



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-47897

August 27, 2018

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

Subject: Licensee Event Report 50-458 / 2018-005-00

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,

A handwritten signature in dark ink, appearing to read "W. Maguire", written over a large, stylized loop.

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)

RB1-18-0170

**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, 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
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4. Title
Loss of Reactor Protection System Scram Function During Main Steam Isolation Valve Channel Functional Tests due to Use of a Test Fixture

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
06	26	2018	2018	005	00	8	23	2018	NA	05000 NA

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)(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)
10. Power Level	<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 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 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 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

Licensee Contact Tim Schenk, Manager - Regulatory Assurance	Telephone Number (Include Area Code) 225-381-4177
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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
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No		NA	NA	NA

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

On June 26, 2018 during a review of industry operating experience, it was determined that use of the Reactor Protection System (RPS) test fixture described in station procedures would potentially result in the loss of one RPS reactor scram safety function. Technical Specification (TS) 3.3.1.1 requires that RPS instrumentation for Table 3.3.1.1-1 Function 6 for Main Steam Isolation Valve-Closure (MSIV) remain OPERABLE. It was concluded that the required number of Main Steam Line inputs for each RPS trip system was not maintained during the use of the RPS test fixture. Surveillance procedures were revised to incorporate the use of the test box in November 2014. Between November 2014 and May 2018, the MSIV Closure procedure was performed 15 times using the test fixture. While it did not meet the TS bases, RPS remained functional at all times. The failure to recognize the impact of the modification and procedure revisions is considered a human performance error by engineering personnel.

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

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
River Bend Station - Unit 1	05000-458	YEAR 2018	SEQUENTIAL NUMBER 005	REV NO. 00

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

On June 26, 2018, River Bend Station (RBS) was operating in Mode 1 at 100% Power. There were no structures, systems, or components that were inoperable at the start of this event that contributed to this event.

B. DESCRIPTION

On June 26, 2018, engineering personnel identified that the use of the Reactor Protection System (RPS) [JC] test fixture, as implemented in a surveillance test procedure, unintentionally resulted in the loss of Technical Specification (TS) Table 3.3.1.1 Function 6, Main Steam Isolation Valve-Closure, as defined in the TS bases at the time of the event. TS bases required signals from 3 of 4 Main Steam Line (MSL) inputs for each RPS trip system for the Main Steam Isolation Valve (MSIV) [SB][(**ISV**) closure function. A review determined that use of the test fixture did not maintain the required number of MSL inputs for each RPS trip system.

The test fixture was designed to reduce unnecessary RPS actuations. Before the use of the test fixture was incorporated into procedure, half scrams would occur during the performance of the RPS Main Steam Isolation Valve Closure surveillance test. The test fixture consists of a 5-ohm resistor in parallel with a 5 VAC lamp terminated with banana jacks. The RPS test fixture establishes a low resistance path in parallel with the trip logic relay contacts.

RPS has two independent trip systems (A and B) with two logic divisions in each trip system: A and C divisions for Trip System A, and B and D divisions for Trip System B. For Function 6 (MSIV Closure) there are sixteen total instrument channels (two per MSIV) with each logic division having four instrument channels and each trip system having eight. This logic ensures a full reactor scram when at least one MSIV in three or more MSLs are less than full open.

The use of the RPS test fixture, as implemented by procedure, would bypass MSIV position signal inputs for two MSLs (i.e., bypass four instrument channels) and prevent the associated trip logic division from being in a tripped condition (i.e., half-scram). If two isolated MSLs are in a bypassed division, a scram would not occur if only three MSLs are isolated.

The first use of the test fixture was performed on November 11, 2014. To date, the surveillance test procedure has been performed fifteen times using the test fixture. The longest time the test fixture was installed during the fifteen surveillances was 5 hours and 15 minutes with three exceptions. On two separate occasions issues were encountered during performance of the procedure and it was not clear if the RPS test fixture was installed during the full occurrence. On one occasion the test procedure was performed when the plant was in a mode where the TS was not applicable.

With one trip division bypassed and Function 6 inoperable, Technical Specification 3.3.1.1 Required Action G requires restoring RPS trip capability or being in Mode 2 within 6 hours. TS 3.3.1.1 Condition G was not intentionally entered during the performance of the surveillance but was either met each time or no firm evidence could be found to show that Condition G Completion Time was not met.

C. REPORTABILITY

This event is being reported under 10CFR50.73(a)(2)(v)(A) 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 and (D) mitigate the consequences of an accident.

D. CAUSE

The cause of this event was an incorrect procedure revision due to an inadequate 50.59 evaluation of the associated design change. While the requirement of having 3 valve position signals per trip system to maintain the RPS trip capability was recognized during preparation of the procedure change and the associated 10 CFR 50.59 evaluation, the understanding of

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CONTINUATION SHEET**

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River Bend Station - Unit 1	05000- 458	YEAR 2018	SEQUENTIAL NUMBER 005	REV NO. 00

NARRATIVE

how this requirement translates to relay contact logic development and the complexities introduced by the parallel logic strings was not identified.

E. CORRECTIVE ACTIONS

The following actions are completed or planned.

Completed:

Revised MSIV Closure surveillance procedures to remove the use of RPS test fixture.

Planned actions included in the corrective action program which may be changed in accordance with the program:

Brief Operations and Maintenance procedure writers and Engineering on the inadequate risk recognition and lack of technical rigor that occurred during this event.

F. SAFETY SIGNIFICANCE

When the RPS test fixture was installed during performance of STP-051-0201, RPS Function 6 trip capabilities was lost. TS bases at the time of the event required signals from 3 of 4 MSL inputs for each RPS trip system for the MSIV closure function. Performance of the surveillance test procedure using the test fixture did not maintain the availability of the required number of input signals. Despite this loss of trip capability, the remaining trip signals active in Mode 1 (Average Power Range Monitors, Reactor High Pressure, Reactor Water Level Low, Reactor Water Level High, Drywell Pressure High, Scram Discharge Volume Water Level High, Turbine Control Valve Fast Closure, Reactor Mode Switch to SHUTDOWN, and Manual Scram) provide sufficient redundancy to initiate an automatic scram, should conditions warrant.

MSIV closure is an anticipatory trip for reactor vessel overpressure transients, and produce a scram signal earlier than either the neutron monitoring system or nuclear system high pressure. The nuclear system high-pressure scram provides diversity of trip initiation and, in conjunction with the pressure-relief system, is adequate to preclude over-pressurizing the nuclear system. Based on this, RPS safety function to preclude all over-pressurization events was maintained at all times.

Function 6 had a minimum total bypass time of 45 hours and 27 minutes over thirteen occurrences in the 42 month period the test fixture was in use. This excludes the two occurrences in which the time the test fixture was installed is not known. While Function 6 did not meet the bases requirement for operability while bypassed, RPS remained functional and would have initiated a scram on a Group 1 MSIV isolation (isolation of all four MSLs). In addition, RBS credits Function 2.c, Fixed Neutron Flux- High, with generating a scram in the over-pressurization protection analysis rather than a direct scram from MSIV closure. Furthermore, reload analyses show that MSIV closure is not an otherwise limiting event. Based on this, RPS safety function was maintained at all times.

The actual consequences as stated in the problem statement were unintended LCO entries. There were no other actual consequences to general safety of the public, nuclear safety, industrial safety and radiological safety for this event.

G. PREVIOUS SIMILAR OCCURRENCES

No previous similar events could be found.

(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.)