



Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775
Tel 225-381-4157

Steven P. Vercelli
General Manager –Plant Operations

RBG-47764

June 8, 2017

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

Subject: Licensee Event Report 50-458 / 2016-003-01
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-17-0067

Dear Sir or Madam:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report. This is a supplement to the original report dated March 17, 2016. Updated information is annotated by change bars in the right margin. Additionally, for the sake of consistency, all references to “control rod” have been changed to “control blade.”

This document contains no commitments. If you have any questions, please contact Mr. Tim Schenk at 225-381-4177.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Vercelli".

SPV / 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

INPO
(via ICES reporting)

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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)

(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, NEOF-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
Operations Prohibited by Technical Specifications Due to Reactor Control Blade Drift During Core Alterations

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
01	19	2016	2016	003	01	06	08	2017	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
5	<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)	
0	<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
	<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 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

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	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
(see text)									

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				MONTH	DAY	YEAR

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

On January 19, 2016, at 5:28 a.m. CST, while conducting core alterations, an alarm was actuated in the main control room alarm indicating that a reactor control blade had drifted out of the fully inserted position. At the time, a fuel bundle was being raised out of the core, and the control blade in the same cell drifted out one notch with no "withdraw" command present. This condition actuated a corresponding alarm on the refueling platform, and system interlocks stopped the platform hoist with the fuel bundle partially withdrawn. When the control blade moved from the fully inserted position, the Technical Specification applicability for the intermediate range neutron monitoring system was inadvertently entered, while a certain function of those instruments was not operable. This event constituted operations prohibited by Technical Specifications, and is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B). After a detailed assessment of the situation, the fuel bundle and the control blade were returned to their original positions. The drive mechanism for the control blade was disabled, and the control blade remained fully inserted for the remainder of the fuel cycle. In the recent refueling outage that commenced on January 28, 2017, the control blade was removed and inspected. This event was caused by the development of a bulge in one or more of the wings on the affected control blade that caused sufficient friction to support the blade without the collet fingers in the drive mechanism being engaged. No other control blades were affected at the time of the original event in January 2016. The operational cycle was successfully completed with the blade fully inserted. This event was, thus, of minimal safety 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-m/doc-collections/nuregs/staff/sr1022/r3/>)

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
River Bend Station – Unit 1	05000-458	2016	003	01

**NARRATIVE
REPORTED CONDITION**

On January 19, 2016, at 5:28 a.m. CST, while conducting core alterations, an alarm was actuated in the main control room alarm indicating that a reactor control blade had drifted out of the fully inserted position. At the time, a fuel bundle was being raised out of the core, and the control blade in the same cell drifted out one notch with no “withdraw” command present. This condition actuated a corresponding alarm on the refueling platform, and system interlocks stopped the platform hoist with the fuel bundle partially withdrawn.

One subset of instrumentation in the core neutron monitoring system is the intermediate range monitors (IRM)[IG]. A safety function of the IRMs, as required by Technical Specifications, is to actuate a trip of the reactor protection system upon a “high flux” signal, as might occur during a reactor startup. This function required to be operable only in MODE 5 (refueling) if all reactor control blades are not fully inserted, and in MODE 2 (reactor startup). Since it was not anticipated that the plant would enter the applicability for that IRM function until near the scheduled time of reactor startup, the surveillance requirement for that function had not been performed to verify operability at the time of this event. When the control blade drifted out of the fully inserted position, the applicability of the “high flux” trip function was inadvertently entered. As the function was not operable at the time, this event constituted operations prohibited by Technical Specifications.

INVESTIGATION and IMMEDIATE CORRECTIVE ACTIONS

After a detailed assessment of the situation, the fuel bundle was manually lowered back to into the core. The system interlock preventing any intentional control blade motion was temporarily bypassed, and the control blade was fully re-inserted with a normal “insert” command at 11:58 a.m. The bypass on the control blade motion interlocks was then removed.

Later on the same day, the surveillance test procedures for six IRM channels were successfully performed, re-establishing operability of the “high flux” function. The drive mechanism for the control blade has been disabled, and the control blade will remain fully inserted for the remainder of the current fuel cycle.

CAUSAL ANALYSIS

This event was caused by the development of a bulge in one or more of the wings on the affected control blade that caused sufficient friction to support the blade without the collet fingers in the drive mechanism being engaged. The blade vendor (Westinghouse) reported that such degradation has been experienced at other facilities with the Model CR82M blade, and provided a recommendation that the CR82M blades be replaced during the next refueling outage when the boron-10 depletion exceeds 40 percent of design life.



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CONTINUATION SHEET**

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CORRECTIVE ACTION TO PREVENT RECURRENCE

During the refueling outage that commenced on January 28, 2017, a total of 18 control blades of the same model with similar boron-10 depletion rates were replaced.

The procedure for calculating control blade service life will be revised to incorporate the vendor recommendation concerning CR82M blades.

PREVIOUS OCCURRENCE EVALUATION

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

SAFETY SIGNIFICANCE

River Bend Technical Specifications require that adequate shutdown margin exists at all times. It is required that the reactor core is subcritical (or at any time can be made so) by a specified margin of a percentage of the total reactivity in the core. One of the base assumptions of the shutdown margin calculation is that the control blade with the highest reactivity is fully withdrawn. In this event, one control blade moved out of the fully inserted position by only one notch. Therefore, the assumption of the shutdown margin calculation was not violated, and the calculation remained fully bounding.

No other control blades were affected at the time of the original event in January 2016. The operational cycle was successfully completed with the blade fully inserted. This event was, thus, of minimal safety significance to the health and safety of the public.

(NOTE: Energy Industry Identification System system name of each system referred to in the LER is annotated as [XX].)