



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

August 10, 2016

EA-15-043

Mr. William F. Maguire
Site Vice President
Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

**SUBJECT: RIVER BEND STATION – NRC SUPPLEMENTAL INSPECTION REPORT
05000458/2016011**

Dear Mr. Maguire:

Prior to January 30, 2015, your simulator failed to demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond. The simulator failed to accurately model feedwater flow and reactor vessel level response following a scram, failed to provide the correct alarm response for loss of a reactor protection system motor generator set, and failed to correctly model the operation of the startup feedwater regulating valve. These simulator modeling issues led to negative operator training, which subsequently complicated the operators' response to a reactor scram at River Bend Station on December 25, 2014.

On June 29, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the River Bend Station. Based on the results of this inspection, documented in NRC Inspection Report 05000458/2015009 dated July 7, 2015 (ML15188A532) and NRC Final Significance Determination Letter dated September 10, 2015 (ML15253A352), the NRC assigned a White Mitigating Systems Cornerstone finding for the Action Matrix input effective the second quarter of 2015.

In response to this Action Matrix input, the NRC completed a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," on April 13, 2016, and documented the results in NRC Inspection Report 05000458/2016010 (ML16146A792). The NRC determined that your extent of condition evaluation was insufficient; therefore, not all inspection objectives were met, and the White finding remained open and continued to receive consideration as an Action Matrix input.

On May 25, 2016, you informed the NRC that the River Bend Station was ready for a supplemental re-inspection. On June 29, 2016, the NRC completed a follow-up supplemental inspection and discussed the results of the inspection with you and other members of your staff.

On July 22, 2016, Mr. Greg Warnick, Chief, Reactor Projects Branch C, NRC, Region IV, conducted a Regulatory Performance Meeting with Mr. M. Chase, Director, Regulatory and Performance Improvement. The topics of this meeting included the NRC inspector's observations, your staff's improved effort in preparing for this inspection, and the lessons learned from the revised extent of condition evaluation. The results of this inspection are documented in the enclosed inspection report.

The NRC performed this follow-up supplemental inspection to determine if the extent of condition for the simulator modeling and negative operator training issues were understood, and if your completed or planned corrective actions were sufficient to address and prevent repetition of the root causes and contributing causes.

The NRC determined that your staff performed an additional extent of condition evaluation in order to ensure the integrity and fidelity of simulator modeling and processing, and to ensure that concerns regarding component modeling and design basis deviations were fully addressed. The NRC reviewed the extent of condition evaluation and associated completed or planned corrective actions, and determined that your actions are sufficient to address the performance that led to the White finding. Based on these determinations, the NRC concluded that all inspection objectives associated with Inspection Procedure 95001 have been satisfied. Therefore, the finding is closed and is no longer considered as an Action Matrix input as of July 1, 2016. No findings were identified during this inspection.

As a result of its continuous review of plant performance, including the results of this inspection, the NRC has determined the performance at the River Bend Station will remain in the Regulatory Response Column of the Action Matrix until all objectives have been met for the supplemental inspection associated with a White Unplanned Scrams with Complications Performance Indicator (PI), which was a White Action Matrix input from the fourth quarter of 2014 through the third quarter of 2015.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agency wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Troy W. Pruett, Director
Division of Reactor Projects

Docket No. 50-458
License No. NPF-47

Enclosure: RBS IR 05000458/2016011
w/ Attachment: Supplemental Information

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Letter to Mr. William Maguire from Mr. Troy Pruett, dated August 10, 2016

SUBJECT: RIVER BEND STATION – NRC SUPPLEMENTAL INSPECTION REPORT
05000458/2016011

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000458

License: NPF-47

Report: 05000458/2016011

Licensee: Entergy Operations, Inc.

Facility: River Bend Station

Location: 5485 U.S. Highway 61N
St. Francisville, LA 70775

Dates: June 27 through June 29, 2016

Inspector: Neil Day
Resident Inspector
Grand Gulf Nuclear Station

Approved: Troy W. Pruett
By: Director
Division of Reactor Projects

SUMMARY

IR 05000458/2016011; 06/27/2016 – 06/29/2016; River Bend Station; Supplemental Inspection – Inspection Procedure 95001

This supplemental inspection was conducted by a resident inspector from the Grand Gulf Nuclear Station. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

No findings were identified.

Cornerstone: Mitigating Systems

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," dated February 9, 2011, to assess the licensee's evaluation associated with the failure to maintain the simulator modeling consistent with the reference unit (River Bend Station) response for normal and transient conditions. Specifically, the licensee's failure to maintain the simulator response for normal and transient conditions involved the failure to: (1) correctly model leakage flow rates through the feedwater regulating valves; (2) provide the correct alarm response for a loss of a reactor protection system motor generator set; and (3) correctly model the behavior of the startup feedwater regulating valve controller. These simulator modeling issues led to negative operator training, which subsequently complicated the operators' response to a reactor scram at River Bend Station on December 25, 2014. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC Inspection Report 05000458/2015009 (ML15253A352).

The licensee identified one root cause and one contributing cause for the White finding. The root cause involved ineffective simulation benchmarking, as an organizational programmatic breakdown, between the Operations organization and the Training organization. The contributing cause involved the lack of implementation of a consistent process when personnel failed to recognize or correct inadequacies with Procedure EN-TQ-202, "Simulator Configuration Control," until April 21, 2014. This resulted in a condition that allowed simulator configuration to be misaligned with the design basis, prevented early detection, extended the non-conforming condition, and impacted operator response during an actual event. The inspector determined that the licensee completed corrective actions to ensure simulator fidelity issues were corrected; and to provide procedural guidance for simulator benchmarking, simulator configuration control, and organizational programmatic interface. Further, the inspector determined that the licensee addressed the extent of condition issues for simulator response during normal, transient, and accident conditions.

Given the licensee's acceptable performance in addressing simulator fidelity between the simulator and reference unit, the White finding associated with this issue is closed and is no longer considered in assessing plant performance as of July 1, 2016, in accordance with the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

REPORT DETAILS

4. OTHER ACTIVITIES

4OA4 Supplemental Inspection (95001)

.01 Inspection Scope

The initial Inspection Procedure (IP) 95001 supplemental inspection was completed on April 13, 2016, and documented in NRC Inspection Report 05000458/2016010. The NRC determined that the licensee's extent of condition evaluation was insufficient; therefore not all inspection objectives were met, and the White finding remained open and continued to receive consideration as an Action Matrix input.

This re-inspection was conducted in accordance with IP 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation of a White finding, which affected the Mitigating Systems Cornerstone in the reactor safety strategic performance area. The re-inspection focused on evaluating the revised extent of condition evaluation, as well as evaluating additional corrective actions. The inspector reviewed the licensee's root cause evaluation documented in Condition Report CR-RBS-2015-04375, Revision 4, dated April 26, 2016. The inspector reviewed the licensee's May 2016 snapshot self-assessment, and corrective actions that were taken or planned to address the identified causes. The inspector also performed walkdowns of the River Bend Station simulator and main control room, as well as inspected simulator response during several transient scenarios.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

This inspection requirement was previously assessed and determined to be adequate as documented in NRC Inspection Report 05000458/2016010 (ML16146A792).

02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. Determine whether the root cause evaluation addressed the extent of condition of the problem.

The licensee's root cause evaluation included an extent of cause evaluation for the identified root cause and contributing cause. This was initially assessed and documented in NRC Inspection Report 05000458/2016010 (ML16146A792). The team concluded that the licensee's extent of cause evaluation was adequate, but that the extent of condition evaluation was limited in scope. The simulator testing activities used to evaluate extent of condition were not effective in identifying differences between the simulator and reference unit operating characteristics for components and systems, which resulted in negative operator training. Additionally, the team determined the licensee's sample selection for valve controllers was inadequate. As a result, the team concluded that the inspection objective involving the extent of condition was not met.

During the follow-up supplemental inspection, the inspector reviewed the licensee's extent of condition re-evaluation documented in the root cause evaluation associated with Condition Report CR-RBS-2015-04375. The snapshot self-assessment performed for Corrective Action 53 validated the integrity and fidelity of simulator models and processes to ensure the thorough review of the extent of condition. The assessment considered seven objectives to ensure that a thorough extent of condition review was done. The objectives included:

- Benchmarking simulator safety-related equipment against plant data
- Reviewing simulator discrepancy reports
- Evaluating operable but degraded nonconforming equipment
- Evaluating operations decision making issues
- Evaluating open work orders
- Evaluating controllers in the simulator
- Performing walkdowns to compare the reference unit and simulator

The inspector assessed the potential impacts of simulator controllers with regards to simulator response and negative training. The licensee's snapshot self-assessment considered all controllers in the simulator that were modeled. The inspector noted that the snapshot self-assessment verified the controllers changed modeled plant parameters, but did not provide any insights on the correct functionality of the simulator controllers (i.e. a change in controller input corresponded to a change in the modeled parameter). The licensee provided the inspector with additional information and documentation with respect to benchmarking simulator controllers against plant data; or if that was not possible, information to demonstrate how the simulator controller was not used in abnormal or accident scenarios that would contribute to a negative operator training issue or simulator issue. The inspector concluded that the licensee's review for potential impacts of simulator controllers with regards to simulator response and negative training was appropriate.

The inspector performed detailed walkdown inspections to identify and evaluate discrepancies between the main control room and simulator. The inspector identified a simulator annunciator with an out-of-service status indication, even though the main control room deficiency had been corrected in September 2015. The inspector determined that this was a minor violation associated with simulator configuration management for tracking the differences between the simulator and reference unit, as required in Section 5.1, Part [2] of Procedure EN-TQ-202, "Simulator Configuration Control," Revision 9, because operators were able to use other indications to determine plant configuration and status. Further, there were no negative operator training implications with the failure to correct a simulator annunciator being out of service when the reference unit was repaired. This failure to comply with procedure requirements constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The licensee initiated Condition Report CR-RBS-2016-04883 and corrected the simulator annunciator on June 28, 2016, to match the reference unit. The licensee also performed a human performance evaluation to determine apparent and contributing causes for the performance deficiency. The apparent causes were determined to be the lack of attention to detail and questioning

attitude of the instructor performing the pre-training cycle reference unit and simulator comparison. The contributing cause was determined to be the lack of procedural guidance (e.g. checklists) for individuals performing the pre-training cycle reference unit and simulator comparison. The inspector determined the causal evaluation that was performed was adequate and included appropriate corrective actions, including planned corrective actions.

The inspector performed an assessment of the simulator's capabilities during scenarios that included transient events to validate that additional extent of condition issues were not present. Corrective Action 48 of Condition Report CR-RBS-2015-04375 required that plant data gathered during a transient be provided to training personnel for evaluation to ensure that simulator response was consistent with actual plant response. The inspector selected the reactor scram that occurred on June 11, 2016, to validate that the simulator response appropriately modeled actual transient plant conditions from a recent event. The inspector discussed the specifics of the reactor scram with training personnel and observed simulator response to the same transient conditions. The inspector determined that simulator response was consistent with actual plant response for a scenario that matched plant conditions from the reactor scram that occurred June 11, 2016. The inspector also selected a simulator scenario that involved the closure of main steam isolation valves due to this plant transient's impact on reactor vessel water level and observed that the simulator response was consistent with actual plant response.

In addition to reviewing the licensee's snapshot self-assessment, the inspector reviewed backlogs and issue tracking programs, such as operations aggregate index inputs, standing orders, and temporary modifications to ensure that operational and equipment issues associated with the actual plant did not have a negative impact on simulator performance and operator training. The inspector did not identify any problems with simulator performance and determined that the licensee's extent of condition evaluation was appropriate, and that the inspection objective involving the extent of condition was met.

Other elements of this inspection requirement were previously assessed and determined to be adequate as documented in NRC Inspection Report 05000458/2016010 (ML16146A792).

b. Findings

No findings were identified.

02.03 Corrective Actions

- a. Determine whether appropriate corrective actions are specified for each root and contributing cause or that the licensee has an adequate evaluation for why no corrective actions are necessary.

During the follow-up supplemental inspection, the inspector reviewed the licensee's extent of condition performed in the root cause evaluation associated with Condition Report CR-RBS-2015-04375 and assessed in Corrective Actions 46, 47, 52, and 53.

The inspector determined that the snapshot self-assessment performed by the licensee per Corrective Action 53 was appropriate, and determined that the extent of condition evaluation that was performed in the root cause evaluation associated with Condition Report CR-RBS-2015-04375 did not require additional corrective actions to address issues associated with the root and contributing causes. Therefore, the inspector concluded that the inspection objective of ensuring the licensee's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and to prevent recurrence was met.

Other inspection requirements associated with Corrective Actions were previously assessed and determined to be adequate as documented in NRC Inspection Report 05000458/2016010 (ML16146A792).

b. Findings

No findings were identified.

02.04 Evaluation of Inspection Manual Chapter 0305 Criteria For Treatment Of Old Design Issues

This inspection requirement was assessed and documented in NRC Inspection Report 05000458/2016010 (ML16146A792).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On June 29, 2016, the inspector presented the inspection results to Mr. W. Maguire, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspector had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Chase, Director, Regulatory and Performance Improvement
K. Huffstatler, Senior Licensing Engineer
E. Frey, Simulator Specialist
G. Krause, Training Superintendent
W. Maguire, Site Vice President
C. Rich, General Manager-Plant Operations
M. Desilant, Director of Training
B. Ford, Senior Manager Nuclear Safety and Licensing
P. O'Conner, Training Manager
J. Reynolds, Operations Manager

NRC Personnel

J. Sowa, Senior Resident Inspector
B. Parks, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000458/2015009-05 VIO Failure of the Plant-Reference Simulator to Demonstrate
Expected Plant Response (Section 40A4)

LIST OF DOCUMENTS REVIEWED

Section 40A4: Supplemental Inspection (95001)

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-102	Corrective Action Program	25
EN-LI-118	Cause Evaluation Process	22
EN-TQ-202	Simulator Configuration Control	9
Policy 97-02	Simulator Training Configuration Control	
Policy 97-06	Conduct of Simulator Training	
GOP-0003	Scram Recovery	27
GOP-0006	Condensate and Feedwater Failures	22
GOP-0002	Main Turbine and Generator Trips	27
EOP-0001	Emergency Operating Procedure, RPV Control	27

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EOP-0005	Emergency Operating and Severe Accident Procedure Enclosures	
OSP-0015	Annunciator Compensatory Monitoring for H13-P601/19A/B08 and B11	

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
LO-CR-RBS-2015-4372 CA#53	Simulator Model Validation	0
RSMS-OPS-0910	Simulator Scenario Number 7	13
	Performance Improvement Agenda	May 6, 2016
	List of Simulator Discrepancy Reports	June 13, 2016
	List of Operator Burdens	June 28, 2016
	List of Standing Orders	June 28, 2016
	List of Temporary Modifications	June 28, 2016

Condition Reports (CRs)

CR-RBS-2016-02896	CR-RBS-2015-04375	CR-RBS-2016-02550	CR-RBS-2016-02541
CR-RBS-2016-03862	CR-RBS-2016-03860	CR-RBS-2016-03859	CR-RBS-2016-03473
CR-RBS-2016-02415	CR-RBS-2016-02414	CR-RBS-2016-02322	CR-RBS-2016-02319
CR-RBS-2015-03027	CR-RBS-2015-01901	CR-RBS-2015-01902	CR-RBS-2016-04883

Simulator Deficiency Reports (DRs)

16-0117