiating Events cornerstone and adversely affected the associated cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, on May 12, 2016, an electrical transient on vital AC bus 2B246 occurred as a result of a phase to ground fault in breaker cubicle 2B24609, which resulted in a loss of bus 2B246 and associated safety related loads. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not cause both a reactor trip and loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding did not have a cross-cutting aspect because the performance deficiency was a historical issue with the actions taken in 2005, 2006, and 2009, and is not indicative of current licensee performance.
Inspection Report# : 2016008 *(pdf)*

Mitigating Systems

Significance: G Dec 31, 2016
Identified By: Self-Revealing
Item Type: FIN Finding
Failure Rates Exceed (20%) Twenty Percent for Biennial Requalification Exam
A self-revealing finding was identified associated with inadequate licensed operator performance during the annual licensed operator requalification operating test and biennial written examination. Specifically, 17 of 71 operators (23.9%) failed at least one portion of the requalification examinations. This finding is more than minor because it is associated with the Mitigating Systems cornerstone attribute of human performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, 17 of 71 licensed operators failed to demonstrate a satisfactory understanding of the required knowledge and abilities required to safely operate the facility under normal, abnormal, and emergency conditions. The inspectors evaluated this performance deficiency using IMC 0609, "SDP", Appendix I, "Licensed Operator Requalification SDP." This finding is of very low safety significance (Green) because the finding is related to requalification exam results, did not result in a failure rate of greater than 40 percent and all 17 operators were remediated and successfully retested prior to returning to licensed duties. This finding has a cross-cutting aspect in the area of Human Performance, Training, because Susquehanna did not provide adequate operator requalification training

to maintain a knowledgeable, technically competent workforce.
Inspection Report# : 2016004 *(pdf)*

Significance: G Dec 31, 2016
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Promptly Correct a Condition Adverse to Quality with LPCI Swing Bus Automatic Transfer Switches
A finding of very low safety significance (Green) and associated NCV of Title 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed when Susquehanna failed to assure that conditions adverse to quality were promptly identified and corrected on two separate occasions. Both examples resulted in the failures of safety-related automatic transfer switches (ATSs) associated with the low pressure coolant injection (LPCI) swing buses. Corrective actions included enhancing the work instructions for all applicable ATSs based off original equipment manufacturer (OEM) input and scheduling the enhanced work instructions to be performed on the four swing bus ATSs during their next scheduled bus outages. Inspectors determined that the finding was more than minor because it was associated with the Equipment Performance attribute of the Reactor Safety - Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). In both examples, the failure to correct conditions adverse to quality resulted in the loss of power to the LPCI swing bus and inoperability of the respective division of LPCI. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, inspectors and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, inspectors determined that the finding was of very low safety significance (Green). Specifically, though a single train was inoperable for greater than its technical specification (TS) allowed outage time, in consultation with regional senior reactor analysts, inspectors determined it did not represent an actual loss of function. The finding is related to the cross-cutting area of Problem Identification and Resolution, Evaluation, because Susquehanna did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, Susquehanna either failed to evaluate deficiencies encountered during maintenance or failed to ensure that corrective actions aligned with and corrected the identified causes.
Inspection Report# : 2016004 *(pdf)*

Significance: G Oct 21, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Specify and Maintain Safety-Related Quality Standards and Materials Essential for Reactor Core Isolation Cooling
The team identified a Green non-cited violation of Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix B, Criterion III, "Design Control," for the failure to classify and maintain reactor core isolation cooling (RCIC) system components as safety-related as specified by Updated Final Safety Analysis Report Table 3.2-1 and Section 7.1.1. Specifically, although Talen, the operator of Susquehanna Steam Electric Station, classified the RCIC system as safety-related, this classification did not extend to the Unit 1 and Unit 2 RCIC barometric condenser relief valves. The team determined failure of the non-safety related barometric condenser relief valves could result in a loss of RCIC lube oil cooling and failure of RCIC to perform its design basis safety function. Talen entered the issue into the corrective action program as condition report 2016-23615 and performed an immediate operability determination, which concluded RCIC remained operable. The finding was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated this finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2 - Mitigating System Screening Questions. The team determined the finding screened as very low safety significance (Green),

because the finding was a design deficiency which did not result in an actual loss of functionality of the RCIC system. This finding was not assigned a cross-cutting aspect because the performance deficiency occurred during original plant design and did not reflect current licensee performance.
Inspection Report# : 2016007 *(pdf)*

Significance: G Sep 30, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Risk Management Actions Not Adequately Implemented
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]
Inspection Report# : 2016003 *(pdf)*

Significance: G Jul 22, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Write a Condition Report for Degraded Conditions Which Challenged Operability of Safety Related Equipment (4OA2.1.c(1))
The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Susquehanna failing to identify and correct conditions adverse to quality in a timely manner. Specifically, between April 16, 2016 and April 22, 2016, condition reports for potential or suspected degraded or non-conforming conditions related to the High Pressure Coolant Injection System (HPCI) and Reactor Core Isolation Cooling System (RCIC) were not written and operability determinations performed. In both cases, the equipment was subsequently declared inoperable due to the conditions. The issues were entered into the CAP and the equipment was taken out of service, repaired, and retested satisfactorily. The inspectors determined that there were two examples of the same performance deficiency and violation. In accordance with NRC Enforcement Manual Section 1.3.4, "Documenting Multiple Examples of a Violation," multiple examples of a single violation are allowed to be documented as a single violation bounded by the characterization of the most significant example. The RCIC example is considered the most significant

due to the longer exposure time in a required mode and number of mode changes that occurred during the exposure period. The finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the associated cornerstone objective to ensuring the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to identify and correct degraded conditions associated with a RCIC system lube oil leak which rendered that system inoperable. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated June 19, 2012, the inspectors determined that this finding screened to Green because the safety function was not lost, and the finding did not represent an actual loss of function of at least a single train for greater than its Tech Spec Allowed Outage Time or two separate safety systems out-of-service for greater than its Tech Spec Allowed Outage Time. This finding had a cross-cutting aspect in the area of Human Performance, Teamwork, because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, in both examples, individuals were aware of potential degraded conditions but actions were not taken to communicate the activity to other groups, such as the control room operators, to allow for the issues to be evaluated for operability and determine if proposed actions were timely and/or appropriate. [H.4]
Inspection Report# : 2016008 *(pdf)*

Significance: G Jul 22, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Implement and Maintain Quality Procedure Results in Control Room Chiller Inoperability (4OA2.1.c (2))
The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to implement and maintain a quality procedure, MT-GE-021, "Chiller Maintenance and Inspection." This resulted in the safety related 0K112A chiller being operated outside of its design specifications and being declared inoperable. Specifically, on January 9, 2014, a system engineer directed the maintenance personnel to overcharge 0K112A with R-114a refrigerant, which led to higher power consumption by the chiller's compressor motor, and the failure of the next biennial surveillance test on December 10, 2015 due to excessive compressor motor current. Susquehanna entered the issue into the CAP, conducted testing to establish the proper refrigerant charge, removed the excess refrigerant, and revised the procedure. The finding was determined to be more than minor because it was associated with the Mitigating System cornerstone attribute of Equipment Performance and adversely affected the associated cornerstone objective to ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The refrigerant overcharge condition resulted in the 0K112A chiller being inoperable and unable to fulfil its safety function to cool safety related switchgear and equipment during accident conditions for a period of 23 months. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined a detailed risk evaluation would be required because the finding involved an actual loss of function of at least a single Train for greater than its Technical Specification allowed outage time of 30 days. A detailed risk assessment was performed by a Region 1 Senior Reactor Analyst (SRA). The SRA determined the finding to be of very low safety significance (Green.) This finding had a cross-cutting aspect in the area of Human Performance, Procedure Adherence because individuals did not follow processes, procedures, and work instructions. Specifically, for many years maintenance and engineering personnel relied upon informal work practices vice referring to the procedure when charging the chillers with refrigerant. [H.8]
Inspection Report# : 2016008 *(pdf)*

Barrier Integrity

Significance: G Mar 31, 2017
Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation
Human Performance Error Results in Loss of Secondary Containment Safety Function
A self-revealing finding of very low safety significance (Green) and associated NCV of TS 5.4.1, "Procedures," was identified for failure to implement procedures that resulted in a secondary containment fan trip and associated loss of safety function. Susquehanna's immediate corrective actions included restoring the secondary containment system to an operable configuration, and entering the issue into their corrective action program (CAP). Inspectors determined that the finding was more than minor because it was associated with the Human Performance attribute (Routine OPS/Maintenance Performance) of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers (Secondary Containment) protect the public from radionuclide releases caused by accidents or events. The failure to adequately implement procedures for operation and maintenance of the secondary containment resulted in the inoperability of Zone 3 secondary containment and an associated loss of safety function. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated October 7, 2016, and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green) because the performance deficiency only impacted the radiological barrier function of secondary containment. This finding had a cross-cutting aspect in the area of Human Performance, Teamwork because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, personnel did not conduct a re-brief of the team after the plan deviated from what was originally briefed, and the team did not adequately respond to challenges from workers in the field about whether it was appropriate to commence load center restoration with work still in progress.
Inspection Report# : 2017001 *(pdf)*

Emergency Preparedness
Occupational Radiation Safety
Public Radiation Safety
Security

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

Miscellaneous

Current data as of : August 03, 2017

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