NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
PLANT HATCH, UNIT 2	0 5 0 0 0 3 6 6	1 OF 1 2

TITLE (4)
INADEQUATE PROCEDURE CAUSES MIS-ASSEMBLY OF VALVE RESULTING IN ESF SYSTEM INOPERABILITY

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 1	0 6	8 8	8 8	— 0 0 1	— 0 0	0 1	2 9	8 8		0 5 0 0 0
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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)	0 7 5	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)		
		20.405(a)(1)(i)	50.36(c)(1)	X 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)	X 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
Raymond D. Baker, Nuclear Licensing Manager - Hatch	AREA CODE 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	
D	B J	S H V A O 5 8		Y							

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 1/6/88 at approximately 0800 CST, Unit 2 was in the run mode at an approximate power level of 1826 MWt (approximately 75 percent of rated thermal power). The Reactor Core Isolation Cooling (RCIC EIIS Code BN) system was out of service for valve maintenance and testing. At that time, plant operations personnel determined that the High Pressure Coolant Injection (HPCI EIIS Code BJ) system was inoperable. Having both the HPCI and RCIC systems inoperable in the run mode is prohibited by the plant's Technical Specifications.

The root cause of this event is an inadequate procedure. Specifically, a maintenance procedure did not provide sufficient guidance to ensure that proper clearances were maintained on a turbine stop valve.

Corrective actions for this event included: 1) investigating the status of the HPCI turbine stop valve, 2) returning RCIC to an operable status and performing Technical Specifications required actions, 3) repairing the HPCI turbine stop valve, 4) initiating procedure revisions, and 5) verifying that the Unit 1 HPCI turbine stop valve does not have a similar problem.

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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)(i), because both the High Pressure Coolant Injection (HPCI EIIS Code BJ) and the Reactor Core Isolation Cooling (EIIS Code BN) systems were out of service at the same time. This condition caused plant operations personnel to enter section 3.0.3 of the Technical Specifications. Per the guidance provided in NUREG 1022, Supplement 1, Question 2.4, any entry into Technical Specification 3.0.3 is a reportable event under the criteria of 10 CFR 50.73 (a)(2)(i).

Even though Technical Specification 3.0.3 was entered, corrective actions for the event were completed before the action time frames of this specification were exceeded. As such, a true condition prohibited by the Technical Specifications (such as a violation of a Technical Specification action statement) did not occur.

This report is also required per 10 CFR 50.73 (a)(2)(v), because the HPCI system could have been incapable of performing its intended safety function.

B. UNIT(s) STATUS AT TIME OF EVENT

1. Power Level/Operating Mode

On 1/6/88, Unit 2 was in the run mode at an approximate power level of 1826 MWt (approximately 75 percent rated thermal power).

2. Inoperable Equipment

The Reactor Core Isolation Cooling (RCIC EIIS Code BN) system was out of service due to Motor Operated Valve (MOV) maintenance and testing.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

C. DESCRIPTION OF EVENT

1. Event

On 1/6/88 at approximately 0655 CST, during the performance of plant procedure 34GO-OPS-033-2S (ECCS Status Check), the assistant plant equipment operator (non-licensed personnel) reported that the HPCI turbine stop valve had double indication for valve position. A double indication on valve position is an indication of a valve which is between its open and closed position. Plant operations personnel documented the anomalous condition on a Deficiency Card as required by the plant's administrative control procedures. Additionally, shift personnel (licensed and non-licensed) started an investigation and requested assistance from plant engineering and maintenance personnel.

On 1/6/88 at approximately 0800 CST, a team consisting of plant operations, engineering, and maintenance personnel, were operating the HPCI turbine stop valve (stroking the valve) in order to determine the actual operability status of the valve. The first two times the HPCI turbine stop valve was stroked, it stroked properly. However, on the third time, the HPCI turbine stop valve, when going from open to closed, stuck at approximately 50 percent closed and a metal-to-metal binding noise was heard in the valve.

Licensed operations personnel then declared HPCI inoperable (due to the HPCI turbine stop valve problem) and entered the Limited Condition of Operation (LCO) required by the Unit 2 Technical Specifications section 3.5.1 action: a. This LCO states that with the HPCI system inoperable, power operation may continue provided that the following systems are operable: RCIC, Automatic Depressurization System (ADS EIIS Code JE), Core Spray (EIIS Code BM), and Low Pressure Coolant Injection (LPCI EIIS Code BO).

However, this Technical Specification LCO could not be met since the RCIC system was inoperable. Therefore, the unit entered the requirements of the Unit 2 Technical Specifications section 3.0.3. This specification states:

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

"In the event a Limiting Condition for Operation and/or associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specification, the facility shall be placed in at least hot shutdown within 6 hours and in cold shutdown within the following 30 hours ..."

On 1/6/88 at approximately 1200 CST, the RCIC system was returned to operable status. This was accomplished before the six hour hot shutdown requirement of section 3.0.3 had elapsed, and these shutdown requirements were terminated. Additionally, with RCIC now operable, the unit was in compliance with the LCO requirements of Technical Specifications section 3.5.1.

On 1/11/88 at approximately 1220 CST, non-licensed maintenance personnel began performance of plant procedure 52GM-E41-001-2S (HPCI Turbine Stop Valve Steam Balance Chamber Pressure Adjustment). This occurred following the repair of the HPCI turbine stop valve.

On 1/12/88 at approximately 2108 CST, licensed operations personnel performed procedure 34SV-E41-003-2S (HPCI Quick Start), following the return of the HPCI turbine stop valve to service.

On 1/12/88 at approximately 2135, licensed operations personnel had satisfactorily completed performance of plant procedures 34SV-E41-001-2S (HPCI Valve Operability) and 34SV-E41-002-2S (HPCI Pump Operability).

On 1/13/88 at 0445 CST, following review of the satisfactory completion of the HPCI turbine stop valve repairs and HPCI operability, the HPCI system was returned to operable status.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

2. Dates/Times

Date	Time (CST)	Description
1/6/88	0655	Non-licensed operations personnel were performing procedure 34GO-OPS-033-2S and noticed that the HPCI turbine stop valve had a double indication for valve position. They documented the anomalous condition on a Deficiency Card as required by the plant's administrative control procedures.
	0800	Plant operations, engineering, and maintenance personnel investigated the double indication of the valve by stroking it and determined that the valve was binding. Plant operations personnel declared the HPCI system inoperable. With the HPCI system declared inoperable, plant operations personnel entered the appropriate LCO. However, the LCO requirements could not be met because the RCIC system was out of service. Plant operations personnel then entered the action statement of Technical Specifications section 3.0.3 which is a shutdown LCO.
	1200	Plant maintenance and operations personnel returned the RCIC system to an operable status. Plant operations personnel terminated the shutdown requirements of Technical Specification section 3.0.3. A LCO was still in effect for the HPCI system being out of service.

Date	Time (CST)	Description
1/11/88	1220	Non-licensed maintenance personnel began performance of plant procedure 52GM-E41-001-2S (HPCI Turbine Stop Valve Steam Balance Chamber Pressure Adjustment). This occurred following the repair of the HPCI turbine stop valve.
1/12/88	2108	Licensed operations personnel performed plant procedure procedure 34SV-E41-003-2S (HPCI Quick Start), with acceptable results.
	2135	Licensed operations personnel performed plant procedures 34SV-E41-001-2S (HPCI Valve Operability) and 34SV-E41-002-2S (HPCI Pump Operability), with acceptable results.
1/13/88	0445	The HPCI system was returned to operable status and the LCO required by Unit 2 Technical Specifications Section 3.5.1 was terminated.

3. Other Systems Affected

No plant systems other than the HPCI and RCIC systems were affected by this event. These systems perform no secondary functions that were affected by this event.

4. Method of Discovery

Non-licensed operations personnel were performing procedure 34GO-OPS-033-2S and noticed that the HPCI turbine stop valve had a double indication for valve position. This procedure is performed once per shift.

5. Operator Actions

Operations personnel performed the following:

1. Determined that the HPCI turbine stop valve had a double position indication. They documented the anomalous condition on a Deficiency Card as required by the plant's administrative control procedures.

2. Participated in a team to investigate the condition and later declared the HPCI system inoperable.

3. Entered the appropriate LCO actions for the HPCI system being inoperable and also for the condition of both HPCI and RCIC being inoperable.

4. Returned RCIC to an operable status and cleared the shutdown requirements of the Technical Specifications.

5. Verified that the HPCI system was returned to an operable status and cleared the HPCI LCO.

Plant maintenance personnel performed the following:

1. Participated in the investigation of the HPCI turbine valve double indication.

2. Performed maintenance on the HPCI system.

Plant engineering personnel performed the following:

1. Participated in the investigation of the HPCI turbine stop valve double indication.

2. Provided engineering support to maintenance personnel in the repair and rework of the HPCI turbine stop valve.

6. Auto/Manual Safety System Response

No safety systems actuated, nor were any required to actuate, in this event.

D. CAUSE OF EVENT

1. Immediate Cause

The immediate cause of this event was component failure. The HPCI turbine stop valve, while cycling from open to closed, failed on the third cycle in the mid-travel position (50% closed). A metal-to-metal binding noise heard coming from the valve. Maintenance personnel disassembled the HPCI turbine stop valve. Engineering Support and Maintenance personnel found that the HPCI turbine stop valve disc galled and stuck in the valve bonnet cylinder guide. This caused the HPCI system to be inoperable.

2. Root/Intermediate Cause

During the disassembly of the HPCI turbine stop valve (as part of the root cause investigation of this event), the split coupling that connects the valve stem to the hydraulic actuator piston rod was found to have a clearance of 5/8-inch between the stem and piston rod. The clearance should have been 1/16-inch or less. This improper clearance created a longer valve stroke, which allowed the actuator to lift the valve disc to a reduced diameter area in the bonnet guide. When the valve disc contacted this area in the bonnet guide, contact was made on the top edge of of the disc.

Over a period of the last five years of normal valve operation, this contact caused a metal burr on the disc, which resulted in the disc galling in the valve bonnet cylinder guide on 1/6/88.

Plant personnel reviewed historical plant records and determined that the last time that the HPCI turbine stop valve was disassembled and then reassembled was on 6/3/83. The procedure that was used for this work was procedure HNP-2-6010 (HPCI System Maintenance). This procedure refers the reader to the HPCI system manual and to Service Information Letter (SIL) 306, Revision 1, Attachment 1, for specific steps for recoupling the HPCI turbine stop valve.

Plant personnel reviewed this procedure and concluded that the procedure failed to use step-by-step instructions (incorporating all of the applicable technical information from the HPCI system manual and the SIL) to describe how to reassemble the HPCI turbine stop valve. Thus, when personnel used HNP-2-6010 on 6/3/83, the confusion of the referencing from one document to another resulted in the improper adjustment of the clearance between the stem and the piston rod.

Based on the above information, plant personnel concluded that while the event could be the result of personnel error, the most likely root cause of the event is a procedural deficiency. Specifically, the procedure did not fully cover all activities required with the assembly of the HPCI turbine stop valve.

E. ANALYSIS OF EVENT

The HPCI system is provided to assure that the reactor core is adequately cooled to limit fuel clad temperature in the event of a small break in the nuclear system where the loss of coolant does not result in a rapid depressurization of the reactor vessel. The HPCI system operates until reactor vessel pressure is below the pressure at which the Low Pressure Coolant Injection (LPCI EIIS Code BO) operation or Core Spray (CS EIIS Code BM) system operation maintains core cooling.

With the HPCI and RCIC system inoperable, core cooling is achieved via the redundant and diverse Automatic Depressurization System (ADS EIIS Code JE) operating in conjunction with the low pressure cooling systems.

During this event, all of the required backup systems (ADS, LPCI and CS) remained operable. Additionally, once the RCIC system was was returned to an operable status, RCIC could also be used to provide makeup at reactor operating pressures. It should be noted that the RCIC system, while available to provide makeup to the reactor vessel, is not required for core cooling: no credit is taken for the RCIC system in the safety analyses.

Since these events occurred at a high power level (75 percent of rated thermal power), it is not believed that the consequences of these events would be significantly different under other reactor power conditions. Additionally, since all of the required backup systems and RCIC (after being returned to operable status) were capable of performing their intended safety functions, it is concluded that this event had no adverse nuclear safety impact.

F. CORRECTIVE ACTIONS

Corrective actions for this event included:

1. Licensed personnel, in conjunction with engineering and maintenance personnel, investigated the HPCI turbine stop valve double indication. Upon determination of the HPCI turbine stop valve failure, the appropriate Technical Specifications LCOs were implemented.

2. Licensed operations personnel returned RCIC to an operable status, terminated the shutdown LCO requirements of Technical Specification section 3.0.3, and maintained unit operation in accordance with the LCO requirements of Technical Specification section 3.5.1.

3. The HPCI turbine stop valve was repaired, and the HPCI system was returned to operable status on 1/13/88 at 0445 CST.

4. Procedure 52PM-E41-003-2S (HPCI System Maintenance) (the procedure that replaced plant procedure HNP-2-6010 for HPCI maintenance), will be revised to give step by step instructions for reassembly of the HPCI turbine stop valve. This procedure revision is expected to be completed by 8/30/88. The Procedures Upgrade Program (PUP) required validation for this procedure will occur in a future refueling outage.

   The Unit 1 procedure, 52PM-E41-003-1S (HPCI System Maintenance) will be revised by 8/30/88 to include the step by step instructions added to plant procedure 52PM-E41-003-2S. The PUP required validation of this procedure will occur in a future Unit 1 refueling outage.

5. Plant personnel reviewed maintenance history files and determined that the Unit 1 HPCI turbine top valve was last reassembled during the work activities associated with Maintenance Work Order (MWO) 1-87-6069. This MWO was completed on 8/24/87.

   The work associated with this MWO required the use of plant procedure 52GM-E41-001-1S (HPCI Turbine Stop Valve Steam Balance Chamber Pressure Adjustment) to reassemble the HPCI turbine stop valve. When plant personnel reviewed this procedure, they determined that the procedure had step by step instructions (complete with sign offs documenting work step completion) for the proper assembly of the HPCI turbine stop valve. The step by step instructions are similar to those that will be added to plant procedure 52PM-E41-003-1S.

   From this information, plant personnel concluded that the Unit 1 HPCI turbine stop valve is properly assembled and it does not have a problem similar to the problem on the Unit 2 valve.

G. ADDITIONAL INFORMATION

1. FAILED COMPONENT(s) IDENTIFICATION

   MPL (Plant Index Identifier): 2E41-C002
   Manufacturer: AMETEK Inc. (Schutte & Koerting)
   Model Number: 68-XC-71
   Type: Inverted Oil Operated Stop Valve
   EIIS: BJ

   Note: The listed MPL number is for the HPCI pump turbine. The oil operated stop valve is part of the skid mounted equipment and does not have a separate MPL number.

2. PREVIOUS SIMILAR EVENTS

   Previous LERs have reported events where the HPCI system could have been prevented from fulfilling its intended safety function. These events were reported by the following LERs: 50-366/1986-014 (dated 7/17/86), 50-366/1987-004 (dated 6/16/87) [with revision currently in draft form], and 50-366/1987-017 (dated 11/19/87).

The events described in these LERs occurred for a variety of reasons: 1) a rag blocking a shaft driven oil pump, 2) procedure deficiencies combined with personnel errors relative to part procurement and part verification, and 3) part wear out due to normal equipment aging.

The corrective actions for these events included: 1) performing corrective maintenance and verifying HPCI operability, 2) notifying maintenance personnel of the consequences of careless work habits, 3) issuing As Built Notices (ABNs), 4) revising procedures, 5) placing materials on hold, 6) initiating vendor feedback forms, 7) developing desk top instructions and increasing supervisory involvement, 8) reviewing procedure controls, 9) counseling involved personnel, and 10) replacing defective equipment.

These corrective actions would not have prevented the event described in LER 50-366/1988-001 because plant procedure 52PM-E41-003-2S (the one that replaced procedure HNP-2-6010) had not been through the complete Procedures Upgrade Program (PUP). The PUP is the long term corrective action to prevent recurrence of these sorts of events.

Georgia Power Company
333 Piedmont Avenue
Atlanta, Georgia 30308
Telephone 404 526-6526

Mailing Address:
Post Office Box 4545
Atlanta, Georgia 30302

L. T. Gucwa
Manager Nuclear Safety
and Licensing

Georgia Power
the southern electric system

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January 29, 1988

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

PLANT HATCH - UNIT 2
NRC DOCKET 50-366
OPERATING LICENSE NPF-5
LICENSEE EVENT REPORT
INADEQUATE PROCEDURE CAUSES MIS-ASSEMBLY
OF VALVE RESULTING IN ESF SYSTEM INOPERABILITY

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i) and 10 CFR 50.73 (a)(2)(v), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning an event where the plant was in a condition prohibited by the Technical Specifications and where a safety system could have been prevented from performing its intended safety function. The event occurred at Plant Hatch - Unit 2.

Sincerely,

William E. Burn /for

L. T. Gucwa

LGB/lc

Enclosure: LER 50-366/1988-001

c: (see next page)

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Georgia Power

c: Georgia Power Company
Mr. J. P. O'Reilly, Sr. Vice President - Nuclear Operations
Mr. J. T. Beckham, Jr., Vice President - Plant Hatch
GO-NORMS

U. S. Nuclear Regulatory Commission, Washington, D. C.
Mr. L. P. Crocker, Licensing Project Manager - Hatch

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