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Eric W. Olson
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RBG-47649

February 8, 2016

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

Subject: Licensee Event Report 50-458 / 2015-010-00
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-16-0012

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. Joseph Clark at 225-381-4177.

Sincerely,

Eric W. Olson

EWO / 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

IE22
NRR

INPO
(via ICES reporting)

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

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet 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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
River Bend Station - Unit 1	05000 458	1 OF 3

4. TITLE

Potential Loss of Safety Function of High Pressure Core Spray Due to Failure of Main Control Building Ventilation Chiller

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
										05000
12	11	2015	2015	- 010	- 00	02	08	2016	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
83	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☑ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Joseph A. Clark, Manager - Regulatory Assurance	(225) 381-4177

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
n/a									

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☑ NO				

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

On December 11, 2015, at 4:16 a.m. CST, with the plant operating at 83 percent power, the high pressure core spray system (HPCS) was declared inoperable following the failure of the operating chiller in the Division 2 control building ventilation system (HVK). Chiller "D" was in service when it tripped automatically due to a high bearing temperature signal. The "C" chiller in the Division 1 subsystem automatically started as designed, and was confirmed to be operating correctly within approximately 5 minutes. The Technical Specifications for the Division 3 DC distribution system requires that the HPCS system be immediately declared inoperable. This condition potentially causes the HPCS system to be incapable of performing its safety function. The investigation determined that, during a recent corrective maintenance activity, too much oil was added to the chiller prior to its return to service. A subsequent load increase on the chiller caused excess oil to migrate into the compressor sump, where it contributed to the high bearing temperature condition. The HVK system continued to support the safety function of Division 3 electrical equipment after chiller trip, since the time required to restore an operable chiller is significantly less than the time limit for restoration of equipment room cooling. This event had no actual adverse effect on the ability of the Division 3 HPCS electrical system to perform its design safety function since there was more than sufficient time to align the other chiller in the same division to provide control building switchgear room cooling. This event, thus, did not constitute an actual loss of the ability of the HPCS system to perform its design safety function.

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NARRATIVE

REPORTED CONDITION

On December 11, 2015, at 4:16 a.m. CST, with the plant operating at 83 percent power, the high pressure core spray system (HPCS) (BG) was declared inoperable following the failure of the operating chiller (**CHU**) in the Division 2 control building ventilation (HVK) system. HVK chiller "D" was in service when it automatically tripped due to a high bearing temperature signal. The "C" chiller in the Division 1 HVK subsystem automatically started as designed, and was confirmed to be operating normally within approximately 5 minutes. The "B" chiller was aligned to the standby configuration approximately 23 minutes after the "D" chiller tripped. The HPCS system was again declared operable at 4:39 a.m.

The HVK system provides cooling to the equipment rooms housing the battery chargers and inverters for the safety-related onsite electrical distribution systems. The loss of cooling to the various equipment rooms in the control building requires that the supported equipment in those areas be declared inoperable. The Technical Specifications for the Division 3 DC distribution system requires that the HPCS system be immediately declared inoperable. This condition potentially causes the HPCS system to be incapable of performing its safety function, and is, thus, reportable in accordance with 10 CFR 50.73(a)(2)(v)(D).

CAUSAL ANALYSIS

HVK chiller "D" had recently undergone corrective maintenance to replace an oil seal on the compressor drive shaft. When the unit was being prepared for return to service, oil was added to raise the level to the band required by the operator's logs. The chiller was started on December 8, and operated until the automatic trip on the December 11. During this period, a change in the prevailing weather conditions caused the load on the compressor to increase significantly. When the load increases on this type of chiller, the oil inventory tends to migrate from the evaporator to the compressor sump, raising the oil level as monitored in the compressor sight glasses. This rise in level was sufficient to cause the compressor drive gears to entrain oil, increasing the load on the driveshaft bearings. The bearing temperature increased to the point where it caused an automatic trip of the compressor.

CORRECTIVE ACTIONS to PREVENT RECURRENCE

The following actions are being planned to address the causes of this event:

- The acceptance criterion for compressor oil level on the operators' logs will be revised to lower the upper end of the range.
- Maintenance instructions will be revised to provide for optimization of oil inventory prior to return to service.

These actions are being tracked in the site corrective action program.

PRIOR OCCURRENCE EVALUATION

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

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NARRATIVE

SAFETY SIGNIFICANCE

Within the bounds of the site accident analysis, there is a plausible (albeit, highly unlikely) scenario in which a complete loss of offsite power occurs following an unrelated failure of the operating HKV chiller, concurrent with the assumed failure of the emergency diesel generator in the division opposite that of the failed chiller.

Each of the two divisions of the HVK system has two 100 percent capacity chillers. The chilled water and service water subloops are configured such that manual operator action is required to shift service between the two chillers within a division. In the normal alignment, one chiller is carrying the building heat loads, and one chiller in the opposite division is in standby, capable of automatically starting in the event that the running chiller fails.

An unanticipated trip of an operating chiller automatically initiates the start sequence of the standby chiller. If the start of that standby chiller is closely followed by the loss of offsite power, the assumed subsequent failure of the diesel generator then leaves the HVK system with no chillers aligned for service. These circumstances result in the failure of the cooling function of the HVK system until the operators take the manual actions. The maximum time needed to perform the realignment has been conservatively estimated to be 76 minutes. Calculations have determined temperatures in the Division 3 equipment rooms will remain below the 122 F limit of the equipment for at least 24 hours.

In the event on December 11, the "C" chiller automatically started as designed, and it was confirmed to be operating correctly within approximately 5 minutes. The HVK system continued to support the safety function of Division 3 electrical equipment after chiller trip, since the time required to restore an operable chiller is significantly less than the time limit for restoration of equipment room cooling. This event had no adverse effect on the ability of the Division 3 HPCS electrical system to perform its design safety function following the trip of a HVK chiller since there is more than sufficient time to align the other chiller in the same division to provide control building switchgear room.

(NOTE: Energy Industry Component Identification codes are annotated as (**XX**))