



**Entergy**<sup>®</sup>

**Entergy Operations, Inc.**

River Bend Station  
5485 U.S. Highway 61N  
St. Francisville, LA 70775  
Tel 225-381-4374

**William F. Maguire**  
Site Vice President

RBG-47898

September 4, 2018


Attn: Document Control Desk  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2738

Subject: Licensee Event Report 50-458 / 2018-006-00  
River Bend Station, Unit 1  
Docket No. 50-458  
License No. NPF-47

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. Tim Schenk at 225-381-4177.

Sincerely,

 (Engineering Director for Bill Maguire)  
WFM/twf

Enclosure

cc: (with Enclosure)

U.S. Nuclear Regulatory Commission  
Attn: Ms. Lisa M. Regner, Project Manager  
09-D-14  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

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

NRC Senior Resident Inspector  
Attn: Mr. Jeff Sowa  
5485 U.S. Highway 61, Suite 1  
St. Francisville, LA 70775

Public Utility Commission of Texas  
Attn: PUC Filing Clerk  
1701 N. Congress Avenue  
P. O. Box 13326  
Austin, TX 78711-3326

INPO  
(via ICES reporting)

RB1-18-0171

**LICENSEE EVENT REPORT (LER)**

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202, (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.

|  |                                      |                          |
|--|--------------------------------------|--------------------------|
| <b>1. Facility Name</b><br>River Bend Station - Unit 1 | <b>2. Docket Number</b><br>05000 458 | <b>3. Page</b><br>1 OF 3 |
|--|--------------------------------------|--------------------------|

**4. Title**  
Potential Loss of Safety Function and Condition Prohibited by Technical Specifications due to Emergency Diesel Generator Lube Oil Chiller Leak Caused by Design Deficiency.

| 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 |
| 07                       | 06  | 2018 | 2018   | 006   | 00   | 09  | 04  | 18  | NA                                   | 05000 NA      |
| <b>9. Operating Mode</b> |     |      | <b>11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)</b> |   |  |   |   |   |                                      |               |
| 1                        |     |      | <input type="checkbox"/> 20.2201(b)  | <input type="checkbox"/> 20.2203(a)(3)(i)             |  | <input type="checkbox"/> 50.73(a)(2)(ii)(A)           |   | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |                                      |               |
|                          |     |      | <input type="checkbox"/> 20.2201(d)  | <input type="checkbox"/> 20.2203(a)(3)(ii)            |  | <input type="checkbox"/> 50.73(a)(2)(ii)(B)           |   | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |                                      |               |
|                          |     |      | <input type="checkbox"/> 20.2203(a)(1)   | <input type="checkbox"/> 20.2203(a)(4)                |  | <input type="checkbox"/> 50.73(a)(2)(iii)             |   | <input type="checkbox"/> 50.73(a)(2)(ix)(A)   |                                      |               |
|                          |     |      | <input type="checkbox"/> 20.2203(a)(2)(i)  | <input type="checkbox"/> 50.36(c)(1)(i)(A)            |  | <input type="checkbox"/> 50.73(a)(2)(iv)(A)           |   | <input type="checkbox"/> 50.73(a)(2)(x)       |                                      |               |
| <b>10. Power Level</b>   |     |      | <input type="checkbox"/> 20.2203(a)(2)(ii)   |   | <input type="checkbox"/> 50.36(c)(1)(ii)(A)                                    |   | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(A) |   | <input type="checkbox"/> 73.71(a)(4) |               |
| 100                      |     |      | <input type="checkbox"/> 20.2203(a)(2)(iii)  | <input type="checkbox"/> 50.36(c)(2)                  |  | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(B) |   | <input type="checkbox"/> 73.71(a)(5)          |                                      |               |
|                          |     |      | <input type="checkbox"/> 20.2203(a)(2)(iv)   | <input type="checkbox"/> 50.46(a)(3)(ii)              |  | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(C) |   | <input type="checkbox"/> 73.77(a)(1)          |                                      |               |
|                          |     |      | <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)(D) |   | <input type="checkbox"/> 73.77(a)(2)(i)       |                                      |               |
|                          |     |      | <input type="checkbox"/> 20.2203(a)(2)(vi)   | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) |  | <input type="checkbox"/> 50.73(a)(2)(vii)             |   | <input type="checkbox"/> 73.77(a)(2)(ii)      |                                      |               |
|                          |     |      | <input type="checkbox"/> 50.73(a)(2)(i)(C)   |   | <input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A) |   |   |   |                                      |               |

**12. Licensee Contact for this LER**

|   |   |
|---|---|
| <b>Licensee Contact</b><br>Tim Schenk, Manager - Regulatory Assurance | <b>Telephone Number (Include Area Code)</b><br>225-381-4177 |
|---|---|

**13. Complete One Line for each Component Failure Described in this Report**

| Cause   | System | Component | Manufacturer | Reportable to ICES | Cause  | System | Component | Manufacturer | Reportable to ICES |       |     |      |    |    |    |
|---|--------|-----------|--------------|--------------------|--|--------|-----------|--------------|--------------------|-------|-----|------|----|----|----|
| B   | LA     | CLR       | C634         | Y                  | NA   | NA     | NA        | NA           | NA                 |       |     |      |    |    |    |
| <b>14. Supplemental Report Expected</b>   |        |           |              |                    | <b>15. Expected Submission Date</b>  |        |           |              |                    |       |     |      |    |    |    |
| <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No |        |           |              |                    | <table border="1"><tr><th>Month</th><th>Day</th><th>Year</th></tr><tr><td>NA</td><td>NA</td><td>NA</td></tr></table> |        |           |              |                    | Month | Day | Year | NA | NA | NA |
| Month   | Day    | Year      |              |                    |  |        |           |              |                    |       |     |      |    |    |    |
| NA  | NA     | NA        |              |                    |  |        |           |              |                    |       |     |      |    |    |    |

**Abstract** (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On 7/4/18 River Bend Station declared the Division II Emergency Diesel Generator (EDG) operable after completing a planned maintenance outage. On 7/4/18 immediately following the outage, the Division I EDG was declared inoperable for planned testing for approximately 4 hours. On 7/5/18 operators noted a rise in the Division II EDG lube oil filter differential pressure. A grab sample was obtained that indicated the presence of water in the lube system which led operators to declare the Division II EDG inoperable. An engineering evaluation later determined that this condition started when the Division II EDG was restored to normal operating temperature following the maintenance outage. It was then recognized that the Division I and the Division II EDG were declared inoperable simultaneously and the Technical Specification required action completion times for one inoperable EDG were not met prior to discovery of the water intrusion. The cause of the water intrusion was determined to be a design deficiency in the EDG lube oil cooler which led to a leak in the floating tubesheet seals. The leak was repaired and the Division II EDG was returned to an operable status. Design changes have been developed to correct the design deficiency and are scheduled to be in place by the end of 2019. This event had minimal significance to the health and safety of the public.

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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| 1. FACILITY NAME            | 2. DOCKET NUMBER | 3. LER NUMBER |                   |         |
|-----------------------------|------------------|---------------|-------------------|---------|
| River Bend Station - Unit 1 | 05000-458        | YEAR          | SEQUENTIAL NUMBER | REV NO. |
|                             |                  | 2018          | 006               | 00      |

**NARRATIVE****A. PLANT CONDITIONS PRIOR TO THE EVENT**

On 7/6/18, River Bend Station (RBS) was operating in Mode 1 at 100% Power. Prior to the event there were no inoperable structures, systems, or components that contributed to the event.

**B. DESCRIPTION**

On 6/24/18 14:15 the Division II Emergency Diesel Generator (EDG) (\*\*DG\*\*) [EK] was declared inoperable for a planned maintenance outage. The outage was completed and the Division II EDG was declared operable on 7/4/18 03:27. RBS then began a surveillance test of the Division I EDG. The Division I EDG was placed in maintenance mode as part of the surveillance test, rendering it inoperable on 7/4/18 04:27. The Division I EDG was later declared operable after the surveillance test on 7/4/18 07:53.

On 7/5/18, Operators recognized that Division II Emergency Diesel Generator lube oil filter differential pressure increased from 0.5 Pounds per Square Inch Differential (PSID) to 13 PSID in less than one day. A lube oil sample was obtained and the cause was determined to be water intrusion. The Division II EDG was declared inoperable on 7/6/18 01:43. The condition was verified not to exist on the Division I EDG. All Technical Specification (TS) required actions for one inoperable EDG were completed within the allowed completion times.

The exact amount of water in the oil system could not be determined, but the fact that the lube oil filter was severely restricted indicates there was a significant amount of water contamination. The water intrusion was determined to be due to leakage past the floating tubesheet seals in the lube oil cooler (\*\*CLR\*\*) [LA]. System tagouts in which the components are allowed to go cold followed by rewarming are often associated with the initiation of new leakage past these seals. The Division II EDG had just undergone an extended maintenance window in which it was inoperable from 6/24/18 14:15 to 7/4/18 03:27 and the lube oil system was allowed to cool to ambient temperature. There is no concern that there was any water-to-oil leakage in Division II or that it was susceptible to this failure mechanism before this extended maintenance window. There is no technical basis to be able to determine that the Division II EDG would have been capable of meeting its mission, from 6/24/18 14:15 when the maintenance outage started until it was repaired and restored on 7/9/18 22:09. Therefore, the entirety of the Division II EDG was from 6/24/18 14:15 to 7/9/18 22:09. The Division I EDG was also inoperable during this window from 04:27 to 07:53 on 7/4/18.

**C. REPORTABILITY**

Because both EDGs were considered inoperable from 04:27 to 07:53 on 7/4/18, this event is being reported under 10CFR50.73(a)(2)(v)(A), 10CFR50.73(a)(2)(v)(B), 10CFR50.73(a)(2)(v)(C), and 50.73(a)(2)(v)(D) as an event that that could have prevented the fulfillment of the safety function of structures or systems that are needed to (A) shut down the reactor and maintain it in a safe shutdown condition, (B) remove residual heat, (C) control the release of radioactive material and (D) mitigate the consequences of an accident. This event is also being reported under 10CFR50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications, due to the completion times of the TS required actions of one inoperable EDG from 6/24/18 14:15 to 7/9/18 22:09 not being met.

**D. CAUSE**

The cause of the Lube Oil Cooler leakage is a design deficiency in which there is a mismatch between the lantern ring at the packed floating tube sheet and the tube sheet outside diameter. The clearance is too large between the lantern ring inside diameter and tube sheet outside diameter to fully cover the annulus between the tube sheet outside diameter and flange inside diameter. The lantern ring should fit tightly around the tube sheet (1/32" clearance). The RBS lube oil cooler has a non-standard floating tube sheet (14-15/16" ), machined smaller by the original vendor, but the size of the lantern ring appears to not have been changed to match the tube sheet. This causes improper retaining of the rubber packing, which over time deforms and extrudes into open spaces around the lantern ring. This deprives it of its normal resiliency,

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|-----------------------------|------------------|---------------|-----------------------------|------------------|
| River Bend Station - Unit 1 | 05000- 458       | YEAR<br>2018  | SEQUENTIAL<br>NUMBER<br>006 | REV<br>NO.<br>00 |

**NARRATIVE**

such that if the cooler temperatures decrease to ambient, the packing cannot expand enough to continue sealing. This excess clearance allows extrusion of the packing, potentially blocking the lantern ring drain holes, allowing water to migrate into the lube oil side of the lube oil cooler. By design, any leakage should pass harmlessly to the exterior.

**E. CORRECTIVE ACTIONS**

An Engineering Change has been developed to replace the existing lantern rings in the Lube Oil Coolers with the correct size rings in order to fit tightly around the tube sheet. The changes are currently scheduled for October 2018 for Division I and October 2019 for Division II.

**F. SAFETY SIGNIFICANCE**

There is no technical bases to support the ability of the Division II EDG to perform its design safety function from 6/24/18 14:15 to 7/9/18 22:09. Although the Division I EDG was considered inoperable on 7/4/18 from 04:27 to 07:53, it was available for a majority of that time and would have been capable of performing its design safety function. The only time the Division I EDG would not have been capable of performing its design safety function during this period is when it was in maintenance mode, which was a total of 40 minutes. In the event of an actual Loss of Offsite Power while the Division I EDG was in maintenance mode, control room operators would have taken immediate action to manually restore the EDG in accordance with Operations Section Procedure-Emergency and Transient Response Support Procedure and/or Emergency Operating Procedure-Reactor Pressure Vessel Control. This event had minimal significance to the health and safety of the public.

**G. PREVIOUS SIMILAR OCCURRENCES**

Similar failures have occurred multiple times at RBS however, this is the first time this condition has resulted in a reportable condition in accordance with 10CFR50.72 or 10CFR50.73.

(NOTE: Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER are annotated as (\*\*XX\*\*) and [XX], respectively.)