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Georgia Power
the southern electric system

April 15, 1996

Docket No. 50-321 HL-5139

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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
Inadequate Procedure Results in Reactor
Pressure Increase and Automatic Reactor Shutdown

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning the inadequate procedure which resulted in a reactor pressure increase and automatic reactor shutdown.

Sincerely,

J. T. Beckham, Jr.

IFL/eb

Enclosure: LER 50-321/1996-004

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

220069

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. Ebneter, Regional Administrator
Mr. B. L. Holbrook, Senior Resident Inspector - Hatch

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NRC FORM 366 (5-92)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 5/31/95

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Edwin I. Hatch Nuclear Plant - Unit 1	05000321	1 OF 5

TITLE (4)
Inadequate Procedure Results in Reactor Pressure Increase and Automatic Reactor Shutdown

EVENT DATE (5) MONTH	DAY	YEAR	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	REPORT DATE (7) MONTH	DAY	YEAR	OTHER FACILITIES INVOLVED (8) FACILITY NAME	DOCKET NUMBER(S)
03	23	96	96	- 004 -	00	04	22	96		05000
										05000

OPERATING MODE (9): 1

POWER LEVEL (10): 017

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR ?: (Check one or more of the following) (11)

	20.402(b)		20.405(c)	X	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)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	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)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (include area code)
Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch	912 367-7851

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)

On 3/23/96 at 0135 EST, Unit 1 was in the Run mode at a power level of 424 CMWT (17.4% rated thermal power). At that time, personnel manually shut down the turbine. When the turbine was shut down as part of a planned activity for the purpose of beginning a refueling outage, reactor pressure increased to approximately 1045 psig and the reactor automatically shut down on high pressure. Water level decreased due to void collapse from the rapid reduction in power. However, the transient did not result in level decreasing to the automatic reactor shutdown and Primary Containment Isolation System setpoint; therefore, no additional automatic actions occurred. Level decreased to 12 inches above instrument zero (170 inches above the top of the active fuel) before being restored by the reactor feedwater pump. No Emergency Core Cooling Systems actuated nor were any required to actuate. Pressure reached its maximum value of 1045 psig at the time of the automatic shutdown and was reduced and controlled by steam loads and the turbine bypass valves. No safety/relief valves lifted nor were any required to lift.

This event was caused by an inadequate procedure. When the turbine is manually shut down, an immediate pressure increase occurs. Procedure 34SO-N30-001-1S, "Main Turbine Operation," did not require pressure to be decreased in order to provide sufficient margin to the high pressure automatic shutdown setpoint prior to manual shutdown of the turbine. Procedures 34SO-N30-001-1S and 34SO-N30-001-2S, "Main Turbine Operation," have been revised.

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 3/23/96 at 0135 EST, Unit 1 was in the Run mode at a power level of 424 CMWT (17.4% rated thermal power) with reactor pressure at approximately 995 psig. At that time, Operations personnel manually shut down the main turbine (EIIS Code TA) per system operating procedure 34SO-N30-001-1S, "Main Turbine Operation," as part of routine, scheduled activities to begin the 16th refueling outage. When the turbine was shut down, reactor pressure immediately increased by about 50 psig, which is normal when the main turbine is shut down manually, to approximately 1045 psig. This exceeded the automatic high reactor pressure shutdown setpoint of 1042 psig and the reactor automatically shut down on high pressure per design.

Reactor water level decreased due to void collapse from the rapid reduction in power. However, because the reactor was at low power at the time of the automatic shutdown, the transient did not result in water level decreasing to the automatic reactor shutdown and Group 2 Primary Containment Isolation System (EIIS Code JM) setpoint of three inches above instrument zero. Therefore, no additional automatic actions occurred. Reactor water level decreased to its minimum value of 12 inches above instrument zero (170 inches above the top of the active fuel) before being restored automatically by the operating reactor feedwater pump (EIIS Code SJ). No Emergency Core Cooling Systems actuated nor were any required to actuate to restore or maintain water level.

Reactor pressure reached its maximum value of about 1045 psig at the time of the automatic reactor shutdown. Pressure was reduced and controlled thereafter by the main turbine bypass valves (EIIS Code SO) and other steam loads, such as the reactor feedwater pump turbine (EIIS Code SJ), the steam sealing system (EIIS Code TC), and the steam jet air ejector (EIIS Code SH). No safety/relief valves lifted nor were any required to lift to reduce or control reactor pressure.

CAUSE OF EVENT

This event was caused by an inadequate procedure. System operating procedure 34SO-N30-001-1S, "Main Turbine Operation," did not require reactor pressure to be decreased in order to provide sufficient margin between actual pressure and the automatic high reactor pressure shutdown setpoint prior to manual shut down of the main turbine. Consequently, reactor pressure was not decreased from 995 psig prior to shutdown of the main turbine, resulting in reactor pressure exceeding the high reactor pressure automatic shutdown setpoint of 1042 psig when the turbine was shut down manually.

When the main turbine is manually shut down, an immediate reactor pressure increase of approximately 50 psig occurs before the bypass valves can reduce and control pressure. This increase is usual and, normally, not of concern. Reactor pressure decreases approximately linearly with decreasing power: decreasing reactor power from 100% to less than 30% (where the main turbine is manually shut down) decreases reactor pressure by about 70 psig. This decrease provides sufficient margin to the automatic high reactor pressure shutdown setpoint such that an automatic reactor shut down on high pressure does not occur when the main turbine is shut down manually.

Reactor power was reduced to about 1400 CMWT (57% rated thermal power) several days prior to the beginning of the refueling outage in order to remove a circulating water pump from service for maintenance. This was necessary to ensure the maintenance could be completed and the pump returned to service by the scheduled end of the refueling outage. Normally, the unit is shut down for a refueling outage by continuously decreasing reactor power from near 100% to less than 30%, at which point the main turbine is shut down manually. Reactor pressure is not maintained at or near its normal value during the shutdown. Instead, it is allowed to decrease linearly with power. However, reactor pressure was returned to 998 psig, near its normal full-power value, to maximize electrical generation at the reduced power level during the several days prior to the start of the refueling outage. This is allowed by plant procedure 34GO-OPS-005-1S, "Power Changes."

The reduction from about 57% power to 17% power did result in a reactor pressure decrease. However, with the unit at a reduced power level, the pressure decrease was not as large as would be expected if the unit shutdown had begun at a higher power level. Since the shutdown was started at a lower power level, with pressure near its normal full-power value, the resulting pressure decrease was not enough to provide adequate margin to the automatic high reactor pressure shutdown setpoint to avoid an automatic reactor shutdown when the turbine was shut down. Procedure 34SO-N30-001-1S did not require reactor pressure to be reduced, as needed, to provide the necessary margin.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73 (a)(2)(iv) because of the unplanned actuation of Engineered Safety Feature systems. The Reactor Protection System (EIIS Code JC), an Engineered Safety

Feature system, actuated on high reactor pressure per design when pressure increased to approximately 1045 psig following manual shut down of the main turbine.

An increase in reactor pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This causes the neutron flux and thermal power transferred to the reactor coolant to increase which could challenge the integrity of the fuel cladding and the reactor coolant pressure boundary. Therefore, the reactor is shut down automatically on high reactor steam dome pressure to limit the neutron flux and thermal power increase. The automatic reactor shutdown on high pressure, along with the safety/relief valves, limits the peak reactor pressure to less than the American Society of Mechanical Engineers Section III Code limits.

In this event, the main turbine control valves (EIIS Code TA) and stop valves (EIIS Code TA) closed rapidly when the turbine was shut down manually. Their rapid closure resulted in a normal reactor pressure increase of about 50 psig. The bypass valves opened to limit the pressure increase, to reduce pressure to the desired value, and to control pressure at that desired value per their design. However, there was insufficient margin to the automatic high reactor pressure shutdown setpoint because the unit was operating at a pressure higher than normal for the given power level. When pressure reached approximately 1042 psig, the reactor automatically shut down per design. No safety/relief valves opened nor were any required to open to limit or reduce pressure.

Reactor water level decreased due to void collapse from the rapid decrease in reactor power. The operating reactor feedwater pump automatically restored water level; the minimum water level reached was 170 inches above the top of the active fuel and was only about 25 inches below normal. No Emergency Core Cooling Systems actuated nor were any required to actuate to recover or maintain water level during or following this event. All automatic functions operated per design in response to the pressure increase and the automatic reactor shutdown.

Based upon the preceding discussion, it is concluded that this event had no adverse impact on nuclear safety. This analysis is applicable to all power levels.

CORRECTIVE ACTIONS

Procedures 34SO-N30-001-1S and 34SO-N30-001-2S, "Main Turbine Operation," have been revised to require reactor pressure to be decreased to provide an adequate margin between reactor pressure and the automatic high pressure shutdown setpoint prior to a planned manual shut down of the main turbine.

ADDITIONAL INFORMATION

No systems other than those already mentioned in this report were affected by this event.

No failed components caused or resulted from this event.

A previous similar event in which an unplanned automatic reactor shutdown on high pressure occurred was reported in Licensee Event Report 50-321/1996-001, dated 1/26/96. In the previous event, the high reactor pressure resulted when the main turbine control valves drifted closed while the unit was operating at greater than 30% rated thermal power. The valves drifted closed due to material blocking their servovalve strainers; this material prevented hydraulic fluid from reaching the control valve positioning devices (i.e., the servovalve spools). Upon loss of hydraulic fluid, the control valves closed per their fail-safe design.

As the control valves drifted closed, the bypass valves opened to control reactor pressure. However, the bypass valves could not pass all the steam generated at the high reactor power level. Therefore, when the control valves closed, the excessive steam generated caused reactor pressure to increase and the reactor automatically shutdown.

In this event, the main turbine control valves and stop valves closed rapidly when the turbine was shut down manually. Their rapid closure resulted in a normal reactor pressure increase of about 50 psig. The bypass valves opened to limit the pressure increase, to reduce pressure to the desired value, and to control pressure at that desired value per their design. Because the unit was operating at a pressure higher than normal for the given power level, there was insufficient margin to the automatic high reactor pressure shutdown setpoint. When pressure reached approximately 1042 psig, the reactor automatically shut down per design

Since the causes of the two events were different, the corrective actions for the previous event could not have prevented this event.