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Georgia Power
the southern electric system

HL-2912
003996

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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
ORGANIC INTRUSION RESULTS IN
MAIN STEAM LINE HIGH RADIATION,
REACTOR SCRAM AND GROUP 1 ISOLATION

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 an organic intrusion which caused an increase in main steam line high radiation levels and resulted in a Group 1 isolation and a reactor scram. This event occurred at Plant Hatch - Unit 1.

Sincerely,

J. T. Beckham, Jr.

280082

MCM/cr

Enclosure: LER 50-321/1992-021

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

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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)
ORGANIC INTRUSION RESULTS IN MAIN STEAM LINE HIGH RADIATION, REACTOR SCRAM AND GROUP 1 ISOLATION

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)
									PLANT HATCH UNIT 2	0 5 0 0 0 3 6 6
0 8	2 7	9 2	9 2	0 2 1	0 0	0 9	2 5	9 2		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)									
POWER LEVEL	1 0 0		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	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 (16)

On 8/27/92 at 0222 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the unit scrammed, the Group 1 Primary Containment Isolation System (PCIS) valves closed, and the pressurization mode of the Main Control Room Environmental Control System initiated per design on Main Steam Line (MSL) high radiation. Reactor water level decreased as expected due to void collapse from the rapid decrease in power. This resulted in isolation of Group 2 PCIS valves, isolation of Units 1 and 2 Secondary Containments, initiation of Units 1 and 2 Standby Gas Treatment systems, a trip of both Reactor Recirculation pumps, and initiation of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems. Water level reached a minimum of 44 inches below instrument zero (114 inches above the top of the active fuel) before being recovered and controlled. Reactor pressure reached a peak of 1079 psig. Low Low Set was initiated manually and all four Low Low Set SRVs opened to decrease and control pressure per design.

The cause of this event was most probably an organic intrusion. It is believed that oil trapped on the resin and filter elements of the "B" Condensate Filter/Demineralizer (F/D) entered the reactor feedwater when it was freed by flow and pressure changes resulting from the F/D being returned to service. The oil broke down in the reactor causing an increase in activation product transport to the MSLs. This caused an increase in MSL radiation levels. Corrective actions for this event include increasing the time to return the F/Ds to service, replacing the filter elements in the "B" Condensate F/D, and preparing a Technical Specifications change request.

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 8/27/92 at 0222 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the unit scrammed, the Group 1 Primary Containment Isolation System (PCIS, EIIS Code JM) valves closed, the pressurization mode of the Main Control Room Environmental Control System (MCRECS, EIIS Code VI) initiated, and the Steam Packing Exhauster (EIIS Code TC) tripped and isolated per design on Main Steam Line (MSL, EIIS Code SB) high radiation. MSL radiation levels increased to above 8500 milliRem/hour from their steady state level of approximately 3900 milliRem/hour. This increase in MSL radiation levels, which occurred three to four minutes after the "B" Condensate Filter/Demineralizer (EIIS Code SF) had been returned to service, was sufficient to actuate the MSL high radiation trip logic.

Following the scram, reactor water level decreased as expected due to void collapse from the rapid decrease in reactor power. As water level decreased from its normal level of 36 inches above instrument zero (194 inches above the top of the active fuel) to 12.5 inches above instrument zero, another scram signal and a Group 2 PCIS isolation signal were received. The Group 2 PCIS valves closed on low (Level 3) reactor water level per design. This occurred approximately five seconds after the initial scram on MSL high radiation.

Water level decreased to its minimum value of 44 inches below instrument zero (114 inches above the top of the active fuel) about seven seconds into the event. This resulted in an isolation signal to the Group 5 PCIS valves, which were in the closed position prior to the event; isolation of Units 1 and 2 Secondary Containments; initiation of Units 1 and 2 Standby Gas Treatment (SBGT, EIIS Code BH) Systems; a trip of both Reactor Recirculation pumps (EIIS Code AD); and initiation of the High Pressure Coolant Injection (HPCI, EIIS Code BJ) and Reactor Core Isolation Cooling (RCIC, EIIS Code BN) Systems on low low (Level 2) reactor water level per design. All systems functioned as expected and all isolation valves closed within their allowable times. This was confirmed using the Safety Parameter Display System (EIIS Code IQ) computer tape of the event. Water level was recovered using the "A" and "B" Reactor Feedwater Pumps (RFPs, EIIS Code SJ) and RCIC. HPCI started and ran on minimum flow, but did not inject to the vessel because water level was increased above the low low water level setpoint before its injection valve, 1E41-F006, received all its permissive signals to open.

Water level increased to approximately 60 inches above instrument zero. The RFPs, HPCI, and RCIC tripped on high reactor water level (Level 8) per design. This occurred about 2 1/2 minutes into the event. Licensed Operations personnel reset the high water level trips when level decreased below the trip setpoint. The "A" RFP was used to control water level until it exhausted its steam supply

from the Moisture Separator/Reheater (EIIS Code SB). With the Main Steam Line Isolation Valves (EIIS Codes JM and SB) closed from the Group 1 PCIS isolation, steam from reactor decay heat was not available to the RFP turbines. HPCI and RCIC were then used to control water level.

Reactor pressure reached a peak of approximately 1079 psig. A Licensed Operator manually opened the "B" Safety/Relief Valv (SRV) at this point to complete the arming of the Low Low Set actuation logic. When the "B" SRV was opened, Low Low Set was armed and all four Low Low Set SRVs opened per design. The "F" SRV, a non-Low Low Set valve, also opened at this time. After the four Low Low Set SRVs opened, the "B" SRV and the "F" SRV closed three and four seconds later, respectively. The four Low Low Set SRVs remained open to decrease pressure. They closed sequentially as pressure decreased to their individual reset points. Low Low Set reduced pressure to about 847 psig at which point the last Low Low Set SRV closed per design. Low Low Set then controlled pressure between 847 psig and 983 psig.

By 0230 CDT, the unit was stable with HPCI and RCIC maintaining water level greater than 18 inches above instrument zero and Low Low Set maintaining pressure between 847 psig and 983 psig.

CAUSE OF EVENT

The cause of this event was most probably an organic intrusion into the reactor vessel. Specifically, RFP lubricating oil trapped on the resin and filter elements of the "B" Condensate Filter/Demineralizer was freed by flow and pressure changes internal to the filter/demineralizer resulting from it being returned to service. The oil entered the reactor feedwater and subsequently broke down in the high temperature and radiation environment of the reactor vessel. This caused an increase in activation product carryover to the MSLs and a corresponding increase in MSL radiation levels. The increase in radiation levels was sufficient to trip the MSL radiation monitors and associated logic on high radiation.

Indications of an organic intrusion into the reactor, that is, increased levels of primary coolant conductivity and MSL radiation levels and decreased levels of oxygen in the Main Condenser (EIIS Code SQ) offgas, have been seen previously when filter/demineralizers were removed from and returned to service. Increased flows through the remaining filter/demineralizers when one is removed from service, and internal flow and pressure changes when one is returned to service, cause oil to enter the feedwater and reactor vessel. Actions had been taken to reduce the amount of oil entering the Main Condenser hotwell and to minimize the size of the flow changes in the filter/demineralizers. The pressure on the RFP bracket drain line to the Main Condenser was increased to minimize oil leakage along the pump shaft into the seal water leakoff in the bracket. The amount of time taken to remove filter/demineralizers from and return them to service was increased to minimize the forces from flow changes.

These actions were taken in May and June of 1992 and appear to have been successful. However, around 8/21/92, the requirement to remove filter/demineralizers from and return them to service in 15 to 20 minutes was rescinded. Operations returned to performing these actions in three to five minutes as allowed by procedure. This was done because there appeared to be evidence that oil in the system was no longer a significant problem; hence, it was believed that there was no longer a need to slowly manipulate the filter/demineralizers.

On 8/27/92, a Plant Equipment Operator removed the "B" Condensate Filter/Demineralizer from service in order to confirm the position of a filter/demineralizer valve with double indication. A few minutes later, after confirming the valve was in the proper position, he returned the filter/demineralizer to service and increased flow through it in the procedurally required three to five minutes, as confirmed on the filter/demineralizer flow recorder. The internal flow and pressure changes resulting from increasing flow this quickly were sufficient to free the oil on the resin (which had been in service for 12 days) and filter elements. The oil then entered the reactor via the feedwater.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73(a)(2)(iv) due to the unplanned actuation of the Reactor Protection System (RPS, EIIS Code JC) and several Engineered Safety Feature systems. Specifically, the Groups 1, 2, and 5 PCIS, the pressurization mode of the MCRECS, Units 1 and 2 Secondary Containment isolation systems, Units 1 and 2 SBGT Systems, and the HPCI System actuated. These actuations occurred on MSL high radiation and from the low reactor water level condition which resulted from the scram.

High radiation in the vicinity of the MSLs could indicate gross fuel failure in the core. When high radiation is detected near the steam lines, a scram is initiated to limit the fission products released from the fuel. The same high radiation condition also initiates the Group 1 PCIS valves in order to isolate the reactor vessel and contain any released fission products. The Groups 2 and 5 PCIS valves close on low and low low reactor water levels, respectively, to limit the loss of reactor coolant inventory through process lines which may be breached.

In this event, sensed MSL high radiation resulted in a scram, initiation of the Group 1 PCIS valves, and initiation of the pressurization mode of the MCRECS per design. The high radiation condition was most probably the result of an organic intrusion into the reactor feedwater which caused an increased carryover of activation products to the MSLs. It was not the result of any fuel damage. A laboratory analysis of a reactor coolant sample performed about 1 1/2 hours after the scram confirmed there was no fuel damage. However, all systems functioned per design to limit fission product release had there been actual fuel damage.

As an expected result of the scram, reactor water level decreased. The Group 2 PCIS valves closed as required as water level decreased to the isolation setpoints. The Group 5 PCIS valves were in the closed position prior to the event. Other Engineered Safety Feature systems also were initiated per their design in response to the low water level condition. HPCI and RCIC initiated, although HPCI did not inject to the reactor vessel because water level was recovered before its injection valve received all of its permissive signals to open. HPCI was later used in the manual mode to control water level.

Water level was never less than 114 inches above the top of the active fuel. The RFPs and RCIC were used to recover water level, and HPCI and RCIC were used manually to control water level when the RFPs became unavailable due to a lack of a steam supply to the RFP turbines. Reactor pressure peaked at approximately 1079 psig. Low Low Set was manually armed and the Low Low Set SRVs then opened to decrease pressure to 847 psig. Thereafter, Low Low Set maintained pressure between 847 psig and 983 psig per its design.

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

CORRECTIVE ACTIONS

On 8/27/92, following the scram, Operations returned to the policy of taking Condensate Filter/Demineralizers out of service and returning them to service in 15 to 20 minutes. This policy will be incorporated into plant procedures 34SO-N21-003-1S, "Condensate Polishing Demineralizer System," and 34SO-N21-003-2S, "Condensate Polishing Demineralizer System," by 12/31/92.

The filter elements on the "B" Condensate Filter/Demineralizer were replaced.

A request to change the Unit 1 and Unit 2 Technical Specifications to delete the MSL high radiation scram and Main Steam Line Isolation Valve isolation, which would cause a scram on Main Steam Line Isolation Valve closure, is currentl being prepared for submittal to the NRC.

ADDITIONAL INFORMATION

No systems other than those previously mentioned were affected by this event.

No failed components caused or resulted from this event.

No previous similar events in which a scram occurred on MSL high radiation or unexpected Engineered Safety Feature system actuations were caused by an organic intrusion have been reported in the last two years.