

# River Bend 1

## 1Q/2012 Plant Inspection Findings

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### Initiating Events

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Inadequate Relief Valve Configuration Control Results in a Reactor Downpower**

The inspectors identified a self-revealing finding for failing to maintain configuration control of the gland seal header relief valves bonnet vent port. The configuration control failure lead to a subsequent decrease in condenser vacuum requiring an unplanned power reduction to maintain adequate condenser vacuum margin. This finding has been entered into the licensee's corrective action program as Condition Report CR-RBS-2012-00736.

The failure to maintain configuration control of the glad seal header relief valve was a performance deficiency. The finding was determined to be more than minor because it was associated with the configuration control attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the failure to maintain configuration control resulted in an unplanned down power. Using Inspection Manual Chapter IMC 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating systems will not be available. The inspectors determined that the apparent cause of this finding was that when the licensee prepared work orders that directed installation of the gland seal header relief valves, they did not comply with procedural requirements to provide plant configuration controls. Therefore, this finding has a cross-cutting aspect in the human performance area associated with the work practice component because the licensee did not define and effectively communicate expectations regarding procedural compliance [H.4 (b)].

Inspection Report# : [2012002](#) (*pdf*)

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Failure to Properly Fabricate and Install the mid-Standard Turbine Shaft Brush**

The inspectors reviewed a self-revealing finding regarding the improper fabrication of a turbine shaft grounding brush that resulted in turbine trip and subsequent reactor scram. The licensee identified the improper fabrication of a turbine shaft grounding brush as the cause of a spurious main turbine over-speed trip signal from an electrical discharge from the turbine shaft. This issue was entered into the licensee's corrective action program as Condition Report CR-RBS-2012-9053.

Failure to fabricate the turbine shaft grounding brush in accordance with vendor instructions is a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the improperly fabricated grounding brush resulted in a turbine trip and subsequent reactor scram. The inspectors reviewed the finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Based on the Phase 1 screening of the finding, the inspectors determined that the finding was of very low safety significance (Green) because it did not affect loss of coolant accident initiators, did not contribute to increasing the likelihood of both an initiating event and affecting mitigating equipment, and did not increase the likelihood of a fire or flood. The apparent cause of the performance deficiency was the failure in 2004 to appropriately perform a post maintenance test for the turbine shaft grounding brush modification. Therefore the inspectors did not identify a cross-cutting aspect because the performance deficiency is not reflective of the licensee's current performance.

**Significance:**  Sep 30, 2011

Identified By: NRC

Item Type: FIN Finding

### **Ineffective Corrective Actions on the Main Steam Equalizing Header Drain Bypass Valve Results in an Unplanned Down Power**

The inspectors identified a self-revealing finding involving inadequate corrective actions in response to a failure in the main steam equalizing header drain bypass valve, resulting in a steam leak and an unplanned plant down power. Specifically, plant personnel failed to properly address the dual indication on the bypass valve and fluid flow through the valve caused water to flash to steam accelerating pipe wall erosion and piping failure. The licensee's immediate corrective actions were to identify, secure, and temporarily repair the steam leak. The licensee entered this issue into the licensee's corrective action program as Condition Report CR-RBS-2011-04592.

The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors reviewed the finding using Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Based on the Phase 1 screening of the finding, the inspectors determined that the finding was of very low safety significance (Green) because it was not a loss of coolant accident initiator, did not contribute to both the likelihood of an initiating event and the likelihood that mitigating equipment or functions would not be available, nor increase the likelihood of an external event (seismic, flooding, or severe weather event). The apparent cause of the performance deficiency was that the control room and outage control center personnel presumed that the main control room dual indication for the valve was incorrect because previously valve operation successfully closed the valve. Consequently, this finding has a crosscutting aspect in the area of human performance associated with the decision-making component because station personnel did not use a systematic process to assess the condition of the bypass valve, and failed to verify the validity of the underlying assumptions that were used to justify operation with the valve having dual indications [H.1(a)].

Inspection Report# : [2011004](#) (pdf)

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## **Mitigating Systems**

**Significance:**  Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Appropriately Assess and Manage Risk for Internal Flooding Events**

The inspectors identified a non-cited violation of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," due to the failure of work control and operations personnel to adequately assess the increase in risk associated with internal flooding events. This issue has been entered into the licensee's corrective action program as Condition Reports CR-RBS-2012-00641.

The failure of work control and operations personnel to adequately assess the risk associated with internal flooding is a performance deficiency. The performance deficiency resulted in the overall elevated plant risk placing the plant into the higher licensee-established risk category ('Green' to 'Yellow'). The performance deficiency is more than minor, because it is associated with the configuration control attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowcharts 1 and 2, the finding was determined to have very low safety significance (Green) because the incremental core damage probability deficit was less than 1E-6 and the incremental large early release probability deficit was less than 1E-7. The inspectors determined that the apparent cause of the finding was that station personnel routinely failed to review the qualitative risk checklist required by the station's risk management procedure. Therefore, this finding has a cross-cutting aspect

in the human performance area associated with the work practice component because the licensee did not define and effectively communicate expectations regarding procedural compliance. [H.4(b)].

Inspection Report# : [2012002](#) (*pdf*)

**Significance:**  Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Verify Assumptions used in Standby Equipment Room Temperature Analysis**

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because, prior to February 7, 2012, the licensee did not verify that assumptions used in confirming that the safety-related battery inverter rooms would remain below their design basis temperature limits during a design basis event agreed with the as-built condition of the plant. This finding was entered into the licensee's corrective action program as Condition Report CR-RBS-2012-01046.

The inspectors determined that the failure to verify that design documents match the actual configuration of the plant is a performance deficiency. The finding was more than minor because it adversely affects the Mitigating Systems Cornerstone objective of equipment performance to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the licensee had not verified assumptions that ensure the standby switchgear room air conditioning system would reliably maintain the standby equipment rooms below the design temperature limits. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because it did not represent a loss of system safety function, nor actual loss of safety function of a single train, and it did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that this issue has a cross-cutting aspect in the area of human performance decision-making regarding nonconservative assumptions. When the licensee conducted the flow balance test, they assumed that measuring air inflow alone was sufficient, but did not check that the doors' gaps were allowing a sufficient amount of warm air to exit standby equipment rooms and be circulated back to the general areas [H.1(b)].

Inspection Report# : [2012002](#) (*pdf*)

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Appropriately Set Reactor Core Isolation Cooling Flow Controller High Output Limit**

The inspectors identified a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Procedures," when the reactor core isolation cooling turbine tripped on mechanical over speed. Troubleshooting determined the cause was an improperly tuned flow controller. This issue has been entered into the licensee's corrective action program as Condition Reports CR-RBS-2012-01188 and CR-RBS-2012-01262.

The failure to provide specific flow controller tuning instructions for the reactor core isolation cooling turbine flow controller was a performance deficiency. The finding was more than minor in accordance with Appendix B, "Issue Screening," of Inspection Manual Chapter IMC 0612, "Power Reactor Inspection Reports," because the finding was associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, improper tuning of the reactor core isolation cooling controller impacted operability and availability of the reactor core isolation cooling system. The inspectors performed a Phase 1 significance determination process review of this finding per Inspection Manual Chapter IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones," the finding represented a loss of system safety function. Therefore, a Region IV senior reactor analyst used Inspection Manual Chapter IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," to review the finding using the Standardized Plant Analysis Risk (SPAR) model for River Bend Station. The Phase 3 analysis determined the Delta-CDF was 4.68E-7/yr. For a 7-month exposure, the incremental conditional core damage probability is 2.73E-7. The majority of the risk came from sequences involving a loss of feedwater (48 percent) and a loss of offsite power (33 percent). Consequently, the analyst determined that the risk associated with the performance deficiency was very low (green). The inspectors determined the apparent cause of this finding was the failure to perform a post maintenance test to identify that the

high output limit was not properly set by the maintenance work instruction. Therefore, this finding has cross-cutting aspect in the area of human performance associated with the resources component due to less than adequate work package testing instruction. [H.2(c)].

Inspection Report# : [2012002](#) (*pdf*)

**Significance:**  Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Standby Service Water Pump Motor Lubrication Deficiencies**

The inspectors identified a Green non-cited violation of Technical Specification 5.4.1.a, because the station did not establish appropriate maintenance procedures to lubricate standby service water pump lower motor bearings. Specifically, the inspectors found a legacy of improper maintenance practices involving lubrication of the standby service water pump motor lower bearings going back to 1986. This included mixing of incompatible greases without change evaluations, lubrication techniques that did not comply with pump motor vendor manual or EPRI guidance, improper volume of greases added to the bearings, and improper preventive maintenance frequency for performing re-greasing of the bearings. The licensee entered this issue into the licensee's corrective action program as Condition Report CR-RBS-2011-08367.

This performance deficiency is more-than-minor and is therefore a finding because if left uncorrected, this performance deficiency has the potential to lead to a more significant safety concern. Specifically, if the subject work orders are not corrected, future work activities that grease the subject bearings in accordance with those work orders may not grease the bearings adequately, which may result in common-cause failures of the station service water pumps. Because this finding was identified while the unit was operating, the inspectors used MC 0609 Appendix A to assess its risk significance. In accordance with that Appendix, the finding screened as green (of very low safety significance) because it was not a design or qualification deficiency; it did not represent a loss of system safety function; and it did not screen as potentially risk-significant due to seismic, flooding, or severe weather initiating events. The inspectors determined that the apparent cause of this finding was failure to include the appropriate scope of information in the work instructions due to overconfidence and lack of adequate review by engineering staff. Specifically, the system engineer who developed the revised instructions failed to develop appropriate steps with adequate detail to appropriately perform the task and the field engineer failed to stop work and discuss the issue with the system engineer that developed the work instructions. Therefore, the finding has a crosscutting aspect in the area of human performance associated with work practices, because engineering personnel failed to use the applicable human error prevention techniques [H.4(a)].

Inspection Report# : [2011005](#) (*pdf*)

**Significance:**  Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Adequately Monitor the Performance of the Control Building Chiller System**

The inspectors identified a Green non-cited violation of 10 CFR 50.65(a)(2) involving the failure to adequately monitor the performance of the control building chilled water system. Specifically, the inspectors determined that the station had failed to track system unavailability following the system's classification of a high risk system and did not monitor the system at the train level, ultimately masking the performance of individual trains. The licensee entered this issue into the licensee's corrective action program as Condition Report CR-RBS-2011-07332.

The finding was more than minor since violations of 10 CFR 50.65(a)(2) necessarily involve degraded system performance which, if left uncorrected, could become a more significant safety concern. This finding has very low safety significance because the finding did not lead to an actual loss of safety function of the system or cause a component to be inoperable, nor did it screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined the cause of the finding was the lack of management oversight. Following the issuance of River Bend Station Probabilistic Risk Assessment interim Revision 4a, several personnel functioned as the maintenance rule coordinator and control building chilled water system engineer. During this period, station management did not ensure sufficient knowledge transfer for effective maintenance rule implementation. Therefore, this finding has a cross-cutting aspect in the human performance area associated with the resources component because the licensee failed to ensure supervisory and management oversight of work activities such that



**Significance:**  Oct 27, 2011  
Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Testing of Division I and Division III Standby Diesel Generators**

The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” which states, in part, “A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.” Specifically, prior to October 27, 2011, the licensee failed to ensure surveillance testing procedures of Division I and III standby diesel generators incorporated the correct acceptance limits for maximum expected load at max frequency and voltage specified in design basis documents. This finding was entered into the licensee’s corrective action program as Condition Reports CR-RBS-2011-07132, CR-RBS-2011-07294, and CR-RBS-2011-07518.

The team determined that the failure to ensure that the test procedures required to demonstrate that Division I and Division III standby diesel generators will perform satisfactorily in service incorporated the requirements and acceptance limits contained in applicable design documents was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of safety systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee could not ensure that the standby diesel generators would reliably provide power for the maximum expected post-accident loads including maximum frequency and voltage. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings,” the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. The finding had a crosscutting aspect in the area of problem identification and resolution, corrective action program component, because the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of condition [P.1(c)].

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Oct 27, 2011  
Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Use Conservative Design Assumptions in the Ultimate Heat Sink Inventory Calculation**

The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” which states, in part, “Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, prior to October 27, 2011, the licensee failed to assure that the design basis information for expected heat loads to the ultimate heat sink was correctly translated into the ultimate heat sink 30-day inventory analysis. The analysis used a less conservative, frictionless form of the conservation of energy equation to determine heat load in the standby service water system during a 30-day design basis event. This finding was entered into the licensee’s corrective action program as Condition Reports CR-RBS-2011-07430 and CR-RBS-2011-07654.

The team determined that the failure to correctly translate expected heat loads into the ultimate heat sink inventory analysis was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring availability, reliability, and capability of systems needed to respond to undesired consequences. Specifically, the neglect of friction heat load in the ultimate heat sink analysis system resulted in a condition where there was reasonable doubt on the operability of a system to meet its 30-day mission time without a makeup water source. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings,” the finding was determined to have very low safety significance (Green) because it was

a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. Specifically, the licensee's revised analysis to determine operability removed overly conservative assumptions for operating the low pressure core spray pump for 30 days to account for the friction heat load added to the system. The finding has a crosscutting aspect in the area of problem identification and resolution, corrective action program component, because the licensee failed to thoroughly evaluate problems such that the resolutions address cause and extent of condition [P.1(c)].

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Establish Residual Heat Removal Heat Exchanger Testing Frequency**

The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Specifically, from October 1998 to October 27, 2011, the licensee failed to establish a NRC Generic Letter 89-13 test program which incorporated a final test frequency for the residual heat removal heat exchangers and perform an adequate trending analysis upon which to base a final test frequency. This finding was entered into the licensee's corrective action program as Condition Report CR-RBS-2011-07713.

The team determined that failure to establish a NRC Generic Letter 89-13 test program which incorporated a final testing frequency of the residual heat removal heat exchangers was a performance deficiency. The finding was more than minor because it was associated with the equipment performance 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, the inappropriate test frequency affected the licensee's ability to ensure residual heat removal heat exchangers, when called upon, were available and capable to reliably perform as expected. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determine to have very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding did not have a crosscutting aspect because the most significance contributor did not reflect current licensee performance.

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Procedures for Monitoring Standby Service Water System Leakage**

The team identified a Green, noncited violation of 10 CFR 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," which states, in part, "Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Specifically, prior to October 27, 2011, the licensee failed to provide appropriate quantitative or qualitative acceptance criteria in station and abnormal operating procedures to determine if actions for leak detection were satisfactorily accomplished to protect the standby service water system and ultimate heat sink during design basis events. This finding was entered into the licensee's corrective action program as Condition Report CR-RBS-2011-07555.

The team determined that the failure to include appropriate acceptance criteria for leak detection in abnormal operating procedures for the standby service water system and ultimate heat sink was a performance deficiency. The finding was more than minor because it was 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, the inadequate

procedure guidance could lead to operators not recognizing conditions that would degrade the availability of the standby service water system. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.  
Inspection Report# : [2011008](#) (pdf)

**Significance:** SL-IV Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Obtain NRC Approval for Change to Ultimate Heat Sink Inventory Requirements**

The team identified a Severity Level IV, noncited violation of 10 CFR 50.59, "Changes, Tests and Experiments" which states, in part, that "a licensee shall obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change, test, or experiment if this activity would; result in more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC important to safety previously evaluated in the final safety analysis report (as updated)." Specifically, from December 16, 2002, to October 27, 2011, the licensee changed the design basis of the ultimate heat sink inventory requirements to provide a 30-day cooling water supply without makeup capability to providing a less than 30-day cooling water supply with makeup capability without obtaining a license amendment. This finding was entered into the licensee's corrective action program as Condition Report CR 2011-07674.

The team determined that the failure to obtain a license amendment prior to implementing a proposed change, test or experiment to the ultimate heat sink requirements was a performance deficiency. The performance deficiency was evaluated using traditional enforcement because the finding has the ability to impact the regulatory process. The finding was more than minor because it involved a change to the updated final safety analysis report description where there was a reasonable likelihood that the change would require NRC approval. In accordance with the NRC Enforcement Policy, the team used insights from MC 0609, "Significance Determination Process," to determine the final significance of the finding. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding represented a loss of system safety function in that the ultimate heat sink could not meet its 30-day mission time to provide decay heat removal. Therefore, a Phase 2 evaluation was necessary. The significance of the finding could not be assessed quantitatively through a Phase 2 or Phase 3 analysis. Consequently, an assessment was performed in accordance with IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." The finding was determined to have very low safety significance because the frequency of events that would require long term use of the ultimate heat sink is very low and the difference in the failure probability to replenish the ultimate heat sink in 10 days versus 30 days is very small. This was because an early depletion of the inventory would be easily detected and would become a priority. At the time that replenishment would be needed, plant conditions should be stable and local transportation arteries should be restored. Therefore, since the finding had very low safety significance, the finding was determined to be Severity Level IV, in accordance with the NRC Enforcement Policy. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Abnormal Procedure for Reducing Loads on Standby Diesel Generators**

The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "Instructions, procedures, and drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Specifically, prior to October 27, 2011, the licensee failed to include appropriate qualitative and quantitative acceptance criteria in abnormal operating procedures for control room operators to recognize the need to reduce loads on the standby diesel generators during design basis accidents. This finding was entered into the licensee's corrective action program as Condition Report CR-RBS-2011-07716.

The team determined that the failure to include appropriate quantitative or qualitative acceptance criteria in abnormal operating procedures for control room operators to recognize the need to reduce loads on the standby diesel generators during design basis accidents was a performance deficiency. The finding was more than minor because it was associated with the procedure quality 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 undesired consequences. Specifically, a control room operating crew's failure to recognize the need to reduce loads to prevent the standby diesel generator failure during design basis accidents adversely affected the reliability of the standby diesel generators. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of human performance, resources component, because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety for the correct training of licensed operator personnel [H.2(b)].

Inspection Report# : [2011008](#) (*pdf*)

**Significance:**  Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Emergency and Abnormal Procedures for Standby Diesel Generator Fail to Load Sequences**

The team identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "Instructions, procedures, and drawings shall include appropriate qualitative and quantitative criteria for determining that important activities have been satisfactorily accomplished." Specifically, prior to October 27, 2011, the licensee failed to include appropriate quantitative or qualitative acceptance criteria in procedures for control room operators to recognize and recover a standby diesel generator that starts but fails to load with the remaining standby diesel generator out of service during a loss-of-offsite-power event. This finding was entered into the licensee's corrective action program as Condition Reports CR-RBS-2011-07716, CR-RBS-2011-07717, and CR-RBS-2011-07718.

The team determined that the failure to include appropriate quantitative or qualitative acceptance criteria to determine that important activities are satisfactorily accomplished in emergency and abnormal operating procedures used during loss-of-offsite-power events was a performance deficiency. The finding was more than minor because it is associated with the procedure quality 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 undesired consequences. Specifically, a control room operator crew's failure to diagnose recoverable conditions adversely affected the availability of standby diesel generators during a loss-of-offsite-power event. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in a loss of operability or functionality, loss of a system safety function, loss of a single train for greater than technical specification allowed outage time, loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of problem identification and resolution, operating experience component, because the licensee did not implement and institutionalize operating experience through changes to station processes, procedures, equipment, and training programs [P.2(b)].

Inspection Report# : [2011008](#) (*pdf*)

**Significance:**  Oct 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Simulator Fidelity for Emergency Diesel Generator Loading**

The team identified a Green, noncited violation of 10 CFR 55.46(c)(1), "Simulation Facilities," which states, in part,



that “a plant-referenced simulator used for the administration of the operating test must demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond.” Specifically, prior to October 27, 2011, the River Bend Station simulator did not demonstrate the expected plant response for standby diesel generator loading during accident conditions to which the simulator was designed to respond. The electrical loading on the emergency diesel generator in the simulator was approximately 800 kW less than the expected full load for the diesel generator. This finding was entered into the licensee’s corrective action program as Condition Report CR-RBS-2011-07682.

The team determined that the failure of the plant-referenced simulator to demonstrate expected plant response for standby diesel generator loading during accident conditions to which the simulator has been designed to respond was a performance deficiency. The finding was more than minor because it is associated with the human performance 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, the incorrect simulator response adversely affected the control room operator crew’s capability to assess standby diesel generator loading conditions. In accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets and the associated Appendix I, the finding was determined to be of very low safety significance (Green). Specifically, Manual Chapter 0609, Appendix I, “Operator Requalification Human Performance Significance Determination Process,” block 12, establishes a Green finding for failure to correctly replicate the plant’s response on the simulator that either has the potential to cause or actually causes negative training to operators. Negative training did occur for this finding because operators thought they had electrical load margin on the emergency diesel generators when the diesels were actually fully loaded with minimal margin without securing other equipment. This finding had a crosscutting aspect in the area of human performance, resources component, in that the licensee did not ensure that equipment (plant-referenced simulator) was adequate to assure nuclear safety for the correct training of licensed operator personnel [H.2(b)].

Inspection Report# : [2011008](#) (*pdf*)

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: FIN Finding

#### **Failure to Track and Document Plant Equipment Oil Usage**

The inspectors identified a finding for the failure to properly document equipment oil additions in the oil lubrication accountability log per General Maintenance Procedure GMP-0015, “Lubrication Procedure.” To correct the programmatic deficiencies, the station revised General Maintenance Procedure GMP-0015 instructions to enhance and amplify the requirement to record all oil additions in the lubrication accountability log, revise preventative maintenance tasks that sample or change oil to explicitly state “record oil additions in the lubrication accountability log,” and to brief station personnel concerning changes to General Maintenance Procedure GMP-0015. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2011-02883.

The finding is more than minor because if left uncorrected the performance deficiency would have the potential to lead to a more significant safety concern. Using Inspection Manual Chapter 0609, “Significance Determination Process,” Phase 1 Worksheet, the finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency; did not represent either a loss of system safety function, an actual loss of safety function of a single train, or an actual loss of safety function; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the apparent cause of the performance deficiency was incomplete work package instructions that did not explicitly state to record oil additions in the lubrication accountability log per General Maintenance Procedure GMP-0015, thereby making equipment operability conclusions based on incomplete monitored trends suspect and potentially inaccurate. Consequently, this finding has a cross-cutting aspect in the human performance area associated with the resources component because the station’s work packages lacked the necessary instructions to adequately control the lubrication monitoring program [H.2(c)].

Inspection Report# : [2011003](#) (*pdf*)

**Significance:**  May 12, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

## **Failure to Take Corrective Action for Service-Induced Failures of Gould J-series Relays**

The inspectors reviewed a self-revealing green noncited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," for the licensee's failure to take corrective action to address service-induced failures of Gould J series relays. In response, the licensee initiated condition report CR RBS 2010 06032 to ensure that appropriate levels of preventive maintenance are performed on high-critical components.

The performance deficiency was the licensee's failure to take adequate corrective actions to address service-induced failures of the high-critical, high-duty-cycle Gould J series relay designated as EHS MCC16B6D 33X1. This performance deficiency was determined to be more than minor and was therefore a finding because it impacted the Mitigating Systems Cornerstone attribute of equipment performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding had very low safety significance because the finding was not a design or qualification deficiency confirmed not to result in a loss of operability, did not represent a loss of system safety function, 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. Because the apparent cause of this finding was the licensee's misclassification of the failed relay within the preventive maintenance optimization program in 2008, and because the licensee's performance in that program was not reflective of current licensee performance, no cross-cutting aspect was assigned to this finding.

Inspection Report# : [2011006](#) (*pdf*)

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## **Barrier Integrity**

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Inadequate Maintenance Instructions used for Suppression Pool Cooling Isolation Valve Maintenance**

The inspectors identified a Green, self-revealing non-cited violation of Technical Specification 5.4.1.a, "Procedures," for inadequate maintenance procedures to properly assemble containment isolation valves on the suppression pool cooling system. This resulted in a failure of the suppression pool cooling system's outboard containment isolation valve marriage coupling that ensures the valve stem is connected to the valve actuator. This issue has been entered into the licensee's corrective action program as Condition Reports CR-RBS-2011-09171.

The failure to establish adequate work instructions to assemble the suppression pool cleanup system isolation valves is a performance deficiency. The inspectors determined that the finding was more than minor because it is associated with the Barrier Integrity Cornerstone attribute of Systems, Structures, and Components and Barrier Performance, and affected the cornerstone objective of providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding using IMC 0609, Appendix A, Attachment 1, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Using the Phase 1 SDP worksheet for the barrier integrity cornerstone, the inspectors answered "no" to all four screening questions under the containment barrier column. Specifically, the affected penetration did not represent an actual open pathway in the physical integrity of reactor containment due to an operable and functionally redundant containment isolation valve in the suppression pool cooling piping penetration. The apparent cause of the finding was the failure of the planning department to recognize and develop design documentation to identify the set screw size and starting material necessary to determine the appropriate set screw torque for work affecting safety related equipment. The inspectors determined the finding had a cross cutting aspect in the human performance, area associated with the resources component because of the lack of complete accurate and up to date design documentation associated with the work package development. [H.2(c)].

Inspection Report# : [2012002](#) (*pdf*)

**Significance:**  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Standby Gas Treatment Electric Heater Power Output Calculation**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III “Design Control,” for an inadequate calculation methodology used in determining standby gas treatment system operability. The inspectors found that the calculation neither considered instrument uncertainty nor applied a proper voltage drop from the breaker to the standby gas treatment system filter train heater. The licensee entered this issue into the licensee’s corrective action program as Condition Report CR-RBS-2011-07332.

The finding was more than minor because it was associated with the design control attribute of the Barrier Integrity Cornerstone to maintain radiological barrier functionality of standby gas treatment trains, and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, operating the standby gas system filter train heaters without sufficient output power is detrimental to the charcoal filters ability to retain radioactive iodine. This could result in a greater amount of radiation release to the environment in the event of an accident. In accordance with Inspection manual Chapter 0609, Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations,” the Phase 1 significance determination process screening determined the finding to be only of very low safety significance (Green) because the finding only represented a degradation of the radiological barrier function provided for the standby gas treatment system. The apparent cause of this finding was the decision to develop an engineering evaluation that did not include instrument uncertainty and did not validate the correct voltage drop between the filter train heater feeder breaker and the heater elements. The finding has a crosscutting aspect in the area of human performance associated with the decision-making component because station personnel failed to use conservative assumptions when developing the modified output power methodology for operation of the standby gas treatment system filter heaters with only 8 of 9 heater elements installed [H.1(b)].

Inspection Report# : [2011004](#) (pdf)

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## Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Perform a Radiation Survey**

Inspectors reviewed a self-revealing non-cited violation of 10 CFR 20.1501(a) for the failure to perform a radiation survey. A survey was not completed after two contaminated valves were transferred from the 98-foot elevation of the main steam tunnel to the radwaste area. During shift turnovers, workers responsible for transferring the valves did not understand that they needed to remove two buckets, and perform a survey after completing the valve transfer.

Consequently, a bucket with highly contaminated water and residual was left in the tunnel causing radiation levels as high as 300 millirem per hour. This resulted in an unposted high radiation area. The licensee entered the issue into the corrective actions program as Condition Report CR-RBS-2011-01552.

The failure to perform a radiation survey to evaluate the radiological conditions is a performance deficiency. The finding is more than minor because it negatively impacted the Occupational Radiation Safety cornerstone’s attribute of program and process, in that the lack of a post-work survey did not ensure exposure control for workers. Using NRC Manual Chapter 0609, Appendix C, “Occupational Radiation Safety Significance Determination Process,” the finding was determined to be of very low safety significance because: (1) it was not associated with ALARA planning or work controls, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and the ability to assess dose was not compromised. The finding has a Human Performance cross-cutting component associated with the aspect of work practices because expectations regarding procedural compliance for post-job radiation surveys were ineffective [H.4(b)].

Inspection Report# : [2012002](#) (pdf)

**Significance:**  Mar 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Control Access to a High Radiation Area**

Inspectors reviewed a self-revealing non-cited violation of Technical Specification 5.7.1(c), resulting from the licensee's failure to control access to a high radiation area. Specifically, a carpenter entered a high radiation area in the main steam tunnel near valve V112 without proper authorization before a health physics technician completed radiation surveys and received an unexpected alarming dosimeter reading of 110 millirem per hour. The carpenter had not been briefed that dose rates in the area measured 140 millirem per hour. He had been instructed not to perform any work before the health physics technician surveyed the area, but River Bend did not make it clear enough that he was to follow all health physics instructions. The licensee entered the issue into the corrective actions program as Condition Report CR-RBS-2011-01426 and the worker was counseled.

The failure to control access to a high radiation area was a performance deficiency. The finding was more than minor because it was associated with the occupational radiation safety attribute of exposure control and affected the cornerstone objective in that not controlling a high radiation area could increase personal exposure. In addition, this type of issue is addressed in Example 6.h of IMC 0612, Appendix E, "Examples of Minor Issues." Using NRC Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined that the finding was of very low safety significance because it did not involve: (1) an as low as is reasonably achievable finding, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. The finding has a Human Performance cross-cutting component associated with the aspect of work practices because expectations regarding supervisory and management oversight of work activities, including contractors to ensure that safety is supported were not met [H.4(c)].

Inspection Report# : [2012002](#) (*pdf*)

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## Public Radiation Safety

**Significance:**  Mar 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Adequately Monitor the Performance of the Digital Radiation Monitoring System**

The inspectors identified a non-cited violation of 10 CFR 50.65(a)(2) involving the failure to adequately monitor the performance of the digital radiation monitoring system. Specifically, the maintenance rule expert panel performed an inadequate analysis after the digital radiation monitoring system exceeded the condition monitoring criteria by failing to follow the procedural requirements of EN-DC-206 to have cause evaluations for system failures so that maintenance preventability could be properly evaluated. This issue has been entered into the licensee's corrective action program as Condition Reports CR-RBS-2011-00485.

The inspectors determined that the failure to adequately monitor the performance of the digital radiation monitoring system is a performance deficiency. The inspectors reviewed Inspection Manual Chapter (IMC) 0612 and determined that the finding is more than minor because the finding is associated with the plant facilities/equipment and instrumentation attribute (reliability of process radiation monitors) of the radiation safety cornerstone (public radiation safety) and adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian use. The finding was assessed using the IMC 0609, Appendix D, Public Radiation SDP, and because there was no failure to implement the effluent program, the finding was determined to be of very low safety significance (Green). The inspectors reviewed the apparent cause of this finding and found that the oversight of the maintenance rule program was adversely affected by personnel changes and lack of effective turnover. Therefore, the finding has a cross-cutting aspect in the human performance area and resources component because the licensee failed to ensure that maintenance rule program personnel were trained and sufficiently qualified to perform their duties in an effective manner [H.2(b)].

Inspection Report# : [2012002](#) (*pdf*)

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# Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

**Significance:** N/A May 12, 2011

Identified By: NRC

Item Type: FIN Finding

### **River Bend Plant, 2011, Biennial PI&R Inspection Summary**

The team determined that the licensee's program for identifying, prioritizing, and correcting conditions adverse to quality was effective. With few exceptions, the licensee identified conditions adverse to quality at a low threshold, properly classified and evaluated those conditions, and developed appropriate corrective actions.

The licensee appropriately evaluated industry operating experience for relevance to the facility and had entered applicable items in the corrective action program. The licensee used industry operating experience when performing root cause and apparent cause evaluations. In addition, the licensee performed effective quality assurance audits and self-assessments.

The team determined that the licensee had a healthy safety-conscious work environment in that workers felt free to raise safety concerns without fear of retaliation using all avenues available.

Inspection Report# : [2011006](#) (*pdf*)

Last modified : May 29, 2012