



Entergy

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10 CFR 50.73

RBG-47927

January 23, 2019

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

Subject: Licensee Event Report 50-458 / 2018-011-00, "Condition Prohibited by Technical Specifications due to Inadequate Design Change of Under Voltage Relay Trip Set Point Range".
River Bend Station, Unit 1
NRC Docket No. 50-458
Facility Operating 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,

SPV/twf

Enclosure: Licensee Event Report 50-458 / 2018-011-00, "Condition Prohibited by Technical Specifications due to Inadequate Design Change of Under Voltage Relay Trip Set Point".

cc: NRC Region IV Regional Administrator, w/o Enclosure
NRC Senior Resident Inspector – River Bend Station, Unit 1
Ji Young Wiley, Department of Environmental Quality, Office of Environmental Compliance, Radiological Emergency Planning and Response Section
Public Utility Commission of Texas, Attn: PUC Filing Clerk
NRC Project Manager

**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 4
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4. Title Condition Prohibited by Technical Specifications due to Inadequate Design Change of Under Voltage Relay Trip Set Point Range

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
11	29	2018	2018	011	00	01	23	2019	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 type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
99	<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

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

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

On October 24, 2018, three under voltage relay as found trip set points were found outside of the Technical Specification (TS) allowed range. The condition was discovered during the performance of a planned Surveillance Requirement test. The relays were replaced or calibrated to within the TS allowed range and returned to service. On November 29, 2018, a past operability report was completed on the condition. The report concluded that there was no reasonable assurance that the under voltage relay trip values would remain within the TS allowed range for the entirety of the 2 year calibration Preventive Maintenance (PM) interval. The calibration PM interval was changed from 2 years to 60 days. The cause of the out-of-tolerance relay trip values was an inadequate design change. This event was of 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
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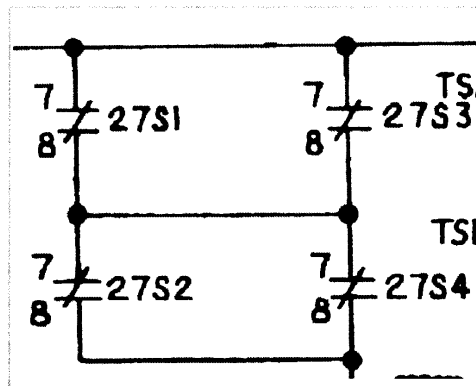
1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
River Bend Station - Unit 1	05000-	YEAR 2018	SEQUENTIAL NUMBER 011	REV NO. 00

NARRATIVE**BACKGROUND**

Under voltage relays (**RLY**) E22-S004-27S1 (27S1), E22-S004-27S2 (27S2), E22-S004-27S3 (27S3), and E22-S004-27S4 (27S4) monitor the Division III 4160 Volt Alternating Current (VAC) Switchgear (**SWGR**) [EK] (E22-S004) bus voltage. These relays perform the following safety functions on a bus under voltage condition:

- Trip High Pressure Core Spray [BG] Diesel Generator Service Water [BI] Pump (SWP-P2C).
- Start the load sequence timer for SWP-P2C.
- Provide a start signal to the Division III Emergency Diesel Generator.
- Provide a closure permissive for the Emergency Diesel Generator output breaker.
- Provide a closure permissive for the High Pressure Core Spray Pump Motor Breaker.

The 27S relays are arranged in a one-out-of-two-twice arrangement as seen below. The contacts are normally open. When the relay actuates the associated contact closes. In order for the safety function to occur the 27S1 or 27S3 and the 27S2 or 27S4 must actuate.



Under voltage relays E22-S004-27N1 (27N1) and E22-S004-27N2 (27N2) monitor the voltage of the normal offsite supply to E22-S004. The safety function of these relays is to actuate on an E22-S004 under voltage condition to isolate E22-S004 from the normal offsite supply by providing a trip signal to the offsite power supply circuit breaker. Actuation of either relay will perform the safety function.

All six of these relays are made by the same manufacturer and have the same model number. These relays are not used on the Division I or Division II safety related switchgears. The Technical Specification (TS) allowable trip value range for these relays is 86.23 VAC to 95.00 VAC as measured downstream from the 120/4200 VAC potential transformers which equates to 3019 VAC to 3325 VAC at E22-S004.

REPORTED CONDITION

On October 23, 2018, three E22-S004 under voltage relay as found trip set points were outside of the TS allowed range. The condition was discovered during the performance of a planned Surveillance Requirement (SR) test. The 27S2 relay

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NARRATIVE

was found below the TS allowed range with a value of 84.8 VAC. Relays 27S4 and 27N2 were found above the TS allowed range with values of 99.0 VAC and 100.4 VAC respectively. The 27N2 relay could not be calibrated and was replaced. The 27S2 and 27S4 relays were calibrated to within the TS allowable range.

On November 29, 2018, a technical evaluation of the under voltage relays was completed. The evaluation concluded that there was no reasonable assurance that the Division III under voltage relay trip values would remain within the TS allowed tolerance for the entirety of the 2 year calibration Preventive Maintenance (PM) interval.

The same surveillance was also performed on October 24, 2016. During this performance, the 27S1 and 27N2 relay as found trip set points were found above the TS allowable range with values of 97.6 VAC and 99.5 VAC respectively.

There were no other performances of this surveillance at River Bend Station (RBS) in the last three years.

Therefore, this condition is being reported as a Condition Prohibited by Technical Specifications, 50.73(a)(2)(i)(B).

PREVIOUS OCCURRENCE EVALUATION

There have been no recent previous occurrences similar to this condition at RBS.

CAUSAL ANALYSIS

In 2011, a drift study calculation was performed on the under voltage relays in question to support extending the SR interval to 2 years for 24 month cycle operation. The calculation concluded that the bounding analyzed drift for these relays is +/- 5.823 VAC for 30 months (24 months + 25%). Prior to RBS TS Amendment 179, the Division III under voltage relay trip set point allowable value range was 80.89 VAC - 93.11 VAC (12.22 VAC range). This range would allow the relay to experience the worst case calculated drift and still remain within the TS allowable value range for 24 months, assuming it was calibrated with an as-left value in the middle of the range. RBS TS Amendment 179, issued in March 2013, revised the Division III under voltage relay trip set point TS allowable value range to 86.23 VAC - 95.00 VAC (8.77 VAC range). A relay calibrated in the middle of this range has a +/- 4.385 VAC margin to the limits of the TS allowable range. The bounding analyzed drift of +/- 5.823 VAC is greater than the +/- 4.385 VAC margin to the limits of the TS allowable range of Amendment 179.

An additional contributor was the as-left acceptance values in the SR test procedure. For relays 27N1 and 27N2, the as-left acceptance criterion was 89.25 VAC - 91.23 VAC (1.98 VAC range). This range ensures that the as-left set point is near the center of the TS allowable range. However, the as-left acceptance criterion for relays 27S1, 27S2, 27S3, and 27S4 was the same as the as-found administrative range of 87.63 VAC to 92.85 VAC (5.22 VAC range). This can lead to an as-left set point with only 1.4 VAC margin to the TS allowable limit.

CORRECTIVE ACTION TO PREVENT RECURRENCE

The following actions have been completed to prevent recurrence.



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- Perform the calibration PM on or prior to 12/20/2018. When performing the calibration, the as-left set points shall be between 89.5 VAC and 91.7 VAC to ensure adequate margin to the TS allowable value.
- The system monitoring plan has been updated to include monitoring of relay drift.

The following actions have been assigned to prevent a recurrence of this event and are documented in the station's corrective action program.

- Perform the calibration PM on or prior to 2/17/2019. When performing the calibration, the as-left set points shall be between 89.5 VAC and 91.7 VAC to ensure adequate margin to the TS allowable value.

SAFETY SIGNIFICANCE

The out of tolerance conditions of 27N2 would not have prevented the safety function. The relays are arranged in such a way that actuation of either relay will perform the safety function. Therefore the out-of-tolerance relay would have actuated slightly early on an under voltage condition to separate E22-S004 from its offsite source in both instances. The October 2016 as found trip set point value correlates to an E22-S004 separation from offsite power at 3482.5 VAC. The October 2018 as found trip set point value correlates to 3514.0 VAC.

The out of tolerance conditions of the 27S relays would not have prevented the safety function. Due to the one-out-of-two-twice arrangement, the 27S relays that were found within the TS allowable range would have performed the safety function in both the October 2016 and October 2018 occurrence.

The basis for the bus under voltage TS allowable range is to prevent inadvertent power supply transfer and to ensure power is available to required equipment. In the degraded off-site power scenario, this reported condition would have caused a power supply transfer from offsite power to the on-site safety VAC system slightly sooner than required by TS.

This condition would not have prevented any safety system function. Therefore this event is considered to be of minimal significance to the health and safety of the public.

(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.)