

CP&L

Carolina Power & Light Company

Brunswick Nuclear Project
P. O. Box 10429
Southport, N.C. 28461-0429

May 15, 1991

FILE: B09-13510C

10CFR50.73


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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325
LICENSE NO. ERP-71
LICENSEE EVENT REPORT 1-91-010

Gentlemen:

In accordance with Title 10 of the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is submitted in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,


J. W. Spencer, General Manager
Brunswick Nuclear Project

TMJ/

Enclosure

cc: Mr. S. D. Ebnetter
Mr. N. B. Le
BSEP NRC Resident Office

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.5 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Brunswick Steam Electric Plant Unit 1	DOCKET NUMBER (2) 05000325	PAGE (3) 01 OF 03
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TITLE (4) **ESF Actuation; Primary Containment Isolation System Group 1 Isolation of the Main Steam Line Isolation Valves When the Turbine Speed Control Logic Spuriously Selected the 1800 RPM Mode When Normally Closed Relay Contacts Failed to Remain Closed After the Relay De-energized.**

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQ. NO.	REV. NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
04	15	91	91	- 010	- 00	05	15	91			

OPERATING MODE (9) POWER LEVEL (10) 4 000	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)									
		20.402(b)		20.405(c)	<input checked="" type="checkbox"/>	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)(vi)		OTHER (Specify in Abstract and Text)		
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(A)				
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)					
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(viii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME THERESA M. JONES, REGULATORY COMPLIANCE SENIOR SPECIALIST	TELEPHONE NUMBER
	(919) 457-2039

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	EG	RLY	G080	Y					

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION	MONTH	DAY	YEAR
YES (if yes, complete EXPECTED SUBMISSION DATE)				X NO	DATE (15)		

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

The Unit 1 reactor was in cold shutdown. At 225853 on April 15, 1991, the main turbine was reset in accordance with the applicable steps of the Turbine System Operating Procedure. At 230055 the Main Steam Isolation Valves (MSIVs) closed when a Group 1, Primary Containment Isolation System (PCIS) isolation signal occurred (ie; low condenser vacuum coincident with the main turbine stop valves not fully closed). At that time it was noted that the electro-hydraulic control (EHC) logic had selected the 1800 rpm turbine speed mode. Instrumentation and Control personnel attached a brush recorder to the EHC circuitry. This monitoring revealed that the spurious selection of the 1800 rpm mode was caused by the normally closed contacts of a relay failing to maintain closure after the relay coil was de-energized. The relay card in the EHC circuitry was replaced. A work request has been initiated to investigate the corresponding Unit 2 relay during the next refueling outage. The MSIVs operated as designed and closed in response to the PCIS Group 1 isolation signal. The purpose of the PCIS signal which occurred during this event is to prevent a possible uncontrolled release of radioactive steam to the turbine building. The reactor was in cold shutdown, at atmospheric pressure, and being maintained at 144 degrees fahrenheit, therefore, no radioactive steam was present. This event had no nuclear safety significance.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1) Brunswick Steam Electric Plant Unit 1	DOCKET NUMBER (2) 05000325	LER NUMBER (6)				PAGE (3) 02 OF 03
		YEAR		SEQUENTIAL NUMBER	REVISION NUMBER	
		91	-	010	- 00	

TEXT (IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC FORM 365A'S) (17)

EVENT

Primary Containment Isolation System (PCIS), Group 1 isolation signal (low condenser vacuum coincident with the main turbine stop valves (SVs) not fully closed) resulting in an automatic closure of the Main Steam Isolation valves (MSIVs).

INITIAL CONDITIONS

The Unit 1 reactor was in cold shutdown. The B loop of the Residual Heat Removal (RHR) system was operating in the Shutdown Cooling mode and the C loop of the Core Spray (CS) was operable in standby readiness. The A loop of both the RHR Low Pressure Coolant Injection (LPCI) system and the CS system were available for manual operation. Preparations were in progress to perform maintenance surveillance test 1MST-RPS15NA, Reactor Protection System (RPS) Turbine Control/Stop Valve (CV/SV) Closure and First-Stage Pressure Permissive Channel Functional Test.

EVENT DESCRIPTION

At 225853 on April 15, 1991, the main turbine was reset in accordance with the applicable steps in section 5.2 of the Turbine System Operating Procedure. At 230055 a Group 1 PCIS isolation occurred. At that time it was noted that the electro-hydraulic control (EHC) logic had selected the 1800 rpm turbine speed mode. This resulted in the opening of the turbine SVs and the subsequent isolation of the MSIVs on a Condenser Vacuum Low isolation signal, per design.

The MSIVs were left in the closed position and a work request was initiated to determine the cause of the EHC system spuriously selecting the 1800 rpm mode. At 2331, the turbine was reset a second time with Technical Support and Instrumentation and Control (I&C) personnel present to monitor the reset. The EHC system again selected the 1800 rpm mode; a short time after the turbine was reset. At 0005 on April 16, 1991, the turbine was reset a third time and the EHC system functioned properly (ie; the All Valves Closed mode remained selected). Commencement of the test was authorized; I&C continued its investigation of the circuitry during day shift.

EVENT INVESTIGATION

I&C personnel attached a brush recorder to the EHC circuitry at the voltage supply to the 1800 rpm select point and the all valve closed point. This monitoring revealed that the cause of the spurious 1800 rpm selection was relay K1D44. This relay de-energizes when the turbine is reset. With the relay de-energized, normally closed contacts are made which energize the speed control logic for the turbine and also maintains power to the All Valves Closed circuitry until a speed is selected by the Operator.

The recorder revealed that the normally closed contacts of this relay were "bouncing" (ie; when the relay de-energized, the normally closed contacts did not close crisply), causing a momentary loss of power in the speed control logic. When power is restored to the circuit, a "relay race" is set up between the K8B09 and the K7B07 relays (relays which prevent power from being supplied to the 1800 rpm mode or the All Valves Closed mode, respectively) that can last from seconds to minutes. Eventually, the 1800 rpm or the All Valves Closed mode is selected.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">YEAR</td> <td style="width: 25%;">SEQUENTIAL NUMBER</td> <td style="width: 25%;">REVISION NUMBER</td> <td style="width: 25%;"></td> </tr> <tr> <td style="text-align: center;">91</td> <td style="text-align: center;">- 010</td> <td style="text-align: center;">- 00</td> <td></td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		91	- 010	- 00		
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The electro-hydraulic circuitry is designed by General Electric (GE). Relay K1D44 is manufactured by Agastat (model 2112DH11GYE; 125VDC coil; time delay 0.75 - 10 seconds) and is utilized by GE in the EHC circuitry. The relay is actually installed on a "card" in the EHC circuitry. The cause of the relay "bouncing" is unknown. A new relay card was installed and testing of the circuit was conducted to verify that the problem had been corrected. This card is part of the originally supplied GE EHC circuitry. This relay has not exhibited this problem in the past.

On February 18, 1988, a similar event occurred on Unit 1 which was reported in LER 1-88-007. That event was not caused by the "bouncing" of relay K1D44 and the corrective actions taken would not have prevented this event.

ROOT CAUSE

The spurious selection of the 1800 rpm mode of the turbine speed control logic was caused by the normally closed contacts of relay K1D44 failing to maintain closure after the relay coil was de-energized.

CORRECTIVE ACTIONS

The relay card in the EHC circuitry was replaced. A work request has been initiated to investigate the Unit 2 K1D44 relay during the next refueling outage.

EVENT ASSESSMENT

The MSIVs operated as designed and closed in response to the PCIS Group 1 isolation signal. The purpose of this PCIS signal is to prevent radioactive steam from being admitted to the turbine/condenser when a condenser vacuum condition does not exist and thereby prevent a possible uncontrolled release to the turbine building. During this event no radioactive steam existed because the reactor was in cold shutdown, at atmospheric pressure and being maintained at 144 degrees fahrenheit therefore it had no nuclear safety significance.

EIIS Codes

System/Component

PCIS
Main Turbine SV/CV
MSIVs
RHR/SDC
CS
RHR/LPCI
RPS
EHC/relay

EIIS CODE

JM
TA/ISV/CV
SE/ISV
**
BM
BO
JC
TG/EG/RLY