Entergy

**Entergy Operations, Inc.**
River Bend Station
5485 U. S. Highway 61N
St. Francisville, LA 70775
Tel 225 381 4374
Fax 225 381 4872
eolson@entergy.com

**Eric W. Olson**
Site Vice President

RBG-47506

September 26, 2014

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

Subject: Licensee Event Report 50-458 / 2014-004-00
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-14-0142

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,

Eric W. Olson

EWO/dhw

Enclosure

IE22
NRR

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

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

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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.

# LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. PAGE |
|---|---|---|
| River Bend Station - Unit 1 | 05000 458 | 1 OF 3 |

**4. TITLE**

Unanalyzed Condition of the Ultimate Heat Sink That Degraded Its Ability to Perform Its Design Safety Function Due to Water Inventory Less Than Requirement of Accident Analsyis

| 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 |
| | | | | | | | | | | 05000 |
| 07 | 30 | 2014 | 2014 | - 004 - | 00 | 09 | 26 | 2014 | 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 | ☐ 20.2201(b) | ☐ 20.2203(a)(3)(i) | ☐ 50.73(a)(2)(i)(C) | ☑ 50.73(a)(2)(vii) |
| | ☐ 20.2201(d) | ☐ 20.2203(a)(3)(ii) | ☐ 50.73(a)(2)(ii)(A) | ☐ 50.73(a)(2)(viii)(A) |
| | ☐ 20.2203(a)(1) | ☐ 20.2203(a)(4) | ☑ 50.73(a)(2)(ii)(B) | ☐ 50.73(a)(2)(viii)(B) |
| | ☐ 20.2203(a)(2)(i) | ☐ 50.36(c)(1)(i)(A) | ☐ 50.73(a)(2)(iii) | ☐ 50.73(a)(2)(ix)(A) |
| **10. POWER LEVEL** | ☐ 20.2203(a)(2)(ii) | ☐ 50.36(c)(1)(ii)(A) | ☐ 50.73(a)(2)(iv)(A) | ☐ 50.73(a)(2)(x) |
| | ☐ 20.2203(a)(2)(iii) | ☐ 50.36(c)(2) | ☐ 50.73(a)(2)(v)(A) | ☐ 73.71(a)(4) |
| 100 | ☐ 20.2203(a)(2)(iv) | ☐ 50.46(a)(3)(ii) | ☐ 50.73(a)(2)(v)(B) | ☐ 73.71(a)(5) |
| | ☐ 20.2203(a)(2)(v) | ☐ 50.73(a)(2)(i)(A) | ☐ 50.73(a)(2)(v)(C) | ☐ OTHER |
| | ☐ 20.2203(a)(2)(vi) | ☐ 50.73(a)(2)(i)(B) | ☐ 50.73(a)(2)(v)(D) | Specify in Abstract below or in NRC Form 366A |

**12. LICENSEE CONTACT FOR THIS LER**

| LICENSEE CONTACT | TELEPHONE NUMBER *(Include Area Code)* |
|---|---|
| Joseph A. Clark, Manager - Regulatory Assurance | (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 | 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
|---|---|---|---|---|
| ☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☑ NO | | | | |


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

On July 30, 2014, with the plant operating at 100% power, a review of an engineering analysis of the ultimate heat sink (UHS) determined that the UHS was in an unanalyzed condition that degraded plant safety. This condition was the result of a design basis deficiency for the UHS that did not account for the adverse effects of system leakage on compliance with the 30-day inventory required by Regulatory Guide 1.27. The system design basis requires that 30-day inventory be maintained, with the assumption that no replenishment of the UHS inventory occurs for the entire duration of the postulated event. In support of the development of the engineering analysis, compensatory measures have been implemented which provide adequate assurance that the UHS will perform its design safety function. Corrective actions to restore full compliance with design basis requirements are in development. This event is being reported in accordance with 10 CFR 50.73 (a)(2)(ii) as an unanalyzed condition that degrades the safety function of the UHS.

| 1. FACILITY NAME | 2. DOCKET | 6. LER NUMBER | | | 3. PAGE |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. | |
| River Bend Station - Unit 1 | 05000 458 | 2014 | - 004 | - 00 | 2 OF 3 |

**NARRATIVE**

REPORTED CONDITION

On July 30, 2014, with the plant operating at 100% power, a review of an engineering analysis of the ultimate heat sink (UHS) (BS) determined that the UHS was in an unanalyzed condition that degraded plant safety. This condition was the result of a design basis deficiency for the UHS that did not account for the adverse effects of system leakage on compliance with the 30-day inventory required by Regulatory Guide 1.27. The system design basis requires that 30-day inventory be maintained, with the assumption that no replenishment of the UHS inventory occurs for the entire duration of the postulated event.

In support of the development of the engineering analysis, compensatory measures have been implemented which provide adequate assurance that the UHS will perform its design safety function. Corrective actions to restore full compliance with design basis requirements are in development.

This event is being reported in accordance with 10 CFR 50.72 (b)(3)(ii) as an unanalyzed condition that degrades the safety function of the UHS.

BACKGROUND

The service water system comprises a non-safety related loop, and two joined (but normally idle) safety-related loops supported by the two divisional emergency diesel generators (EDGs). The standby service water (SSW) subsystem, with the standby cooling tower and four divisional pumps, is referred to as the ultimate heat sink (UHS). The UHS, in the standby configuration, is isolated from the normal service water system by motor-operated valves. Upon an actuation signal, the UHS automatically starts and assumes the heat loads for all safety-related systems.

During a 2011 Component Design Basis Inspection, RBS received a non-cited violation concerning calculations related to the UHS. Design changes were developed to correct the condition, but would require prior NRC approval for implementation. A license amendment request (LAR) was submitted in February 2014 to request approval for crediting replenishment of the UHS inventory approximately 22 days after the onset of a loss of offsite power / loss of coolant accident to account for both UHS out-leakage to the normal service water system and the operation of both divisions of SSW.

During acceptance review of the LAR, NRC raised concerns with the inability to meet the 30-day post-accident mission time without replenishment. The analysis that confirms compliance with the 30-day mission time assumes the operation of only one division of safety-related systems. This analysis is in compliance with the license basis as documented in the original Final Safety Analysis Report, and has been carried forth without revision into the current Updated Safety Analysis Report. Therefore, the RBS design for UHS inventory is in compliance with the licensing bases on the issue of divisional equipment operation.

The issue of leakage is not as clearly delineated in the licensing basis. The design basis accounts for evaporation and drift from the standby cooling tower, but does not take into consideration UHS out-leakage through the isolation valves. The UHS does not meet the 30-day mission time without replenishment when assuming this out-leakage. The current known leakage is 8.9 gpm for Division 1 and 6.3 gpm for Division 2. The basin does not contain adequate capacity at the Technical Specification minimum water level of 111' 10" to meet the 30-day mission time with the existing measured leakage without compensatory measures.

| 1. FACILITY NAME | 2. DOCKET | 6. LER NUMBER | | | 3. PAGE |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. | |
| River Bend Station - Unit 1 | 05000 458 | 2014 | - 004 | - 00 | 3 OF 3 |

**NARRATIVE**

IMMEDIATE ACTIONS

In order to provide reasonable assurance of the ability of the UHS to fulfill its design basis function, several compensatory measures were instituted.

1. The standby cooling tower basin water level was raised approximately three feet.

2. A standing order was issued to direct the following:

a. Within four hours of the onset of the event, perform a qualitative assessment of the ability to provide at least 120 gpm of makeup flow to the UHS

b. If insufficient makeup capacity exists, shut down either Division 1 or 2 EDG.

c. Enter the abnormal operating procedure for a malfunction of the SSW system.

CORRECTIVE ACTION TO PREVENT RECURRENCE

Various options are being evaluated to ultimately correct this condition and restore the UHS to a fully operable status. Resolution of this condition is being tracked in the station's corrective action program.

PREVIOUS OCCURRENCE EVALUATION

No similar conditions have been reported at River Bend Station during the past 3 years.

SAFETY SIGNIFICANCE

For the condition of the UHS prior to the institution of the compensatory measures described above, the UHS is considered to have been operable, but degraded. Various means of replenishing the UHS inventory have been described in abnormal operating procedures for over ten years. Therefore, there is reasonable assurance that the UHS would have been capable of supporting the response to a design basis event. With the new compensatory measures in place, the UHS is considered operable, and is capable of fulfilling its design safety function. Thus, this condition has been of minimal significance to the health and safety of the public.