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Docket No. 50-321

HL-3260
005221

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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
Corrosion-Induced Boiling Results in
Safety Relief Valve Setpoint Drift

Gentlemen:

Georgia Power Company is submitting the enclosed, voluntary Licensee Event Report (LER) to support the ongoing efforts of the Boiling Water Reactor Owners' Group in addressing the issue of safety relief valve setpoint drift.

Sincerely,

J. T. Beckham, Jr.

OCV/cr

Enclosure: LER 50-321/1993-002

cc: Georgia Power Company
Mr. H. L. Sumner, General Manager - Nuclear Plant
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

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Plant E. I. Hatch, Unit 1										DOCKET NUMBER (2) 05000321				PAGE (3) 1 OF 4		
TITLE (4) Corrosion-Induced Bonding Results in Safety Relief Valve Lift Setpoint Drift																
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	01	93	93	002	00	04	21	93					05000			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)														
POWER LEVEL																
000																
		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)		
		20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)		
		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				X OTHER (Specify in		
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)				Abstract below)		
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)				Voluntary		
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME										TELEPHONE NUMBER						
Steven B. Tipps, Manager Nuclear Safety and Compliance, Hatch										AREA CODE		912 367-7851				
COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS						
B	JE	RV	T020	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 4/1/93, Unit 1 was in the Refuel mode with all fuel removed from the vessel. At that time plant engineering personnel notified licensed shift personnel of the results of off-site testing of the reactor pressure vessel safety relief valves (SRVs, EIIIS Code JE). Five of the SRVs experienced setpoint drift in excess of the +3 percent tolerance specified by in-service testing (IST) requirements. Nine of the SRVs experienced setpoint drift in excess of the +1 percent tolerance specified by Unit 1 Technical Specifications section 2.2.A. This voluntary report is being submitted due to the potential industry interest in this event in view of the ongoing efforts to reduce setpoint drift by the Boiling Water Reactor Owners' Group (BWROG). The setpoint drift experienced was well within the analytical limits existing for reactor vessel over-pressure protection.

The root cause of the SRV setpoint drift in excess of the +3 percent tolerance is corrosion-induced bonding of the pilot valve disc and seat.

Corrective actions for this event include refurbishing the valves and continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue. In addition, a system is being installed during the ongoing Unit 1 refueling outage to provide redundant electrical activation signals to the SRVs. A similar system has been installed on Unit 2. Since these systems provide added assurance that the SRVs will function when required, GPC does not anticipate submitting further voluntary reports on the issue of SRV lift setpoint drift.

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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 EVENT

On 3/21/93, as part of ongoing Unit 1 refueling outage activities, the Safety Relief Valves (SRVs, EIIIS Code JE) 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, IWB-3512. On 4/1/93, plant engineering personnel were notified of the test results for the SRVs and relayed the information to licensed shift personnel via a Deficiency Card in accordance with plant administrative control procedures. Five of the eleven SRVs experienced setpoint drift in excess of the ± 3 percent tolerance required by Section XI. Additionally, nine of the eleven SRVs experienced setpoint drift outside the ± 1 percent tolerance specified in Unit 1 Technical Specifications section 2.2.A. The following is a tabulation of the test results for the eleven SRVs:

MPL NUMBER	PILOT CARTRIDGE SERIAL NUMBER	NAMEPLATE LIFT SETPOINT	AS-FOUND LIFT PRESSURE	PERCENT DRIFT
1B21-F013A	1009	1080	1118	3.51
1B21-F013B	306	1100	1111	1.01
1B21-F013C	313	1100	1103	0.27
1B21-F013D	302	1090	1108	1.65
1B21-F013E	1005	1080	1136	5.19
1B21-F013F	1187	1090	1061	-2.66
1B21-F013G	1010	1080	1082	0.19
1B21-F013H	1007	1090	1107	1.56
1B21-F013J	1190	1100	1151	4.55
1B21-F013K	1006	1090	1130	3.67
1B21-F013L	1011	1080	1114	3.15

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 did not differ significantly from that measured in previous events. All of the valves in this event had discs made of Stellite-6 material.

CAUSE OF THE EVENT

The root cause of the SRV lift setpoint drift in excess of ± 3 percent is corrosion-induced bonding of the pilot valve disc and seat. Georgia Power Company is continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue.

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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 Steamline Isolation Valves (MSIVs, EIS Code SB). The SRVs are manufactured by Target Rock Company. There are three sets of valves. Four valves are designed to lift at 1080 psig, four at 1090 psig, and three at 1100 psig. The size of the valves, coupled with the designated lift pressures, is intended to limit a reactor vessel pressure transient to 110 percent of the vessel design pressure of 1250 psig, or a maximum of 1375 psig.

In this event, five of the eleven SRVs had setpoint drifts in excess of the ± 3 percent tolerance specified in ASME Section XI, with the maximum setpoint drift being 5.19 percent. Nine of the SRVs experienced setpoint drift in excess of the ± 1 percent tolerance required by Unit 1 Technical Specifications 2.2.A. 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 over a 100 psi drift.

Specifically, the analysis evaluated the most limiting pressurization event, MSIV closure with a high flux scram. It was conservatively assumed that the setpoints on ten SRVs had drifted up to 1195 psig and that one SRV was out of service. The resulting pressure transient was limited to 1325 psig, less than the maximum limit of 1375 psig. Since the average setpoint drift experienced by the SRVs in this event was less than 1195 psig, the pressure assumed in the referenced analysis, and since all SRVs were capable of opening, 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 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 include:

1. Refurbishing the SRVs to bring lift pressures to within the ± 1 percent tolerance required by the Unit 1 Technical Specifications. This action is complete.

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2. Continuing to participate in the BWROG efforts to resolve the SRV setpoint drift issue.
3. Installing a system on Unit 1 which will provide redundant electrical actuation signals to the SRVs. This will provide increased assurance that the SRVs will open as required when reactor vessel pressure reaches their designed lift setpoints. This action will be completed prior to restarting Unit 1 following the refueling outage currently in progress. A similar system has already been installed on Unit 2.

ADDITIONAL INFORMATION

1. Previous Similar Events: Events reported in the past two years in which the SRVs were found to have experienced setpoint drift in excess of the Technical Specifications ± 1 percent requirement are described in the following LERs:

50-321/1991-022, dated 11/06/91,
50-366/1991-009, dated 05/08/91,
50-366/1992-022, dated 10/26/92.

Corrective actions for these events included refurbishing the SRVs to bring the lift pressures within the ± 1 percent tolerance, continuing to participate in the BWROG efforts to resolve the issue of SRV setpoint drift, performing a metallurgical examination of corrosion-bonded pilot discs and seats, and installing a system of redundant electrical actuation signals on the SRVs. These actions would not have prevented this event because proven, effective corrective actions to limit SRV setpoint drift have not yet been fully developed by the industry. Additionally, the redundant actuation system is only now being installed on Unit 1.

2. Affected Components Identification:

Master Parts List Numbers: 1B21-F013A, B, C, D, E, F, G, H, J, K, L
Manufacturer: Target Rock Company
Model Number: 7567F
Type: Two Stage Safety Relief Valve
Manufacturer Code: T020
EIS System Code: JE
Reportable to NPRDS: Yes
Root Cause Code: B
EIS Component Code: RV

3. Other Affected Equipment: No systems other than the Unit 1 Safety Relief Valves were affected by this event.