NON-PUBLIC?: N
ACCESSION #: 8908140002
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Plant Vogtle - Unit 2 PAGE: 1 of 4

DOCKET NUMBER: 05000425

TITLE: Failure of Intercept Valves to Open Results in Reactor Trip on
SG Lo-Lo Level
EVENT DATE: 05/22/89 LER #: 89-021-01 REPORT DATE: 08/07/89

OPERATING MODE: 1 POWER LEVEL: 012

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. M. Odom, Nuclear Safety and Compliance TELEPHONE: (404) 826-3201
Manager

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 5-22-89, preparations were underway to start up the main turbine. At approximately 1547 CDT, steps were initiated to bring the turbine speed up to 1800 RPM. At 1605 CDT, indications of a steam/feed mismatch problem were seen on Steam Generator (SG) #2 and the Reactor Operator (RO) observed a decrease in Tave greater than expected. Because SG levels and pressure were decreasing, the Balance of Plant operator tripped the turbine at 1606 CDT. Feed to the steam generators was increased and the steam dumps were manually closed. However, at 1607 CDT, an automatic reactor trip occurred on Low-Low level in SG #2. Control room operators took appropriate actions to stabilize the Unit in Mode 3 (Hot Standby).

The direct cause of the event was the failure of the intercept valves to open and a contributing cause was operator oversight in not recognizing the intercept valves' failure to open as turbine speed was increased. When the main turbine reached 1800 RPM, the control valves opened further to maintain a constant turbine speed creating a large steam load. This caused

pressurization of the high pressure turbine and Moisture Separator Reheaters (MSR), eventually lifting the "B" MSR relief valve. The operator tripped the main turbine, SG water levels lowered and a reactor trip occurred. Corrective actions included adjustment of the closing bias voltage on the intercept valve circuit cards.

END OF ABSTRACT

A. REQUIREMENT FOR REPORT

This report is required per 10
FR 50.73(a)(2)(iv) because the event
resulted in an unplanned automatic reactor trip.

B. UNIT STATUS AT TIME OF EVENT

At the time of the event the unit was in Mode 1 (Power Operation) at
12% rated thermal power.

On 5-14-89 Unit 2 experienced a large load transient. Generator load had gradually dropped from 1040 to 980 MWe over approximately a 4 minute period. The generator load then dropped to zero and recovered to approximately 980 MWe during a period of approximately 90 seconds. After this transient the plant remained stable. The turbine load control circuits were placed in standby until a thorough investigation could be performed. During a planned outage on 5-20-89, troubleshooting of the turbine control circuitry was performed. A discrepancy was found between the output of the Electrohydraulic Control (EHC) system's Permanent Magnetic Generator (PMG) and the house supplied power. The house supplied power was found to be the preferred source: however the PMG supplied power should have been preferred soruce. The PMG was adjusted to 22.00V and the house power supply to 21.950V making the PMG the preferred source.

On 5-22-89 turbine shell warming could not be performed because four control valves and the No. 2 stop valves would not open. It was discovered that the previous voltage adjustments to the PMG and house power supply had changed the closing bias voltage for the valves in question, preventing them from opening. The closing bias voltage was adjusted on the four control valves and the No. 2 stop valve, allowing satisfactory turbine shell and chest warming. At this time the closing bias voltage was not adjusted for the intercept valves.

C. DESCRIPTION OF EVENT

On 5-22-89 preparations were underway to start up the main turbine. The operating staff on Unit 2 consisted of the Unit 2 Shift Supervisor (SS), a Reactor Operator (RO), a Common Plant Operator (PO) for water level control, and a Balance of Plant Operator (BOP). At approximately 1547 CDT, steps were initiated to bring the turbine up to 1800 RPM. At 1606 CDT, indications of a steam flow/feed flow mismatch problem were seen on Steam Generator #2. The common PO checked the status of the steam dumps, and observed that the atmospheric relief valves were closed and that the main steam safety valve tailpipe temperatures were normal, but could not determine the cause of mismatch. At approximately the same time, the RO observed a cooldown of the reactor coolant (Tave) that was greater than expected. Because steam generator levels and pressures were decreasing, the BOP operator tripped the main turbine at 1606 CDT. Feed to the Steam Generators was increased

and the steam dumps were manually closed. Upon realizing the actions taken were not restoring steam generator levels, the Common PO directed the RO to trip the reactor. However, at 1607 CDT, 1.7 seconds before the RO initiated the manual trip, an automatic reactor trip occurred on Low-Low Level in Steam Generator #2, and subsequently the level in another steam generator also decreased below the Low-Low level setpoint. Both motor driven and the turbine driven Auxiliary Feedwater pumps started. At approximately 1610 CDT, as a precautionary measure, the outboard Main Steam Isolation Valves were closed. At 1646 the reactor was stable in Mode 3 at normal operating temperature and pressure. An evaluation of the event found that the six (6) intercept valves had failed to open when the turbine was initially brought up to 100 RPM. When the main turbine reached 1800 RPM, the control valves opened further to maintain a constant turbine speed creating a large steam load. This caused pressurization of the high pressure turbine and Moisture Separator Reheaters (MSR), eventually lifting the "B" MSR relief valve.

D. CAUSE OF EVENT

The direct cause of this event was failure of the intercept valves to open.

The primary root cause of the event is attributed to personnel error, in that the scope of work previously performed was limited to the specific problem at hand (i.e., being able to perform chest and shell warning of the turbine). Appropriate plant and vendor personnel (General Electric) failed to identify that adjustment to the closing bias voltage

for the intercept valves should also be performed.

A secondary root cause for the event was another personnel error. Procedure 13800-2, "Main Turbine Operation", section 4.1.6.23b, requires the operator to observe the opening of the intercept valves. The BOP operator failed to make this required observation.

E. ANALYSIS OF EVENT

During the event all safety related systems operated as required. Initial data review revealed no primary system parameters were exceeded. However, concern was expressed about the reactor coolant cooldown rate. Computer tapes were reviewed indicating the cooldown to be 25 deg. F in 7 minutes. This is well within the Technical Specification limitation of 100 deg. F in any one hour period. Based on these considerations, there was no impact on plant safety or the health and safety of the public.

F. CORRECTIVE ACTIONS

1. Immediate corrective action was to make the proper adjustments to correct the closing bias voltage on the circuit cards for the intercept valves.

2. Upon the recommendation of General Electric, engineering has evaluated the modification of the circuit cards and has eliminated the closing bias for Unit 2. (This modification is being considered for implementation on Unit 1.)

3. Appropriate personnel have been counseled regarding the necessity to ensure the entire scope of a problem is addressed.

4. The BOP operator has been counseled regarding the necessity to ensure proper procedure compliance.

G. ADDITIONAL INFORMATION

1. Failed Components
None

2. Similar Events
None

3. Energy Industry Identification System Code

o Main Turbine System - TA
o Turbine Supervisory Control System - JJ

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ELV-00757
1569n

August 7, 1989

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

VOGTLE ELECTRIC GENERATING PLANT
NRC DOCKET 50-425
OPERATING LICENSE NPF-81
LICENSEE EVENT REPORT
FAILURE OF INTERCEPT VALVES TO OPEN
RESULTS IN REACTOR TRIP ON SG LO-LO LEVEL

Gentlemen:

In accordance with 10 CFR 50.73, Georgia Power Company hereby submits the enclosed revised report related to an event which occurred on May 22, 1989. This revision clarifies the sequence of events.

Sincerely,

W. G. Hairston, III

WGH,III/PAH/gm

Enclosure: LER 50-425/1989-021-01

xc: Georgia Power Company
Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
Mr. R. M. Odom
Mr. P. D. Rushton
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U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
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Mr. J. F. Rogge, Senior Resident Inspector, Vogtle

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