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

August 9. 2010

Joseph Kowalewski, Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-0751

Subject: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – NRC INSPECTION PROCEDURE 95001 SUPPLEMENTAL INSPECTION REPORT 05000382/2010007

Dear Mr. Kowalewski:

On April 19 - 23, 2010, the U.S. Nuclear Regulatory Commission (NRC) staff completed a supplemental inspection pursuant to Inspection Procedure 95001, “Inspection for One or Two White Inputs in a Strategic Performance Area,” at your Waterford Steam Electric Station, Unit 3. The enclosed inspection report documents the inspection results, which were discussed with you and your staff on April 23 and June 11, 2010, during the preliminary exit briefings and with Mr. Charles Arnone and other members of your staff on July 7, 2010, during the final exit meeting.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was performed because a finding of low to moderate safety significance (White) was identified in the third quarter of 2009 for failure to follow plant procedures during corrective maintenance on a safety-related station battery. The staff previously documented this issue in NRC Inspection Report 05000382/2009008. The NRC staff was informed on January 14, 2010 of your staff’s readiness for this inspection.

The objectives of this supplemental inspection were to provide assurance that: (1) the root causes and the contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause of the issues were identified; and (3) corrective actions were sufficient to address and preclude repetition of the root and contributing causes. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license.

In general, the inspectors determined that your staff performed an adequate evaluation of the White finding. Your staff’s evaluation identified the cause of the condition as a failure to maintain plant configuration control due to a lack of specific work instructions and a lack of work order documentation to track the status of the intercell connectors that were loosened or removed. The inspectors determined that your staff planned and implemented the appropriate corrective actions to address the root cause and contributing causes.

Based on the results of this inspection, no findings of significance were identified.

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 Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA for/ RVA

Jeffrey A. Clark, P.E.
Chief, Project Branch E
Division of Reactor Projects

Docket Nos.: 50-382
License No.: NPF-38

Enclosure:
NRC Inspection Report 05000382/2010007
w/Attachment: Supplemental Information

cc w/Enclosure:

John T. Herron
President and CEO
Nuclear Operations/CNO
Entergy Services, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Jeff Forbes
Senior Vice President and
Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Thomas Palmisano
Vice President, Oversight
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Senior Manager, Nuclear Safety
and Licensing
Entergy Services, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Manager, Licensing and Regulatory Affairs
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-0751

Director, Nuclear Safety Assurance
Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-0751

Associate General Council – Nuclear
Entergy Services, Inc.
639 Loyola Avenue
New Orleans, LA 70113

General Manager, Plant Operations
Waterford 3 SES
Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-0751

Manager, Licensing
Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-0751

Chairman
Louisiana Public Service Commission
P. O. Box 91154
Baton Rouge, LA 70821-9154

Parish President Council
St. Charles Parish
P. O. Box 302
Hahnville, LA 70057

St. Charles Parish
Dept. of Emergency Preparedness
Emergency Operations Center
P.O. Box 302
Hahnville, LA 70057

Director, Nuclear Safety & Licensing
Entergy, Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

Ms. Ji Wiley
Environmental Scientist Supervisor
Radiological Emergency Planning
and Response
Louisiana Department of

Environmental Quality
P. O. Box 4312
Baton Rouge, LA 70821-4312

Chief, Technological Hazards
Branch
FEMA Region VI
800 North Loop 288
Federal Regional Center
Denton, TX 76209

Electronic distribution by RIV:
Regional Administrator (Elmo.Collins@nrc.gov)
Deputy Regional Administrator (Chuck.Casto@nrc.gov)
DRP Acting Director (Anton.Vegel@nrc.gov)
DRP Acting Deputy Director (Troy.Pruett@nrc.gov)
DRS Director (Roy.Caniano@nrc.gov)
DRS Acting Deputy Director (Jeff.Clark@nrc.gov)
Senior Resident Inspector (Marlone.Davis@nrc.gov)
Resident Inspector (Dean.Overland@nrc.gov)
Branch Chief, DRP/E (Jeff.Clark@nrc.gov)
Senior Project Engineer, DRP/E (Ray.Azua@nrc.gov)
WAT Administrative Assistant (Linda.Dufrene@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Public Affairs Officer (Lara.Uselding@nrc.gov)
Project Manager (Kaly.Kalyanam@nrc.gov)
Branch Chief, DRS/TSB (Michael.Hay@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
Regional Counsel (Karla.Fuller@nrc.gov)
Congressional Affairs Officer (Jenny.Weil@nrc.gov)
OEMail Resource
Regional State Liaison Officer (Bill.Maier@nrc.gov)
NSIR/DPR/EP (Robert.Kahler@nrc.gov)
DRS/TSB STA (Dale.Powers@nrc.gov)
OEDO RIV Coordinator (Leigh.Trocine@nrc.gov)
ROPreports
DRS/TSB STA (Dale.Powers@nrc.gov)
OEDO RIV Coordinator (Margie.Kotzalaz@nrc.gov)

R:_REACTORS_WAT\2010\WAT2010007RP-MFD.docx ADAMS ML102220354

ADAMS: □ No ☒ Yes	☒ SUNSI Review Complete	Reviewer Initials: RVA
	☒ Publicly Available	☒ Non-Sensitive
	□ Non-publicly Available	□ Sensitive

RIV:SRI:DRP/E	PE:DRP/E	SPE:DRP/E	C:DRP/E
MFDavis	WTSchaup	RVAzua	JAClark
Via e-mail	***Via email***	***/RA/***	***RVA for***
08/9/2010	08/5/2010	08/9/2010	08/9/2010

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket Nos.:	50-382
License No.:	NPF-38
Report:	05000382/2010007
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	17265 River Road Killona, LA 70057-0751
Dates:	April 19 through July 7, 2010
Inspectors:	M. Davis, Senior Resident Inspector W. Schaup, Project Engineer
Approved By:	Jeff Clark, P.E., Chief Reactor Projects Branch E Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY OF FINDINGS

IR 05000382/2010007; 04/19/2010 – 06/30/2010; Waterford Steam Electric Station, Unit 3; Supplemental Inspection – Inspection Procedure 95001

A senior resident inspector and one region-based inspector performed this inspection. No findings of significance were identified. The significance of most findings is indicated by their color (i.e., Green, White, Yellow, or Red) using the NRC Inspection Manual Chapter 0609, "Significance Determination Process." Crosscutting aspects are determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Area." 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.

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," to assess the licensee's evaluation associated with a violation of Technical Specification, Section 6.8.1.a, for the failure to follow plant procedures during corrective maintenance on a safety-related station battery. This led to a loose battery connection of two intercell connecting bolts for battery cells (57-58), which rendered the entire battery bank inoperable. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC inspection report 05000382/2009008. During this supplemental inspection, the inspectors determined that, in general, the licensee performed an adequate evaluation of the White finding. Their root cause evaluation identified the cause of the condition as a failure to maintain plant configuration control due to a lack of specific work instructions and a lack of work order documentation to track the status of the intercell connectors that were loosened or removed. The inspectors determined that the licensee implemented the appropriate corrective actions to address the root cause and contributing causes.

Given the licensee's acceptable performance in addressing the loose battery connection, the white finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program." Therefore, this issue is being closed and will only be considered in assessing plant performance through the second quarter of 2010.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA4 Supplemental Inspection (95001)

.01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure 95001 to assess the licensee's evaluation of a low to moderate safety significant (White) inspection finding that affected the Mitigating Systems Cornerstone in the reactor safety strategic performance area. The inspection objectives were to:

- provide assurance that the root and contributing causes of risk-significant issues were understood;
- provide assurance that the extent of condition and extent of cause of risk-significant issues were identified; and
- provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition.

Waterford Steam Electric Station, Unit 3, entered the Regulatory Response Column of the NRC's Action Matrix in the third quarter of 2009 as a result of one inspection finding of low to moderate safety significance (White). The White finding was associated with a violation of Technical Specification, Section 6.8.1.a, for the failure to follow plant procedures during corrective maintenance on a safety-related station battery. Specifically, licensee personnel performed work order instructions out of sequence after the replacement of a single battery cell in May of 2008. At that time, electricians failed to ensure that the work scope was fully met. This led to a loose battery connection of two intercell connecting bolts for battery cells that rendered the entire battery bank inoperable. The finding was characterized as having low to moderate safety significance (White) based on the results of an NRC evaluation performed by a region-based senior reactor analyst, as discussed in NRC Inspection Report 05000382/2009008.

The licensee informed the NRC on January 14, 2010, that they were ready for the supplemental inspection. In preparation for the inspection, the licensee performed a root cause analysis, Station Battery 3B-S failed weekly pilot cell test due to a loose connection, Revision 1, to understand how the intercell connections at the battery cells became loose. The licensee also compiled a safety culture component assessment as a part of their 95001 preparations.

The inspectors reviewed the root cause analysis associated with Condition Report CR-WF3-3008-4179, along with several other evaluations that were conducted in support and as a result of the root cause analysis. The inspectors reviewed the licensee's extent of condition and extent of cause evaluations to ensure they were sufficient in breadth. The inspectors reviewed the corrective actions that were taken or planned to address the identified causes. The inspectors also held discussions with licensee personnel to ensure that the root and contributing causes, as well as the

contribution of safety culture components, were understood and that corrective actions taken or planned were appropriate to address the causes and preclude repetition.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

a. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.

The inspectors determined that the licensee's root cause analysis provided sufficient detail on how the loose battery intercell connector was discovered. The issue was identified during the performance of the weekly battery operability surveillance test. The inspectors verified that this information was documented in the root cause analysis.

b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.

The licensee's root cause analysis documented that the intercell connections for battery cell numbers 56, 57 and 58 were most likely loosened and not retightened properly when cell 56 was replaced on May 24, 2008. In addition, the root cause analysis also discussed why other opportunities did not detect the issue until September 3, 2008. The inspectors determined that the root cause analysis was adequate with respect to identifying how long the issue existed and why prior opportunities may have not detected the problem.

c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents the plant-specific risk consequence, as applicable, and compliance concerns associated with the issue.

The licensee's root cause analysis documents the plant-specific risk consequence for the loose intercell connection and gives credit for reasonable recovery actions. Licensee personnel performed a detailed probability risk assessment as part of the corrective actions for this issue. In addition, the NRC determined this issue was a White finding, as documented in the NRC Inspection Report 05000382/2009008. The licensee entered the White finding in their corrective action program to address the issue. The inspectors concluded that the licensee appropriately documented the risk consequences and compliance concerns associated with the issue.

d. Findings

No findings were identified

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

a. Inspection Procedure 95001 requires that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes.

The licensee used the following systematic methods to complete the root cause analysis:

- Events and causal factor charting
- Failure mode analysis
- Data gathering through interviews and document reviews

The inspectors determined that the licensee evaluated the issue using systematic methodologies to identify the root and contributing causes.

b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause analysis was conducted to a level of detail commensurate with the significance of the issue.

The licensee's root cause analysis included an extensive timeline of events and used the event and causal factor method, as discussed in the previous section. The root cause analysis identified the cause of the condition as a failure to maintain plant configuration control due to a lack of specific work instructions and a lack of work order documentation to track the status of the intercell connectors that were loosened or removed. The licensee also identified six contributing causes that led to a loose battery connection of two intercell connecting bolts for battery cells, which evenly rendered the entire battery bank inoperable. The root cause analysis also contained information related to organizational and programmatic weaknesses. Based on the extensive work performed for this root cause evaluation, the inspectors concluded that the root cause analysis was conducted to a level of detail commensurate with the significance of the problem.

c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause analysis include a consideration of prior occurrences of the problem and knowledge of prior operating experience.

The licensee's root cause analysis included an evaluation of internal and external operational experience. It considered prior occurrences and operational experience. The inspectors concluded that the root cause analysis properly considered and documented prior occurrences of events, including prior operating experience.

d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause analysis addresses the extent of condition and the extent of cause of the issue.

The licensee's root cause analysis considered the extent of condition associated with a loose battery connection of two intercell connecting bolts. They performed a review of all other intercell connections on safety related station batteries. They verified that each intercell connection was within recommended torque values and met intercell resistance specifications. However, the extent of condition section of the root cause analysis did not consider equipment of a different type or perform a review of other similar conditions involving inadequate work instructions that led to other equipment failures. The licensee captured these deficiencies in Condition Report CR-WF3-2010-2557 and performed an immediate review of previous related conditions.

The licensee's root cause analysis considered the extent of cause associated with a failure to maintain plant configuration control due to a lack of specific work instructions and a lack of work order documentation of intercell connectors that were loosened and/or removed. However, the extent of cause section of the root cause analysis did not consider other groups that may be impacted when performing work without tracking the status of work instructions or obtaining new work instructions when the scope of the work changes. The licensee captured these deficiencies in Condition Report CR-WF3-2010-2557 and performed an immediate review of previous related causes.

The inspectors concluded that the licensee's root cause analysis addressed the extent of condition and extent of cause of the issue. Additionally, the inspectors determined that the immediate corrective actions performed to address the deficiencies in the extent of condition and cause evaluations were adequate.

e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause analysis, extent of condition, and extent of cause appropriately considered the safety culture components as described in Inspection Manual Chapter 0305.

The root cause analysis did not include a proper consideration of whether a weakness in any safety culture component was a root cause or significant contributing cause of the performance issue. The licensee performed this evaluation during a self assessment in preparation for the 95001 inspection. The 95001 assessment evaluated whether applicable safety culture components were identified, and if so, that adequate corrective actions were taken to address the applicable safety culture components. The licensee documented the results of the safety culture analysis in a table attached to their 95001 self-assessment.

The inspectors determined that the licensee appropriately considered whether weakness in safety culture components were root or contributing causes for the performance issues. The identified root causes and contributing causes were broad and encompassed the applicable safety culture attributes associated with human performance, aspects of procedural inadequacy and adherence, and decision making. The inspectors did not identify any safety culture component that could reasonably have been a root cause or significant contributing cause that had not been addressed in the root cause analysis or self-assessment.

f. Findings

No findings were identified

02.03 Corrective Actions

a. Inspection Procedure 95001 requires that the inspection staff determines that (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.

The licensee took immediate corrective actions to restore the station battery to an operable status by tightening the loose connections. The corrective actions for the root and contributing causes identified in the root cause analysis appear to be appropriate. The licensee updated procedures and maintenance guidelines, provided additional

training to electrical maintenance personnel, and communicated expectations of procedural requirements to the maintenance department. To address the contributing causes, the licensee established and reinforced standards and expectations for configuration control and included these standards and expectations in appropriate guidelines, procedures, and training. The inspectors determined that the proposed corrective actions were appropriate and addressed each root and contributing cause.

b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.

   The licensee implemented corrective actions to address the root and contributing causes identified in the root cause analysis. They prioritized the corrective actions in accordance with their corrective action program Procedure EN-LI-102, "Corrective Action Program." They established corrective actions to consider the risk significance and regulatory compliance of the issues as delineated in EN-LI-102. Based upon the guidance in EN-LI-102 and the prioritization of the corrective actions in accordance with this procedure, the inspectors determined that the corrective actions were prioritized with consideration of the risk significance and regulatory compliance.

c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.

   At the time of the supplemental inspection, the licensee had already completed and implemented a significant portion of the corrective actions. They identified the corrective actions to prevent recurrence, as well as a significant number of corrective and preventive actions in the root cause analysis. They established due dates for the corrective actions in accordance with their corrective action program. The inspectors determined that all the corrective actions listed in the root cause analysis have been either scheduled or completed.

d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.

   As documented in the root cause analysis, the licensee established measures for determining the effectiveness of the corrective actions to preclude repetition. They conducted the effectiveness reviews in accordance with Procedure EN-LI-118, "Root Cause Analysis Process." During the effectiveness reviews, licensee personnel identified issues with the closures of some corrective actions. They entered these corrective action items into their corrective action program to ensure that these effectiveness reviews and enhanced monitoring were performed. They also initiated Condition Report CR-WF3-2010-2270 to resolve and provide additional explanation in the closure of these corrective actions. The inspectors determined that quantitative and qualitative measures of success had been developed for determining the effectiveness of the corrective actions to preclude repetition.

e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation that was the basis for the supplemental inspection, if applicable.

The NRC staff issued an Notice of Violation to the licensee in a letter dated January 14, 2010. The licensee implemented several corrective actions to address the violation. The corrective actions included, in part, communicating expectations of procedural requirements to the maintenance department, establishing configuration control forms, revising maintenance guidelines, and providing additional training to electrical maintenance. The inspectors determined that the licensee planned and implemented the appropriate corrective actions to address the Notice of Violation.

f. Findings

No findings were identified.

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

The licensee did not request credit for self-identification of an old design issue; therefore, this risk-significant issue was not evaluated against the Inspection Manual Chapter 0305 criteria for treatment of an old design issue.

4OA6 Exit Meeting

On July 7, 2010, the resident inspectors presented the inspection results to Mr. Charles Arnone, General Manager of Plant Operations, and other members of the licensee's staff who acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. There was no proprietary information identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Entergy Personnel

J. Kowalewski, Site Vice President
C. Arnone, General Manager, Plant Operations
M. Adams, Electrical-I&C Supervisor, Maintenance
J. Briggs, Acting Manager, Maintenance
K. Cook, Manager, Operations
C. Fugate, Operations
W. McKinney, Manager, Corrective Action and Assessments
S. Meiklejohn, Temporary Manager, Maintenance
B. Murillo, Acting Director, Nuclear Safety Assurance
K. Nichols, Director, Engineering
R. Putnam, Manager, Programs and Components
B. Steelman, Acting Manager, Licensing
J. Williams, Licensing Specialist, Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000382/2009008-01	VIO	Inoperable 125 Vdc battery because electricians failed to follow work instructions

LIST OF DOCUMENTS REVIEWED

Section 4OA4: Supplemental Inspection (95001)

PROCEDURES/DOCUMENTS

NUMBER	TITLE	REVISION
EN-LI-102	Corrective Action Program	14
EN-LI-118	Root Cause Analysis Process	12
EN-HU-101	Human Performance Program	1
EN-MA-101	Fundamentals of Maintenance	9
EN-WM-102	Work Implementation Closeout	2
EN-WM-105	Planning	7

MG-32	Maintenance Expectations	17
MG-33	Configuration Control Guidelines & Completing the Lifted Lead Verification Form and the Switch Manipulation and Restoration	3
ME-003-200	Station Battery Bank and Charger Weekly	306
ME-004-807	Battery Cell Jumpering and Replacement	10
ME-004-213	Battery Intercell Connections	14
95001 Self Assessment	B Battery Loose Connection Assessment	0

CONDITION REPORTS

CR-WF3-2008-4179	CR-WF3-2009-2182	CR-WF3-2010-0503	CR-WF3-2009-4154
CR-WF3-2009-0697	CR-WF3-2009-0069	CR-WF3-2010-2270	CR-WF3-2010-2271
CR-WF3-2009-1177	CR-WF3-2008-5852	CR-WF3-2010-1545	CR-WF3-2010-2269
CR-WF3-2009-2138	CR-WF3-2008-5382	CR-WF3-2010-0056	CR-WF3-2010-0875
CR-WF3-2010-1112	CR-WF3-2010-2274	CR-WF3-2010-2557	CR-WF3-2009-2846

WORK ORDERS

152819	108092
51655765	152819