

River Bend 1

4Q/2006 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Sep 30, 2006

Identified By: Self-Revealing

Item Type: FIN Finding

Inadequate procedure for reassembly of the turbine bypass valve hydraulic system filter cartridge

A self-revealing finding of very low safety significance was reviewed involving an inadequate procedure for conducting maintenance on the turbine bypass valve hydraulic system filter cartridge. This resulted in the improper reassembly of the filter. The resultant hydraulic oil leak caused the main turbine bypass valves to be inoperable, and a power reduction to less than 23.8 percent power was required by Technical Specifications. This issue was entered into the licensee's corrective action program as Condition Report CR-RBS-2006-02632.

The performance deficiency associated with this finding was: (1) the failure to provide adequate instructions for reassembly of the turbine bypass valve hydraulic system filter cartridge to ensure that the cover gasket was properly installed, and (2) the failure to perform an adequate operational leak test of the system. The finding was more than minor because it was associated with the mitigating systems cornerstone attribute of equipment performance and it affected the associated cornerstone objective to ensure the availability and reliability of a system that responds to initiating events to prevent undesirable consequences. The inspectors performed a Phase 2 analysis using Manual Chapter 0609 and determined that the finding was of very low safety significance. The cause of the finding was related to the crosscutting element of human performance in that the licensee failed to provide complete, accurate, up-to-date instructions in the maintenance work package to change the hydraulic oil filter cartridge.

Inspection Report# : [2006004](#) (*pdf*)

Significance:  Jun 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to identify Division III ESF bus supply breaker not racked in

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was reviewed involving the failure of the licensee to identify that the normal supply breaker to the Division III 4.16 kV engineered safety features bus was not properly racked in for a period of 24 days following maintenance. This issue was entered into the licensee's corrective action program as CR-RBS-2006-02402.

The finding was more than minor because it was associated with the mitigating system cornerstone attribute of configuration control and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Utilizing Manual Chapter 0609, "Significance Determination Process," a Phase 3 analysis concluded that the finding was of very low safety significance. The cause of the finding was related to the crosscutting aspect of problem identification and resolution in that the licensee failed to properly evaluate available indications to identify that the breaker was not properly racked in.

Inspection Report# : [2006003](#) (*pdf*)

Significance:  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to adequately manage an increase in plant risk

An NRC identified noncited violation of 10 CFR 50.65 Maintenance Rule Section (a)(4) was identified for the failure of the licensee to provide prescribed compensatory measures for two Orange shutdown risk conditions during Refueling Outage 13. Specifically, the preoutage risk assessment recommended that two work orders be in place for maintenance electricians to provide power to one spent fuel pool cooling pump in the event of problems with the running pump during periods of electrical bus maintenance. The inspectors found that the work packages were not in place before entering shutdown risk condition Orange on April 26, 2006, during the Division II engineering safety features bus testing, and May 3, 2006, during the Division I engineered safety features bus outage. This issue was entered into the licensee's corrective action program as CR-RBS-2006-01937.

The finding was more than minor because the licensee failed to implement a prescribed compensatory measure during the highest risk condition of Refueling Outage 13. The specific compensatory measures were called for in the preoutage risk assessment and the shutdown operations protection plan. The finding affected the mitigating system cornerstone because of the increased risk of a sustained loss of spent fuel pool cooling during core offloading operations. The finding could not be evaluated using the significance determination process, therefore the finding was reviewed by regional management and determined to be of very low safety significance. Factors that were considered included: (1) electrical maintenance technicians had previously performed the task of providing alternate power to a spent fuel pool cooling pump, (2) the necessary equipment was staged as part of the abnormal operating procedure for loss of decay heat removal, and (3) the relatively long "time to boil" of the spent fuel storage pool at that time during the refueling outage. The cause of the finding was related to the crosscutting aspect of human performance because the licensee's planned maintenance activities and the predetermined increase in outage risk was not effectively managed by prescribed compensatory measures.

Inspection Report# : [2006003](#) (*pdf*)

Significance:  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate procedure to verify required offsite power breaker alignment

An NRC identified noncited violation of Technical Specification 5.4.1.a was identified for the failure of the licensee to provide an adequate surveillance test procedure to perform Technical Specification Surveillance Requirement 3.8.1.1. Specifically, STP-000-0102, "Power Distribution Alignment Check," Revision 4, did not verify the required offsite power circuit breaker alignment and indicated power availability for the Division III 4.16 kV engineered safety features bus as required in Modes 1, 2, and 3. This issue was entered into the licensee's corrective action program as CR-RBS-2006-02675 and -02402.

The finding was more than minor because it was associated with the mitigating system cornerstone attribute of configuration control and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Utilizing Manual Chapter 0609, "Significance Determination Process," a Phase 3 analysis concluded that the finding was of very low safety significance.

Inspection Report# : [2006003](#) (*pdf*)

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 reseat, 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*)

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)

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)

Barrier Integrity

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*)

Emergency Preparedness

Significance:  May 10, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain a Standard Scheme of Emergency Classification and Action Levels in Use

The NRC has considered the information developed during the inspection, the EOI position on the issue which was attached to the inspection report, the information you provided at the Regulatory Conference, and the information provided by your staff in a July 28, 2006, letter following the conference. On the basis of this information, the NRC has concluded that a violation occurred. The violation involves a failure to meet 10 CFR 50.54(q), which requires that the licensee follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b). Specifically, during periods when certain seismic monitoring instrumentation was out of service, the licensee could not implement the emergency actions levels as described in the applicable Emergency Plan implementing procedure. However, there was other seismic instrumentation available during these periods that could be used to determine the ground force acceleration associated with a seismic event in the vicinity of the River Bend Station. This information could then be used by the Operations Shift Manager or Emergency Director to determine the correct classification for a seismic event; although, the classification could be delayed for as long as 4 hours. On the basis of this information, the NRC has concluded that the inspection finding did not represent a degradation of a risk significant planning standard function, as defined in Appendix B of NRC's Inspection Manual Chapter 0609, and therefore is of very low safety significance.

Also, this finding had crosscutting aspects in the area of problem identification and resolution because the River Bend Station staff did not identify the effect that inoperable seismic monitoring instrumentation had on the ability to implement the River Bend Station Emergency Plan and did not effectively utilize pertinent industry operating experience to prevent the performance deficiency.

Inspection Report# : [2006005](#) (*pdf*)

Inspection Report# : [2006011](#) (*pdf*)

Occupational Radiation Safety

Significance:  Sep 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to follow radiation work permit requirements

The inspector reviewed a self-revealing, noncited violation of Technical Specification 5.4.1 resulting from workers' failure to follow radiation work permit requirements. Two workers performing a scaffolding modification in the inclined fuel transfer system canal became externally and internally contaminated. As the workers were exiting the controlled access area, they alarmed the personnel contamination monitors. Based upon the whole-body count results, the licensee assigned a committed effective dose equivalent of 30 millirem to one worker and 70 millirem to the other worker. The licensee's investigation determined that the workers did not inform radiation protection personnel that they would be lowering the scaffolding 3 feet below surveyed areas and contamination control devices. Consequently, the workers were in radiological conditions not bounded by the radiation work permit and as low as is reasonably achievable planners did not have a chance to conduct a total effective dose equivalent as low as is reasonably achievable review to determine if respiratory protection was necessary. As a corrective action, the licensee is incorporating a lessons learned item associated with this event into radiation worker training.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure/contamination control) and affects the Occupational Radiation Safety cornerstone objective in that the failure to follow radiation work permit instructions resulted in additional personnel exposure. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this 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 doses. Additionally, this finding has a crosscutting aspect in the area of human performance because the workers failed to use error prevention tools such as self- and peer-checking.

Inspection Report# : [2006004](#) (*pdf*)

Significance:  Sep 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to evaluate radiological conditions

The inspector reviewed a self-revealing, noncited violation of 10 CFR 20.1501(a) resulting from the licensee's failure to correctly measure the airborne radioactivity where personnel worked. The licensee's review of the January 26, 2006, contamination event identified that the air sample taken to support the work activity was positioned above the high-efficiency particulate air hose suction in an air flow area above the actual work area. This meant that the air sample was not representative of the workers' actual work area. In addition, the radiation protection technician providing continuous job coverage failed to identify the deficiency and adjust the position of the air sampler. As a corrective action, the licensee is incorporating a lessons learned item associated with this event into the radiation protection technician training.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure control) and affects the Occupational Radiation Safety cornerstone objective in that an inadequate evaluation of the hazards could lead to inadequate radiation protection and dose saving measures. This finding could also be reasonably viewed as a precursor to a significant event, such as a personnel overexposure, had contamination levels been higher. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this 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 doses. Additionally, this finding has a crosscutting aspect in the area of human performance because radiation protection personnel failed to use error prevention tools such as self- and peer-checking.

Inspection Report# : [2006004](#) (*pdf*)

Significance:  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to evaluate radiological conditions

The inspector identified a noncited violation of 10 CFR 20.1501(a), resulting from the licensee's use of an inadequate alpha contamination survey technique. The inspector determined that the licensee's procedure for the use of the Eberline SAC-4 alpha scintillation counter established a screening limit that did not allow sufficient sample activity for the discovery of alpha emitting radionuclides. Therefore, the inspector concluded that surveys using this technique could not identify alpha contamination and were inadequate. As a corrective action, the licensee adapted the corporate procedural guidance, which raised the maximum sample activity.

This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure control) and affects the Occupational Radiation Safety cornerstone objective in that an inadequate evaluation of the hazards could lead to inadequate radiation protection and dose saving measures. This finding could also be reasonably viewed as a precursor to a significant event, such as a personnel overexposure, had contamination levels been higher. Using the Occupational Radiation Safety Significance Determination Process, the inspector determined that this 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 doses. Additionally, this finding has a crosscutting aspect in the area of human performance because the licensee used procedures that were inadequate to ensure that alpha contamination was identified.

Inspection Report# : [2006004](#) (*pdf*)

G

Significance: Jun 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to control access to a high radiation area

The inspector reviewed a self-revealing noncited violation of Technical Specification 5.7.1, resulting from the licensee's failure to control access to a high radiation area. While transferring reverse osmosis system filters in the radwaste building, the licensee allowed two workers to inadvertently enter a high radiation area. This occurred after a guard prematurely left his post in front of the 123 foot elevation elevator door. The highest dose rate recorded by an electronic alarming dosimeter was 164 millirem per hour. The guard returned and evacuated the workers before they accrued additional radiation dose. Planned corrective action was still being evaluated by the licensee at the conclusion of the inspection.

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. Using the 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. Additionally, this finding had crosscutting aspects associated with human performance in that the failure of the individual to guard the elevator door directly contributed to the violation.

Inspection Report# : [2006003](#) (*pdf*)

G

Significance: Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to perform airborne radiation survey

The inspector identified a noncited violation of 10 CFR 20.1501(a) because the licensee failed to survey airborne radioactivity. During the removal of local power range monitors, the licensee started collecting an air sample of the work area, but discarded the sample before analyzing it. Successful passage through the portal monitors at the exit of the controlled access area confirmed that no worker experienced an uptake of radioactive material. Planned corrective action is still being evaluated.

The finding was more than minor because it was associated with the occupational radiation safety program attribute of exposure control and affected the cornerstone objective in that the lack of knowledge of radiological conditions could increase personnel dose. Using the 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. Additionally, this finding had crosscutting aspects associated with human performance in that the failure to maintain

the sample for analysis directly contributed to the violation.

Inspection Report# : [2006003](#) (*pdf*)

Public Radiation Safety

Physical Protection

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

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*)

Last modified : March 01, 2007