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225-381-4177

RBG-48239

10 CFR 50.73

June 29, 2023

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

Subject: Licensee Event Report 50-458 / 2023-002-00, Division I and II Diesel Generators Inoperable due to Exceeding Load Sequence Times

River Bend Station – Unit 1
NRC Docket Nos. 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.

Should you have any questions, please contact Mr. Randy Crawford, Regulatory Assurance Manager, at 225-381-4177.

Respectfully,

RTC/dmw

Enclosure: Licensee Event Report 50-458 / 2023-002-00, Division I and II Diesel Generators Inoperable due to Exceeding Load Sequence Times

cc: NRC Region IV Regional Administrator - Region IV
NRC Senior Resident Inspector - River Bend Station

Enclosure

RBG-48239

Licensee Event Report 50-458 / 2023-002-00, Division I and II Diesel Generators Inoperable due to Exceeding Load Sequence Times

NRC FORM 366 (03-14-2023) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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/)

1. Facility Name	■ 050 / ☐ 052	2. Docket Number	3. Page
River Bend Station, Unit 1		458	1 OF 3

4. Title

Division I and II Diesel Generators Inoperable due to Exceeding Load Sequence Times

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	☐ 050	Docket Number
02	12	2023	2023	- 002 -	00	06	29	2023	N/A		N/A
									Facility Name N/A	☐ 052	Docket Number N/A

9. Operating Mode	10. Power Level
4	0%

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 20**	☐ 50.46(a)(3)(ii)	☑ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☑ 50.73(a)(2)(i)(B)	☑ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Randy Crawford	225-381-4577

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
X	EK	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☐ No	☑ Yes (If yes, complete 15. Expected Submission Date)		08	29	2023

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced type written lines)

On February 12, 2023, with River Bend Station (RBS) in Mode 4 during Refueling Outage 22, testing of the Division II Emergency Core Cooling System (ECCS) revealed that both Division II Control Building Chillers (HVK-CHL1B and HVK-CHL1D) failed to sequence onto the emergency bus within the Technical Specification (TS) required time. Investigation of the issue revealed that the same condition was present for the Division I Control Building Chillers (HVK-CHL1A and HVK-CHL1C). The condition described above was caused by a modification that replaced the Control Building Chiller controllers. The preliminary root cause identified that when the controllers were replaced, a delay was introduced in the start logic. Corrective actions to restore TS compliance were completed prior to the next mode of applicability.

This condition resulted in the inability to comply with a Surveillance Requirement of TS 3.8.1. At the time of discovery, RBS was in a mode of operation that is not applicable to TS 3.8.1. An evaluation determined that the TS 3.8.1 Surveillance Requirement was previously not met and appropriate actions were not taken in accordance with TS 3.8.1 - AC Sources – Operating.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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/)

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
River Bend Station, Unit 1	■ 050 ☐ 052	458	2023	- 002 -	- 00 -

NARRATIVE

EVENT DESCRIPTION

On February 12, 2023, RBS performed STP-309-0602, DIVISION II ECCS TEST. During the performance of Section 7.4, ECCS/LOP/LOCA Test Initiation, HVK-CHL1B [KM] did not load sequence within the required time. Load sequence time was 237.1 seconds with acceptance criteria of 180.9 to 221.1 seconds. During performance of Section 7.25, ECCS/LOP Test Initiation, HVK-CHL1D [KM] did not load sequence within the required time. Load sequence time was 241 seconds with acceptance criteria of 180.9 to 221.1 seconds. Condition Reports were generated for both issues.

On May 2, 2023, the station determined that the Division I and Division II Diesel Generators [EK] had been inoperable as a result of the chiller controller modification. HVK-CHL1C [KM] and HVK-CHL1D modifications were completed in 2014. HVK-CHL1A [KM] and HVK-CHL1B modifications were completed in 2020.

The discovery date was determined to be February 12, 2023. The event is reportable as an Operation or Condition Prohibited by Technical Specifications per 10 CFR 50.73(a)(2)(i)(B) and an Event or Condition that Could Have Prevented Fulfillment of a Safety Function per 10 CFR 50.73(a)(2)(v)(A) and (D).

EVENT CAUSE

This event was caused by the HVK-CHL1(A)(B)(C)(D) Controller Modifications that were installed in 2014 and 2020.

SAFETY ASSESSMENT

The Division I and II Diesel Generators were declared inoperable based on load sequence time of the HVK Chillers exceeding TS SR 3.8.1.18 requirements. The following engineering analysis provided evidence that the delay had no effect on the generator loading sequence.

Calculation E-192, STANDBY DIESEL GENERATOR LOADING CALCULATION, evaluates the loading of the standby diesel generators during the worst-case loading conditions (LOP concurrent with LOCA). The calculation verifies that the maximum magnitude for the load blocks is within the tested values of loading established by the vendor. HVK-CHL1B/D are in the 1.5-10-minute load block for the Division II Diesel Generator. The chiller is the last component in the load block to start with a listed start time of 211 seconds from the LOP. The next component to start is at the 10-minute mark. HVK-CHL1A/C are in the 1.5-10-minute load block for the Division I Diesel Generator. The chiller is the last component to start in the 1.5-10-minute load block with a start time of 241 seconds. Even with the additional 40 second delay, the chiller will remain in the 1.5-10-minute load block and there will be at least 5 minutes between a chiller start and the start of the next component. Therefore, the delay has no effect on the generator loading sequence.

Based on the engineering analysis, the Division I and II Diesel Generators remained capable of performing their required safety function for the duration of the event and the event will not be counted as a Safety System Functional Failure (SSFF) for the NRC Performance Indicators. The analysis also supports that there were no consequences to the health and safety of the public.

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NARRATIVE

ADDITIONAL INFORMATION

The Control Building [NA] Air Conditioning System (CBAC) consists of two independent, redundant subsystems that provide cooling and heating of the control building air. The associated control building chilled water subsystem (HVK) supplies chilled water to both subsystem AC units, as well as to the Main Control Room AC units.

The design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems. Each ESF bus has a dedicated onsite Diesel Generator (DG). A DG starts automatically on loss of coolant accident (LOCA) or an ESF bus degraded voltage, undervoltage/loss of power (LOP) signal. Certain required plant loads in Divisions I and II (including HVK) are returned to service in a predetermined sequence to prevent overloading the DG.

RBS completed controller modifications for HVK-CHL1C and HVK-CHL1D in 2014. HVK-CHL1A and HVK-CHL1B modifications were completed in 2020. A review of historical chiller data logs shows that since the HVK chiller controls upgrade, the start of HVK chillers may be delayed past the design start time by approximately 40 seconds.

TS Surveillance Requirement (SR) 3.8.1.18 states, "Verify sequence time is within +/- 10% of design for each load sequencer timer."

CORRECTIVE ACTIONS

Completed Corrective Actions

1. Engineering Change Modifications were completed for all Control Building Chillers to correct sequence delays as detailed below:
   - Work Order 594333-01 Modify HVK-CHL1A Start Logic per EC-95152 - COMPLETE
   - Work Order 594334-01 Modify HVK-CHL1B Start Logic per EC-95151 - COMPLETE
   - Work Order 594335-01 Modify HVK-CHL1C Start Logic per EC-95153 - COMPLETE
   - Work Order 594336-01 Modify HVK-CHL1D Start Logic per EC-95150 - COMPLETE

Planned Corrective Actions

1. Complete Root Cause Evaluation.

PREVIOUS SIMILAR OCCURRENCES

This section will be updated in the supplemental report following completion of Root Cause Analysis.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX]. River Bend equipment codes are identified as (XX).