Dennis R. Madison
Vice President - Hatch

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SOUTHERN COMPANY

April 16, 2010

Docket No.: 50-321

NL-10-0760

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

Edwin I. Hatch Nuclear Plant
Licensee Event Report
Corrosion Induced Bonding Results in
Safety Relief Valve Lift Setpoint Drift

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning safety relief valves allowable test range exceeded due to corrosion induced bonding.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

Dennis R. Madison

D. R. Madison
Vice President – Hatch

DRM/MJK/msc

Enclosure: LER 1-2010-001

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Ms. P. M. Marino, Vice President – Engineering
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Hatch
Mr. E. D. Morris, Senior Resident Inspector – Hatch

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE
Corrosion Induced Bonding Results in Safety Relief Valve Lift Setpoint Drift

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
03	08	2010	2010	- 001 -	0	04	16	2010	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 5

10. POWER LEVEL: 000

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 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)
☐ 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)
☐ 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

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Edwin I. Hatch / Steve Tipps, Principle Licensing Engineer	912-537-5880

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
B	SB	RV	T020	Yes					

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 March 11, at approximately 1300 EST, Unit 1 was at 0 CMWTh, which is 0.00 percent of rated thermal power (RTP). On that day it was concluded that at the completion of bench testing five Safety Relief Valves (SRVs) experienced setpoint drift that exceeded the allowable plant Technical Specifications (TS) limit.

The root cause of the SRV setpoint drift is corrosion-induced bonding between the pilot disc and seating surface.

Immediate corrective actions for this event included replacement of all eleven SRV pilot valves with refurbished pilot valves which have pilot discs made from Stellite 21 material. Also improvements in the insulation surrounding each SRV were made to reduce the likelihood of corrosion-induced bonding between the pilot disc and seating surface.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor
Energy Industry Identification System codes appear in the text as (EIIS Code XX).

DESCRIPTION OF EVENT

On March 11, at approximately 1300 EST, Unit 1 was at 0 CMWTh, which is 0.00 percent of rated thermal power (RTP). On that day it was concluded that at the completion of bench testing five Safety Relief Valves (SRVs, EIIS Code SB) experienced setpoint drift that exceeded the allowable plant Technical Specifications (TS) limit which is +/- 3%. The setpoint for each of the eleven SRVs is 1150 +/- 34.5 psig. The following is a tabulation of the test results for the eleven SRVs:

MPL Number	Pilot Serial Number	As-Found Lift Pressure	Percent Drift
1B21-F013A	313	1147	99.7
1B21-F013B	1006	1167	101.5
1B21-F013C	306	1250	108.7
1B21-F013D	304	1165	101.3
1B21-F013E	1007	1205	104.8
1B21-F013F	303	1168	101.6
1B21-F013G	1228	1239	107.7
1B21-F013H	310	1160	100.9
1B21-F013J	1231	1297	112.8
1B21-F013K	1004	1208	105.0
1B21-F013L	1189	1173	102.0

These valves were removed from service during the Spring 2010 refueling outage and replaced with like kind valves that were serviced and tested in accordance with plant procedures.

CAUSE OF EVENT

The cause of the SRV setpoint drift exceeding the allowable plant TS limit is corrosion-induced bonding between the pilot disc and seating surface. Proper insulation of the SRV's has an impact on the formation of corrosion on the pilot seats. This impact is addressed in GE SIL 169, Supplement 16. Proper insulation improves the environment in the pilot area. Per the GE SIL, higher temperature in the pilot area results in higher concentration of steam in that area, which further results in lower concentration of oxygen. The lower concentration of oxygen reduces the amount of corrosion that will occur in the seating area. The as-found condition of the Unit 1 insulation revealed that the insulation was in poor condition, that only one layer of blankets was used, and that the blankets were sagging down around the pilot flange.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 50.73(a)(2)(i)(B) because an event occurred which is prohibited by Technical Specifications (TS). Specifically, multiple test failures of the SRVs is defined as reportable in NUREG-1022, Revision 2, dated October 2000, in section 3.2.2, example 3, titled "Multiple Test Failures."

The 11 SRVs, which are located on the four main steam lines within the drywell (EIIS Code NH) between the reactor vessel (EIIS Code AD) and the inboard main steam isolation valves (MSIV EIIS Code SB), are required during Modes 1, 2, and 3 to limit the peak pressure in the nuclear system such that it will not exceed the applicable ASME Boiler and Pressure Vessel Code limits for the reactor coolant pressure boundary. Per TS Surveillance Requirement 3.4.3.1, the valves are tested in accordance with the In-service Testing Program to verify the safety function lift setpoints are within the specified limits. The SRVs must accommodate the most severe pressurization transient which, for the purposes of demonstrating compliance with the ASME Code limit of 1375 psig peak vessel pressure, has been defined as a closure of all MSIVs with a failure of the direct reactor protection system trip from the MSIV position switches; the reactor ultimately shutdowns from a high neutron flux trip. Analysis of this event comparing the as-found bench test results for SRV actuation pressures with previously analyzed lifting pressures for each SRV has demonstrated that the resultant peak pressure was within the ASME Code limit of 1375 psig. The previously analyzed lifting pressures were evaluated and determined to be bounding in comparison to the as-found lift points for this event. Furthermore, the plant TS overpressure safety limit of 1325 psig dome pressure must be met during normal operations and for anticipated operational occurrences (AOOs). The analysis of the as-found test results by comparison with previously analyzed lifting pressures also showed that the resultant dome pressure was within the plant TS Safety Limit.

In addition, a non-credited electrical actuation system was installed in 1993 to ensure proper actuation of the SRVs. This system provides a redundant, independent method (i.e., electrical signal) to actuate the SRVs. During the run cycle the redundant electrical system was available. The system was procured to Class 1E environmental and seismic standards, and is deemed highly reliable.

Based on this analysis, it is concluded that this event had no adverse impact on nuclear safety.

CORRECTIVE ACTIONS

All eleven pilot valves have been replaced with refurbished pilot valves.

Each of the eleven pilot disc from the valves removed were replaced with a pilot disc made from Stellite 21 material.

Insulation surrounding each SRV has been upgraded to improve resistance to corrosion induced bonding.

ADDITIONAL INFORMATION

Other Systems Affected: None

Failed Components Information:

Master Parts List Number: 1B21-F013
Manufacturer: Target Rock
Model Number: 7567F
Type: Relief Valve
Manufacturer Code: T020

EIIS System Code: SB
Reportable to EPIX: Yes
Root Cause Code: B
EIIS Component Code: RV

Commitment Information: This report does not create any new permanent licensing commitments.

Previous Similar Events:

LER 2-2009-001, identified multiple SRV setpoint drift for five of the eleven SRV's. Corrective actions for this event replaced all eleven pilot discs with Stellite 21 material, and improvements were made in the insulation surrounding the SRV's. These actions were taken on Unit 2 therefore they do not directly impact Unit 1 performance. However improvement in the insulation was incorporated into corrective action for the current LER, 1-2010-001.

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LER 2-2008-004; identified multiple SRV setpoint drift for three of the four tested SRV's. Four SRV's were removed mid-cycle. Corrective actions for this LER, replacement of discs were implemented but discs made of stellite 21 for the Unit 2 SRV's were not available for all of the replaced discs. These actions were taken on Unit 2 therefore they do not directly impact Unit 1 performance.

LER 1-2008-002; identified multiple SRV setpoint drift for three of the eleven SRV's. Corrective action for this LER, replacement of discs with stellite 21 discs, was completed during the 2008 Unit 1 refueling outage. Industry experience indicates the stellite 21 material to be resistive to corrosion induced bonding. The initial experience for plant Hatch did not follow the industry experience. During the 2008 refuel outage the condition of insulation surrounding the SRV's was not closely controlled.

LER 2-2007-006, identified multiple SRV setpoint drift for five of the eleven SRV's. Corrective action for this LER was replacement of discs with stellite 21 discs. The discs were replaced during the 2009 Unit 2 refueling outage. These actions were taken on Unit 2 therefore they do not directly impact Unit 1 performance.

LER 1-2006-003, which identified an error in reporting multiple SRV setpoint drift, also described results from the previous three outages where multiple SRV setpoint drift had occurred. Corrective actions for that LER focused on ensuring proper reporting of SRV setpoint drift was performed.