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the southern electric system

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HL-2130
003176

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

PLANT HATCH - UNIT 1
NRC DOCKET 50-321
OPERATING LICENSE DPR-57
LICENSEE EVENT REPORT
MALFUNCTIONING MOTOR OPERATED VALVE RESULTS
IN GROUP 1 ISOLATION DURING PLANT SHUTDOWN

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed, revised Licensee Event Report (LER) concerning a malfunction motor operated valve which resulted in a Group 1 isolation. This event occurred at Plant Hatch - Unit 1.

If you have any questions in this regard, please call this office.

Sincerely,

W. G. Hairston, III

JKB/cr

Enclosure: LER 50-321/1991-029, Rev. 1

cc: (See next page.)

G30131

IE22 1/1

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, Regio II
Mr. S. D. Ebneter, Regional Administrator
Mr. L. D. Wert, Senior Resident Inspector - Hatch

NRC Form 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
PLANT HATCH, UNIT 1	0 5 0 0 0 3 2 1	1 OF 5

TITLE (4)
MALFUNCTIONING MOTOR OPERATED VALVE RESULTS IN GROUP 1 ISOLATION DURING PLANT SHUTDOWN

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)
										0 5 0 0 0
1 1	2 6	9 1	9 1	0 2 9	0 1	0 3	3 0	9 2		0 5 0 0 0

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)			
POWER LEVEL	0 0 4	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)
		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	
	AREA CODE	
STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH	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	

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

ABSTRACT (16)

On 1/26/91, Unit 1 was in the Startup mode at approximately 4% rated thermal power and was starting up from a refueling outage when system leaks in the drywell led to a decision to shut down the unit and perform repairs. At 1539 CST, the reactor was shut down by manual scram per procedure. Since the core had been critical for only 109 hours, the decay heat level was relatively low, and the reactor began to cool down rapidly. Therefore, licensed personnel closed the inboard Main Steamline Isolation Valves, intending to retard cooldown rate by throttling a non-safety related motor operated valve in the main steamline drain, 1B21-F020. However, this valve did not respond to the control switch, so the main steamline drain had to be isolated. This isolated all steam loads from the reactor and required the Main Condenser vacuum breakers to be opened since steam seal pressure was not available. At 1620 CST, when condenser vacuum decreased to the set point of the Group 1 Primary Containment Isolation System trip on low condenser vacuum, an automatic isolation signal was received. Group 1 valves which went closed were the 3/4-inch Reactor Water Sample valves and redundant valves in penetrations which had already been isolated including the outboard Main Steamline Isolation Valves. All affected valves functioned as designed. Although the automatic actuation could have been prevented by bypassing the low condenser vacuum trip, licensed operators properly focused their attention on the higher priority of controlling cooldown rate.

The root cause of this event was the inability of valve 1B21-F020 to throttle on demand.

The torque switch on valve 1B21-F020 was adjusted.

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 11/26/91, Unit 1 was in the Startup mode at approximately 4% rated thermal power. The unit was being restarted following a refueling outage, and had been critical for approximately 109 hours. Several leaks inside the drywell had been discovered during an operating pressure test. Therefore, plant management had directed the unit to be shut down in order to repair the leaks prior to ascending to power operation. At 1539 CST, the reactor was manually scrammed at plant management direction in accordance with 34GO-OPS-013-1S, "NORMAL PLANT SHUTDOWN."

Since the core had been critical for only a short time, only a relatively small amount of decay heat was being produced, and reactor pressure decreased rapidly following the scram. Within 30 minutes, pressure decreased from 950 to 450 psig, and reactor coolant temperature decreased from 522 to 460 degrees. To retard the cooldown rate by reducing the steam load on the reactor, the Steam Jet Air Ejectors (SJAEs, EIIS Code SH) were secured at 1557 CST. At 1603 CST, the licensed shift supervisor (SS) further directed that the inboard Main Steamline Isolation Valves (MSIVs, EIIS Code SB) be closed. This left the main steam drain line as the only path for reactor steam to reach the Main Condenser (EIIS Code SG). In conjunction with closing the MSIVs, the SS directed that non-safety related motor operated valve 1B21-F020, located in the main steamline drain system, be throttled to further reduce heat loss from the reactor. However, valve 1B21-F020 did not respond to input from the control switch. Therefore, since the only motor operated valve in the flow path with throttling capability could not be throttled, the SS elected to isolate reactor steam by closing a different valve in the drain line, 1B21-F019, which is a Group 1 Primary Containment Isolation System (PCIS, EIIS Code JM) valve. Since closing 1B21-F019 would isolate reactor steam, steam flow would not be available to the Main Turbine Steam Seal system (EIIS Code TC). Therefore, the Main Condenser vacuum breakers were opened at 1611 CST in preparation for closing the valve. Three minutes later, valve 1B21-F019 was closed, isolating reactor steam and terminating the cooldown.

At 1620 CST, a full Group 1 isolation occurred when condenser vacuum decreased to the low condenser vacuum isolation setpoint of 10 inches of mercury. Since reactor steam paths were already isolated, this actuation had no effect on the reactor. Remaining Group 1 isolation valves which had not been previously closed responded as designed. At 1628 CST, the Group 1 isolation signal caused by low condenser vacuum was bypassed as permitted by procedure 34GO-OPS-013-1S.

CAUSE OF EVENT

The root cause of this event was the inability of valve 1B21-F020 to throttle on demand. When this valve was inspected per Maintenance Work Order (MWO) 1-91-7288, it was found that the torque switch setting did not permit sufficient closing force and caused the motor operator to trip before the valve could move. The torque switch was then adjusted to increase the closing force per procedure 52GM-MEL-022-0S, "LIMITORQUE VALVE OPERATOR ELECTRICAL MAINTENANCE."

Additional investigation, performed after revision 0 of this report was submitted, revealed that the torque switches had been adjusted to incorrect settings under MWO 1-89-3964, dated 2/27/90. Per the data package from procedure 52GM-MEL-022-0S, completed per MWO 1-89-3964, the torque switches were adjusted to 2.75 in the open direction and to 1.0 in the close direction. However, the settings should have been 2.75 in the close direction and 1.0 in the open direction. Since the setting for the close direction was too low, the valve motor tripped on high torque as it was trying to close the valve. Because of the elapsed time since the torque switches were incorrectly adjusted, it is not possible to conclusively determine the cause of the error. There are two likely possibilities. First, the electrician who performed the work may have mistaken the close switch for the open switch, and thus reversed the settings. Second, the electrician may have transposed the open and close settings when the as-found conditions were recorded in the procedure data package during disassembly. Either would have caused the torque switches to be adjusted incorrectly when the valve was reassembled.

The isolation could have been prevented by bypassing the Group 1 isolation signal on low condenser vacuum prior to opening the Main Condenser vacuum breakers. However, licensed shift personnel focused on control of the cooldown rate as the matter of higher priority. The isolation signal had no practical effect on the reactor because reactor steam had already been isolated prior to receiving the automatic actuation.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because an unplanned actuation of an engineered safety feature (ESF) occurred. Specifically, a Group 1 PCIS isolation signal was received due to low condenser vacuum.

The Group 1 Primary Containment Isolation System is designed to initiate automatic isolation of the appropriate lines which penetrate the Primary Containment (EIIS Code NH) when needed to limit the release of radioactive materials from nuclear system process barriers. One of the parameters monitored by the PCIS is Main Condenser vacuum. Specifically, in the event that condenser vacuum is less than 10 inches of mercury, the PCIS initiates automatic isolation of the MSIVs, the Main Steamline Drain isolation valves, and the Reactor Water Sample valves (all Group 1 PCIS valves). This provides protection for the Main Condenser against rupture due to overpressure should the Main Turbine (EIIS Code TA) stop valves and bypass valves fail to close. This, in turn, precludes the potential release of radioactive material from the Main Condenser which might occur if the excessive steam flow entered the condenser.

In this event, condenser vacuum was lost when the Main Condenser vacuum breakers were intentionally opened in preparation for isolating reactor steam. At the time the isolation signal was received, the four inboard MSIVs were closed, and the outboard Main Steamline Drain isolation valve was closed. The only Group 1 PCIS valves which went closed were the Reactor Water Sample valves and the redundant valves in lines already isolated. Therefore, the Group 1 isolation had no practical effect on plant operation since the reactor was fully shut down and was isolated by operator action before the condenser vacuum reached its trip setpoint. All the Group 1 valves responded per design.

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

CORRECTIVE ACTIONS

1. The torque switch setting on valve 1B21-F020 was adjusted to provide increased closing force and the valve was stroked to demonstrate operability.

2. Procedure 52GM-MEL-022-0S, "LIMITORQUE VALVE OPERATOR ELECTRICAL MAINTENANCE," was revised. Although the revision did not take place as a result of this event, the changes made reduce the probability of a recurrence of a similar event. The procedure now requires the electrician to obtain torque settings from the Maintenance Engineering department, reducing the probability that an error could occur involving the use of as-found torque switch settings. A note in the procedure requires the electrician to ensure that the as-left settings are at least as great as the as-found setting. Also, Limitorque torque switch settings are being published in a permanent plant procedure, 53GM-MNT-001-0S, "LIMITORQUE TORQUE SWITCH SETTINGS FOR NON GL 89-10 MOVS." The ready availability of these settings will help reduce the likelihood that as-found settings could be incorrectly recorded during valve disassembly, and subsequently used to return a valve to service. The procedure will be issued for use by 6/30/92.

ADDITIONAL INFORMATION

1. Other Systems Affected: No systems were affected other than those described in this report.

2. Previous Similar Events: Events reported in the last two years in which low condenser vacuum signal resulted in a Group 1 isolation are described in LERs 50-366/1990-001, dated 02/07/90 and 50-366/1991-015, dated 06/24/91. Corrective actions for these events included changing valves, switches and tubing related to the sensors for the low condenser vacuum trip, and replacing failed servo valves for the Main Turbine Control Valves. These actions would not have prevented this event because none of these components was involved in the trip.

One event was reported in the last two years involving a valve which inappropriately tripped on high torque. The event is described in LER 50-321/1990-020, dated 10/26/90. In that event, a non-safety related MOV, 1N38-F101A, in the Moisture Separator/Reheater (MSR, EIIS Code SB) system did not close upon demand and resulted in an unbalanced steam flow to a portion of the Main Turbine (EIIS Code TA). The unbalanced flow lead to a trip of the Main Turbine on high vibration. Upon investigation, it was found that although the close torque switch was set within the vendor's recommended tolerance, the setting was still too low to ensure the valve could fully close. Corrective actions for that event included increasing the torque switch setting on 1N38-F101A. The final setting was still within the vendor's recommended tolerance. Corrective actions for that event would not have prevented the present event from occurring because the root causes of the two events were different. In the former event, the close torque switch on 1N38-F101A was set correctly (even though the setting did not permit proper valve operation), but in the latter event, the close torque switch on 1B21-F020 was incorrectly set up and had to be corrected.

3. Failed Components Identification: No failed components contributed to or resulted from this event.