UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

November 6, 2008

Michael Perito
Site Vice President
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

Subject: RIVER BEND STATION - NRC INTEGRATED INSPECTION REPORT
05000458/2008004

Dear Mr. Perito:

On September 27, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your River Bend Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 6, 2008, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings and two self-revealing findings of very low safety significance (Green). Three of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd., Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the River Bend Station facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS).

ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA Wayne Walker for/

Geoffrey B. Miller, Chief
Project Branch C
Division of Reactor Projects

Docket: 50-458
License: NPF-47

Enclosure:

NRC Inspection Report 05000458/2008004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000458
License:	NPF-47
Report:	05000458/2008004
Licensee:	Entergy Operations, Inc.
Facility:	River Bend Station
Location:	5485 U.S. Highway 61 St. Francisville, LA
Dates:	June 29 through September 27, 2008
Inspectors:	G. Larkin, Senior Resident Inspector, Project Branch C C. Norton, Resident Inspector, Project Branch C R. Kopriva, Senior Reactor Inspector, Engineering Branch 1 D. Bollock, Project Engineer, Project Branch C R. Azua, Senior Resident Inspector, Project Branch E
Approved By:	Geoffrey B. Miller, Chief, Project Branch C Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000458/2008004; 06/29/2008 – 09/27/2008; River Bend Station; Adverse Weather Protection; Maintenance Effectiveness; Maintenance Risk Assessments and Emergent Work Control; Event Follow-up.

The report covered a 3-month period of inspections by resident inspectors and announced baseline inspections by regional based inspectors. Three Green noncited violations and one Green finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified for wind induced turbine building siding failure that occurred significantly below design specified stress levels as a result of design and installation deficiencies. This resulted in a forced outage to repair transformer damage and to repair the turbine building siding. The licensee missed prior opportunities to identify turbine building siding design and installation deficiencies following damaging wind events in 1992 and 2005. The licensee entered this issue into the corrective action program as Condition Report CR-RBS-2008-5176.

  This finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) 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 evaluated the significance of this finding using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined it to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available (Section 4OA3).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a involving the failure to have an adequate procedure to ensure the availability of on-site emergency ac power sources following the four-hour coping period of a postulated station blackout. Specifically, station procedures did not ensure that the station blackout diesel generator would be reliably deployed to fulfill its intended function during sustained high winds. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2008-5050.

  This finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) of the mitigating systems

cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined it to be of very low safety significance because it did not result in an actual loss of safety function and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event (Section 1R01).

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the licensee's failure to take adequate corrective actions in response to a condition adverse to quality resulting in repetitive failures of the standby service water switchgear room ventilation fans. Following failure of the switchgear fans in July 2008, the licensee found that inappropriate flow switch settings on the fans had been identified in a condition report in October 1999, but no actions had been taken to correct the condition. Subsequently, more failures of the standby service water switchgear room ventilation fans occurred, including nineteen in the past three and one half years, many of which were attributed to flow switch issues. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2008-5761.

  The finding was more than minor because it affected the equipment performance attribute of the mitigating systems cornerstone, and it directly affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to preclude undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the condition did not result in an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time. This finding has a crosscutting aspect in the area of human performance associated with resources in that the licensee failed to maintain long term plant safety by minimization of long standing equipment issues [H.2(a)] (Section 1R12).

- Green. The inspectors identified a noncited violation of 10 CFR 50.65(a)(4) involving the licensee's failure to assess and manage the increase in risk that may result from proposed maintenance activities. Specifically, while conducting maintenance in the transformer yard during severe weather with high pressure core spray inoperable, the licensee did not assess the affects on the shutdown risk. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2008-05383.

  The inspectors determined this finding was more than minor since it was similar to Manual Chapter 0612, Appendix E, Example 7.e, and since it caused the licensee's risk model to change from a Green to Yellow risk window. In accordance with NRC Inspection Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management," the inspectors requested that a senior reactor analyst evaluate the risk of this condition. The analyst determined that this finding was of very low risk significance because the associated risk deficit was less than 1.0E-6 (Section 1R13).

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

River Bend Station began the inspection period increasing reactor power to 100 percent following a down power at the end of the last inspection period to add oil to the reactor recirculation Pump A lower motor bearing oil reservoir. The plant remained at 100 percent power except for short periods to adjust the existing control rod pattern until September 1, 2008, when, in response to degrading electrical grid conditions caused by Hurricane Gustav, plant personnel performed a controlled reactor shutdown. River Bend Station remained in a forced outage to complete a comprehensive wind damage recovery plan which included isophase bus duct and main power transformer bushing repairs as well as turbine building siding upgrade and replacement. River Bend personnel commenced a reactor startup on September 21, 2008, and the plant reached 100 percent reactor power on September 27, 2008. River Bend Station remained at 100 percent reactor power for the remainder of the inspection period except for short periods to adjust the existing control rod pattern.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of the licensee's adverse weather procedures in preparation for hurricane season. The inspectors verified that weather-related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extremes; and evaluated the implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of, and during, the adverse weather conditions.

During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Instrument Air
- Reactor Core Isolation Cooling
- Standby Service Water
- Normal Service Water
- Station Blackout Diesel Generator

These activities constitute completion of one readiness for seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

Introduction. The inspectors identified a noncited violation of Technical Specification 5.4.1.a involving the failure to have an adequate procedure to ensure the availability of on-site emergency ac power sources following the four-hour coping period of a postulated station blackout. Specifically, station procedures did not ensure that the station blackout diesel generator would be reliably deployed to fulfill its intended function during sustained high winds. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2008-5050.

Description. The station blackout diesel generator is a trailer mounted 60 cycle 480 Vac generator that is normally stored, maintained, and tested in a berm area remote from its emergency service location. The storage area is equipped with tie-downs that serve to protect the station blackout diesel generator during severe weather and electric power connections that maintain the batteries charged and the engine coolant warm. In order to provide emergency ac power, the station blackout diesel generator must be towed from its exposed open air storage location and set in place in its exposed open air emergency service location. Station personnel would need to find and move into place tie-down blocks to secure the station blackout diesel generator in the emergency service location.

When severe weather is predicted to approach the station, abnormal operating Procedure AOP-0029, "Severe Weather Operation," Revision 21, directs operators to ensure the station blackout diesel generator is either securely tied down in the berm area or moved to interior locations to protect it from damage. With the risk of personal injury and the many challenges to successful implementation, shift management would likely not order the movement of the station blackout diesel generator to its emergency service location while severe weather conditions were in progress. During the approach of Hurricane Gustav, following the NRC inspectors' challenge of the station blackout diesel generator's ability to fulfill its function during severe weather, River Bend Station relocated the station blackout diesel generator to the emergency service location designated to fulfill its station blackout function. This included tie-down blocks and a power supply to maintain the station blackout diesel generator in a standby condition.

Analysis. Failure to have an adequate procedure to ensure the availability of on-site emergency ac power sources following the four-hour coping period of a postulated station blackout was a performance deficiency. Specifically, the station procedures did not ensure reliable station blackout diesel generator deployment to fulfill its intended function. This finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) of the mitigating systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined it to be of very low safety significance (Green) because it did not result in an actual loss of safety function and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Enforcement. Technical Specification 5.4.1.a, "Administrative Control (Procedures)," requires that written procedures shall be established, implemented, and maintained, covering the activities recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Appendix A, Section 6(w) requires specific procedures for combating emergencies and other significant events (acts of nature). Contrary to the above, Procedure AOP-0029, "Severe Weather," did not ensure the availability of the station blackout diesel generator for on-site emergency ac power following the four-hour coping period of a postulated station blackout. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-RBS-2008-5050, this violation is being treated as a noncited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000458/2008004-01, "Inadequate Procedure for Staging the Station Blackout Diesel Generator During Severe Weather."

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

Hurricanes with the potential for thunderstorms, tornados, and high winds were forecast in the vicinity of the facility for August 23-24, 2008 (Hurricane Fay), September 1-2, 2008 (Hurricane Gustav), and September 10-13, 2008 (Hurricane Ike). The inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On these three occasions from August 18 through September 14, 2008, the inspectors walked down portions of the instrument air system, reactor core isolation cooling system, normal service water, standby service water, and 125 Vdc power systems because their safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of off-site power. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspector's evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. The inspectors also reviewed a sample of corrective action program items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the corrective action program in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three readiness for impending adverse weather condition samples as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

.3 Readiness to Cope with External Flooding

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review for deviations from the descriptions provided in the Updated Safety Analysis Report for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate flooding were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site that would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one external flooding sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Reactor plant ventilation (HVR)
- Residual heat removal Division 2

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected to identify any discrepancies that could affect the function of the system and therefore potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Safety Analysis Report, Technical Specification requirements, administrative Technical Specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also performed walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with

the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two partial system walkdown samples as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

On August 28, 2008, the inspectors performed a complete system alignment inspection of the standby gas treatment system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors performed a walkdown of the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- July 3, 2008, Turbine Building, 67-foot level, 95-foot level and 123-foot level
- July 7, 2008, Control Building, 98-foot level, 116-foot level and 136-foot level
- July 21, 2008, Auxiliary Building, 70-foot level, Fire Zone AB-1/Z-1, AB-15/Z-1; Auxiliary Building, 95-foot level, Fire Zone AB-1/Z-2, AB-15/Z-2; Auxiliary

Building, 114-foot level, Fire Zone AB-1/Z-3, AB-15/Z-3 and AB-10; Auxiliary Building, 141-foot level, Fire Zone AB-1/Z-1, AB-15/Z-4; E Tunnel

- July 24, 2008, Reactor Building, 95-foot level, 114-foot level, 141-foot level, 162-foot level and 186-foot level
- July 31, 2008, Standby Cooling Tower, 98-foot level, 118-foot level and 137-foot level
- August 7, 2008, Reactor Building, 70-foot level, 95-foot level, 114-foot level and 141-foot level
- August 19, 2008, Auxiliary Building, 95-foot level, Fire Zone AB-6/Z-2, AB-1/Z-2; Auxiliary Building, 141-foot level, Fire Zone AB-13, AB-14; Fuel Handling Building, 95-foot level, Fire Zone FB-1/Z-1; Fuel Handling Building, 70-foot level, Fire Zone FB-1/Z-1; E and F Tunnel

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of seven quarterly fire-protection inspection samples as defined by Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On August 21, 2008, the inspectors observed a fire brigade activation for a fire in the normal switchgear 123-foot level on NHS-MCC20D. The observation evaluated the readiness of the plant fire brigade. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and

layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

These activities constitute completion of one annual fire-protection inspection sample as defined by Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors completed the annual portion of Inspection Procedure 71111.07 by reviewing licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for containment building Unit Cooler A (HVR-UC1A). The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines;" the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of the heat exchanger tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one heat sink inspection sample as defined by Inspection Procedure 71111.07-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On July 1, 2008, August 27, 2008, and September 23, 2008, the inspectors observed three different crews of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas for licensed operator performance:

- clarity and formality of communications
- ability to take timely actions in the conservative direction
- prioritization, interpretation, and verification of annunciator alarms

- correct use and implementation of abnormal and emergency procedures
- control board manipulations
- oversight and direction from supervisors
- ability to identify and implement appropriate Technical Specification actions and emergency plan actions and notifications

The inspectors compared the operators' performance in these areas to pre-established operator action expectations and successful critical task completion requirements.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three quarterly licensed-operator requalification program samples as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following three risk significant systems:

- Ventilation-Yard Structures (HVY)
- Standby Gas Treatment System
- Reactor Recirculation System

The inspectors reviewed events where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices
- identifying and addressing common cause failures
- scoping of systems in accordance with 10 CFR 50.65(b)
- characterizing system reliability issues for performance
- charging unavailability for performance
- trending key parameters for condition monitoring
- ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or (a)(2)
- verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance

through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

Introduction. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the licensee's failure to take adequate corrective actions in response to a condition adverse to quality resulting in repetitive failures of the standby service water switchgear room ventilation fans. Following failure of the switchgear fans in July 2008, the licensee found that inappropriate flow switch settings on the fans had been identified in a condition report in October 1999, but no actions had been taken to correct the condition. Subsequently, more failures of the standby service water switchgear room ventilation fans occurred, including nineteen in the past three and one half years, many of which were attributed to flow switch issues.

Description. During a corrective action program performance review of the standby service water cooling tower switchgear fans (HVY-FN2A, B, C and D), the inspectors identified nineteen failures in the last three and one half years. The underlying cause of these failures had been identified in 1999 and never corrected. Specifically, the licensee had identified inappropriate flow switch settings as a condition adverse to quality and the cause of the repetitive fan failures on October 21, 1999. The licensee assigned corrective actions for the condition and subsequently closed the corrective actions to other corrective actions without correcting the condition. A root cause analysis completed in July 2000 identified ineffective corrective action to correct the inappropriate flow switch settings as the cause of subsequent fan failures. More corrective actions were assigned and closed without correcting the condition adverse to quality. Subsequently, many more failures of the standby service water switchgear room ventilation fans occurred, including two failures that resulted in unplanned entries into Technical Specification 72-hour shutdown limiting conditions of operation. Licensee analysis of recent failures identified inappropriate flow switch settings as the primary cause of the numerous fan failures. The inspectors concluded the inadequate action to correct the previously identified condition adverse to quality resulted in repetitive failures of the standby service water switchgear room ventilation fans.

Analysis. The performance deficiency was the failure to take corrective action to correct a condition adverse to quality. The finding was more than minor because it affected the equipment performance attribute of the mitigating systems cornerstone, and it directly affected the cornerstone objective ensure the availability, reliability and capability of systems that respond to initiating events to preclude undesirable consequences. Using

Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” the finding was determined to have very low safety significance because the condition did not result in an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time. This finding has a crosscutting aspect in the area of human performance associated with resources in that the licensee failed to maintain long term plant safety by minimization of long standing equipment issues [H.2(a)].

Enforcement. 10 CFR Part 50, Appendix B, Criteria XVI requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, from October 1999 to July 2008, the licensee failed to promptly correct an identified condition adverse to quality which resulted in multiple failures of Technical Specification required equipment. Because the finding was of very low safety significance and has been entered into the licensee’s corrective action program as Condition Report CR-RBS-2008-5761, this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000458/2008004-02, “Inadequate Corrective Actions Results in Multiple Failures of Standby Service Water Switchgear Room Ventilation Fans.”

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed licensee’s evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Fancy Point switchyard line maintenance, July 21-23, 2008
- Division 1 service water system outage, July 30, 2008
- Fancy Point switchyard maintenance, August 18-21, 2008
- Plant operations during Hurricane Fay, August 23-24, 2008
- Plant operations during Hurricane Gustav, August 30 through September 2, 2008
- Plant operations during Hurricane Ike, September 10-13, 2008

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the Technical Specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six maintenance risk assessments and emergent work control inspection samples as defined by Inspection Procedure 71111.13-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR 50.65(a)(4) involving the licensee's failure to assess and manage the increase in risk that may result from proposed maintenance activities. Specifically, while conducting maintenance in the transformer yard during severe weather with high pressure core spray inoperable, the licensee did not assess the affects on the shutdown risk.

Description. On September 1, 2008 the reactor was shut down in response to grid instabilities resulting from Hurricane Gustav. Following the shutdown, the licensee brought cranes and man lifts into the transformer yard to clear siding from the turbine building that had fallen into the transformer yard. On September 11, the operators entered the station severe weather procedure in preparation for Hurricane Ike, which made landfall in Texas on September 12. The inspectors identified that, at one point, the high pressure core spray system was inoperable at the same time that work was occurring in the transformer yard and a severe weather condition was in progress. The inspectors noted that the shutdown risk monitor (Shutdown Operations Protection Plan) showed no impact to risk from the cranes and work crews in the transformer yard. Cranes in switchyards have caused losses of offsite power or partial losses of offsite power in shutdown plants as discussed in Information Notice 92-13, "Inadequate Control over Vehicular Traffic at Nuclear Power Plant Sites." The Shutdown Operations Protection Plan is a qualitative assessment and has no consideration for severe weather or switchyard/transformer yard work. The inspectors questioned the accuracy of that risk assessment because while online these activities would place the plant in a Yellow risk maintenance window. The inspectors interviewed engineering personnel and found that the plant uses a shutdown risk model that was last modified in 2004. The shutdown risk model did not have a multiplier for a loss of offsite power initiator for work in the switchyard or transformer yard or for severe weather. Applying the severe weather multiplier to the loss of offsite power initiator on the shutdown risk model resulted in an increase in 29 percent core damage frequency for the plant conditions at the time. The licensee added the appropriate multiplier to the shutdown risk model for severe weather as used in the at-power model. The licensee then added another multiplier to account for switchyard work. Given the conditions of the plant – high pressure core spray inoperable with the cranes in the transformer yard and severe weather due to Hurricane Ike – the shutdown risk model using the new risk calculation showed a Yellow risk window, which is a higher risk category than the Green risk window the plant was in at the time.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to appropriately manage risk actions during periods of elevated risk. The inspectors determined this finding was more than minor since it was similar to Manual Chapter 0612, Appendix E, Example 7.e, and since it caused the licensee's risk model to change from a Green to Yellow risk window. In accordance with NRC Inspection Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management," the inspectors requested that a senior reactor analyst evaluate the risk of this condition. Step 4.1.2, "NRC Evaluation of Risk," was utilized because the inspectors determined that there were notable limitations with the licensee's configuration risk assessment tool because it did not address potential changes to initiating event frequencies when work was being performed over station transformers. The analyst quantified the actual risk associated with the performance deficiency using a

combination of hand calculations and the River Bend Shutdown Operation Standardized Plant Analysis Risk Model, Revision 3.01, dated November 2004.

Realizing that the subject performance deficiency only affected the frequency of a loss of offsite power, the analyst quantified the probability that a loss of offsite power would occur during the subject configuration. The analyst used the generic loss of offsite power frequency quantified for the River Bend grid of 3.59E-2/year. As utilized in the licensee's assessment of the condition, the analyst determined that a 10 times multiplier was appropriate for quantifying the significance of work performed above the station transformers. Therefore, the analyst calculated the probability of a loss of offsite power (PLOOP) occurring during the 14 minute exposure period of this finding as follows:

PLOOP = 3.59E-2/yr * 10 ÷ 8760 hrs/yr ÷ 60 min/hr * 14 min

= 9.6E-6

The analyst established the plant operating state in the Shutdown Standardized Plant Analysis Risk by setting the following conditions:

Plant in Shutdown
Mode 4
Early Time Frame
Time Window 3
RCS at Low Pressure
RCS Level Normal

The analyst then set the shutdown initiator IESD-LOOP to a probability of 1.0 and set all other initiators to the house event FALSE, indicating that a loss of offsite power had occurred and no other initiator could occur at the same time. Finally, the analyst set the basic event HCS-MDP-TM-TRAIN to the house event TRUE, indicating that the high pressure core spray pump was out of service for test and maintenance at the time of the evaluated configuration. The conditional core damage probability for a loss of offsite power in the above plant operating state with the high pressure core spray system out of service was calculated to be 1.1E-5.

Therefore, the actual risk of the maintenance configuration as it applied to a potential loss of offsite power was the product of the probability of a loss of offsite power and the conditional core damage probability (1.0E-10). The analyst noted that all other initiators were baseline risk because the performance deficiency did not affect those initiators. As such, this value is, by definition, higher than the risk deficit. Therefore, the analyst determined that this finding was of very low risk significance (Green) because the risk deficit is less than 1.0E-6.

Enforcement. 10 CFR 50.65 (a)(4) requires, in part, that before performing maintenance activities the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, the licensee failed to adequately assess the increase in risk before performing maintenance in the transformer yard during a severe weather condition on September 11-12, 2008. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-RBS-2008-05383, this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy:

NCV 05000458/2008004-03, “Inadequate Risk Assessment for Transformer Yard Maintenance While Shut Down.”

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- CR-RBS-2008-01669, 10 CFR Part 21 evaluation for boiling water reactor suction strainer head loss, reviewed on June 25, 2008
- CR-RBS-2008-04386; missing blade seal on HVR-AOD10B, reviewed on July 15, 2008
- CR-RBS-2008-04027; past operability of turbine bypass valves, reviewed on September 15, 2008
- CR-RBS-2007-04391, BYS-EG1 Phase A ground detection light is brighter than Phase Lights B or C, reviewed on September 24, 2008
- CR-RBS-2008-05033, noted elevated temperatures in containment, reviewed on September 25, 2008

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that Technical Specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Updated Safety Analysis Report to the licensee’s evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five operability evaluations inspection sample as defined in Inspection Procedure 71111.15-05.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following temporary modifications to verify that the safety functions of important safety systems were not degraded:

- Main transformer Number 2 cooling system breaker replacement (EC-9280)
- Install 2-gallon auxiliary oil reservoir for reactor recirculation Pump A motor lower bearing (EC-9722)

The inspectors reviewed the temporary modifications and the associated safety evaluation screenings against the system design bases documentation, including the Updated Safety Analysis Report and the Technical Specifications, and verified that the modifications did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration was consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modifications were identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two samples for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- WO 156706 Task 2, “Recirculation Pump A Lower Motor Bearing Oil Replacement,” reviewed on June 27, 2008
- WO 51650557, “SWP-MOV506A Clean, Inspect Valve Op,” reviewed on July 28, 2008
- WO 153656, “HVY-FN2D MCR Alarm STBY Service Water Pump House Fan,” reviewed on August 12, 2008
- WO 108571, “HVY-DMP6D Hanging Open at 5/8 Open,” reviewed on August 14, 2008

- WO 149075, “HVRB17 Replace Relay Global PM,” reviewed on September 17, 2008

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities to ensure the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; and test instrumentation was appropriate.

The inspectors evaluated the activities against the Technical Specifications, the Updated Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the River Bend Station Forced Outage FO-08-03, conducted from September 1 through September 23, 2008, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the forced outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense-in-depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service.

- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.

- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.

- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities.

- Monitoring of decay heat removal processes, systems, and components.
- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by the Technical Specifications.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.

These activities constitute completion of one forced outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Safety Analysis Report, procedure requirements, and Technical Specifications to ensure that the two surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address preconditioning; evaluation of testing impact on the plant; acceptance criteria; test equipment; procedures; jumper/lifted lead controls; test data; testing frequency and method demonstrated Technical Specification operability; test equipment removal; restoration of plant systems; fulfillment of ASME code requirements; updating of performance indicator data; engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct; reference setting data; and annunciator and alarm setpoints.

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- RCIC Pump Quarterly Operability and Flow Test, September 16, 2008
- HPCS Quarterly Pump and Valve Operability Test, September 16, 2008
- WO 163692, Task 11, “Shift Engineer Perform Turbine Building Pressure Test per EC-10451 and PEP-0036m,” performed on September 20, 2008

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from the third quarter 2007 through the second quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance were used. The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC inspection reports for the period of October 2007 through June 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator.

These activities constitute completion of one safety system functional failures sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - emergency ac power system performance indicator for the period from the third quarter 2007 through the second quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s operator narrative logs, mitigating systems performance index derivation reports, issue reports, event reports and NRC inspection reports for the period of October 2007 through June 2008 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI

guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator.

These activities constitute completion of one mitigating systems performance index emergency ac power system sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - high pressure injection systems performance indicator for the period from the third quarter 2007 through the second quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports and NRC inspection reports for the period of October 2007 through June 2008 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator.

These activities constitute completion of one mitigating systems performance index high pressure injection system sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: the complete and

accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of April 1, 2008, through September 27, 2008, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute a single semi-annual trend inspection sample as defined by Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors reviewed a corrective action item documenting main control room deficiencies. The inspectors reviewed the deficiencies to determine the aggregate impact of the deficiencies. The inspectors verified that the licensee is identifying operator workaround problems at an appropriate threshold and entering them in the corrective action program, and has proposed or implemented appropriate corrective actions.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153)

.1 Turbine Building Siding Design and Installation Deficiencies Result in Significant Unplanned Plant Degradation

a. Inspection Scope

On September 1, 2008, the inspectors at River Bend Station monitored the station response to Hurricane Gustav. The inspectors observed, documented, and provided assessment information to the NRC Region IV Emergency Response Center on the licensee's controlled reactor shutdown in response to degrading grid conditions. The inspectors observed and provided information on the initial assessment of turbine building wind induced damage and the subsequent main power transformer bushing damage and the isophase bus duct damage. The inspectors verified the availability of adequate sources of ac power to reach and maintain cold shutdown reactor conditions and communicated with station personnel to verify that the nuclear, radiological, and industrial safety measures taken during and as a result of this wind event were timely and appropriate. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71153-05.

b. Findings

Introduction. A self-revealing Green finding was identified for wind induced turbine building siding failure that occurred significantly below design specified stress levels as a

result of design and installation deficiencies. This resulted in a forced outage to repair transformer damage and to repair the turbine building siding. The licensee missed prior opportunities to identify turbine building siding design and installation deficiencies following damaging wind events in 1992 and 2005.

Description. On September 1, 2008, River Bend Station was performing a controlled reactor shutdown due to grid disturbances related to Hurricane Gustav when high winds damaged the siding on the south, west, and east sides of the turbine building. Shortly following the shutdown, wind blown siding damaged main transformers Number 1 and 2 and the main and auxiliary transformers isophase bus ducts. In addition the turbine building design function to act as a radioactive control boundary for monitoring radioactive releases to the environment during operation was lost.

The licensee's structural evaluation determined that original design and installation deficiencies resulted in premature siding failure well below the design stress levels required by Design Specification ANSI-A58.1, "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures." These design and installation deficiencies include the lack of sub-girts at the base of the inner panels, inconsistent and inadequate spacing of shear rivets, missing girts in the southwest wall as well as inadequate design calculations and drawings for the siding wall corners. As a result, there was premature detachment of the siding along the south, west, and east turbine building walls. Failure analysis determined that the siding failed at 21 pounds per square foot outward pressure and 31 pounds per square foot inward pressure. This is approximately half the ANSI-A58.1 requirement to accommodate wind pressures of at least 50 pounds per square foot and not more than 70 pounds per square foot.

The licensee missed opportunities in 1992 (CR-RBS-1992-0125) and in 2005 (CR-RBS-2005-3363) to identify faulty turbine building siding design and installation deficiencies. In September 2005, tropical storm force winds from Hurricane Rita detached a 50 foot long section of metal siding from the turbine building west wall. The licensee concluded that the siding released as designed at elevated wind speeds to minimize loading on the building's structural members. The licensee repaired the detached siding but did not conduct an apparent cause analysis to determine the appropriate failure mechanism. In March 1992, a thunderstorm event removed siding from the southeast and southwest corners of the turbine building resulting in siding landing on an energized 230 kV transmission line, damaging the Number 2 main transformer and causing a generator trip with a subsequent automatic reactor scram. The licensee again concluded that the siding performed as designed without performing an apparent cause evaluation.

Analysis. Design and installation errors resulting in wind induced turbine building siding failure significantly below design specified stress levels is a performance deficiency. In addition, the licensee missed opportunities to identify turbine building siding design and installation deficiencies following damaging wind events in 1992 and 2005. This finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) 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 evaluated the significance of this finding using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined it to be of very low safety significance (Green) because the finding did not contribute to both the

likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available.

Enforcement. Enforcement action does not apply because the turbine building panel siding, main transformers, and isophase bus ductwork are not safety related equipment. The licensee entered this into the corrective action program as Condition Report CR-RBS-2008-5176. This finding is identified as Finding FIN 05000458/2008004-04, **"**Turbine Building Siding Failure Below Design Specifications."

.2 (Closed) Licensee Event Report 05000458/2008002-00, "Automatic Reactor Scram Due to Malfunction of Main Turbine Control System**"**

On March 5, 2008, River Bend Station automatically tripped due to a high reactor vessel pressure. The high reactor pressure was caused from main turbine control valve closure due to a high speed error signal. The licensee found that the primary speed probe had a higher than expected impedance and that the impedance was also affected when the probe was manipulated, indicating a connector or connection problem. The licensee replaced the speed probes and instituted a preventive maintenance task to assure that the connectors are tight and electrical resistance is within expected ranges. The inspectors reviewed this report and no findings of significance were identified and no violations of NRC requirements occurred. This Licensee Event Report is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 6, 2008, the inspectors presented the integrated baseline inspection results to Mr. M. Perito, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Bush, Manager, Plant Maintenance
M. Chase, Manager, Training and Development
J. Clark, Assistant Operations Manager – Training
C. Forpahl, Manager, Engineering Programs & Components
B. Heath, Superintendent, Chemistry
K. Higginbotham, Acting Manager, Operations
B. Houston, Manager, Radiation Protection
K. Huffstatler, Technical Specialist, Licensing
A. James, Manager, Security
R. Kowaleski, Manager, Corrective Action
J. Leavines, Manager, Emergency Preparedness
D. Lorfing, Manager, Licensing
W. Mashburn, Manager, Design Engineering
B. Matherne, Manager, Planning and Scheduling/Outage
R. McAdams, Manager, System Engineering
J. McElwain, Manager, Human Resources
E. Olson, General Manager, Plant Operations
J. Roberts, Director, Nuclear Safety Assurance
J. Schlesinger, Supervisor, Engineering
J. Schroeder, Assistant Operations Manager - Support
T. Tankersley, Manager, Quality Assurance
D. Wiles, Director, Engineering
R. Womack, Manager, Outage

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000458/2008004-01	NCV	Inadequate Procedure for Staging the Station Blackout Diesel Generator During Severe Weather (Section 1R01)
05000458/2008004-02	NCV	Inadequate Corrective Actions Results in Multiple Failures of Standby Service Water Switchgear Room Ventilation Fans (Section 1R12)
05000458/2008004-03	NCV	Inadequate Risk Assessment for Transformer Yard Maintenance While Shut Down (Section 1R13)
05000458/2008004-04	FIN	Turbine Building Siding Failure Below Design Specifications (Section 4OA3)

Closed

50-458/2008-002-00	LER	Automatic Reactor Scram Due to Malfunction of Main Turbine Control System (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
AOP-0029	Severe Weather Operation	21
AOP-0064	Degraded Grid	0
EN-LI-101	10CFR50.59 Review Program	4
ENS-DC-199	Off-Site Power Supply Design Requirements	2
ENS-DC-201	ENS Transmission Grid Monitoring	2
OSP-063	Grid Monitor	1

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
NUM 87-00	Guidelines and Technical Bases for NUM INITIATIVES ADDRESSING STATION BLACKOUT AT LIGHT WATER REACTORS	1
NUREG-1407	Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Weather Vulnerabilities	0
NUREG-1779	Regulatory Effectiveness of the Station Blackout Rule	0
Regulatory Guide 1.155	Station Blackout	0
RIS-2004-05	Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power	

Section 1RO4: Equipment Alignment

CONDITION REPORTS

CR-RBS-2007-1096
CR-RBS-2007-3591
CR-RBS-2007-4643
CR-RBS-2007-5166
CR-RBS-2008-3899

WORK REQUESTS

WR 86954
WR 98263

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
SOP-0031	Residual Heat Removal B System	305

DRAWINGS

NUMBER	TITLE	REVISION/ DATE
PID-09-10D	Engineering P&ID Diagram – System 118 – Service Water – Normal	33
PID-09-10F	Engineering P&ID Diagram – System 118 – Service Water – Normal	29

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
ER-RB-2002-0416	Evaluation of Temporary Holes in Secondary Containment (Auxiliary Bldg Doors)	0
ER-RB-2005-0342	Functional Impairment of Auxiliary Building Floor Drains	0
ES-205	Tech Spec Secondary Containment Integrity Draw Times During Normal Operations	
G13.18.14.0*199	Determination of Allowable Auxiliary Building Penetration Size Given the Measured Draw Down Time	0
G13.18.2.1*179	Evaluation of Standby Gas Treatment System Drawdown Data	0

Section 1RO5: Fire Protection

MISCELLANEOUS DOCUMENTS

USAR Section 9A.2, Fire Hazards Analysis
Pre-Fire Plan/Strategy Book

Section 1RO7: Heat Sink Performance

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
USAR 9.4.6.2.1	Containment Ventilation System	18
USAR Table 9.4-9	Design Data for Reactor Building Ventilation System	August, 1987
EPRI NP-7552	Heat Exchanger Performance Monitoring Guidelines	December, 1991

Section 1R11: Licensed Operator Requalification Program

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
RSMS-OPS-431	MSL Leak	Revision 6/ 07/01/08
RSMS-OPS-512	Steam Leak in the Drywell	Revision 3/ 09/23/08
RSMS-OPS-813	Loss of NPS-SWG1B/MSIV Isolation/Open SRV	Revision 0/ 08/27/08

Section 1R12: Maintenance Effectiveness

CONDITION REPORTS

CR-RBS-2004-1427	CR-RBS-2007-03648	CR-RBS-2008-00005
CR-RBS-2004-1436	CR-RBS-2007-03692	CR-RBS-2008-03579
CR-RBS-2006-04285	CR-RBS-2007-04500	CR-RBS-2008-04255
CR-RBS-2006-04578	CR-RBS-2007-04503	CR-RBS-2008-04811
CR-RBS-2007-00189	CR-RBS-2007-05490	CR-RBS-2008-03039
CR-RBS-2007-00589	CR-RBS-2007-02785	CR-RBS-2008-35067
CR-RBS-2007-02550	CR-RBS-2007-03681	
CR-RBS-2007-03406	CR-RBS-2007-03708	

WORK ORDERS

WO 00086627
WO 00091025

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

CONDITION REPORTS

CR-RBS-2008-03206
CR-RBS-2008-03212

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
AOP-0029	Severe Weather Operation	21
AOP-0064	Degraded Grid	0
ADM-0096	Risk Management Program and Implementation Risk Assessment	302
ENS-DC-199	Off-Site Power Supply Design Requirements	2
OSP-0037	Shutdown Operations Protection Plan	17
OSP-0048	Switchyard, Transformer Yard, and Sensitive Equipment Controls	5

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
NUM 87-00	Guidelines and Technical Bases for NUM INITIATIVES ADDRESSING STATION BLACKOUT AT LIGHT WATER REACTORS	1
NUREG-1407	Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Weather Vulnerabilities	0
Regulatory Guide 1.155	Station Blackout	0
RIS-2004-05	Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power	0

MISCELLANEOUS

Daily plant status sheets for the week of September 1, 2008

Information Notice 92-13, Inadequate Control Over Vehicular Traffic at Nuclear Power Plant Sites

Standing Order #217, Shutdown EOOS Modeling

Section 1R15: Operability Evaluations

CONDITION REPORTS

CR-RBS-2002-01568	CR-RBS-2008-02167
CR-RBS-2007-04391	CR-RBS-2008-04386
CR-RBS-2008-02163	CR-RBS-2008-05033

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
EN-OP-104	Operability Determinations	Revision 2/ 02/15/06
EN-OP-115	Conduct of Operations	3
EN-LI-102	Corrective Action Process	12
SOP-0054	Contingency Equipment Operations	Revision 302/ 08/06/08

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
GE Hitachi Nuclear Energy Part 21 Communication: SC08-02	BWR Suction Strainer LTR Head Loss	0
G13.18.14-180	Insulation Debris Generated During LOCA Accumulating on ECCS	0
G13.18.14.0*199	Determination of Allowable Auxiliary Building Penetration Size Given the Measured Draw Down Time	0

Section 1R18: Plant Modifications

WORK ORDERS

WO 00161843 01
WO 00164378

Section 1R19: Postmaintenance Testing

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
EN-AD-102	Procedure Use and Adherence	3
EN-AD-103	Document Control and Records Management Programs	7
EN-WM-105	Planning	1
EN-WM-102	Work Implementation and Closeout	2

Section 1R22: Surveillance Testing

CONDITION REPORTS

CR-RBS-2006-4460
CR-RBS-2007-4922
CR-RBS-2008-3911
CR-RBS-2008-5092

WORK ORDERS

WO 51645927
WO 51658759

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
STP-203-6305	HPCS Quarterly Pump and Valve Operability Test	19
STP-209-6310	RCIC Pump Quarterly Operability and Flow Test	28

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
G13.18.2.6*183	High Pressure Core Spray System Hydraulic Performance	0
G13.2.3	RCIC system Head Calcs – Power Uprate	2C

Section 4OA2: Identification and Resolution of Problems

NUMBER	TITLE	REVISION/ DATE
EN-LI-102	Corrective Action Process	12

Section 4OA3: Event Follow-Up

Condition Reports

CR-RBS-2001-01344
CR-RBS-2005-00505
CR-RBS-2008-02182

MISCELLANEOUS

Simplified Electro-hydraulic Control System Diagram