

River Bend 1

4Q/2016 Plant Inspection Findings

Initiating Events

Significance: G Nov 08, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Create Adequate Effectiveness Review Plans for Corrective Actions to Prevent the Recurrence of Significant Performance Issues

The inspectors identified a finding of very low safety significance and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to create adequate effectiveness review plans in accordance with River Bend Station Procedure EN-LI-118, "Cause Evaluation Process." Specifically, for 10 out of 22 corrective actions that were created to prevent recurrence of significant performance issues, the licensee did not have appropriate quantitative or qualitative measures of success to determine the effectiveness of correction actions. The licensee entered this issue into their corrective action program as Condition Reports CR-RBS-2016-06652 and CR-RBS-2016-06694. The licensee restored compliance by immediately preparing and approving adequate effectiveness review plans.

The inspectors determined that the performance deficiency was more than minor, and therefore a finding, because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the root cause evaluations were performed as a result of significant performance issues, and adequate effectiveness reviews are designed to ensure that corrective actions to prevent recurrence are effective in precluding the said significant performance issues. Inadequate effectiveness review plans would reasonably have the potential to prevent identifying ineffective corrective actions and allow significant performance issues to recur. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that the finding was of very low safety significance. This finding has an evaluation cross-cutting aspect in the area of problem identification and resolution because the organization did not thoroughly evaluate the issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, when creating effectiveness review plans the licensee believed that an aggregate review was appropriate in all circumstances, resulting in the plans having inadequate measures of success [P.2]. (Section 02.04.e)

Inspection Report# : [2016012](#) (*pdf*)

Significance: G Apr 14, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Follow Procedure While Installing Jumpers for Shutdown Cooling

The team reviewed a self-revealing, non-cited violation of Technical Specification 5.4, "Procedures," for the licensee's failure to correctly implement Procedure SOP-0031, "Residual Heat Removal System," Revision 326. SOP-0031, Attachment 5, Step 5.4.1, required that a retractable sheathed banana jumper be used when bypassing the 135-psi SDC isolation. Instead, the licensee used a standard banana jumper, which resulted in a short circuit and inadvertent closure of Valves E12MOV-F008, Shutdown Cooling Suction Valve, and E12MOV-F053A, Shutdown Cooling Injection Valve. This caused a loss of decay heat removal. This issue was entered into the licensee's corrective action program as Condition Report CR-RBS-2016-0210. Corrective actions included revising Procedure

SOP-0031 to include actions to de-energize the applicable valves while bypassing the 135-psi shutdown cooling isolation.

The failure to use the correct jumpers as specified in Procedure SOP-0031 was a performance deficiency. This performance deficiency is more than minor, and therefore a finding, because it is associated with the human performance attribute of the Initiating Events Cornerstone and adversely affected the 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, the shorting of contacts resulting from the use of incorrect jumpers caused a loss of shutdown cooling and decay heat removal. The team evaluated the finding using NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Screening and Characterization of Findings." When applying "Exhibit 2 - Initiating Events Screening Questions," the team determined the loss of residual heat removal event did not occur when the refuel cavity was flooded, and therefore it required a risk evaluation using the Appendix G, Attachment 3, "Phase 2 Significance Determination Process Template for Boiling Water Reactors during Shutdown." The analyst determined that a modified but still conservative Phase 2 quantitative estimate in combination with qualitative and deterministic insights led to a final conclusion that the finding was of very low safety significance (Green).

The finding has a field presence cross-cutting aspect within the human performance area because the licensee failed to promptly correct deviations from standards and expectations. Specifically, the licensee failed to correct deviations from standards and expectations during the performance of the pre-job brief and ensure proper communication and oversight is maintained in the control room during risk significant evolutions [H.2]. (Section 2.11.a)

Inspection Report# : [2016009](#) (*pdf*)

Significance:  Apr 14, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Implement Corrective Actions to Prevent the Recurrence of a Reactor Scram Due to Grid Disturbances

The team reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to establish measures to assure that corrective action is taken to preclude repetition of a significant condition adverse to quality. Specifically, following a November 27, 2015, reactor scram, the licensee failed to implement corrective actions associated with the alternate power lineup of the reactor protection system buses to preclude repetition of a significant condition adverse to quality during the January 9, 2016, reactor scram. This issue was entered into the licensee's corrective action program as Condition Report CR-RBS-2016-0180. Corrective actions included supplying reactor protection system bus A from the normal power source on January 12, 2016.

The failure to assure corrective actions are promptly taken for a significant condition adverse to quality to preclude repetition of a reactor scram associated with both buses being affected by a switchyard voltage transient was a performance deficiency. This performance deficiency is more than minor, and therefore a finding, because it is associated with the human performance attribute of the Initiating Events Cornerstone and adversely affected the 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, the licensee's failed to implement corrective actions to address grid instabilities following the November 27, 2015, reactor scram to preclude the January 9, 2016, reactor scram. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Inspection Manual Chapter 0609, Appendix A, the team determined that this finding is of very low safety significance (Green) because it did not involve the loss of mitigation equipment or a support system.

This finding has an evaluation cross-cutting aspect within the problem identification and resolution area because the

licensee failed to thoroughly evaluate the cause of the November 27, 2015, reactor scram and ensure that the resolution addresses causes and extent of conditions commensurate with their safety significance [P.2].

(Section 2.11.c)

Inspection Report# : [2016009](#) (*pdf*)

Significance:  Apr 14, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Assess Risk During Motor Generator Set Unavailability

The team identified a non-cited violation of 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” for the licensee’s failure to adequately assess the increase in risk that may result from proposed maintenance activities. Specifically, the team identified that since 2012, the licensee failed to adequately assess the risk of simultaneously powering both reactor protection system buses from the alternate power sources, which resulted in an increased risk of a reactor scram due to grid instabilities. This issue was entered into the licensee’s corrective action program as Condition Report CR-RBS-2016-3176. Corrective actions included revising Procedure SOP-0079, “Reactor Protection System,” to include precautions to address the increased risk associated with supplying both reactor protection system buses from the alternate power source.

The team determined that the licensee’s failure to adequately assess the increase in risk associated with simultaneously powering both reactor protection system buses from the alternate power sources was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the performance deficiency resulted in an increased risk of a reactor scram due to grid instabilities. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, “Initiating Events Screening Questions,” a detailed risk evaluation was required since the finding resulted in a reactor scram and main steam isolation valve closure. The finding was evaluated using Inspection Manual Chapter 0609, Appendix K, “Maintenance Risk Assessment and Risk Management Significance Determination Process,” Flowchart 1, “Assessment of Risk Deficit,” dated May 19, 2005, to assess the significance of the finding. A senior reactor analyst estimated the incremental core damage probability deficit to be 2.0E-7 and the incremental large early release probability deficit to be 4.0E-8. Since this incremental core damage probability deficit was less than 1E-6 and the incremental large early release probability deficit was less than 1E-7, the analyst used Flowchart 1 to determine the finding was of very low safety significance (Green).

This finding has a conservative bias cross-cutting aspect within human performance area because the licensee determined that powering both reactor protection system buses from the alternate source instead of the motor generator sets was safe even though the motor generator sets are the preferred source and provide protection against grid perturbations [H.14]. (Section 2.11.d)

Inspection Report# : [2016009](#) (*pdf*)

Mitigating Systems

Significance:  Oct 12, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Plant Operating Procedures with Ten Examples

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for ten examples of failing to provide appropriate qualitative and quantitative criteria in alarm response procedures, and abnormal operating procedures. The licensee is currently evaluating the scope of these and other procedural inadequacies. These procedure deficiencies were entered into the licensee’s corrective action program as Condition Report CR-RBS-2016-06683.

The failure of these ten procedures to have the appropriate qualitative and quantitative criteria to complete these activities was a performance deficiency. The finding was more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring availability, reliability, and capability of systems needed to respond to initiating events to prevent undesired consequences. Specifically, inadequate procedures could adversely affect the operating crew’s ability to take appropriate actions to ensure reactor safety is being maintained. Using Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, the team determined that the finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significance in accordance with the licensee’s maintenance rule program for greater than 24 hours. The finding has a cross-cutting aspect in the area of human performance associated with documentation because the organization did not maintain complete, accurate, and up-to-date documentation for procedure writing and modification [H.7].

Inspection Report# : [2016301](#) (*pdf*)

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Design and Extent of Condition Review Leaves Circuit Breaker Failure Mechanism Uncorrected

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to promptly identify and correct a condition adverse to quality. Specifically, after receiving a vendor nonconformance report identifying a failure-to-close vulnerability in Masterpact circuit breakers, the licensee failed to fully diagnose the extent of the vulnerability and take actions to correct the adverse impacts on safety-related plant systems. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2016-01702 and Condition Report CR-RBS-2016-03637. Corrective actions included implementing modifications to affected Masterpact circuit breakers.

The failure to fully evaluate and correct binding vulnerabilities in Masterpact circuit breakers 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, the licensee’s failure to appropriately resolve binding vulnerabilities in Masterpact circuit breakers adversely affected the availability, reliability, and capability of emergency diesel generators, standby gas treatment fans, auxiliary building unit coolers, and containment unit coolers. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions.” The finding required a detailed risk evaluation because it involved a loss of system and/or function. A Region IV senior reactor analyst performed a detailed risk evaluation for the issue and determined the issue to be of very low safety significance (Green). The finding had a cross-cutting aspect in the area of problem identification and resolution, evaluation, because the licensee failed to thoroughly evaluate an issue to ensure that the resolution addressed causes and extent of conditions commensurate with their safety significance [P.2].

Inspection Report# : [2016003](#) (pdf)

Significance:  Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Establish Criteria for Alternating Control Building Chilled Water System Chillers

The inspectors reviewed two examples of a self-revealing, non-cited violation of Technical Specification 5.4, “Procedures,” for the licensee’s failure to establish adequate instructions in the control building chilled water system operating procedures. The procedures for operating the control building chilled water system did not establish limits on oil level as a prompt to swap chillers. As a result, station personnel did not take action to swap chillers, which resulted in a trip of the in-service control building chiller. The licensee entered these issues into their corrective action program as Condition Reports CR-RBS-2015-08834 and CR-RBS-2016-03361. Corrective actions included initiating a standing order to provide guidance on monitoring oil levels and direction to alternate operating chillers.

The failure to establish limits on oil level as a prompt to swap control building chillers in quality related system operating Procedure SOP-0066, “Control Building HVAC Chilled Water System,” Revision 328, 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, the failure to alternate operating chillers on December 10, 2015, and again on May 2, 2016, upon the observance of rising oil level in the sight glass, resulted in a trip of control building chilled water system chillers 1D and 1C, respectively, and unplanned inoperability and limiting condition for operation entries for multiple safety-related systems. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” the inspectors determined this finding to be of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more trains of safety-related equipment for greater than its technical specification allowed outage time. The finding had a cross-cutting aspect in the area of problem identification and resolution, operating experience, because the licensee failed to systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner. Specifically, the station had previously identified in Condition Report CR-RBS-2006-04291 that the oil phenomenon was the cause of control building chilled water system chiller trips [P.5].

Inspection Report# : [2016003](#) (pdf)

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Follow Station Guidance on Use of Temporary Power Cables and Control of Transient Combustibles

The inspectors identified a non-cited violation of Technical Specification 5.4.1.a, for the licensee’s failure to follow station maintenance procedures related to the use of temporary power cables and storage of transient combustible materials in the auxiliary building. Specifically, the licensee installed energized networking equipment and an associated power cable within one foot of a safety-related cable tray. The station did not initially correct the problem, but later resolved the deficiencies by removing the networking equipment and power cable. The failure to initially correct the issue is documented as a violation in Section 4OA2 of this report. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2016-02398.

The licensee’s installation of energized networking equipment and an associated power cable within one foot of a safety-related cable tray was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the protection against external factors 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, a fire resulting from this energized equipment would impact the availability, reliability, and capability of the low pressure core spray system, residual heat removal system, component cooling primary system, and reactor core isolation cooling system. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings." Since the finding involved a failure to adequately implement fire prevention and administrative controls for transient combustibles, the inspectors dispositioned the finding using NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." In accordance with Manual Chapter 0609, Appendix F, Question 1.3.1.A, the inspectors determined that the finding was of very low safety significance (Green) because the reactor would be able to reach and maintain safe shutdown since the safe shutdown path was deemed independent of fire damage state scenarios for the given fire ignition source. The finding had a cross-cutting aspect in the area of human performance, work management, because the licensee's work management processes failed to plan, control, and execute the work activity that included installation of temporary equipment such that impacts on nuclear safety were properly evaluated and addressed [H.5].

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

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Conduct Common Cause Failure Evaluation in Response to Inoperable Emergency Diesel Generator

The inspectors identified a non-cited violation of Technical Specification 3.8.1, "AC Sources – Operating," for the licensee's failure to take required actions for an inoperable emergency diesel generator. Specifically, after classifying the Division I emergency diesel generator as inoperable on the basis of a nonconforming condition discovered during an extended maintenance outage, and after failing to either verify that the Division II emergency diesel generator was not inoperable due to common cause failure within 24 hours or conduct a surveillance run on the Division II emergency diesel generator within 24 hours, the licensee failed to enter Mode 3 within 12 hours, as required by Actions C.3.1, C.3.2, and G.1 of Technical Specification 3.8.1, respectively. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2016-03978. Corrective actions included the scheduling of training to ensure that operations personnel fully understand the technical specification requirements for common cause evaluation as they relate to adverse conditions on emergency diesel generators.

The failure to take required actions for an inoperable emergency diesel generator was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment reliability 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 operable emergency diesel generator directly affected the cornerstone objective. Using NRC Inspection Manual Chapter 0609, "Significance Determination Process," Appendix A, "Exhibit 2 -- Mitigating Systems Screening Questions," the inspectors determined the finding to be of very low safety significance (Green) because the finding did not represent an actual loss of function of the Division II emergency diesel generator. The finding had a cross-cutting aspect in the area of human performance, consistent process, because the licensee failed to use a consistent, systematic approach to make decisions. Specifically, the licensee failed to review the required actions of the applicable technical specification so as to ensure that all of those actions would be properly carried out [H.13].

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

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Identify and Correct Improperly Stowed Transient Combustibles

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to promptly identify and correct a condition adverse to quality. Specifically, after writing a condition report identifying energized networking equipment and an associated power cable that had been installed within one foot of a safety-related cable tray, the licensee closed the condition report without removing the networking equipment and power cable. The licensee entered this issue into their corrective action program as Condition Reports CR-RBS-2016-02398 and CR-RBS-2016-03152. Corrective actions included removing the networking equipment and power cable and conducting a performance management review of the actions involved with correcting the condition and closing the condition report.

The licensee’s failure to promptly identify and correct a condition adverse to quality was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected 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 correct a known deficient condition resulted in an extended period of vulnerability to a fire that could result from improperly installed energized equipment and challenge the availability, reliability, and capability of the low pressure core spray system, residual heat removal system, component cooling primary system, and reactor core isolation cooling system.

The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings.” Since the finding involved a failure to adequately implement fire prevention and administrative controls for transient combustibles, the inspectors dispositioned the finding using NRC Inspection Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process.” In accordance with Manual Chapter 0609, Appendix F, Question 1.3.1.A, the inspectors determined that the finding was of very low safety significance (Green) because the reactor would be able to reach and maintain safe shutdown since the safe shutdown path was deemed independent of fire damage state scenarios for the given fire ignition source. The finding had a cross-cutting aspect in the area of human performance, teamwork, because the licensee failed to properly communicate expectations to individuals performing work during the course of implementing corrective actions [H.4].
Inspection Report# : [2016002](#) (*pdf*)

Significance:  Apr 29, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Loop Flow Test Procedure

The team identified a non-cited violation of License Condition 2.C.(10) for the failure to implement and maintain in effect all provisions of their approved fire protection program. Specifically, the licensee’s fire protection program surveillance testing procedure for the fire main yard loop did not include appropriate guidance to properly flow test all portions of the underground fire main yard loop to buildings that contained fire safe shutdown equipment. The licensee entered this deficiency into their corrective action program as Condition Report CR-RBS-2016 03212 and initiated actions to correct the procedure and perform the flow testing.

The failure to ensure that fire protection program Surveillance Test Procedure STP 251 3700, “Fire System Yard Water Suppression Loop Flow Test,” Revision 10, included requirements to functionally test all individual underground firewater flow paths to structures that contained fire safe shutdown components was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external factors (fire) attribute of the Mitigating Systems Cornerstone and adversely affected the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was screened in accordance with NRC Inspection Manual Chapter 0609, “Significance Determination Process,” Attachment 4, “Initial Characterization of Findings,” dated June 19, 2012. The team determined that an Inspection Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process,” dated September 20, 2013, review was required because the finding affected the fire water

supply system. Using Inspection Manual Chapter 0609, Appendix F, Attachment 1, “Fire Protection Significance Determination Process Worksheet,” dated September 20, 2013, the finding was screened as a Green finding of very low safety significance in accordance with Task 1.4.7, “Fire Water Supply,” Question A. Since the subject fire main yard loops had not been flow tested since initial testing, and nothing caused the licensee to reevaluate the testing procedure, the team determined that this failure did not reflect current performance, and no cross-cutting aspect was assigned. (Section 1R05.03.b)

Inspection Report# : [2016007](#) (*pdf*)

Significance:  Apr 29, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Isolate Control Circuits for Safe Shutdown Equipment from the Effects of a Control Room Fire

The team identified a non-cited violation of License Condition 2.C.(10) for the failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the team identified two examples where the licensee failed to isolate control circuits for safe shutdown equipment to ensure independence from the effects of a fire in the control room. As immediate compensatory measures the licensee performed visual inspections of the affected cabinets for unacceptable fire hazards and issued Standing Order 323 to reinforce the need for operators to identify and prevent fire hazards while in the control room. The licensee entered this issue into their corrective action program as Condition Reports CR-RBS-2016 02953 and CR-RBS-2016-03264.

The failure to isolate control circuits for safe shutdown equipment from the effects of a control room fire was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the Mitigating Systems 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 Inspection Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process,” dated September 20, 2013, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. A senior reactor analyst performed a Phase 3 evaluation to determine the risk significance of this finding since it involved a postulated control room fire that led to control room evacuation and determined the issue was of very low safety significance (Green). This finding did not have a cross-cutting aspect since it was not indicative of present performance in that the performance deficiency occurred more than three years ago. (Section 1R05.06.b)

Inspection Report# : [2016007](#) (*pdf*)

Significance:  Apr 29, 2016

Identified By: NRC

Item Type: FIN Finding

Failure to Demonstrate that Appendix R Emergency Lights Satisfied their Maintenance Rule Performance Criteria

The team identified a finding for the failure to provide an adequate monitoring and testing program to demonstrate that the required Appendix R emergency lights satisfied the licensee’s maintenance rule performance criteria. Specifically, the failure to provide an adequate monitoring and testing program could result in a large number of Appendix R emergency lights failing to last the required 8 hours without being detected. The team determined that, because the licensee had changed their program to a biennial replacement frequency for the 8-hour batteries, reasonable assurance existed that the lights would function long enough for operators to perform the time critical manual actions directed by their fire protection program. The licensee entered this finding into their corrective action program as Condition Report CR-RBS-2016-03177.

The failure to establish an adequate monitoring and testing program to demonstrate that the required Appendix R emergency lights would satisfy the licensee’s maintenance rule performance criteria was a performance deficiency.

The performance deficiency was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the failure to provide an adequate monitoring and testing program could result in a large number of Appendix R emergency lights failing to function for the required 8 hours without being detected through licensee monitoring and testing. The team determined this finding affected the Mitigating Systems Cornerstone. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. The team assigned the finding to the post-fire safe shutdown category since it impacted the remote shutdown and control room abandonment element. The team assigned the finding a low degradation rating since the ability to reach and maintain safe shutdown conditions in the event of a control room fire would be minimally impacted by the potential failure of the emergency lights to function for 8-hours. Because this finding had a low degradation rating, it screened as having very low safety significance (Green) in Task 1.3.1. The finding did not have a cross-cutting aspect since it was not indicative of present performance in that the performance deficiency occurred more than three years ago. Specifically, the licensee began performing the 8-hour discharge test on a small sample of the batteries more than three years ago. (Section 1R05.08.b)

Inspection Report# : [2016007](#) (pdf)

Significance:  Apr 14, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Establish Adequate Procedural Guidance

The team reviewed a self-revealing, non-cited violation of Technical Specification 5.4, "Procedures," for three examples of the licensee's failure to establish sufficient procedural guidance. Specifically, the licensee's operations and radiation protection procedures did not provide sufficient direction to plant personnel to expeditiously establish a reactor vessel vent path, restore from a loss of shutdown cooling, and perform time sensitive entries into radiologically controlled areas. This issue was entered into the licensee's corrective action program as Condition Reports CR-RBS-2016-0210, CR-RBS-2016-0370, and CR-HQN-2016-0132. Corrective actions included revising the applicable procedures.

The failure to establish adequate procedural guidance in accordance with Regulatory Guide 1.33 was a performance deficiency. Specifically, Procedures GOP-0002, "Power Decrease/Plant Shutdown," Revision 72, and AOP-0051, "Loss of Decay Heat Removal," Revision 313, failed to provide adequate direction to operations personnel to expeditiously establish a reactor vessel vent path and recover shutdown cooling following an isolation. Additionally, Procedure EN-RP-101, "Access Control for Radiologically Controlled Areas," Revision 11, failed to provide adequate guidance to perform time sensitive entries into radiologically controlled areas. This performance deficiency is more than minor, and therefore a finding, because it is associated with the procedure quality 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 licensee failed to ensure that adequate procedural direction was provided to operations personnel following a loss of shutdown cooling. This resulted in a delay in the restoration of shutdown cooling and plant heatup. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process." Using Inspection Manual Chapter 0609, Appendix G, Attachment 1, Exhibit 3, "Mitigating Systems Screening Questions," the team determined that the finding is of very low safety significance (Green) because it: (1) affected the design or qualification of a mitigating structure, system, or component, and (2) the structure, system, or component maintained its operability and functionality. A cross-cutting aspect is not being assigned to this finding due to the timing of the performance deficiency not being indicative of current licensee performance. (Section 2.11.b)

Inspection Report# : [2016009](#) (pdf)

Significance:  Jan 20, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Assess Risk During Chiller Unavailability

NRC INSPECTION REPORT 05000458/2016008 - FINAL SIGNIFICANCE DETERMINATION OF GREEN FINDING

The preliminary significance was estimated to be White. After reviewing new information provided during the April 4, 2016, Regulatory Conference, the significance is now estimated to be Green.

After considering information presented at the Regulatory Conference conducted April 4, 2016, a Region IV senior reactor analyst performed a final detailed risk evaluation. See Attachment 3 of this report, "Final Detailed Risk Evaluation," for further information. This evaluation yielded a maximum incremental core damage probability deficit of $3.2E-7$. The analyst applied this result to Flowchart 1, "Assessment of Risk Deficit," of Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," of Manual Chapter 0609. In applying Flowchart 1, the analyst determined that because the maximum incremental core damage probability deficit was less than $1.0E-6$, the finding was of very low safety significance (Green).

The NRC identified an apparent violation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," paragraph (a)(4) with preliminary white significance.

Prior to March 30, 2015, before performing maintenance activities, the licensee failed to adequately assess the increase in risk that may result from proposed maintenance activities. Specifically, the risk assessment performed by the licensee for plant maintenance failed to account for certain safety significant structures, systems, and components that were concurrently out of service. On multiple occasions, the licensee failed to adequately assess the risk of operating the control building chilled water system (HVK) chillers in various single-failure vulnerable configurations. As a result of this deficiency, the station reduced the reliability and availability of systems contained in the main control room and failed to account for the significant, uncompensated impairment of the safety functions of the associated systems. In response to the NRC's conclusions, the licensee initiated Condition Report CR-RBS-2016-00095. The licensee also completed engineering analyses to evaluate alternate cooling methods, including cross-connecting service water and the HVK chiller systems, in order to provide cooling to spaces housing electrical components.

This performance deficiency is more than minor, and therefore a finding, because it is associated with the configuration control attribute of the Mitigating Systems Cornerstone, and adversely affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to account for a loss of all HVK cooling scenario, either quantitatively or qualitatively, resulted in uncompensated impairment to all systems associated within the main control room. A loss of cooling to the control room could lead to multiple systems exceeding their equipment qualification temperatures and impact control room habitability. The finding was evaluated using Inspection Manual Chapter (IMC) 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." Using Inspection Manual Chapter 0609, Appendix K, the finding was determined to require additional NRC management review using risk insights where possible because the quantitative probabilistic risk assessment (PRA) tools are not well suited to analyze failures from control room heat-up events. Thus, the analyst evaluated the safety significance posed by the heat-up of components cooled by the HVK chillers using Appendix K, Flowchart 1, "Assessment of Risk Deficit," to the extent practical, with additional risk insights by internal NRC management review in accordance with Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." The significance of the finding was preliminarily determined to be White. The team determined the most significant contributing cause of the licensee failing to adequately assess the increase in risk from proposed maintenance activities was inadequate

procedural guidance in Procedure ADM-0096, “Risk Management Program Implementation and On-line Maintenance Risk Assessment,” Revision 316. This finding has a resources cross-cutting aspect within the human performance area because leaders failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety [H.1].

Inspection Report# : [2015010](#) (*pdf*)

Inspection Report# : [2016008](#) (*pdf*)

Significance:  Jan 20, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Identify and Correct Circuit Breakers Failure Mechanism

The team reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to promptly identify and correct a condition adverse to quality related to Masterpact circuit breakers. Specifically, the licensee did not promptly identify and correct a Masterpact breaker failure mechanism, even though related industry operating experience was available. The licensee determined the failure mechanism caused nine breaker failures since 2007, and may have contributed to an additional six failures where the cause was not conclusively determined. In response to the NRC’s conclusions, the licensee initiated Condition Report CR-RBS-2015-03951. Further, the licensee modified all vulnerable Masterpact circuit breakers to remove this failure mechanism.

This performance deficiency is more than minor, and therefore a finding, because it is 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, the licensee’s untimely corrective action contributed to additional failures of Masterpact circuit breakers and decreased the reliability of Masterpact circuit breakers to respond during design basis events. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee’s maintenance rule program. This finding has an operating experience cross-cutting aspect within the problem identification and resolution area because the licensee failed to systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner [P.5].

Inspection Report# : [2015010](#) (*pdf*)

Significance:  Jan 20, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Accomplish an Operability Determination In Accordance With Procedures

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to accomplish an operability determination in accordance with procedure EN-OP-104, “Operability Determination Process,” Revision 8. Specifically, the licensee referenced non-conservative data, contrary to steps 5.5 and 5.11 of procedure EN-OP-104, when assessing the reduced reliability of Masterpact circuit breakers as a degraded or nonconforming condition. The licensee restored compliance by completing a design modification to eliminate the failure mode and initiated Condition Report CR-RBS-2015-03952.

This performance deficiency is more than minor, and therefore a finding, because it is 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, the reliability of components powered by Masterpact circuit breakers was reduced and, by justifying operability using non-conservative data, the licensee did not recognize the actual unreliability. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. This finding has a conservative bias cross-cutting aspect within the human performance area because the licensee failed to use decision-making practices that emphasize prudent choices over those that are simply allowable. Specifically, the licensee did not consider that the failure mechanism only occurs on a close command. Instead, the licensee included opening commands when summing the total demands and this resulted in a non-conservative failure rate [H.14].

Inspection Report# : [2015010](#) (*pdf*)

Significance:  Jan 20, 2016

Identified By: NRC

Item Type: FIN Finding

Failure to Identify and Correct an Adverse Condition in a Timely Manner

The team identified a finding for the licensee's failure to identify and correct an adverse condition in a timely manner as required by plant procedures. Specifically, the licensee did not recognize degrading trends associated with incorrect racking of Magne Blast circuit breakers and failures of the Magne Blast circuit breaker for the Reactor Feed Water Pump Motor 1B in a timely manner. For both cases, the licensee failed to initiate corrective action in a timely manner as required by procedure EN-LI-102, "Corrective Action Program." In response to the NRC's conclusions, the licensee updated circuit breaker procedures, replaced the Magne Blast circuit breaker for the Reactor Feed Water Pump Motor 1B, and initiated Condition Reports CR-RBS-2015-04259 and CR-RBS-2015-03437.

This performance deficiency is more than minor, and therefore a finding, because it is 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, the licensee's untimely corrective action contributed to the unreliability of the Magne Blast circuit breaker for Reactor Feed Water Pump Motor 1B and increased the potential for spurious trips of other Magne Blast circuit breakers during design basis events due to improper racking. The team performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. This finding has an avoid complacency cross-cutting aspect within the human performance area because the licensee failed to recognize

and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the licensee tolerated the adverse trends, did not plan for further degradation, and the latent conditions ultimately resulted in several Magne Blast circuit breaker failures in December 2014 before the trend was recognized [H.12].

Inspection Report# : [2015010](#) (*pdf*)

Barrier Integrity

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