

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

Steve Vercelli Site Vice President

10 CFR 50.73

RBG-48094

May 20, 2021

ATTN: Document Control Desk U.S. Nuclear Regulatory Commission Washington, DC 20555-0001

Subject: Licensee Event Report 50-458 / 2021-01-00, "Manual Reactor Scram due to Loss of Main Condenser Vacuum"

River Bend Station – Unit 1 NRC Docket No. 50-458 Renewed Facility Operating License No. NPF-47

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.

Respectfully,

Storwall

SPV/twf

Enclosure: Licensee Event Report 50-458 / 2021-01-00, "Manual Reactor Scram due to Loss of Main Condenser Vacuum"

cc: NRC Regional Administrator - Region IV NRC Project Manager - River Bend Station NRC Senior Resident Inspector - River Bend Station Louisiana Department of Environmental Quality Public Utility Commission of Texas

Enclosure

RBG-48094

Licensee Event Report 50-458 / 2021-01-00, "Manual Reactor Scram due to Loss of Main Condenser Vacuum"

| NRC FORM 366 (08-2020) | | 66 LIC (See Pa (See NUF <u>https://w</u> | U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) (See Page 3 for required number of digits/characters for each block) (See NUREG-1022, R.3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/) | | | | | | | | APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023 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, Library, and Information Collection Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects. Resource@mrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number. | | | | | | |
|--|--------------------------|--|---|--------------------------|---------------------|-----------------------|--------------------|---------------|--------------|------------------------------------|---|-------------------|------------------|----------------------------------|--------------------|-------------|--|
| 1. Facility Name River Bend Station – Unit 1 | | | | | | | | | | 2. Docket Number 3. Page 05000 458 | | | | 3. Page | 1 OF 2 | | |
| 4. Title Manu | ial F | leactor Scr | ram o | due to | Loss of | Main | Condens | ser Vac | uum | า | | | | | | | |
| 5. Event Date | | | | 6. LER Number | | | 7. Report Date | | | 8. Other Facilities Involved | | | | | | | |
| Month | Day | Year | Ye | ear Se | equential lumber | Rev No. | Month | Day | Y | (ear | Facility Name | me | | | 05000 | Docket Numl | |
| 03 | 25 | 2021 | 20 | 21 - | 001 - | 00 | 05 | 21 | 2 | 021 | Facility Name |) | | | | Docket Numl | |
| 9. Opera | tina N | lode | | | | | | | 10 | 10 Power Level | | | | | | | |
| 1 80 | | | | | | | | | | | | | | | | | |
| 11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply) | | | | | | | | | | | | | | | | | |
| 10 | CF | R Part 20 |) | 20.2203(a)(2)(vi) | | | 50.36(c)(2) | | | | ⊠ 50.73(a)(2)(iv)(A) | | | 50.73(a)(2)(x) | | | |
| □ 20.2 | 2201(| b) | | 20.2203(a)(3)(i) | | | □ 50.46(a)(3)(ii) | | | | 50.73(a)(2)(v)(A) | | | 10 CFR Part 73 | | | |
| | | | | \Box 20.2203(a)(3)(ii) | | | $\Box 50.69(q)$ | | | | \Box 50.73(a)(2)(v)(B) | | □ 73.71(a)(4) | | | | |
| ☐ 20.2203(a)(1) | | | | 20 | .2203(a)(4 | 4) | 50.73(a)(2)(i)(A | | | | □ 50.73(a)(2)(v)(C) □ 73.71(a)(5) | | | .71(a)(5) | | | |
| 20.2 | 2203(| a)(2)(i) | | 10 0 | CFR Pa | art 21 | 50.73(a)(2)(i)(E | | | | □ 50.73(a)(2)(v)(D) | | ☐ 73.77(a)(1)(i) | | | | |
| □ 20.2 | $\Box 20.2203(a)(2)(ii)$ | | | | .2(c) | | □ 50.73(a)(2)(i)((| | | | □ 50.73(a)(2)(vii) □ | | | □ 73.77(a)(2)(i) | | | |
| □ 20.2 | 2203(| a)(2)(iii) | | 10 0 | | art 50 | 50.73(a)(2)(ii) | | | | | ☐ 73.77(a)(2)(ii) | | | | | |
| $\Box 20.2203(a)(2)(iii)$ | | | | | 36(c)(1)(i | | 50.73(a)(2)(ii) | | | | □ 50.73(a)(2)(viii)(B) | | | | / | | |
| $\Box 20.2203(a)(2)(iv)$ $\Box 20.2203(a)(2)(v)$ | | | | 50.36(c)(1)(ii)(A) | | | 50.73(a)(2)(iii) | | | □ 50.73(a)(2)(ix)(A) | | | | | | | |
| ☐ Oth | er (S | pecify here, ii | n Absi | tract, or | in NRC 3 | 66A). | | | , | | _ (//// | | | | | | |
| | | | | | | | 12. Lic | ensee Co | onta | ct for | this LER | | | | | | |
| Licensee C Tim Sch | contac enk, | t Manager – R | egula | tory Ass | urance | | | | | | | | Phor 225 | e Number (In -381-4177 | clude Area (| Code) | |
| | | | | 13. Complete | | One Line for each Com | | npon | Cause System | | Component | | M | | Poportable To IPIS | | |
| Caus | 9 | System | Com | | Manufac | | керопаріе | TOIRIS | | | System | Compone | nt | Manufactu | rer Re | | |
| E | | SH | C | NV | N1 <i>1</i> | 4 | Y | | | NA | NA | NA | | NA | | NA | |
| 14. Supplementa | | | | al Report Expected | | | | | | 15. Expected Submission Date | | | e – | Month | Day | Year | |
| No Yes (If yes, complete 15. Expected Submission Date) | | | | | | | | | | NA | | | | | | | |
| 16. Abst | ract (I | _imit to 1560 sp | aces, i | e., approx | kimately 15 | single-s | paced typew | ritten lines) | | | | | | | | | |
| On March 25, 2021 at 09:01 CDT, River Bend Station was operating at 93% reactor power when Main Condenser vacuum began to lower. Reactor power was lowered in an attempt to maintain Main Condenser vacuum. At 09:18 a manual reactor scram was initiated from approximately 80% reactor power due to Main Condenser vacuum continuing to lower. All control rods fully inserted and there were no complications. All systems responded as designed. | | | | | | | | | | | | | | | | | |
| The loss of vacuum was caused by the in-service Steam Air Ejector Suction Valve closing due to faults within the valve's control components. The Steam Air Ejector Suction Valve function was restored by replacing the faulted components. | | | | | | | | | | | | | | | | | |
| River Bend Station will establish a program to test the fail-as-is function of the Steam Air Ejector Suction Valves | | | | | | | | | | | | | | | | | |

every outage.

| NRC FORM 366A | U.S. NUCLEAR REGU | JLATORY COMMISSION | APPROVED BY OMB: NO. 3150-010 | EXPIRES: | EXPIRES: 08/31/2023 | | | | | |
|-----------------------------------|---|---|---|---------------|--------------------------------------|---------------------------|--|--|--|--|
| (See NUREG-102 https://www.nrd | LICENSEE EVENT CONTINUATION 22, R.3 for instruction and guidan c.gov/reading-rm/doc-collections/ | REPORT (LER) N SHEET ce for completing this form /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 FOIA, Library, and Information Collection Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: <u>oira submission@omb.eop.gov</u> . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number. | | | | | | | |
| 1. FACILITY NAM | E | 2. DOCKET | NUMBER | 3. LER NUMBER | | | | | | |
| River Bend Sta | ation – Unit 1 | 05000- 458 | | YEAR 2021 | SEQUENTIAL NUMBER - 001 | REV NO. - 00 | | | | |
| NARRATIVE | | | | | | | | | | |
| | | | | | | | | | | |

EVENT DESCRIPTION

On March 25, 2021 at 09:01 CDT, River Bend Station was operating at 93% reactor power when the Main Control Room Staff noted multiple trends of lowering Main Condenser (SG) vacuum, lowering generator (GEN) load, and lowering Offgas System (WF) flow. Reactor power was lowered in accordance with operating procedures in an attempt to maintain vacuum. The in-service Steam Air Ejector (SH) Suction Valve was found to have changed position from full open to full closed. A manual reactor scram was initiated at 09:18 due to Main Condenser vacuum continuing to lower. The scram was initiated at 80% reactor power. All control rods fully inserted, and all systems responded as designed.

Main Condenser vacuum was restored following the scram with the Condenser Air Removal Pumps (SH). Main Condenser vacuum did not lower to the automatic main steam line isolation (BL) setpoint. The Main Condenser was available throughout the event.

This event was reported under 10 CFR 50.72(b)(2)(iv)(B), as any event or condition that results in actuation of the Reactor Protection System when the reactor is critical and 10 CFR 50.72(b)(3)(iv)(A) Specified System Actuation as a result of expected post scram level 3 isolations. (EN 55154)

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual actuation of the Reactor Protection System.

SAFETY ASSESSMENT

This event did not result in any incremental risk or consequences to the general safety of the public, nuclear safety, industrial safety, or radiological safety. Main Condenser vacuum did not deteriorate to the Main Steam Isolation Valves automatic closure setpoint. Normal post-trip Main Condenser vacuum level was restored promptly by utilization of the Condenser Air Removal Pumps. Therefore, post-trip availability of the Main Condenser was not jeopardized.

EVENT CAUSE

The loss of Main Condenser vacuum was caused by the in-service Steam Air Ejector Suction Valve closing. Failure analysis following the event, revealed a fault in the valve controller and current-to-pressure (I/P) converter. The valve controller failure resulted in disruption of the electrical signal to the I/P converter. The I/P converter is designed to maintain the valve in position upon loss of electrical power or air pressure (fail-as-is). Because the I/P converter also failed, it did not lock the valve in the open position following failure of the controller.

The Steam Air Ejector Suction Valve design was modified to fail-as-is in September 2007. The recommended testing frequency for the new fail-as-is function was once per cycle. However, the recommended testing frequency was not implemented.

CORRECTIVE ACTIONS:

River Bend Station will establish a program to test the fail-as-is function of the Steam Air Ejector Suction Valves every outage.

PREVIOUS SIMILAR EVENTS None.