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Cooper – Quarterly Plant Inspection Findings

2Q/2017 – Plant Inspection Findings

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Initiating Events

Significance: G Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Loss of Shutdown Cooling due to Relay Maintenance

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a, for the licensee's failure to implement Maintenance Procedure 7.3.16, "Low Voltage Relay Removal and Installation," Revision 22, for relay replacement work. Specifically, on October 28, 2016, the licensee failed to evaluate the potential impact of primary containment isolation system relay PCIS-REL-K27 work on shutdown cooling relay PCIS-REL-K30, which was mounted next to K27 and shared a common mounting rail. As a result, the licensee did not identify the potential of losing residual heat removal shutdown cooling, and while installing the K27 relay and snapping it into the mounting rail, workers caused a momentary actuation of relay K30 and a loss of residual heat removal shutdown cooling. Corrective actions to restore compliance included restoration of shutdown cooling, completion of the K27 relay maintenance with shutdown cooling out of service, and an outage risk management procedure change that prohibited work on or near shutdown cooling relays while the system was required to be in service. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-07645.

The licensee's failure to implement Maintenance Procedure 7.3.16, in violation of Technical Specification 5.4.1.a, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Initiating Events Cornerstone and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. Using Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Process Phase 1 Initial Screening and Characterization of Findings," dated May 9, 2014, the inspectors determined that the finding did not require a quantitative assessment because the event occurred when the refuel canal/cavity was flooded. Therefore, the finding screened as very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance associated with work management, because the licensee

failed to implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority, including the need for coordination with different work groups or job activities. Specifically, the licensee failed to control, execute, and coordinate safety-related primary containment isolation system relay work activities to ensure residual heat removal shutdown cooling was not adversely impacted.

Inspection Report# : 2017001 (*pdf*)

Significance:  Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain Main Steam System Operating Procedure

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to maintain Station Procedure 2.2.56, "Main Steam System," Revision 49, to prevent a main steam line high flow Group 1 primary containment isolation signal when opening an inboard main steam isolation valve. Specifically, the licensee failed to maintain Station Procedure 2.2.56 with adequate differential pressure limits for reopening closed main steam isolation valves during plant shutdown, which caused the unexpected closure of all the open main steam isolation and drain valves during the plant cooldown process. This resulted in a loss of the main steam line decay heat removal path, which caused reactor coolant system pressure and temperature to increase by approximately 13 psig and 3 degrees Fahrenheit, respectively, during the event. The immediate corrective actions were to reset the Group 1 isolation signal and open the main steam line drain valves to recommence plant cooldown. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-05835, and the licensee initiated an apparent cause evaluation to investigate this condition.

The licensee's failure to maintain Station Procedure 2.2.56 to prevent a main steam line high flow Group 1 isolation signal when opening an inboard main steam isolation valve, in violation of Technical Specification 5.4.1.a, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Specifically, the Group 1 isolation signal closed the main steam line drain valves, which resulted in a loss of the main steam line decay heat removal path and caused reactor coolant system pressure and temperature to increase. The inspectors determined Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," dated May 9, 2014, was not applicable because plant temperature and pressure were not within the normal residual heat removal/decay heat removal system operating parameters. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding screened as having very low safety significance (Green) because it did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. A cross-cutting aspect was not assigned to this finding because the performance deficiency occurred in 1988 when the licensee changed the procedural limits for differential pressure across the main steam isolation valves when reopening them, and therefore, was not indicative of current licensee performance.

Inspection Report# : 2016004 (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Maintain Alternate Shutdown Emergency Procedure

The inspectors identified a non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to maintain

Emergency Procedure 5.1ASD, "Alternate Shutdown," Revision 17, for establishing reactor equipment cooling system flow to the high pressure coolant injection system fan coil unit. Specifically, the licensee failed to maintain Emergency Procedure 5.1ASD with adequate instructions to place the reactor equipment cooling system north or south critical loop in service and verify reactor equipment system flow to the high pressure cooling injection system fan coil unit during some control room evacuation scenarios. The immediate corrective actions were to assess operability of the high pressure coolant injection system during control room evacuations that are not related to fire scenarios, and to revise Emergency Procedure 5.1ASD with instructions to open the critical loop supply valves (REC-MOV-711 or REC-MOV-714) in the control room or locally, and verify reactor equipment system flow to the high pressure coolant injection fan coil unit. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2017-01403.

The licensee's failure to maintain Emergency Procedure 5.1ASD to establish reactor equipment cooling system flow to the high pressure coolant injection fan coil unit during some control room evacuation scenarios, in violation of Technical Specification 5.4.1.a, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Specifically, the licensee did not provide instructions to establish reactor equipment cooling system flow to the high pressure coolant injection system fan coil unit, which would have complicated operator response during a control room evacuation. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant nontechnical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with identification. Specifically, the licensee failed to implement a corrective action program with a low threshold for identifying issues during the required annual review of emergency procedures.

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Identify a Condition Adverse to Quality Associated with the 250 Vdc Electrical System

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to identify a condition adverse to quality associated with Station Procedure 2.2.24.1, "250 Vdc Electrical System (Div 1)," Revision 14, in accordance with Station Procedure 0-CNS-LI-102, "Corrective Action Process," Revision 6. Specifically, the licensee failed to identify that Station Procedure 2.2.24.1 contained inadequate instructions to ensure the oncoming charger 1C output voltage was matched with the bus 1A voltage when transferring bus 1A from charger 1A to charger 1C, so that technical specification bus voltage requirements would remain met. This resulted in an unexpected and initially unrecognized decline in voltage on the bus to below the required minimum of 260.4 Vdc. This condition required the licensee to declare the Division 1 250 Vdc electrical system and Division 1 residual heat removal low pressure coolant injection system inoperable. The immediate corrective action was to adjust the charger 1C float voltage greater than 260.4 Vdc to restore operability of the Division 1 250 Vdc electrical and residual heat removal low pressure coolant injection systems. The licensee entered this deficiency into the corrective action program as Condition Reports CR-CNS-2016-08658 and CR-CNS-2017-00750.

The licensee's failure to identify a condition adverse to quality associated with Station Procedure 2.2.24.1, to ensure technical specification bus voltage requirements were met, in violation of Station Procedure 0-CNS-LI-102, was a

performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Specifically, charger 1C, when in service, did not maintain battery 1A terminal voltage within the requirements of Surveillance Requirement 3.8.4.1, which required the licensee to declare the Division 1 250 Vdc electrical system and the Division 1 residual heat removal low pressure coolant injection system inoperable. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant, nontechnical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with evaluation. Specifically, the licensee failed to thoroughly evaluate the charger 1C float voltage issue to ensure that the resolution addressed the cause and extent of condition commensurate with the safety significance.

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Identify a Condition Adverse to Quality

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to identify a condition adverse to quality for Division 1 residual heat removal service water booster pump A, in accordance with Station Procedure 0-CNS-LI-102, "Corrective Action Process," Revision 6. Specifically, on January 5, 2017, the inspectors identified an oil level lower than normally expected, oil on the pump skid, and an oil droplet formed on the Division 1 residual heat removal service water booster pump A inboard bearing sight glass. The inspectors informed the control room of this condition, and the licensee determined the oil leakage from the pump's sight glass would have prevented the pump from operating for the required 30 days during a design basis accident. The immediate corrective action was to repair the Division 1 residual heat removal service water booster pump A inboard bearing sight glass, restoring operability of the pump. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2017-00054.

The licensee's failure to identify a condition adverse to quality for Division 1 residual heat removal service water booster pump A, in violation of Station Procedure 0-CNS-LI-102, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Specifically, the oil leakage from the service water booster pump A inboard bearing sight glass would have prevented the pump from operating for its required 30-day mission time during a design basis accident and resulted in the pump being declared inoperable. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant nontechnical specification train. The finding had a cross-cutting aspect in the area of human performance associated with challenge the unknown because the licensee failed to stop when faced with uncertain conditions and failed to ensure that risks are evaluated and managed before proceeding. Specifically, the licensee did not maintain a questioning attitude during job-site reviews to identify and resolve unexpected conditions, including lower than the expected oil level in the service water

booster pump A inboard bearing sight glass, oil on the pump skid, and an oil droplet formed on the bottom of the sight glass.

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 31, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Address Nonconforming Pipe Thinning in Accordance with the ASME Code

The inspectors identified a non-cited violation of 10 CFR 50.55a(g)(4) for the licensee's failure to use an approved method to disposition an American Society of Mechanical Engineers Code nonconforming condition in the residual heat removal service water system. Specifically, the licensee identified multiple locations with localized pipe thinning below the American Society of Mechanical Engineers Code B31.1 design minimum pipe-wall thickness during an ultrasonic examination but failed to use an approved method to calculate a new acceptable pipe-wall thickness. As a corrective action to restore compliance, the licensee replaced this section of piping on November 1, 2016, during Refueling Outage 29. The licensee entered this issue into the corrective action program as Condition Reports CR-CNS-2016-05558 and CR-CNS-2016-05963.

The licensee's failure to use an approved method to calculate a new minimum allowable pipe-wall thickness, in violation of 10 CFR 50.55a(g)(4), was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating System 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. Specifically, calculating an allowable minimum pipe-wall thickness value that is below the American Society of Mechanical Engineers code design minimum value reduces the piping's structural integrity, potentially leading to the failure of the piping. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined the finding screened as having very low safety significance (Green) because it: was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant nontechnical specification train. This finding had a cross-cutting aspect in the area of human performance associated with design margins because the licensee failed to operate and maintain the residual heat removal service water system within the American Society of Mechanical Engineers code minimum pipe-wall thickness. Specifically, having identified that the affected pipe location was below the allowable pipe-wall thickness, the licensee opted to calculate and accept a new minimum pipe-wall thickness value that was not consistent with code requirements instead of repairing the affected piping at the time of discovery.

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Install Correct Mechanical Stop and Verify Proper Operation

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 3.0.4 for the licensee's failure to install the correct reactor core isolation cooling pressure control valve, RCIC-AOV-PCV23, mechanical stop and verify proper operation of the system prior to entering a mode of applicability for Technical Specification 3.5.3. This condition resulted in RCIC-AOV-PCV23 going fully open during surveillance testing following Refueling Outage 29, causing a pressure transient. This transient caused a failure of the reactor core isolation cooling turbine lube oil cooler gasket, lifting of a pressure relief valve, and a water leak. The licensee immediately shut down the reactor core isolation cooling system and declared it inoperable. The immediate corrective actions were to restore RCIC-AOV-PCV23 from the closed mechanical stop to the required open mechanical stop and to replace the turbine lube oil cooler gasket to

restore operability of the system. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-08122 and initiated a root cause evaluation to investigate this condition.

The licensee's failure to install the correct reactor core isolation cooling pressure control valve, RCIC-AOV-PCV23, mechanical stop and verify proper operation of the system prior to entering a mode of applicability for Technical Specification 3.5.3, in violation of Technical Specification 3.0.4, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. Specifically, the licensee installed RCIC-AOV-PCV23 with the incorrect mechanical stop, and proper valve operation was not verified after installation during Refueling Outage 29, which caused the reactor core isolation cooling system to lose function during surveillance testing. This transient caused a failure of the reactor core isolation cooling turbine lube oil cooler gasket and an associated water leak. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding required a detailed risk evaluation because it represented a loss of system and/or function. In the detailed risk evaluation, the analyst assumed the reactor core isolation cooling system was unavailable for 50 hours. The analyst used the Test/Limited Use Version COOPER-DEESE-HCI03 of the Cooper SPAR model run on SAPHIRE, Version 8.1.5. The analyst updated the initiating event frequencies for transients, losses of condenser heat sink, losses of main feed water, grid related losses of offsite power, and switchyard centered losses of offsite power to the more recent values from the 2014 update to the industry data found in INL/EXT-14-31428, "Initiating Event Rates at U.S. Nuclear Power Plants, 1998-2013," Revision 1. From this, the finding was determined to have an increase in core damage frequency of 8.4E-8/year and to be of very low safety significance (Green). Transients, losses of condenser heat sink, and losses of main feed water were the dominant core damage sequences. The automatic depressurization system and the reactor protection system remained to mitigate these sequences. The finding had a cross-cutting aspect in the area of human performance associated with documentation because the licensee failed to create and maintain complete, accurate, and up-to-date documentation associated with RCIC-AOV-PCV23 design drawings and the maintenance procedure for setting and testing the mechanical stop.

Inspection Report# : 2017001 (*pdf*)

Significance:  Mar 17, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Exceeding the Technical Specification Allowed Out of Service Time of the Division I RHR System

The team reviewed a self-revealed, non-cited violation of Technical Specification 3.5.1, "Emergency Core Cooling Systems - Operating," for the licensee's failure to restore the Division I residual heat removal system (RHR) during clearance restoration, which resulted in exceeding the applicable technical specification action completion time. Specifically, from October 7, 2016, to February 5, 2017, the licensee failed to restore Division I RHR minimum flow isolation valves for RHR pumps A and C to the open position prior to reinstalling the valve sealing devices following maintenance performed during Refueling Outage 29. The licensee's immediate corrective action was to restore the Division I RHR subsystem to operable status by sealing open the minimum flow isolation valves for RHR pumps A and C. The licensee entered this issue into their corrective action program as Condition Report CR-CNS-2017-00553.

The licensee's failure to properly restore the Division I RHR system during clearance restoration resulted in exceeding the applicable technical specification action completion time, in violation of Technical Specification 3.5.1, which was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to follow technical specification requirements to ensure the

availability, reliability, and capability of the Division I RHR subsystem directly affected the cornerstone objective. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding required a detailed risk evaluation because it involved an actual loss of function of at least a single train for greater than its technical specification allowed outage time. A detailed risk evaluation (Attachment 2) calculated an increase in core damage frequency of 4.7E-7 for the 89 days, 12 hours, and 49 minutes exposure period. Therefore, this violation was of very low safety significance (Green). The team determined the finding had a cross-cutting aspect within the human performance area, challenge the unknown, because individuals failed to perform adequate job-site reviews to identify and resolve unexpected conditions. Specifically, operations personnel restoring the Division I RHR subsystem did not ensure that the minimum flow isolation valves were repositioned to the correct position of sealed open.

Inspection Report# : 2017009 (*pdf*)

Significance:  Mar 17, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Implement an Adequate Procedure for Equipment Control

The team reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to maintain Station Procedure 2.0.2, "Conduct of Operations Procedure, Operator Logs and Reports," Revision 106, for conducting sealed valve audits. Specifically, this procedure only checked that the seals were installed, and did not check that the valves were in the correct position. This resulted in an extended period of time that the Division I residual heat removal (RHR) system was unknowingly inoperable. The licensee's immediate corrective action was to revise Station Procedure 2.0.2 to include directions to check the position of sealed valves in addition to checking that the valve sealing devices were installed. The licensee entered this issue into their corrective action program as Condition Report CR-CNS-2017-00553.

Failure to maintain Station Procedure 2.0.2 for conducting sealed valve audits, in violation of Technical Specification 5.4.1.a, was a performance deficiency. This performance deficiency is more than minor, and therefore a finding, because it affected the configuration control attribute of the Mitigating Systems Cornerstone and adversely impacted the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correctly identify and correct out of position Division I RHR minimum flow isolation valves resulted in unnecessarily and unknowingly extending the inoperability time of the Division I RHR subsystem by 39-45 days. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that the violation required a detailed risk evaluation because the finding represented a loss of safety function for greater than its technical specification allowed outage time. A senior reactor analyst performed the risk evaluation and determined that the violation was of very low safety significance (Green). The team determined the finding had a cross-cutting aspect within the human performance area, resources, because leaders did not ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety. Specifically, the licensee had approved Station Procedure 2.0.2, "Conduct of Operations Procedure, Operator Logs and Reports," Revision 106, for conducting sealed valve audits without including the fundamental direction to ensure that the sealed valves were in the correct position.

Inspection Report# : 2017009 (*pdf*)

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Maintain Design Control for Reactor Equipment Cooling Pump B

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the

licensee's failure to correctly translate the design basis into maintenance instructions for reactor equipment cooling pump B. Specifically, on August 7, 2016, during corrective maintenance following a pump trip, the licensee developed work instructions that installed incorrectly sized thermal overload relay heaters, introducing a condition that was nonconforming with the design basis. Immediate corrective actions included replacing the incorrectly sized heaters, performing a failure modes analysis to determine the actual cause of the pump trip, and replacing the thermal overload relay. The issue was entered into the licensee's corrective action program as Condition Report CR-CNS-2016-04649.

The licensee's failure to correctly translate the design basis into work instructions for thermal overload relay heaters associated with reactor equipment cooling pump B was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the design control attribute of the 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. Specifically, the performance deficiency resulted in a challenge to operability, a 2-day extension of pump out of service time, and an initial failure to pursue identification of the actual cause of the August 6, 2016, pump trip. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because: it was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant non-technical specification train. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with evaluation. Specifically, the licensee failed to thoroughly evaluate the reactor equipment cooling pump issues to ensure that the resolution addressed the cause and extent of condition commensurate with the safety significance.

Inspection Report# : 2016003 (*pdf*)

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Maintain Low Pressure Injection/Spray Operable From Internal Flooding Hazards

The inspectors identified a non-cited violation of Technical Specification 3.5.1, "Emergency Core Cooling Systems and Reactor Core Isolation Cooling System," for the licensee's failure to evaluate and implement adequate internal flooding protection compensatory measures to maintain low pressure coolant injection/spray systems operable. Specifically, from July 11, 2016, to July 15, 2016, the licensee placed the torus area and reactor building floor drain valve switches in the open position, defeating the automatic flood protection function credited in the licensee's internal flooding analysis, and failed to implement adequate compensatory measures. These barriers were credited to protect the Division I core spray and Division I residual heat removal systems from flooding caused by a high-energy line break from the 18-inch feedwater line contained in the steam tunnel. This resulted in inoperability of both systems for a period greater than allowed by the plant's technical specifications. Immediate corrective actions included repairing the fire detection equipment that prompted the configuration; restoring torus and reactor building floor drain automatic flood protection functions; and initiating a condition report to evaluate the technical specification impacts. The licensee entered this deficiency into their corrective action program for resolution as Condition Report CR-CNS-2016-06056.

The licensee's failure to maintain emergency core cooling system low pressure injection/spray systems operable for internal flooding hazards, in violation of Technical Specification 3.5.1, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the human performance attribute of the 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. Specifically, without automatic flood barrier protection or an associated compensatory measure, the Division I core spray and Division I residual heat removal systems were inoperable for a high-energy line break from

the 18-inch feedwater line. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding required a detailed risk evaluation because it involved two separate safety systems being out-of-service for greater than their technical specification allowed outage time. A senior reactor analyst performed a detailed risk evaluation for this issue and determined that the finding had very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance associated with documentation because the licensee failed to create and maintain complete, accurate, and up-to-date documentation. Specifically, Station Procedure 2.3_FP-1 contained inappropriate directions to defeat the flood barriers because it did not recognize the credited automatic flood protection function provided by the valves; thus, operations personnel failed to recognize the need for compensatory measures.

Inspection Report# : 2016003 (*pdf*)

Significance:  Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain Service Water Pump Maintenance Procedure

The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to maintain a procedure required by Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically, the licensee failed to maintain Station Procedure 7.2.15, "Service Water Pump Column Maintenance and Bowl Assembly Replacement," Revision 37, in accordance with the documented vendor manual service water pump shaft tolerances. This resulted in an unbalanced condition for service water pump B at running speed and ultimately caused an enclosing tube failure. The failure of the enclosing tube caused a step change in gland water flow, which resulted in the licensee declaring service water pump B inoperable during surveillance testing. The immediate corrective action was to evaluate the cause of the failure and conduct repairs to the pump. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-02342, and initiated an apparent cause evaluation to investigate this condition.

The licensee's failure to maintain Station Procedure 7.2.15 in accordance with documented vendor manual service water pump shaft tolerances, in violation of Technical Specification 5.4.1.a, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone, and adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure of the enclosing tube caused a step change in gland water flow which required the licensee to enter an unplanned limiting condition for operation to conduct repairs. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that the finding had very low significance (Green) because: it was not a design deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and did not result in the loss of a high safety-significant non-technical specification train. A cross-cutting aspect was not assigned to this finding because the performance deficiency occurred in 1997 and, therefore, was not indicative of current licensee performance.

Inspection Report# : 2016003 (*pdf*)

Barrier Integrity

Significance:  Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain Service Water Pump Maintenance Procedure

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 3.6.4.2, "Secondary

Containment Isolation Valves," for the licensee's failure to maintain secondary containment isolation valve HV-AOV-265 operable as a result of erecting scaffolding that interfered with valve operation. Specifically, between June 29, 2016, and September 14, 2016, the licensee erected scaffolding in close proximity of valve HV-AOV-265, such that, during valve stroking, the scaffolding would pinch the actuator air line and prevent the valve from closing, rendering the valve inoperable for approximately 10 weeks. This resulted in the licensee's need to reduce power to approximately 50 percent in order to comply with technical specifications upon discovery. Immediate corrective actions included removal of the scaffolding, replacement of the pinched air line, and restoration of the valve to operable status. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-05608 and initiated a root cause evaluation to investigate this condition.

The licensee's failure to implement Procedure 7.0.7, "Scaffolding Construction and Control," Revision 34, to ensure scaffolding did not adversely affect plant equipment, in violation of Technical Specification 3.6.4.2, was a performance deficiency. The performance deficiency was determined to be more than minor, and therefore a finding, because it was associated with the structure, system, and component and barrier performance attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (secondary containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the improperly erected scaffolding prevented the operation of a secondary containment isolation valve, rendering it inoperable for approximately 10 weeks. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the control room, reactor building, spent fuel pool building, or standby gas treatment system. The finding had a cross-cutting aspect in the area of human performance associated with resources. Specifically, the licensee failed to ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety.

Inspection Report# : 2016004 (*pdf*)

Emergency Preparedness

Significance:  Dec 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure of an Analysis to Demonstrate that Changes Did Not Reduce the Effectiveness of the Emergency Plan

The inspectors identified a non-cited violation of 10 CFR 50.54(q)(3) for the licensee's failure to perform an analysis demonstrating that proposed emergency plan implementing procedure changes did not reduce the effectiveness of the emergency plan. Specifically, the licensee's 50.54(q) evaluation failed to demonstrate that Emergency Plan Implementing Procedure 5.7.1, "Emergency Classification," Revision 54, changes, associated with Emergency Action Level SG2.1 and the fission product barrier matrix, did not result in a reduction in effectiveness. The corrective action was to revise 10 CFR 50.54(q) Evaluation 2016-011 to provide additional information about the ability of emergency coordinators in the Technical Support Center and Emergency Operations Facility to classify using the revised emergency action levels. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-05697.

The licensee's failure to perform an analysis demonstrating that proposed changes to Emergency Plan Implementing Procedure 5.7.1 did not reduce the effectiveness of the emergency plan, in violation of 10 CFR 50.54(q)(3), was a performance deficiency. The finding was more than minor, and therefore a finding, because it was associated with the procedure quality attribute (emergency action level changes) of the Emergency Preparedness Cornerstone and adversely affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to ensure that adequate measures are taken to protect the health and safety of the public is degraded if the licensee

performs inadequate analyses of the effects of changes to the emergency plan. Using Inspection Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Attachment 2, dated September 22, 2015, the inspectors determined that the finding was of very low safety significance (Green) because it was not associated with a risk-significant planning standard function or a planning standard function. This finding had a cross-cutting aspect in the area of human performance, associated with change management, because the licensee failed to use a systematic process for evaluating and implementing changes so that nuclear safety remains the overriding priority. Specifically, the licensee did not have an adequate understanding of the licensing basis for making changes to emergency action levels.

Inspection Report# : 2016004 (*pdf*)

Occupational Radiation Safety

Significance: G Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain Reactor Vessel Assembly Procedure to Ensure Adequate Moisture Separator Shielding

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to ensure sufficient radiological work controls were in place when the reactor pressure vessel moisture separator was installed during vessel reassembly. Specifically, the licensee failed to maintain sufficient detail in Station Procedure 7.4Reassembly, "Reactor Vessel Reassembly," Revision 13, to ensure that the moisture separator had adequate water shielding during lifts, such that radiation fields were appropriately controlled. The licensee took immediate corrective action to ensure re-submergence of the radiologically significant sections of the moisture separator and restore the requisite water shielding, thereby restoring ambient refuel floor radiological conditions. The licensee entered this deficiency into the corrective action program as Condition Report CR-CNS-2016-07552.

The licensee's failure to ensure sufficient radiological work controls were in place when the reactor pressure vessel moisture separator was lifted during vessel reassembly, in violation of Technical Specification 5.4.1.a, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to have sufficient procedural guidance to maintain adequate water shielding on the moisture separator resulted in unanticipated elevated dose rates on the refuel floor and unplanned radiological exposures to workers in the immediate work area. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined that the violation had very low safety significance (Green) because: (1) it was not an as low as reasonably achievable (ALARA) finding; (2) there was no overexposure; (3) there was no substantial potential for an overexposure; and (4) the ability to assess dose was not compromised. The inspectors determined that the finding had a cross-cutting aspect in the area of human performance associated with avoiding complacency. Specifically, the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes and failed to implement appropriate error reduction tools.

Inspection Report# : 2016004 (*pdf*)

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

Page Last Reviewed/Updated Wednesday, August 10, 2016