

## River Bend 1

### 3Q/2005 Plant Inspection Findings

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## Initiating Events

**G****Significance:** Dec 31, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to revise a tagging boundary to support an emergent troubleshooting task resulted in a loss of protected division of offsite power and shutdown cooling**

The inspectors identified a green noncited violation of Technical Specification 5.4.1.a for failure to make a proper change to the tagging boundary around balance of plant Transformer RTX-XSR1F during Refueling Outage 12. This performance deficiency resulted in a trip signal, generated during troubleshooting the transformer sudden overpressure protection circuit, which caused the trip of switchyard Breakers OCB-20670 and OCB-20665. This resulted in the loss of offsite power to Division II engineered safety features Transformer RTX-XSR1D, causing a loss of shutdown cooling, a loss of alternate decay heat removal, containment isolations, and an automatic start of the Division II emergency diesel generator.

The inspectors determined that this human performance error was more than minor because it was associated with the initiating event cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. The inspectors evaluated the finding using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," and determined that the loss of offsite power to Division II engineered safety features switchgear was of very low safety significance because there was no increased likelihood of a loss of reactor coolant system inventory, there was no loss of reactor water level instrumentation, there was no degradation of the licensee's ability to terminate a leak path or add water to the reactor when needed, nor was there any degradation of the licensee's ability to recover decay heat removal once it was lost. Because this human performance error was of very low safety significance (Green) and was documented in the licensee's corrective action program as CR-RBS-2003-03456, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy, NUREG-1600.

Inspection Report# : [2004005\(pdf\)](#)**G****Significance:** Dec 31, 2004

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Human performance error causes a loss of offsite power to Division I ESF Switchgear and start of the Division I emergency diesel generator during Refueling Outage 12**

The inspectors identified a self-revealing noncited violation of Technical Specification 5.4.1.a. that was of very low safety significance (Green). As a result, during preparation for Division I integrated emergency core cooling systems testing, a technician inadvertently made contact with the wrong terminal on an undervoltage relay which tripped the preferred offsite power feeder breaker for the Division I safety-related 4160 Vac switchgear and started the Division I emergency diesel generator.

The inspectors determined that the inadvertent contact of the wrong terminal on Division I was a performance deficiency and a human performance error. Also, ineffective and incomplete corrective actions for similar errors contributed to the performance deficiency. The finding was more than minor because it was associated with the initiating events cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions, namely a partial loss of offsite power. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significant Determination Process," Attachment 1, Checklist 7, "BWR Refueling Operations with RCS Level greater than 23 feet." The finding was of very low safety significance (Green) because it did not cause a loss of shutdown cooling and did not compromise the ac power guidelines that: (1) one qualified circuit of offsite power remain operable; (2) at least one emergency diesel generator remain operable; and (3) necessary portions of the ac electrical power distribution systems remain operable.

The inspectors determined that this human performance error with problem identification and resolution aspects was the result of a violation of Technical Specification 5.4.1.a. which states, in part, that procedures shall be implemented and maintained as recommended in NUREG 1.33, Revision 2, Appendix A. Section 9.e. refers to general procedures for the control of maintenance activities. The licensee failed to evaluate the applicability of error reduction techniques, such as "taping of adjacent leads/contact points," for the installation of jumpers during Division I integrated emergency core cooling system testing, Procedure STP-309-0603, in accordance with Procedure ADM-0023, "Conduct of Maintenance," Revision 17A, Section 8.5. In addition, the licensee failed to install banana jacks on terminals on the back of the undervoltage relay in the Division I safety-related 4160 Vac switchgear, which were jumpered during the performance of Procedure STP-309-0603, in accordance with Procedure EDS-EE-001, "Banana Jack Standard," Revision 3. Because the finding was of very low safety significance and was entered into the licensee's corrective action program as Condition Report CR-RBS-2004-3518, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy, NUREG-1600.

Inspection Report# : [2004005\(pdf\)](#)

**G****Significance:** Dec 31, 2004

Identified By: NRC

Item Type: FIN Finding

**Automatic reactor scram during main turbine control valve testing due to control system malfunction**

The inspectors identified a finding based on the licensee's failure to adequately identify the root cause of the April 21, 2001, turbine trip and reactor scram so as to prevent recurrence. This failure resulted in a subsequent turbine trip and reactor scram on September 22, 2003.

The inspectors determined that the failure by the licensee to adequately identify the root cause of the April 21, 2001, event and to take effective corrective actions to prevent electrostatic arcing from affecting the primary and backup speed probes, was a performance deficiency. The inspectors determined that this performance deficiency led directly to the recurrence of the event on September 22, 2003. 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 the Phase 1 screening of the finding, the inspectors determined that the finding was of very low safety significance because it did not affect loss of coolant accident initiators, did not contribute to increasing the likelihood of both an initiating event and affect mitigating equipment, and did not increase the likelihood of a fire or flood. This finding had problem identification and resolution crosscutting aspects regarding ineffective root cause determinations (evaluation). It was entered into the licensee's corrective action program as Condition Report CR-RBS-2003-3203.

Inspection Report# : [2004005\(pdf\)](#)**G****Significance:** Dec 31, 2004

Identified By: Self-Revealing

Item Type: FIN Finding

**Failure to identify and properly evaluate deficient conditions related to switchyard breakers**

The inspectors identified a self-revealing finding of very low safety significance concerning the licensee's failure to identify a deficient condition due to preconditioned speed testing of station switchyard breakers and properly evaluate three similar failures of station switchyard breakers. As a result, three switchyard breakers opened slowly on August 15, 2004, and a transmission line ground fault that should have been isolated from the station switchyard remained connected to the main transformer long enough to cause a main generator lockout and reactor scram. Additionally, because slow breaker opening deenergized the north 230 kV bus, isolation of a coincident transmission line fault resulted in a loss of power to half of the balance of plant loads and the Division II engineered safety features switchboard.

This problem identification and resolution finding was more than minor because it was associated with the initiating events cornerstone objective to limit those events that upset plant stability and challenge a critical safety function during power operations. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Because the finding contributed to the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available, the finding required a Phase 2 analysis. The inspectors referred the results of the Phase 2 analysis to the regional senior reactor analyst for final determination of risk.

The senior reactor analyst performed a Phase 3 analysis of the event. The factors that contributed to the result of that analysis included: (1) the dominant sequence was a transient with a loss of power to a vital bus; (2) the consequences of the finding were bounded by a complete loss of offsite power; (3) the history of single slow switchyard breaker operation; (4) the design and layout of the station switchyard; and (4) the possibility of recovery from either a partial or complete loss of offsite power given the conditions that led to the events of August 15, 2004. The result was that the finding was of very low safety significance.

Inspection Report# : [2004005\(pdf\)](#)**G****Significance:** Oct 08, 2004

Identified By: Self-Revealing

Item Type: FIN Finding

**Failure to maintain circulating water cooling tower drift eliminators and to take timely corrective actions to address insulator arcing**

The inspectors documented a self-revealing finding for failure to adequately maintain the circulating water cooling tower drift eliminators which resulted in salt contamination of the insulators in the on-site transformer yard, and failure to take corrective actions when pre-established trigger points were reached regarding insulator arcing (corona). The resulting contamination and failure to clean the insulators caused ground faults on Reserve Station Service Line1 and main transformers, which resulted in the loss of the Division I off-site power and a reactor scram on October 1, 2004. This finding had crosscutting aspects related to problem identification and resolution in that corrective actions were not implemented in a timely manner to prevent a significant plant transient.

This finding is 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. A completed Phase 3 evaluation resulted in an incremental conditional core damage probability of 1.2E-7. Therefore, the significance of the finding was determined to be of very low safety significance.

Inspection Report# : [2004012\(pdf\)](#)

## Mitigating Systems

**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\(pdf\)](#)

**Significance:**  Dec 31, 2004

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Wide range reactor water level indication did not respond, as expected by operators, following an unplanned reactor scram**

A self-revealing, noncited violation of 10 CFR 55.46(c) was identified regarding differences between the simulator's and the plant's wide-range reactor water level digital indications during an unplanned reactor scram. This unexpected level indication resulted in indecision on the part of the operators during postscram recovery actions on December 10, 2004.

This finding is more than minor since deficiencies in the operator training program could become a more significant safety concern if left uncorrected. Based on the results of the significance determination process using Inspection Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process," this finding was determined to have very low safety significance, since it did not involve an exam or operating test but did involve a simulator fidelity issue which impacted operator actions during the response to an actual transient in the plant.

Inspection Report# : [2004005\(pdf\)](#)

**Significance:**  Dec 31, 2004

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Rainwater leaked from auxiliary building roof onto Division I auxiliary building 480 Vac ESF switchgear, causing loss of a safety-related auxiliary building area unit**

The inspectors identified a self-revealing noncited violation of 10 CFR Part 50 Appendix B, Criterion XVI, for the licensee's failure to take timely and effective corrective action to prevent recurrence of rainwater leakage from the auxiliary building roof onto auxiliary building 480 Vac safety-related Switchgear EJS-SWGR2A, causing a loss of auxiliary building area unit Cooler HVR-UC11A. Investigation into the source of water determined that rainwater was accumulating inside the auxiliary building fresh air intake structure on the roof and leaking through seals along the air inlet ductwork onto Switchgear EJS-SWGR2A. The inspectors determined that this was a repeat of a February 5, 2004, leak documented in River Bend Station Condition Report 2004-0346 and a problem identification and resolution Noncited Violation 05000458/2004002-02. This finding had crosscutting aspects related to ineffective corrective actions.

The inspectors determined that the licensee's failure to take timely and effective corrective action to stop rainwater leaks from the auxiliary building roof onto Switchgear EJS-SWGR2A was a performance deficiency that caused the loss of Cooler HVR-UC11A. The finding was more than minor because, if left uncorrected, rainwater leaks from the auxiliary building roof could lead to the loss of other Division I safety-related equipment and motor control centers powered by Switchgear EJS-SWGR2A. 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 results of the Phase 1 screening of the finding, the inspectors determined that the finding was of very low safety significance because the short-term loss of unit Cooler HVR-UC11A did not cause an actual loss of safety function of any train of Technical Specification risk significant equipment and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the failure to take timely and effective actions to prevent rainwater from leaking onto Switchgear EJS-SWGR2A was a violation of 10 CFR Part 50,

Appendix B, Criterion XVI, "Corrective Action." Because this finding was of very low safety significance and was entered into the licensee's corrective action program as CR-RBS-2004-4218, this violation is being treated as a noncited violation, consistent with Section IV.A of the NRC Enforcement Policy, NUREG-1600.

Inspection Report# : [2004005\(pdf\)](#)

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**Significance:** Oct 08, 2004

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to implement a required procedure for loss of main condenser vacuum/trip of circulating water pumps**

The inspectors identified a non-cited violation of Technical Specifications 5.4.1.a for the failure of the licensee to implement the Abnormal Operating Procedure AOP-0005, "Loss of Main Condenser Vacuum/Trip of Circulating Water Pump," following the loss of two of three operating circulating water pumps. Failure to implement this procedure contributed to the loss of condenser vacuum. This finding had cross-cutting aspects of human performance in that the operators did not implement the abnormal operating procedure as required. Additionally, this finding had cross-cutting aspects regarding problem identification and resolution in that a similar event had occurred over a month earlier, and no actions were taken to incorporate that operating experience into the operating procedures or process it through the corrective action program.

This finding is greater than minor because it is associated with human performance attribute of the mitigating system cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding actually led to the loss of main condenser vacuum and forced the operators to perform a reactor cool down through safety relief valves, reactor core isolation cooling and the suppression pool. This finding is of very low safety significance because it would only affect the plant during this particular situation of partial loss of offsite power and that all mitigating capability was maintained.

Inspection Report# : [2004012\(pdf\)](#)

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## **Barrier Integrity**

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**Significance:** Dec 31, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to control special processes such as welding in accordance with qualified welding procedures**

The inspector identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion IX, for failure to control special processes, such as welding, in accordance with qualified welding procedures as required. The finding was a human performance error for the failure to follow procedure. Criterion IX, Appendix B, of 10 CFR Part 50, "Control of Special Processes," requires in part that measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Contrary to the above, welding personnel failed to verify interpass temperature during welding activities on feedwater inlet check Valve B21-AOVF032, an ASME Class 1 valve, in accordance with qualified welding procedures.

This finding was determined to be more than minor, through Inspection Manual Chapter 0612, Appendix B, in that it affected the barrier integrity cornerstone attribute of human performance, could have represented a more significant issue if left uncorrected, and there was a reasonable likelihood that the valve would have been returned to service if the inspector had not intervened. Based on the results of a significance determination process Phase 1 analysis, this finding had very low safety significance because it did not result in the loss of a barrier integrity function and has been entered into the licensee's corrective action program as Condition Report CR-RBS-2004-03395. This violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy, NUREG-1600.

Inspection Report# : [2004005\(pdf\)](#)

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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**Significance:** Dec 31, 2004

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to control a high radiation area in accordance with Technical Specification 5.7.3**

The inspector reviewed a self-revealing noncited violation of Technical Specification 5.7.3 because the licensee failed to control a high radiation area with dose rates greater than 1,000 millirems per hour. On October 31, 2004, during maintenance activities on valves located on the 82-foot level of the drywell, three workers' electronic alarming dosimeters unexpectedly alarmed when they were exposed to unanticipated radiation levels of approximately 1,700 millirems per hour. Subsequent radiation surveys at the source of radiation around Valve RCS-V-3009 identified 6,000 millirems per hour on contact and 2,000 millirems per hour at 30 centimeters. The area was not barricaded, conspicuously posted, and did not have a flashing light activated as a warning device. The licensee determined that the three workers received 84, 85, and 95 millirems, respectively. This finding was entered into the licensee's corrective action program.

This finding is more than minor because it is associated with the Occupational Radiation Safety attribute of exposure control and affected the cornerstone objective, in that not controlling locked high radiation areas could increase personal exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that the finding was of very low safety significance (Green) because it did not involve: (1) as low as reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.

Inspection Report# : [2004005\(pdf\)](#)

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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 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 : November 30, 2005