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HL-1625  
001513

May 8, 1991

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

PLANT E. I. HATCH - UNIT 2  
NRC DOCKET 50-366  
OPERATING LICENSE NPF-5  
LICENSEE EVENT REPORT  
SAFETY RELIEF VALVES EXPERIENCE SETPOINT DRIFT  
DUE TO CORROSION INDUCED BONDING

Gentlemen:

Georgia Power Company is submitting the enclosed voluntary Licensee Event Report (LER) concerning safety relief valve setpoint drift due to corrosion induced bonding because of the potential industry interest in the event. This event occurred at Plant Hatch - Unit 2.

Sincerely,

  
J. T. Beckham, Jr.

SWR/ct

Enclosure: LER 50-366/1991-009

cc: (See next page.)

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U.S. Nuclear Regulatory Commission

May 8, 1991

Page Two

cc: Georgia Power Company

Mr. H. L. Sumner, General Manager - Nuclear Plant

Mr. J. D. Heidt, Manager Engineering and Licensing - Hatch  
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.

Mr. K. Jabbour, Licensing Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II

Mr. S. D. Ebnetter, Regional Administrator

Mr. L. D. Wert, Senior Resident Inspector - Hatch

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) PLANT HATCH, UNIT 2										DOCKET NUMBER (2) 05000366		PAGE (3) 1 OF 5				
TITLE (4) SAFETY RELIEF VALVES EXPERIENCE SETPOINT DRIFT DUE TO CORROSION INDUCED BONDING																
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)							
MONTH	DAY	YEAR	YEAR	SEQ NUM	REV	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)					
04	10	91	91	009	00	05	08	91			05000					
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)														
5		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)		
POWER LEVEL		000				20.405(a)(1)(i)				50.73(a)(2)(v)				73.71(c)		
		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				<input checked="" type="checkbox"/> OTHER (Specify in Abstract below)		
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)						
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)						
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME										TELEPHONE NUMBER						
STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH										AREA CODE		367-7851				
912																
COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPROS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPROS						
B	J E	R V	T O 2 0	YES												
SUPPLEMENTAL REPORT EXPECTED (14)																
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR

ABSTRACT (16)

On 4/10/91, at approximately 0800 CDT, Unit 2 was in the Refuel mode with all fuel having been removed from the vessel. At that time plant engineering personnel received written notification of the results of off-site testing of pressure vessel safety relief valves (SRVs, EIS Code RV). Three of the eleven SRVs exhibited drift in the mechanical lift setpoints in excess of the  $\pm 3\%$  tolerance specified by in-service testing (IST) requirements. Four SRVs experienced setpoint drift greater than the  $\pm 1\%$  Unit 2 Technical Specifications tolerance requirement in section 3.4.2.1. This voluntary report is being submitted due to the potential industry interest in this event in view of the ongoing efforts of the Boiling Water Reactor Owners' Group (BWROG) to reduce setpoint drift. The setpoint drift experienced was well within the analytical limits existing for reactor vessel over-pressure protection.

The root cause of the SRV drift in excess of  $\pm 3\%$  is corrosion-induced bonding of the surface between the pilot valve disc and seat. One additional SRV experienced negative drift in excess of  $-1\%$ .

Corrective actions for this event include refurbishing the valves and continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue. The BWROG program direction has been concurred with by the NRC.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
PLANT HATCH, UNIT 2	05000366	91	009	00	2	OF	5

TEXT

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF THE EVENT

On 03/25/91, as part of ongoing Unit 2 refueling outage activities, the Safety Relief Valves (SRVs, EIIIS Code RV) were removed from the main steam lines and sent to an off-site contract test laboratory for the purpose of conducting in-service testing (IST) in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, IWV-3512. On 4/10/91, at approximately 0800 CDT, plant engineering personnel were notified of the test results for the SRVs. Three of the eleven SRVs exhibited drift in the mechanical lift setpoints in excess of the  $\pm 3\%$  tolerance specified in Section XI. Four SRVs experienced setpoint drift greater than the  $\pm 1\%$  Unit 2 Technical Specifications tolerance requirement in section 3.4.2.1. The following is a tabulation of test results for the eleven SRVs.

MPL	PILOT CARTRIDGE SERIAL NUMBER	NAMEPLATE LIFT SETPOINT	AS-FOUND LIFT PRESSURE	% DRIFT
2B21-F013A	301	1100	1101	+ 0.18
2B21-F013B	311	1090	1072	- 1.65
2B21-F013C	1188	1090	1075	- 0.46
2B21-F013D	1001	1100	1104	+ 0.36
2B21-F013E	310	1110	1183	+ 6.58
2B21-F013F	1004	1090	1089	- 0.09
2B21-F013G	1189	1090	1090	0.00
2B21-F013H	1002	1110	1115	+ 0.45
2B21-F013K	1008	1100	1181	+ 7.36
2B21-F013L	315	1110	1113	+ 0.27
2B21-F013M	1186	1100	1168	+ 6.18

While the setpoint drift in excess of  $\pm 1\%$  demonstrated by the four valves (2B21-F013B, E, K, M) has been determined not to be reportable under the requirements of 10 CFR 50.73, this event is of potential interest to the industry in view of ongoing efforts by the Boiling Water Reactor Owners' Group (BWROG) to address the issue of SRV setpoint drift by eliminating corrosion induced bonding as a contributor. The setpoint drift experienced in this event is consistent with the previous in-service data reviewed by the BWROG. All eleven of the valves had discs made of Stellite-6 material. Discs made of PH13-8Mo were not used.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
PLANT HATCH, UNIT 2	0 5 0 0 0 3 6 6	9 1	0 0 9	0 0	3	OF	5

TEXT

On 02/14/91, a Unit 2 trip and subsequent pressure transient occurred in which the SRVs were apparently required to lift but did not. As a result, all eleven SRVs were removed and sent to an off-site facility for testing and refurbishment. This event was reported in LER 50-366/1991-004 dated 03/15/91. Following refurbishment and reinstallation of the SRVs, the plant experienced 21.8 days of operation at rated conditions of temperature and pressure prior to shutting down for the ongoing refueling outage.

CAUSE OF THE EVENT

The root cause of the SRV drift in excess of +3% is corrosion-induced bonding of the surface between the SRV pilot valve disc and seat. One additional SRV experienced negative drift in excess of -1%. Georgia Power Company is continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is being submitted voluntarily because the event may have some bearing on the ongoing efforts of the BWROG to address the issue of SRV setpoint drift.

The purpose of the SRVs is to provide over-pressure protection for the reactor pressure vessel and associated reactor coolant system piping. Eleven SRVs are located on the main steam lines between the reactor pressure vessel and the main steam isolation valves (MSIVs, EIS Code ISV). The SRVs are manufactured by Target Rock Company in compliance with the requirements of ASME Section III (1968 with Winter 1968 addenda), Paragraph N911.4(a)(1) for pilot operated valves. There are three sets of valves. Four valves are designed to open at 1090 psig, four at 1100 psig, and three at 1110 psig. The size of the valves, coupled with the designated lift pressures, is intended to limit a vessel pressure transient to +110% of the reactor vessel design pressure of 1250 psig, or a maximum of 1375 psig.

In this event, three of the eleven SRVs had setpoint drifts in excess of the +3% tolerance specified in ASME Section XI, with the maximum setpoint drift being 7.36% of required lift pressure. Four SRVs experienced setpoint drift greater than the +1% Unit 2 Technical Specifications tolerance requirement in section 3.4.2.1. However, a plant specific analysis has previously been performed for Georgia Power Company by General Electric which demonstrates that Plant Hatch has sufficient margin for over-pressure protection and can tolerate up to a maximum 200 psi drift.

Specifically, the analysis evaluated the peak vessel pressure at various setpoint drifts up to 200 psi for the plant's most limiting pressurization event, the MSIV closure-flux scram event. If it was conservatively assumed that all eleven SRVs opened at a lift pressure +9% above the stated nameplate pressure, the resulting pressure transient would be limited to approximately 1300 psig, which is less than the design limit of 1375 psig. Since the setpoint

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
PLANT HATCH, UNIT 2	05000366	91	009	00	4	OF	5

TEXT

drift experienced by any of the SRVs in this event was significantly less than the +9% assumed in the referenced analysis for all SRVs, it is concluded that the limiting pressure transient occurring in conjunction with the measured SRV setpoint drift would not have resulted in exceeding the 1375 psig limit.

Based on the above information, it is concluded that this event had no adverse impact on nuclear plant safety. The analysis is conservative in that it assumes worst case initial conditions, and is therefore applicable to all power levels.

CORRECTIVE ACTIONS

Corrective actions for this event will include:

1. Refurbishing the SRVs to bring lift pressures within a  $\pm 1\%$  tolerance.
2. Continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue. The BWROG program currently consists of the development, in parallel, of two options to resolve this issue. The NRC has concurred with the BWROG program direction and will be updated on the program's progress in approximately June, 1991.

ADDITIONAL INFORMATION

1. Previous Similar Events:

Events reported in the past two years in which SRVs were found to have experienced mechanical lift setpoint drift were reported in the following LERs:

50-321/1990-005, dated 04/24/90  
50-321/1991-004, dated 03/14/91  
50-266/1989-007, Rev. 1, dated 02/07/91  
50-366/1991-004, dated 03/15/91

Corrective actions for these events included refurbishing the SRVs to bring the lift pressures within a  $\pm 1\%$  tolerance, continuing to participate in BWROG efforts to resolve the issue of SRV setpoint drift, and performing a metallurgical examination of corrosion-bonded pilot discs and seats. These actions would not have prevented this event because proven, effective corrective actions for SRV setpoint drift have not yet been fully developed by the industry.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)  PLANT HATCH, UNIT 2	DOCKET NUMBER (2)  05000366	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
		91	009	00	5	OF	5

TEXT

## 2. Affected Components Identification:

Master Parts List Number: 2B21-F013E, K, M  
Manufacturer: Target Rock Company  
Model Number: 7567F  
Type: Two Stage Safety Relief Valve  
Manufacturer Code: T020  
EIIIS System Code: JE  
Reportable to NPRDS: Yes  
Root Cause Code: B  
EIIIS Component Code: RV

## 3. Other Affected Equipment:

No systems other than the Unit 2 Safety Relief Valves were affected by this event.