



Entergy Operations Inc.

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RBG-47591

July 15, 2015

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Licensee Event Report 50-458 / 2015-004-00
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBf1-15-0108

Dear Sir or Madam:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report.
This document contains no commitments. If you have any questions, please contact
Mr. Joseph Clark at 225-381-4177.

Sincerely,

A handwritten signature in dark ink, appearing to read "N. Todd Brumfield", written over a horizontal line.

NTB/dhw

Enclosure

cc: U. S. Nuclear Regulatory Commission
Region IV
1600 East Lamar Blvd.
Arlington, TX 76011-4511

NRC Sr. Resident Inspector
P. O. Box 1050
St. Francisville, LA 70775

TE22
NRR

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INPO

(via ICES reporting)

Central Records Clerk
Public Utility Commission of Texas
1701 N. Congress Ave.
Austin, TX 78711-3326

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
Ji Young Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

**LICENSEE EVENT REPORT (LER)**(See Page 2 for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

River Bend Station - Unit 1

2. DOCKET NUMBER

05000 458

3. PAGE

1 OF 3

4. TITLE

Potential Loss of Safety Function of Onsite AC / DC Distribution Systems Due to Postulated Main Control Building Heat-up Following Loss of Ventilation Cooling System

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
5	21	2015	2015	004	00	07	15	2015	FACILITY NAME	DOCKET NUMBER
										05000
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
1			<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)		
			<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)		
			<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)		
			<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)		
10. POWER LEVEL 100			<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)		
			<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)		
			<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)		
			<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> OTHER		
			<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A		

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

Joseph A. Clark, Manager - Regulatory Assurance

TELEPHONE NUMBER (Include Area Code)

(225) 381-4177

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
n/a									

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 21, 2015, with the plant operating at 100 percent power, the operations shift manager was notified of the discovery of an error in the plant design basis regarding the safety-related heating, ventilation, and air conditioning (HVAC) system in the main control building. Specifically, a calculation for the heat-up of certain building areas following the postulated failure of the HVAC system had not been updated when new AC / DC inverters were installed in 2009. This resulted in the possibility for exceeding the equipment qualification temperatures in the areas containing safety-related components in the DC distribution system, potentially resulting in the failure of that equipment under certain conditions. The investigation determined that an erroneous entry in the reference documents listed in the building heat-up calculation prevented the recognition of the calculation as an affected document when the 2009 design change was being developed. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event involving the potential inability to perform the safety function of the onsite AC and DC distribution systems. An analysis performed for this investigation developed a preliminary adjustment of ES-246 for updated heat loads. New system modeling indicates that, under the postulated loss of main control building HVAC concurrent with a loss of coolant accident, a failure of the safety-related AC and DC distribution systems due to heat buildup in the inverter rooms or AC switchgear rooms would be unlikely. This condition is, thus, of minimal safety significance to the health and safety of the public.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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NARRATIVE**REPORTED CONDITION**

On May 21, 2015, with the plant operating at 100 percent power, the operations shift manager was notified of the discovery of an error in the plant design basis regarding the safety-related heating, ventilation, and air conditioning (HVAC) system in the main control building. Specifically, a calculation for the heatup of certain building areas following the postulated failure of the HVAC system had not been updated when new AC / DC inverters were installed in 2009. This resulted in the possibility for exceeding the equipment qualification temperatures in the areas containing safety-related components in the DC distribution system, potentially resulting in the failure of that equipment under certain conditions.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event involving the potential inability to perform the safety function of the onsite AC and DC distribution system.

BACKGROUND

The main control building houses the safety-related Division 1 and 2 4.16kv switchgear, as well as the divisional battery banks, DC distribution switchgear, and the associated battery chargers and inverters. The inverters convert the DC output from the batteries into 120v AC power for distribution to safety-related switchgear and load centers. Each division has two inverters, one located in the DC equipment room and one located in the AC switchgear room. Only one inverter is in service at a time.

The building HVAC system comprises redundant divisions of chilled water systems and air handling units. Each division has two 100 percent-capacity chillers. One of the two divisions is in service at all times, and is capable of removing the entire heat load of the equipment in the building. While the air handling units for the spaces housing the electrical equipment are separated by division, the ductwork is common to both divisions, in that, either division will serve the entire building.

In 2009, a design change was implemented to install new AC / DC inverters in Divisions 1 and 2 of the onsite DC distribution systems. The new inverters are of a different design than the original units, and have a significantly higher heat output. The design change process involved updating design basis calculations to address the effects of the higher heat load on the performance of the HVAC system, both in steady-state operations and during transient conditions.

RBS engineering calculation ES 246, "Control Building Heat-up Following the Failure of the HVAC System" determines the temperatures in the limiting control building locations (i.e., the main control room, standby AC switchgear rooms, and standby DC equipment rooms) during a loss of coolant accident (LOCA) and confirms that the temperatures remain below the environmental design criteria limits for the first 23 minutes following a complete loss of control building HVAC. The calculation was developed to account for the control building chiller logic, which prevents restart of a chiller for as much as 20 minutes if the unit had previously been in service.

The postulated scenario addressed in ES-246 is the loss of offsite power, concurrent with a LOCA, followed by the failure of a single emergency diesel generator and a failure of the automatic re-start of the control building HVAC system. If the control building chiller that was previously in service was signaled to start post-LOCA, the chiller would, by design, be prevented by the chiller anti-recycle feature from re-starting for as much as 20 minutes. ES-246 determines the temperature rise in the limiting control building areas during this specific postulated event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

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NARRATIVE

INVESTIGATION AND IMMEDIATE CORRECTIVE ACTIONS

ES-246 was originally prepared utilizing electrical calculation E-160, "Control Building Heat Release (Normal)" as the source of the electrical heat load input. E-160 was superseded in 1987 by E-226, "Control Building Electrical Equipment Heat Release During LOCA Condition with Offsite Power Available". Revision 3 of ES-246 was issued in 1987 to include E-226 as a reference.

When a new calculation or calculation revision is processed into the site data management system, the calculation references are indexed in the database. The indexing of linked site documents allows an engineer performing a design change to identify potentially affected drawings, calculations, or other site documents. A review of the current and historical indexing data for ES-246 was performed for this investigation, and it was discovered that when revision 3 of ES-246 was issued in 1987, a typographical error occurred, resulting in the reference to ES-266 instead of ES-226. This error prevented the identification of ES-246 as an affected document during development of the 2009 design change.

When this condition was reported to Operations, provisions for mitigating actions by a dedicated operator to open battery and inverter room doors within the initial 20 minutes of the postulated event were instituted. Subsequent analysis and a preliminary adjustment of ES-246 have been performed, and the new information indicates that the qualified equipment area temperatures would likely not be exceeded in the postulated event.

CORRECTIVE ACTIONS to PREVENT RECURRENCE

The procedural guidance in effect at the time that the incorrect cross-reference was added to calculation ES-246 did not contain robust barriers to prevent such a condition. This investigation has concluded that the current process would very likely prevent such an error.

PRIOR OCCURRENCE EVALUATION

No similar events have been reported by River Bend Station in the past three years.

SAFETY SIGNIFICANCE

An analysis performed for this investigation developed a preliminary adjustment of ES-246 for updated heat loads. New system modeling indicates that, under the postulated loss of main control building HVAC concurrent with a LOCA, a failure of the safety-related AC and DC distribution system due to heat buildup in the inverter rooms or AC switchgear rooms would be unlikely. This condition is, thus, of minimal safety significance to the health and safety of the public.