NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

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

TITLE (4)
SPURIOUS GROUND FAULT OR ELECTRIC NOISE TRIPS TURBINE OVERSPEED DEVICE CAUSING SCRAM

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
0 1	0 1	8 7	8 7	0 0 1	0 0	0 2	0 2	8 7		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	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 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
	AREA CODE
Raymond D. Baker, Nuclear Licensing Manager - Hatch	4 0 4 5 2 6 - 7 0 1 6

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 fifteen single-space typewritten lines) (16)

On 1/1/87 at approximately 1350 CST, Unit 1 was in the run mode at an approximate power of 2430 MWt (100 percent of rated thermal power). At that time, the main turbine tripped (closure of the main turbine stop valves). The closure of these valves is a scram input to the Reactor Protection System (RPS). A full reactor scram occurred without any complications.

The event is believed to have been caused by a spurious ground fault signal or spurious electrical noise from welding operations which induced a voltage transient in the turbine electrohydraulic control system. This resulted in the trip of the main turbine backup electrical overspeed device which tripped the main turbine and resulted in the reactor scram.

Corrective actions for this event included performing an engineering evaluation of the event and testing the main turbine backup overspeed circuitry.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73 (a)(2)(iv), because an unplanned actuation of the Reactor Protection System (RPS) occurred.

B. UNIT(s) STATUS AT TIME OF EVENT

Unit 1 was in the run mode at an approximate power level of 2430 MWt (approximately 100 percent of rated thermal power).

C. DESCRIPTION OF EVENT

On 1/1/87 at approximately 1350 CST, the main turbine tripped (closure of the main turbine stop valves). The closure of these valves provides a scram signal to the Reactor Protection System (RPS) and a full scram occurred.

Closure of the turbine stop valves caused the reactor pressure to increase to 1100 psig. This caused all the safety relief valves (eleven valves total) to lift at their high pressure setpoints. After the initial pressure spike, vessel pressure was controlled by operations personnel, between 820 psig and 920 psig, using the electrohydraulic control (EHC) system to control the main turbine bypass valves.

The initial pressure transient caused the voids in the reactor core to collapse, and sensed vessel water level decreased to approximately +11 inches from instrument zero. The reactor feedwater pumps sensed the decreasing water level and automatically increased their injection flow. This increase in feedwater flow caused the reactor water level to increase to approximately +60 inches from instrument zero. The reactor water level increased to the high water trip setpoint for the reactor feedwater pumps and both of the pumps tripped automatically.

Reactor vessel water level decreased and plant operations personnel re-started the "A" reactor feedwater pump at approximately 1420 CST. Reactor vessel water level was controlled within its normal range (+32 inches to +42 inches above instrument zero) with the "A" reactor feedwater pump.

No high pressure emergency systems were used to maintain reactor water level, nor were any needed. When the stop valves closed and the transient occurred, the course of the transient was as expected.

D. CAUSE OF EVENT

Plant engineering personnel performed an evaluation of the event. The first hit circuitry of the main turbine supervisory equipment indicated that the main turbine trip was initiated by the backup electrical overspeed device. The backup overspeed is an electrical overspeed protection device that trips the turbine in the event that the mechanical overspeed trip fails and the turbine speed continues to increase. Although a trip of the backup electrical overspeed device caused the turbine trip, engineering personnel believe that an actual turbine overspeed did not occur. Their opinion is substantiated by two facts that were derived from their evaluation. Those facts are:

1. The temporarily installed turbine event monitoring system on the Unit 1 turbine was activated by the main turbine trip. The turbine trip data was recorded on the monitoring systems disk. That data has been evaluated by contractor personnel, and shows that the turbine did not overspeed. Additionally, the turbine speed recorder in the main control room indicates that the maximum turbine speed reached approximately 1835 RPM. This is well below the mechanical overspeed trip setpoint of 1890 RPM and the backup overspeed trip setpoint of 1980 RPM.

2. The main generator's output circuit breakers did not open until approximately five seconds after the turbine trip. This indicates that the turbine remained loaded for five seconds following the trip. A turbine speed increase with the generator tied to the grid is highly unlikely. A genuine turbine overspeed would have tripped the main generator's output circuit breakers (at approximately 61 Hertz) prior to a main turbine trip.

The station battery ground fault annunciator green light window was observed to be flashing in the main control room after the turbine trip. Since this annunciator was green in color (indicating that a sensed condition occurred and then was rectified) it is possible that a ground condition possibly occurred and then cleared itself. The main turbine EHC system receives its 125 Volt D. C. power from the 1A station battery. The main turbine backup electrical overspeed trip circuit receives its power from 24 Volt D.C. power supplies internal to the EHC electrical panel. These 24 volt power supplies receive their power from 120 Volt A.C. normal house power. The EHC system is grounded at the same terminal as the 1A battery ground fault detector circuit. Therefore, it appears possible that a ground fault on station battery 1A might have induced a transient (voltage) in the turbine EHC electrical system, which resulted in a trip of the main turbine's backup electrical overspeed device.

Another potential cause of the event could be spurious electrical noise generated from welding activities. At the time the main turbine tripped, welding was being performed in the High Pressure Coolant Injection (HPCI) equipment room near the EHC ground terminal. It is possible that striking and breaking the welding arc could have induced a voltage into the EHC electrical system sufficient to cause the EHC voltage to spike and actuate the main turbine's backup electrical overspeed device. Welding was the only suspect activity in progress at the time of the turbine trip.

At the present time, the root cause of this event remains under investigation by engineering personnel. If a root cause can be determined, it will be discussed in a revision to this report.

E. ANALYSIS OF EVENT

The turbine stop valve closure scram anticipates the pressure, neutron flux, and heat flux increase that could result from rapid closure of the turbine stop valves. Closure of the turbine stop valves with the reactor at power, can result in a significant addition of positive reactivity to the core as the reactor pressure rise collapses steam voids. The turbine stop valve closure scram initiates a scram earlier than either the neutron monitoring system or the reactor high pressure scrams. With a scram trip setting of less than or equal to 10 percent of valve closure from full open, the scram limits the surface heat flux on the fuel to acceptable thermal hydraulic limits.

Although the reactor high pressure scram, in conjunction with the pressure relief system, is adequate to preclude overpressurizing the nuclear system, the turbine stop valve closure scram provides additional margin to the reactor pressure limit.

Since this event occurred at approximately 100 percent of rated thermal power, it is not believed that the event would have been more severe at other conditions.

From the above information, it is concluded that the event had no nuclear safety significance.

F. CORRECTIVE ACTIONS

Engineering personnel performed an analysis of the event as described in other sections of this LER. Plant technicians tested the main turbine backup overspeed circuitry and determined that it also was functioning correctly.

Since no apparent root cause for the event has been determined to date, and since the turbine backup overspeed circuitry was determined to be functioning correctly, plant operations personnel commenced a normal reactor startup on 1/2/87 at approximately 0100 CST.

G. ADDITIONAL INFORMATION

1. FAILED COMPONENT(s) IDENTIFICATION

No components failed in this event.

2. PREVIOUS SIMILAR EVENTS

No previous similar events were noted.

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Manager Nuclear Safety
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Georgia Power
the southern electric system

SL-1915
0166C

February 2, 1987

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

Attached is Licensee Event Report 50-321/1987-001. This report meets the reporting requirement of 10 CFR 50.73(a)(2)(iv).

Sincerely,

L. T. Gucwa

LGB/lc

Enclosure

c: Georgia Power Company
Mr. J. P. O'Reilly
Mr. J. T. Beckham, Jr.
Mr. H. C. Nix, Jr.
GO-NORMS

Nuclear Regulatory Commission
Dr. J. N. Grace, Regional Administrator
Mr. P. Holmes-Ray, Senior Resident
Inspector - Hatch

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