

# River Bend 1

## 1Q/2006 Plant Inspection Findings

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### Initiating Events

**G****Significance:** Dec 31, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to complete TS required actions within allowed completion time**

The NRC identified a noncited violation of Technical Specification 3.4.1.A for the licensee's failure to shut down one reactor recirculation loop within 2 hours of determining that jet pump loop flow mismatch was greater than 5 percent while operating at greater than 70 percent of rated core flow. On October 31, 2005, the Reactor Recirculation Flow Control Valve B hydraulic power unit tripped because of a blown control power fuse, causing Flow Control Valve B to drift open. Operators throttled closed Flow Control Valve A to maintain reactor power at 100 percent, resulting in a jet pump loop flow mismatch of approximately 8.2 percent. The flow mismatch existed for 4.5 hours. The licensee entered this into their corrective action program as Condition Report CR-RBS-2006-00274.

The finding was more than minor because, if left uncorrected, it would become a more significant safety concern. Matched recirculation loop flows is an assumption used in the accident analysis for a loss of coolant accident resulting from a loop break. A flow mismatch could result in core response that is more severe than assumed in the accident analysis. The significance of this finding could not be evaluated using MC 0609, "Significance Determination Process." Based on management review, the finding was determined to be of very low safety significance based on the short duration of the flow mismatch, 4.5 hours, and the low likelihood of a loss of coolant accident during that time. The cause of this finding is related to the crosscutting element of human performance in that operators failed to implement Technical Specification requirements. Inspection Report# : [2005005\(pdf\)](#)

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### Mitigating Systems

**G****Significance:** Mar 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Installation of Incorrect Relief Valve Caused Leak in Standby Service Water System**

A self-revealing noncited violation of Technical Specifications Section 5.4.1.a. was identified for the failure of procurement engineers to specify the correct replacement relief valve in a repetitive maintenance task to periodically replace thermal relief valves in the standby service water system. As a result, an incorrect valve was installed in the system which, following a system pressure transient, failed to reseal, creating a 10 gpm leak from the system. The valve was replaced and the issue was entered into the licensee's corrective action program as CR-RBS-2006-1054.

The finding is more than minor because it would become more significant if left uncorrected in that additional makeup to the standby service water system would be required during a sustained loss of off-site power. The finding affected the mitigating system cornerstone. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to have very low safety significance because it did not result in the loss of the standby service water system safety function. The cause of the finding is related to the crosscutting element of problem identification and resolution because the problem which led to the installation of the incorrect valve had been previously identified and corrective actions were not effective in preventing recurrence. Inspection Report# : [2006002\(pdf\)](#)

**G****Significance:** Mar 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate maintenance results in a drywell steam leak from Low Pressure Coolant Injection Train A Testable Check Valve**

A self-revealing noncited violation of Technical Specification Section 5.4.1.a. was identified for the failure of mechanical maintenance technicians to correctly reassemble Low Pressure Coolant Injection Testable Check Valve E12-AOVF041A during Refueling Outage 12. As a result, a steam leak from a valve flange caused a rise in drywell unidentified leakage. The issue was entered into the licensee's corrective action program as CR-RBS-2006-00546 and the valve was repaired.

The finding is more than minor because it would have become a more significant safety concern if left uncorrected. The leakage would have continued to increase during the cycle, and it would have continued to have an adverse affect on indicated reactor vessel level. Using the

Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to have very low safety significance because it did not result in a loss of the low pressure coolant injection system safety function and was not potentially risk significant due to seismic, flooding, or severe weather related initiating events. The finding had crosscutting aspects associated with human performance in that maintenance technicians incorrectly reassembled the valve during refueling outage 12.

Inspection Report# : [2006002\(pdf\)](#)

**Significance:**  Mar 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Inadvertent Initiation of High Pressure Core Spray Caused by the Use of the Wrong Test Plug During Surveillance Testing**

A self-revealing noncited violation of Technical Specifications Section 5.4.1.a. was identified for the failure to provide adequate procedural guidance for the use of a test plug during the performance of a required surveillance test procedure. The use of the wrong test plug caused an initiation of the high pressure core spray system and injection into the vessel. The issue was entered in the licensee's corrective action program as CR-RBS-2006-00283.

The finding is more than minor because it is associated with the mitigating system cornerstone attribute of equipment performance and the cornerstone objective to ensure the availability and reliability of high pressure core spray, a system that responds to initiating events to prevent undesirable consequences. The Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," were used to conclude that a Phase 2 analysis was required because there was an actual loss of system safety function. Based on the results of the Phase 2 analysis, the finding was determined to have very low safety significance. The cause of the finding is related to the crosscutting element of human performance because the technicians did not verify that they were using the correct test plug for the surveillance test being performed.

Inspection Report# : [2006002\(pdf\)](#)

**Significance:**  Jan 19, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Unacceptable Preconditioning of a Safety-related Valve Prior to Surveillance Testing**

The team identified a non-cited violation of Technical Specification 5.4.1.a (Procedures) for unacceptable preconditioning of a low pressure core spray keepfill system check valve. The test procedure failed to prescribe testing the check valve in the as-found condition. Instead (during testing of the system pump) the document directed operators to flush the valve at 27 gpm for up to 20 minutes prior to the check valve test. Corrosion buildup in the valve, which had previously caused valve failures, was a known concern and the preconditioning could have masked performance problems. Failure of the valve to perform its safety function puts the low pressure core spray system at risk of water hammer during a loss of offsite power event. The licensee planned to test the valve in the as-found configuration during future tests. The licensee documented this issue in their corrective action program as CR-RBS-2005-04123.

The failure to properly test the subject check valve was a performance deficiency. The finding was more than minor because, if left uncorrected, the problem could result in a more significant safety concern. Specifically, the surveillance test may not identify valve failure. The finding was of very low risk significance because it was not a design/qualification issue, did not represent a loss of system safety function, did not result in a loss of function of a single train for greater than its technical specification allowable outage time, did not result in a loss of function of non safety-related risk significant equipment and was not risk significant due to external events. The finding had problem identification and resolution cross-cutting aspects because the licensee had failed to properly evaluate the issue as preconditioning in response to readily available industry information.

Inspection Report# : [2005008\(pdf\)](#)

**Significance:**  Jan 19, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Untimely Replacement of a Valve to Correct a Significant Condition Adverse to Quality**

The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI (Corrective Actions) for the failure to take prompt corrective measures to address a significant condition adverse to quality. Specifically, the low pressure core spray keepfill pump discharge check valve failed on two occasions (significant conditions adverse to quality) and planned corrective measures to replace the check valve were not timely. The check valve failures put the low pressure core spray system at increased water hammer risk during a loss of offsite power event. The licensee had identified that corrosion buildup was causing the valve to leak excessively when closed. The licensee documented this issue in their corrective action program as CR-RBS-2005-04162 and planned to replace the valve at the next available opportunity.

The failure to take prompt corrective measures to address a significant condition adverse to quality was a performance deficiency. The finding was greater than minor because it was an equipment performance reliability issue which impacted the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was of very low risk significance because it was not a design/qualification issue, did not represent a loss of system safety function, did not result in a loss of function of a single train for greater than its technical specification allowable outage time, did not result in a loss of function of non safety-related risk significant equipment and was not risk significant due to external events. The finding had cross-cutting aspects in the area of problem identification and resolution.

Inspection Report# : [2005008\(pdf\)](#)

**G****Significance:** Jan 19, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Set MOV Limit Switches in Accordance with Design Documentation**

The team identified a 10 CFR 50, Appendix B, Criterion V (procedures) non-cited violation for the failure to set safety-related limit switches in accordance documents appropriate to the circumstances for 34 safety-related throttle valves. The licensee set motor-operated valve (MOV) open indication light limit switches so that the open indication de-energized between the 95% and 100% closed positions, whereas the applicable procedure and design drawing required that the limit switches be set to the 100% closed position. This practice had caused repetitive operational problems in the plant. The licensee entered this issue into their corrective action program as CR-RBS-2005-04113.

The failure to adjust MOV limit switches in accordance with documents appropriate to the circumstances was a performance deficiency. The issue was more than minor because it affected the mitigating systems cornerstone objective, in that it affected the operability, availability, reliability or function of a system or train in a mitigating system. The finding was of very low safety significance because it was a design/qualification deficiency confirmed not to result in loss of operability per "Part 9900, Technical Guidance, Operability Determination Process for Operability and Functional Assessment." This finding had cross-cutting aspects in the areas of human performance, (the failure to follow procedures) and problem identification and resolution because the licensee failed to identify the problem in response to a prior related NRC violation.

Inspection Report# : [2005008\(pdf\)](#)**G****Significance:** Dec 31, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate design assumption results in RCIC turbine exhaust header filling with water following an automatic high water level shutdown**

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified for the licensee's failure to address the worst case conditions in the sizing calculation for the reactor core isolation cooling turbine exhaust line vacuum breaker system as part of a plant modification to remove the internals of the reactor core isolation cooling turbine exhaust line check valve. As a result, on December 10, 2004, when the reactor core isolation cooling system was started and subsequently shutdown on high reactor water level following a scram and loss of feedwater, the turbine exhaust line filled with water from the suppression pool, causing the operators to consider the system unavailable and complicating their response to the event. The licensee entered this finding into their corrective action program as CR-RBS-2005-00724 and reinstalled the turbine exhaust line check valve internals in February 2005.

The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Design Control and affected the cornerstone objective to ensure the availability and reliability of the reactor core isolation cooling system, a system that responds to initiating events (loss of feedwater and station blackout), to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because it represented a design deficiency that did not result in a loss of system function.

Inspection Report# : [2005005\(pdf\)](#)**G****Significance:** Sep 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Implement Corrective Actions in Response to a 10 CFR Part 21 Report**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI for failure to implement corrective actions in response to a 10 CFR Part 21 Report. The corrective actions involved performing vendor-recommended magnetic particle inspections of emergency diesel generator cylinder liners to look for cracks. During a records review in August 2005, the inspectors identified that in April 1999, two cylinder liners from the Division I emergency diesel generator were replaced but the required magnetic particle testing inspections were not performed.

This finding was more than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of emergency power to respond to initiating events to prevent undesirable consequences. Since the finding did not represent an actual loss of safety function for either of the emergency diesel generators, the finding was determined to be of very low safety significance using Phase 1 of the Significant Determination Process. This finding had crosscutting aspects associated with problem identification and resolution. The licensee entered this finding into their corrective action program as CR-RBS-2005-03400.

Inspection Report# : [2005004\(pdf\)](#)**G****Significance:** Sep 30, 2005

Identified By: NRC

Item Type: FIN Finding

**Failure to Troubleshoot a Starting System Failure Caused Station Blackout Diesel Generator to Be Unavailable for 24 Hours Longer than Necessary**

The inspectors identified a finding associated with the licensee's failure to perform adequate troubleshooting of a problem with the station

blackout diesel generator that resulted in the diesel generator being out of service for 24 hours longer than necessary. Licensee personnel focused on the suspected cause, the engine starter, and did not perform comprehensive troubleshooting to identify the actual cause of the failure.

The finding was more than minor because it was associated with the mitigating system cornerstone attribute for equipment performance and the cornerstone objective to ensure the availability of a system that responds to initiating events to prevent undesirable consequences. During Phase 2 of the significance determination process for at power situations, the finding screened as having very low safety significance (Green), because the station blackout diesel generator was unavailable for less than three days and the other diesel generators were available. The finding had crosscutting aspects associated with problem identification and resolution based on the fact that licensee personnel failed to properly assess the starting system failure. This finding is entered in the licensee's corrective action program as CR-RBS- 2005-02897.

Inspection Report# : [2005004\(pdf\)](#)

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**Significance:** Sep 30, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Completely Close a Residual Heat Removal System Valve Resulted in Pumping Suppression Pool Water to Containment Upper Pool**

A self-revealing noncited violation of Technical Specification 5.4.1.a. was identified for a failure to follow procedures. During motor-operated valve stroke time testing of Residual Heat Removal to Upper Pool Fuel Pool Cooling Assist Valve E12-MOVF037A, an operator failed to follow procedures by not completely closing Valve E12-F037A. As a result, when Residual Heat Removal System A was later operated in suppression pool cooling mode, approximately 5,000 gallons of suppression pool level was pumped to the containment upper pool. The licensee took immediate corrective action to identify and close all motor-operated throttle valves and issued a standing order to ensure all motor-operated throttle valves were completely closed when operated from the main control room.

The finding was more than minor because, if left uncorrected, the failure to completely close motor-operated throttle valves could become a more significant safety concern. Using the significance determination process, the inspectors determined that the finding was of very low safety significance (Green) because it was not a design or qualification issue and it did not represent an actual loss of safety function of either residual heat removal System A or the suppression pool. The inspectors determined that this finding had human performance and problem identification and resolution crosscutting aspects. The failure to completely close Valve E12-F037A was a human performance error caused by a lack of understanding of the operation of motor-operated throttle valves and inadequate guidance in the test procedure. The inspectors also determined that a similar event involving the same valve occurred during the last refueling outage, and the licensee failed to identify and correct the underlying cause of the performance deficiency. Because this failure to comply with TS 5.4.1.a. was of very low safety significance and was entered in the licensee's corrective action program as CR-RBS-2005-02772, the inspectors determined that it was a noncited violation in accordance with Section VI. A of the NRC Enforcement Policy.

Inspection Report# : [2005004\(pdf\)](#)

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**Significance:** Jun 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to inspect portable fire extinguishers within the required frequency**

The inspectors identified a Green noncited violation of Attachment 4 to Facility Operating License NPF-47 for failure to inspect portable fire extinguishers within the required frequency. The inspectors identified a total of 24 portable fire extinguishers that had not received an inspection during the month of April 2005. The inspectors found 28 condition reports in the licensee's corrective action program documenting missed inspections of portable fire extinguishers during the period from January 2000 through April 2005. Two of these condition reports were based on NRC-identified missed inspections of portable fire extinguishers in January and September of 2004.

The inspectors determined that this NRC-identified finding was more than minor because it was associated with the mitigating systems cornerstone attribute to protect against external factors, like fire, and because the finding affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." The inspectors determined that the degradation rating was "low" because the fire extinguishers were expected to display nearly the same level of effectiveness and reliability as they would have had the fire extinguishers been inspected during the month of April 2005. Because this finding was assigned a low degradation rating, it was screened as having very low risk significance (Green). This finding also had crosscutting aspects associated with problem identification and resolution since the inspectors found 28 condition reports in the licensee's corrective action program documenting missed inspections of portable fire extinguishers during the period from January 2000 through April 2005. Because this Green finding was documented in the licensee's corrective action program as CR-RBS-2005-01726, this violation is being treated as a noncited violation, consistent with Section VI. A of the NRC Enforcement Policy.

Inspection Report# : [2005003\(pdf\)](#)

**G****Significance:** Jan 19, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain MCPR within Operating Limits**

The team identified two examples of a Technical Specification 3.2.2, "Minimum Critical Power Ratio" (MCPR), non-cited violation for the failure to prevent transition boiling on the fuel during Operational Cycles 8 and 11. Fuel failures due to transition boiling were experienced during each cycle. Engineers failed to properly understand the affect of zinc injection on the cladding surfaces following the Cycle 8 fuel pin failures and zinc injection was reinitiated before the corrective actions to prevent recurrence were in place. The licensee had industry information that indicated that zinc injection contributed to the accumulation of loose crud and the formation of tenacious crud on the fuel. The additional crud rendered the Technical Specifications Minimum Critical Power Ratio (MCPR) calculations inaccurate and transition boiling occurred in localized areas. The licensee entered this issue into their corrective action program as CR-RBS-2006-0255.

The failure to prevent transition boiling in the core was a performance deficiency. The issue was more than minor because it impacted the barrier integrity cornerstone objective to maintain the integrity of the fuel cladding. The finding screened out as of very low safety significance (Green) because it only affected the fuel barrier. The issue had cross-cutting aspects in the areas of problem identification and resolution, in that the licensee failed to properly evaluate pertinent related industry information, which could have precluded the first violation, and failed to properly implement effective corrective measures in response to the first set of fuel failures, which led to the second violation.

Inspection Report# : [2005008\(pdf\)](#)

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## Emergency Preparedness

**G****Significance:** Dec 31, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate procedure for implementation of an EAL**

The NRC identified a noncited violation of 10 CFR Part 50, Appendix E, Section IV. B., as a result of inadequate procedures for the implementation of an emergency action level. The criteria in Procedure EIP-2-001, "Classification of Emergencies," Revision 12, for declaring an Alert emergency action level based on primary coolant leak rate, relied solely on a computer generated leakrate report that would not be valid under all conditions. The licensee entered this finding into their corrective action program as CR-RBS-2005-03078 and issued Standing Order 192, as an interim corrective action, to provide additional criteria to determine whether a primary coolant leak rate Alert emergency action level declaration was required.

The finding is more than minor because it is associated with the Emergency Preparedness Cornerstone attribute of procedural quality and affects the cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inadequate procedure could result in a failure to declare an Alert emergency classification when required. Using Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," this finding was determined to be of very low safety significance since it was a failure to comply with a regulatory requirement associated with a risk-significant planning standard that did not result in the loss or degradation of that risk-significant planning standard function.

Inspection Report# : [2005005\(pdf\)](#)

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Physical Protection

[Physical Protection](#) information not publicly available.

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## Miscellaneous

**Significance:** N/A Jan 19, 2006

Identified By: NRC

Item Type: FIN Finding

### **Problem Identification and Resolution Biannual Assessment**

The team reviewed approximately 225 condition reports, apparent and root cause analyses, as well as supporting documents to assess problem identification and resolution activities. In general, the corrective action program procedures and processes were effective, thresholds for identifying issues were low, and corrective actions were adequate to address conditions adverse to quality. Notwithstanding the above, poor engineering rigor associated with the prioritization and evaluation of issues resulted in a relatively high number of self-revealing and NRC identified findings. Some of these findings culminated in plant scrams and/or complicated operator response to emergency events. Others were related to equipment deficiencies, some of which resulted in inoperable safety-related equipment.

Based on the interviews conducted, the team concluded that a positive safety conscious work environment exists at River Bend Station. The team determined that employees felt free to raise safety concerns to station managers and supervisors, the employee concerns program, and the NRC. However, the team received a few isolated comments regarding the correction action program feedback process. These individuals had previously identified corrective action issues and were not satisfied with the program's responses to their concerns. Some of these individuals commented that they were hesitant to use the corrective action program in the future. The licensee acknowledged the comments and planned to take action to address the concerns. All the interviewees believed that potential safety issues were being addressed.

Inspection Report# : [2005008\(pdf\)](#)

**Significance:** N/A Sep 09, 2005

Identified By: NRC

Item Type: FIN Finding

### **Unplanned Scrams Exceed the Criteria for a White Performance Indicator**

The U.S. Nuclear Regulatory Commission performed this supplemental inspection to assess the licensee's evaluations associated with four unplanned reactor scrams that occurred between August 15, 2004 and January 15, 2005. The cumulative effect of these trips was that the Performance Indicator for unplanned scrams per 7000 critical hours crossed the threshold from Green (very low risk significance) to White (low to moderate risk significance) for the first quarter of calendar year 2005. The licensee performed individual root cause evaluations for all of the four reactor scrams. In addition to the individual trip evaluations, the licensee performed a common cause analysis to identify any performance and process issues that led to the White performance indicator. During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspector determined that for each scram, the licensee performed a comprehensive and thorough evaluation in which specific problems were identified, an adequate root cause evaluation was performed, and corrective actions were taken or planned to prevent recurrence.

Inspection Report# : [2005012\(pdf\)](#)

Last modified : May 25, 2006