

Cooper

4Q/2016 Plant Inspection Findings

Initiating Events

Mitigating Systems

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)

Significance: G Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Follow Work Instructions for Post-Maintenance Testing of Safety-Related Ventilation Systems

The inspectors identified two examples of a non-cited violation of Technical Specification 5.4.1.a, associated with the licensee’s failure to perform required post-maintenance testing for safety-related ventilation systems in accordance with documented instructions, prior to system restoration. Specifically, the licensee failed to follow work order instructions contained in Work Orders 5062878 and 5065112 for (1) performing surveillance testing to measure the airflow of emergency diesel generator supply fan coil unit HV-DG-1C following maintenance, and (2) performing leak testing of a newly created control room ventilation boundary penetration. Corrective actions included performing the required surveillance test for the diesel generator ventilation unit, retesting the control room penetration in accordance with the procedure, and initiating site-wide communications discussing the errors and reemphasizing procedural adherence. The licensee entered these deficiencies into their corrective action program for resolution as Condition Reports CR-CNS-2016-02207 and CR-CNS-2016-02232.

The licensee’s failure to perform required post-maintenance testing for safety-related ventilation systems, in accordance with documented instructions, was a performance deficiency. This performance deficiency was associated with multiple cornerstones. The first example of 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 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 failure to measure supply fan coil unit HV-DG-1C airflow resulted in delayed identification that the maintenance had resulted in degraded flow through the ventilation unit. The second example of the performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Barrier Integrity Cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases and that the radiological barrier functionality of the control room is maintained. Specifically, the licensee’s failure to follow post-maintenance testing instructions resulted in a challenge to the operability of the newly created control room boundary penetration seal. 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 was of very low safety significance (Green) because it did not represent a design or qualification deficiency; did not represent a loss of safety function; did not represent a loss of a single train for greater than its technical specification allowed outage time; did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating events; did not represent an actual open containment pathway; and did not involve a reduction in function of hydrogen igniters. 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 ventilation work activities to ensure all required post-maintenance testing was completed satisfactorily prior to

declaring the associated equipment operable.

Inspection Report# : [2016002](#) (*pdf*)

Significance: G Jun 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Maintain Design Control for High Pressure Coolant Injection System Electrical Circuit

The inspectors reviewed a self-revealed, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the licensee’s failure to verify the adequacy of design of the high pressure coolant injection auxiliary lube oil pump 125 Vdc starter circuit. Specifically, in 1984, the licensee modified the design of the starter circuit and eliminated a resistor that served to protect the circuit from shorting due to indication light bulb failures. As a result, on April 26, 2016, a shorted light bulb resulted in the loss of power to the auxiliary lube oil pump, rendering the high pressure coolant injection system inoperable and unavailable. Immediate corrective actions included replacing the light socket and blown fuse and changing out the nonessential light bulb with an essential bulb. This event was entered into the licensee’s corrective action program as Condition Report CR-CNS-2016-02318, and the licensee initiated a root cause evaluation to investigate the failure.

The licensee’s failure to verify the adequacy of design of the high pressure coolant injection auxiliary lube oil pump starter circuit in accordance with 10 CFR Part 50, Appendix B, Criterion III, 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 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, at the time the modification was installed, the licensee had not taken sufficient actions to ensure that the electrical circuit was protected from light bulb shorting failures, resulting in the high pressure coolant injection system ultimately being rendered inoperable. 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 required a detailed risk evaluation because it represented a loss of the system and function of high pressure coolant injection. The inspectors determined that the finding was of very low safety significance (Green) through performing a detailed risk evaluation. A cross-cutting aspect was not assigned to this finding because the performance deficiency occurred in 1984, and therefore, is not indicative of current licensee performance.

Inspection Report# : [2016002](#) (*pdf*)

Significance: G Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Follow ASME Code Requirements when taking Corrective Actions for a Pump in the Required Action Range

The inspectors identified a non-cited violation of 10 CFR 50.55a, “Codes and Standards,” for the licensee’s failure to follow the ASME Code for Operation and Maintenance of Nuclear Power Plants when addressing the performance of reactor equipment cooling pump A within the high “required action range” of the inservice testing program. Specifically, on February 11, 2016, the licensee failed to follow ASME Subsection ISTB 6200(b) when engineering personnel, taking corrective action to address pump performance, failed to either correct the cause of the deviation or establish new reference values for the pump. Instead of establishing new reference values, the licensee performed an analysis to administratively raise the upper “required action range” limit, creating a wider range of acceptable pump operation than allowed by Table ISTB 5100 1, “Centrifugal Pump Test Acceptance Criteria.” The licensee entered this issue into the corrective action program as Condition Report CR CNS 2016 00920, took action to reevaluate and rebaseline the pump with new reference values, and performed an extent of condition review to determine if other equipment was impacted by similar interpretations of the code.

The licensee's failure to establish new reference values for reactor equipment cooling pump A in accordance with the ASME Code 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, the actions initially taken by the licensee would have required a relief request; could have delayed identification of a degrading pump trend due to the creation of a wider range of acceptable operation; and the licensee's generic interpretation, that the Table ISTB 5100 1 "acceptable range" could be administratively expanded, represented a programmatic vulnerability. The inspectors used Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," and determined that the finding had very low safety significance (Green) because it did not represent a design or qualification deficiency, did not represent a loss of safety function for 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. This finding had a cross-cutting aspect in the area of problem identification and resolution associated with evaluation. Specifically, the licensee failed to thoroughly evaluate performance of reactor equipment cooling pump A in the "required action range" to ensure that the resolution correctly addressed the causes of the degraded performance [P.2].

Inspection Report# : [2016001](#) (*pdf*)

Barrier Integrity

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Meet Technical Specification Requirements for Traversing In-Core Probe B Ball Valve

The inspectors identified a non-cited violation of Technical Specification 3.6.1.3, "Primary Containment Isolation Valves," for the licensee's failure to maintain traversing in-core probe B ball valve, a primary containment isolation valve, operable for its containment isolation function. Specifically, on May 5, 2016, from 5:20 a.m. until 1:08 p.m., the licensee failed to maintain the traversing in-core probe B ball valve operable or isolate its flow path within 4 hours of indications that the mechanical in-shield limit switch had failed. This failure prevented the ball valve from performing its containment isolation function. The licensee took immediate corrective actions upon discovery to restore compliance with Technical Specification 3.6.1.3 by de-energizing the ball valve's solenoid operating valve, causing it to close. The licensee entered this deficiency into their corrective action program for resolution as Condition Report CR-CNS-2016-03665.

The licensee's failure to maintain the traversing in-core probe B ball valve, a primary containment isolation valve, operable for its containment isolation function, in violation of Technical Specification 3.6.1.3, 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 Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases and that the radiological barrier functionality of containment is maintained. Specifically, the traversing in-core probe B ball valve was unable to perform its primary containment isolation function with a failed mechanical in-shield limit switch. 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 was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of reactor containment (valves, airlocks, etc.), containment isolation system (logic and instrumentation), and heat removal components; and did not involve an actual reduction in function of hydrogen igniters in the reactor containment. The finding had a cross-cutting aspect in the area of human performance associated with conservative bias because the licensee failed to use

decision-making practices that emphasized prudent choices over those that were simply allowable and failed to ensure proposed actions were determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, the licensee failed to validate the assumption that the traversing in-core probe B ball valve would fulfill its containment isolation function with a failed mechanical in-shield limit switch, and failed to validate the degraded condition prior to exceeding the 4-hour completion time of Technical Specification 3.6.1.3.

Inspection Report# : [2016002](#) (*pdf*)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Assess Operability of Technical Specification System Functions during Surveillance Testing

The inspectors identified a non-cited violation of Technical Specification 5.4.1.a, for the licensee's failure to follow Station Procedure 0.26, "Surveillance Program," and assess the operability of high pressure coolant injection steam line isolation instrumentation during surveillance testing. Specifically, the licensee failed to assess the operability of required isolation instrumentation when maintenance personnel opened terminal box 392 during surveillance testing and temporarily invalidated its environmental qualification. Licensee procedures required operations personnel to either establish compensatory measures to restore the terminal box during an event, or declare the instrumentation inoperable and enter the applicable technical specification actions when the terminal box was opened. As an immediate corrective action, the licensee implemented Standing Order 2016 03, which directed operators to establish compensatory measures, if applicable, or declare the affected equipment inoperable when environmentally qualified terminal boxes would be opened during testing. The licensee entered this issue into their corrective action program for resolution as Condition Reports CR CNS 2016 00320 and CR CNS 2016 00476.

The licensee's failure to assess the operability of high pressure coolant injection instrumentation when the associated terminal box was opened during surveillance testing, in violation of Station Procedure 0.26, 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, component, and barrier performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective to ensure the radiological barrier functionality of containment isolation. Specifically, with terminal box 392 open, its environmental qualification was temporarily invalidated, making the high pressure coolant injection low steam pressure and high steam flow containment isolation instrumentation inoperable during surveillance testing. In addition, two other terminal boxes and their associated surveillances were impacted by the performance deficiency. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding had very low safety significance (Green) because it: (1) did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components; and (2) did not involve an actual reduction in function of hydrogen igniters in the reactor containment. The finding had a cross-cutting aspect in the area of human performance associated with work management. Specifically, the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority, including the identification and management of risk commensurate with opening terminal box 392 during surveillance testing [H.5].

Inspection Report# : [2016001](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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Miscellaneous

Last modified : February 01, 2017