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THE SOUTHERN INDUSTRIAL SYSTEM

HL-1497  
001252

February 26, 1991

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  
LICENSE EVENT REPORT  
INSTRUMENT TRIP SETPOINTS DETERMINED TO BE  
OUTSIDE TECHNICAL SPECIFICATIONS LIMITS

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i), Georgia Power Company is submitting the enclosed License Event Report (LER) concerning incorrect setpoints for the Unit 2 Condensate Storage Tank level switches as a result of inadequate design documentation. This event occurred at Plant Hatch - Unit 2.

Sincerely,

*W. G. Hairston, III*  
W. G. Hairston, III

JKB/cr

Enclosure: LER 50-366/1991-001

c: (See next page.)

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c: Georgia Power Company  
Mr. H. L. Sumner, General Manager - Nuclear Plant  
Mr. J. D. Heidt, Manager Engineering and Licensing - Hatch  
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. Ebnetter, Regional Administrator  
Mr. L. D. Wert, Senior Resident Inspector - Hatch

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) PLANT HATCH, UNIT 2										DOCKET NUMBER (2) 05000366		PAGE (3) 1 OF 6		
TITLE (4) INSTRUMENT TRIP SETPOINTS DETERMINED TO BE OUTSIDE TECHNICAL SPECIFICATIONS														
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)		
01	29	91	91	001	00	02	26	91				05000		
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)														
OPERATING MODE (9)		1		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)				
POWER LEVEL		100		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)		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 STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH										TELEPHONE NUMBER 912 367-7851				
COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)														
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC					
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)										NO		09	01	91
ABSTRACT (16)														

On 1/29/91 at approximately 0915 CST, Unit 2 was in the Run mode at an approximate power level of 2436 CMWT (approximately 100% rated thermal power). At that time, it was determined the setpoints for Unit 2 Condensate Storage Tank (CST, EISS Code KA) level switches 2E41-N002 and 2E41-N003 were not in compliance with the requirements of Unit 2 Technical Specifications Table 3.3.3-2, item 3.c. Specifically, the switches, which cause High Pressure Coolant Injection (HPCI, EISS Code BJ) system suction source transfer from the CST to the Suppression Pool (EISS Code BT) on low CST water level, were not set to initiate the transfer when 10,000 useable gallons of water were available to the HPCI system as intended by the Unit 2 Technical Specifications. At the time of discovery of this event, the HPCI system was aligned to take suction from the Suppression Pool. It was left in this alignment until the CST water level switch setpoints could be raised.

The cause of this event was less than adequate design documentation. Although the level switch setpoints were designed such that 10,000 gallons of water remained in the CST at the time of the suction source transfer, the design documents did not require 10,000 gallons of water to be available to the HPCI system.

Corrective actions include raising the CST level switch setpoints, initiating revisions to appropriate portions of the Unit 2 Technical Specifications and Final Safety Analysis Report, and reviewing additional setpoints.

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## TEXT

### PLANT AND SYSTEM IDENTIFICATION

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

### SUMMARY OF EVENT

On 1/29/91 at approximately 0915 CST, Unit 2 was in the Run mode at an approximate power level of 2436 CMWT (approximately 100% rated thermal power). At that time, it was determined the setpoints for Unit 2 Condensate Storage Tank (CST, EIIIS Code KA) level switches 2E41-N002 and 2E41-N003 were not in compliance with the requirements of Unit 2 Technical Specifications Table 3.3.3-2, item 3.c. Specifically, the switches, which cause High Pressure Coolant Injection (HPCI, EIIIS Code BJ) system suction source transfer from the CST to the Suppression Pool (EIIIS Code BT) on low CST water level, were not set to initiate the transfer when 10,000 useable gallons of water were available to the HPCI system as intended by the Unit 2 Technical Specifications. At the time of discovery of this event, the HPCI system was aligned to take suction from the Suppression Pool. It was left in this alignment until the CST water level switch setpoints could be raised.

The cause of this event was less than adequate design documentation. The original design specification called for 10,000 gallons of water to be in the CST at the start of suction source transfer. Although the level switch setpoints were designed such that 10,000 gallons of water remained in the CST at the time of the suction source transfer, the design documents did not require 10,000 gallons of water to be available to the HPCI system. Since the centerline of the HPCI system CST suction pipe is approximately 12 inches above the bottom of the CST, the setpoints were not adequate to ensure a successful transfer of the Unit 2 HPCI system suction source to the suppression pool on low CST water level. A contributing factor to delaying identification of this issue was Technical Specifications requirements based on a literal reading of the original design specification.

Corrective actions include raising the CST level switch setpoints, initiating revisions to appropriate portions of the Unit 2 Technical Specifications and Final Safety Analysis Report, and reviewing additional setpoints.

### DESCRIPTION OF EVENT

On 12/19/90, the Plant Review Board (PRB) was performing a routine review of a revision to procedure 57SV-SUV-015-1S, "HPCI/RCIC Pump Suction Source Instrument Functional Test and Calibration." In the course of reviewing the revision, a concern was raised by the PRB members that the current instrument setpoint (el 130 feet 11-1/2 inches MSL) was inconsistent with other CST level setpoints and thus might not meet the intent of Unit 2 Technical Specifications Table 3.3.3-2, item 3.c. PRB Open Item 90-186-1 was issued to the plant's Nuclear Safety and Compliance (NS&C) Department to address this concern.

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After review of this concern with Corporate Licensing and Architect/Engineer (A/E) personnel, it was determined the trip setpoint of 130 feet 11 1/2 inches did not meet the intent of the requirements of the Unit 2 Technical Specifications. Calculations by A/E personnel indicated that CST water level would decrease approximately 13 1/2 inches following suction source transfer initiation as the HPCI system Suppression Pool suction valves opened and the CST suction valves closed. Since the centerline of the HPCI suction line from the CST is at elevation 131 feet, only 7 1/2 inches of the suction pipe would be covered at the time the transfer initiated; thus, the CST suction pipe would be substantially uncovered and the HPCI system would likely trip on low suction pressure before the suction source transfer could be completed. Therefore, the low CST water level trip setpoint of 130 feet 11 1/2 inches was not adequate to ensure a successful transfer of the Unit 2 HPCI system suction source to the Suppression Pool on low CST water level. Upon this determination, a Deficiency Card was written to document this condition as required by plant procedures. It was also determined no problems existed with the Unit 1 CST water level switches 1E41-N002 and 1E41-N003 because they are set to trip at 132 feet 10 inches and 132 feet 8 inches, respectively. Additionally, the Unit 1 and Unit 2 CST water level switches which initiate Reactor Core Isolation Cooling (RCIC, E11S Code BN) suction source transfer were also determined to be set correctly.

The HPCI system's suction source previously had been aligned to the Suppression Pool under Limiting Condition for Operation (LCO) 2-91-45. This was done on 1/28/91 because Suppression Pool level instrument 2E41-N662D had been removed from service for calibration. CST level switches 2E41-N002 and 2E41-N003 were declared inoperable and added to LCO 2-91-45 to ensure the HPCI system's suction source remained aligned to the Suppression Pool until the low CST water level trip setpoint could be raised.

Design Change Request (DCR) 2891-023 was initiated to raise the low CST water level trip setpoint approximately 22 1/2 inches to 132 feet 10 inches. The DCR was reviewed and approved for implementation per plant administrative control procedures. Maintenance Work Orders (MWOs) 2-91-419, 2-91-423, and 2-91-424 were written to perform the work required to implement the design change.

On 2/7/91, the work under the MWOs was completed. The CST level switches were then functionally tested and calibrated per procedure 57SV-SUV-015-2S, "HPCI/RCIC Pump Suction Source Instrument Functional Test and Calibration." CST water level switches 2E41-N002 and 2E41-N003 were declared operable and LCO 2-91-45 was closed on 2/8/91 at approximately 0400 CST. The HPCI system was aligned to take suction from the CST which is the system's normal lineup.

CAUSE OF THE EVENT

The cause of this event was less than adequate design documentation. The original setpoint specification, a design document, called for 10,000 gallons of water to be in the CST at the start of suction source transfer rather than 10,000 gallons of useable water. Because the centerline of the HPCI system CST suction pipe is approximately 12 inches above the bottom of the CST, the setpoints were not adequate to ensure 10,000 useable gallons of water were



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available to the HPCI system at the time of transfer initiation. A contributing factor to delaying identification of this issue was a Technical Specification requirement which was based on a literal reading of the original design specification, i.e., 10,000 gallons of water in the CST instead of the intended 10,000 gallons of water available to HPCI. Also several sections of the Unit 2 FSAR, including Table 7.3-1 and Sections 9.2.6.2 and 9.2.6.3, support this literal reading and, therefore, may have contributed to this event.

In addition, during the investigation of this event, it was discovered the CST water level switch setpoints were determined in 1985 to be incorrect. Proposed new setpoints were transmitted to the site in April, 1985 as part of DCR 84-138. At that time, the existing setpoints for these instruments were identified as "lower than the PSL (process safety limit)." This DCR was initiated as part of a program to establish an instrument setpoint index, establish consistency with Regulatory Guide 1.105 recommendations, and to implement setpoint changes calculated by the plant's A/Es. It is not clear why the setpoints for these instruments were not raised in 1985. A review of the design modification transmittal packages associated with this program identified a potential for a misunderstanding with regard to the necessity for implementing the new setpoints. For example, a previous setpoint index transmittal, dated 9/11/84, noted that the proposed setpoint changes do not constitute previous design deficiencies, but are upgrades of the design philosophy to present day standards. The proposed changes identified in the April, 1985 transmittal were listed as more conservative than existing plant setpoints. Additionally, a subsequent transmittal stated that the proposed setpoint changes constitute an improved design. It appears that individuals involved in this development, review and implementation of the setpoint changes contained in DCR 84-138 may have failed to attach the appropriate level of significance to this concern since the setpoint was in compliance with the literal wording of the existing Technical Specifications. Investigation of this aspect of the event will continue.

## REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73(a)(2)(i) because a condition existed which was prohibited by the plant's Technical Specifications. Specifically, it was determined the HPCI system's suction source would not automatically transfer from the CST to the Suppression Pool while 10,000 gallons of CST water were still available to the HPCI system. This is contrary to the requirements of Unit 2 Technical Specifications Table 3.3.3-2, item 3.c.

The HPCI system is provided to assure the reactor is adequately cooled to limit fuel-clad temperature in the event of a small break in the nuclear boiler system causing a loss of coolant which does not result in rapid depressurization of the reactor vessel. The HPCI system is provided with two suction sources: the CST, its normal source, and the Suppression Pool, its alternate source. On low CST water level or high Suppression Pool water level, the HPCI system's suction source is designed to transfer automatically from the CST to the Suppression Pool.

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In this event, it was determined the trip setpoints for the CST water level switches did not meet the intent of the Technical Specifications trip setpoint requirements. However, the plant's A/E has performed an analysis to show that in all transients and accidents involving HPCI operation its suction source will transfer to the Suppression Pool on high Suppression Pool water level before low CST water level is reached. The analysis assumed the Suppression Pool is at the minimum Technical Specification allowed level of 12 feet 2 inches at the time an accident requiring the operation of HPCI occurs. Considering the Suppression Pool volume between the low and high level setpoints, the water that could be held up in the drywell and not reach the Suppression Pool, and the Reactor Vessel volume between the HPCI initiation setpoint (Level 2) and the HPCI trip setpoint on high water level (Level 8), the maximum amount of makeup water transferred by HPCI from the CST to the Reactor Vessel before suction source transfer to the Suppression Pool was calculated to be less than 62,000 gallons. Stand pipes installed in the CST for all non-essential equipment suction assure that there is at least 100,000 gallons of CST water available for the HPCI system. The analysis assumed that the CST contained only the 100,000 gallons assured by the stand pipes; therefore, 38,000 gallons would remain in the tank after the suction source transfer is accomplished. Calculations showed that approximately 10 1/2 inches of water in the CST is equivalent to a volume of 10,000 gallons. Thus, 38,000 gallons of water would reach a height of over 39 inches in the CST. Since the bottom of the CST is at elevation 130 feet 0 inches, 38,000 gallons of water is at 133 feet 3 inches, well above the required low CST water level trip setpoint of 132 feet 10 inches. Consequently, the analysis concluded the suction source transfer will be caused by a high level in the Suppression Pool and not by a low level in the CST. Under no identified transients does the CST water level switch serve the primary function of facilitating the transfer of the HPCI system's suction source from the CST to the Suppression Pool.

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

CORRECTIVE ACTIONS

Upon determination the trip setpoints for CST water level switches 2E41-N002 and 2E41-N003 were not in compliance with Technical Specifications requirements, they were declared inoperable and added to existing LCO 2-91-45. This ensured the HPCI system would remain aligned to take suction from the Suppression Pool until the setpoints could be raised.

OCR 2H91-023 was implemented which raised the water level switch setpoints approximately 22 1/2 inches. The new trip setpoint of 132 feet 10 inches ensures the CST water level falls no lower than approximately 131 feet 8 1/2 inches before the suction source transfer is complete. A/E calculations show the HPCI system will have adequate flow and suction pressure throughout the entire valve opening and closing sequences at this trip setpoint.

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Level switches 2E41-NO02 and 2E41-NO03 were functionally tested and calibrated per procedure 57SV-SUV-015-2S following implementation of DCR 2H91-023 and declared operable on 2/8/91 at approximately 0400 CST. The HPCI system was aligned to take suction from the CST which is its normal suction source.

A request to revise the Unit 1 and Unit 2 Technical Specifications will be initiated. The requested revision will clearly state the low CST water level trip setpoint is that equivalent to 10,000 gallons of water available to the HPCI system. Additionally, applicable sections of the Unit 1 and Unit 2 PSARs will be revised to indicate the trip setpoint is equivalent to 10,000 gallons of water available to the HPCI system.

Additionally, all the setpoint changes covered under DCR 84-138 will be reviewed by August 15, 1991 to ensure they have been implemented or the unmodified setpoints do not present any safety concerns. A supplement to this LER will be issued by 9/1/91; it will include the results of the above mentioned investigation and any additional corrective actions as warranted.

ADDITIONAL INFORMATION

## 1. Other Systems Affected:

No systems other than the Unit 2 HPCI system were affected by this event.

## 2. Failed Components Identification:

No failed components caused or resulted from this event.

## 3. Previous Similar Events:

No previous similar events in the last two years in which an inadequate design resulted in setpoints not in compliance with the plant's Technical Specifications were noted.