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SOUTHERN COMPANY

July 24, 2014

Docket No.: 50-348

NL-14-1093

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

Joseph M. Farley Nuclear Plant – Unit 1
Licensee Event Report 2014-002-01
B-Train RHR Inoperable for Longer Than Allowed by Technical Specifications due to Misadjusted Flow Control Valve Linkage

Ladies and Gentlemen:

This Licensee Event Report, "B-Train RHR Inoperable for Longer Than Allowed by Technical Specifications due to Misadjusted Flow Control Valve Linkage," is being submitted pursuant to the requirements of the Code of Federal Regulations, 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by Technical Specifications and pursuant to 10 CFR 50.73(a)(2)(v) as an event or condition that could have prevented fulfillment of a safety function.

This letter contains no NRC commitments. If you have any questions regarding the submittal, please contact Ms. Julie Collier at (334) 814-4639.

Sincerely,

Ms. C. A. Gayheart
Vice President – Farley
CAG/JAC

Enclosure: Unit 1 Licensee Event Report 2014-002-01

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. C. R. Pierce, Regulatory Affairs Director
Mr. D. R. Madison, Vice President – Fleet Operations
Mr. R. R. Martin, Regulatory Affairs Manager – Farley
Mr. J. E. Purcell, Nuclear Technical Specialist – Farley
Ms. K. A. Walker, Senior Engineer - Farley
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U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Mr. S. A. Williams, NRR Project Manager – Farley
Mr. P. K. Niebaum, Senior Resident Inspector - Farley
Mr. K. E. Miller, Resident Inspector - Farley
Mr. R. E. Martin, Senior Project Manager- Farley

Joseph M. Farley Nuclear Plant – Unit 1

NL-14-1093

B-Train RHR Inoperable for Longer Than Allowed by Technical Specifications due to Misadjusted Flow Control Valve Linkage

Enclosure

Unit 1 Licensee Event Report 2014-002-01

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)

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4. TITLE

B-Train RHR Inoperable for Longer Than Allowed by Technical Specifications due to Misadjusted Flow Control Valve Linkage

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
02	28	2014	2014	002	01	07	24	2014	FACILITY NAME	DOCKET NUMBER

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)(x)(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)
100	☐ 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)*
Julie A. Collier – Licensing Engineer	(334) 814-4639

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
E	BP	HCV	R340	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		10	10	14

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

On February 28, 2014 at 1300, with Unit 1 operating at 100 percent thermal power, a lower than expected flow rate in the B-Train Residual Heat Removal (RHR) system was observed while conducting a surveillance test per procedure FNP-1-STP-11.2. Investigation of this condition determined that the low flow rate was a result of previous maintenance performed on October 13, 2013 to replace an actuator linkage on the B-Train RHR heat exchanger discharge valve, Q1E11HCV603B. Analysis of the February 28, 2014 test results determined that the B-train RHR system flow rate was less than the minimum allowed by Technical Specifications, rendering the B-Train RHR system inoperable. Since this condition has existed for a time period in excess of the applicable Technical Specification Required Action Completion Time, this is a violation of Technical Specifications and is reportable per 10 CFR 50.73(a)(2)(i)(B). Since the A-Train of RHR has been briefly inoperable during the period of B-Train RHR inoperability, this is also reportable per 10 CFR 50.73(a)(2)(v)(B,D).

To correct the low flow condition the full-open position of valve Q1E11HCV603B was adjusted to provide an acceptable flow rate. Corrective action taken established and communicated – using training, briefings, and performance monitoring plans – goals and expectations to improve issue resolution and prioritization, risk management, and response to operational challenges. Procedures were revised to identify valve adjustment verification requirements. Engineering analysis in support of the safety assessment remains in progress. This report will be supplemented upon completion.

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NARRATIVE

Westinghouse - Pressurized Water Reactor
Energy Industry Identification Codes are identified in the text as [XX].

Requirement for Report

This report is required per 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specification due to the B-Train Residual Heat Removal (RHR) system being inoperable for a period longer than the Required Action Completion Time of Technical Specification 3.5.2 (Emergency Core Cooling Systems – Operating) and due to Unit 1 having entered an operational mode applicable to Technical Specification 3.5.2 with an inoperable train of RHR in violation of Technical Specification Limiting Condition for Operation 3.0.4. Due to concurrent periods of A-Train RHR inoperability this is also reportable as an event or condition that could have prevented fulfillment of a safety function to remove residual heat (10 CFR 50.73(a)(2)(v)(B)) and to mitigate the consequences of an accident (10CFR 50.73(a)(2)(v)(D)).

Unit Status at Time of Event

At the time of discovery of this issue on February 28, 2014 Unit 1 was operating in Mode 1 at 100 percent reactor power. During the replacement of the actuator linkage on the B-Train RHR Heat Exchanger Discharge Valve, Unit 1 was in Mode 6 conducting a refueling outage.

Description of Event

On October 13, 2013, with Unit 1 in Mode 6, the actuator linkage [CON] for the 1B RHR Heat Exchanger discharge Valve [HCV], Q1E11HCV603B, was replaced. An incorrect actuator linkage length was established during the linkage replacement. Post-maintenance testing for the linkage replacement did not identify the altered linkage length.

On December 5, 2013, with Unit 1 at full reactor power in Mode 1, while performing procedure FNP-1-STP-11.2, "1B RHR Pump Comprehensive Inservice Test", a lower than normal flow rate was noted while in the system test configuration. While investigating the low flow rate, the altered length of the heat exchanger discharge valve linkage was identified. An engineering analysis of the flow rate determined that the existing flow rate was sufficient to meet system operability requirements.

On February 28, 2014, during a subsequent performance of procedure FNP-1-STP-11.2, the system flow rate was noted to be lower than during the December 5, 2013 performance and was insufficient to justify operability of the B-Train RHR system. Investigation of test results determined the difference in flow rates was attributed to the heat exchanger bypass valve not being fully closed during the December 5, 2013 surveillance, invalidating the December 5, 2013 test results, and due to slight rotational slip between the discharge valve stem and the attached disc. Adjustments were made to the actuator linkage to establish adequate system flow rate and account for the rotational slip. The B-Train RHR system was returned to operable status at 2235 on March 1, 2014. Based on the February 28, 2014 surveillance test results, the B-Train RHR system is considered to have been inoperable from October 13, 2013 until March 1, 2014 due to not meeting the minimum required Technical Specification injection flow requirement.

From October 13, 2013 until March 1, 2014, while the B-Train RHR system was in a condition of reduced flow, the A-Train RHR system was placed in an inoperable status for brief periods on four occasions for various maintenance and testing activities. No other structures, components, or systems contributed to this event.

LICENEE EVENT REPORT (LER)
CONTINUATION SHEET

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NARRATIVE

Cause of Event

The direct cause of the event is attributed to the incorrect actuator linkage length that was established during the linkage replacement. The apparent cause was non-conservative decision making and improper understanding of risk acceptance associated with the post maintenance testing requirements. A contributing cause was inadequate procedural guidance for correct valve position verification.

Safety Assessment

During the period from October 13, 2013 until March 1, 2014 the B-Train RHR system would have exhibited less than the Technical Specification minimum required flow rate in the post-accident injection mode of operation during a large-break Loss of Coolant Accident (LOCA). An engineering evaluation was performed to determine whether the minimum injection flow required by applicable safety analyses would have been achieved and to verify that the flow rate was sufficient for other design basis accidents and for the reactor coolant system (RCS) cooldown mode of operation. It was determined that all available margins had been used and the Unit 1 "B" Train RHR system would not have been capable of performing its specified safety function. During this period there were no actual demands on the B-Train RHR system for accident mitigation. Therefore, there was no actual adverse impact on the safety and health of the public.

A risk-based analysis using the Farley internal events Probabilistic Risk Analysis model will be performed based on the results of the above mentioned engineering evaluation. This report will be supplemented upon completion of the engineering evaluation and risk-based analysis.

Corrective Action

To correct the insufficient flow rate observed during B-Train RHR surveillance testing, the 1B RHR Heat Exchanger Discharge Valve actuator linkage dimensions were adjusted to provide sufficient flow to meet system operability requirements. A full performance of the surveillance procedure for adjusting the 1B RHR Heat Exchanger Discharge Valve will be performed no later than the end of the next refueling outage. Completed corrective actions included the establishment and communication – using training, briefings, and performance monitoring plans – of goals and expectations to improve issue resolution and prioritization, risk management, and response to operational challenges. Procedures that verify the mechanical stop positions for the RHR Heat Exchanger Discharge Valves were revised to clearly identify all valve adjustment verifications.

Additional Information

Farley Unit 1 and Unit 2 Licensee Event Reports for the previous five years have been reviewed with no reports being identified that were similar to this event or related to RHR system flow. A review of internal operating experience for the previous five year period identified no similar previous issues at Farley.