CP&L

Carolina Power & Light Company
P.O. Box 10429
Southport, NC 28461-0429

APR 26 1996

SERIAL: BSEP 96-0172
10 CFR 50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2
DOCKET NO. 50-324/LICENSE NO. DPR 62
SUPPLEMENTAL LICENSEE EVENT REPORT 2-96-01

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company submits the enclosed Supplemental Licensee Event Report. The original report fulfilled the requirement for a written report within thirty (30) days of a reportable occurrence.

Please refer any questions regarding this submittal to Mr. George Honma at (910) 457-2741.

Sincerely,

W. Levis, Director-Site Operations
Brunswick Nuclear Plant

300101

SFT/sft

Enclosures
1. Supplemental Licensee Event Report
2. Summary of Commitments

cc: Mr. S. D. Ebneter, Regional Administrator, Region II
Mr. D. C. Trimble, NRR Project Manager - Brunswick Units 1 and 2
Mr. C. A. Patterson, Brunswick NRC Senior Resident Inspector
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

IE22 1/1

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant, Unit 2	05000324	1 OF 3

TITLE (4)

Control Rod Average 5% Insertion Time Exceeds Technical Specification Requirements

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 NAME	DOCKET NUMBER
02	02	96	96	-- 01 --	01	04	26	96		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	01
POWER LEVEL (10)	25

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)
20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	X OTHER
20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Steve Tabor, Sr. Analyst - Regulatory Affairs	(910)-457-2178

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
X	AA	V	G080	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 15 single-spaced typewritten lines) (16)

On February 2, 1996, with Unit 2 operating at approximately 25% reactor power, a planned reactor manual scram was inserted to support the start of the Unit 2 B212R1 refueling outage. Subsequent review of the control rod scram time data revealed that the core average 5% insertion time was 0.387 seconds which exceeds the limit of 0.358 seconds specified in Technical Specification 3.1.3.3. This time was primarily skewed by the 5% insertion times of 10 control rods with insertion times ranging from 0.53 to 1.078 seconds. Additionally, 10 two-by-two control rod arrays exceeded the Technical Specification 3.1.3.4 limit for average scram insertion time. The cause of the degraded control rod performance is attributed to accelerated aging of the control rod Hydraulic Control Unit Scram Solenoid Pilot Valve (SSPV) Buna-N diaphragms. The accelerated aging resulted from a less than optimal formulation of the Buna N diaphragm material. Corrective actions include replacement of the degraded SSPV assemblies, increased frequency of monitoring SSPV performance, and sample population inspections to monitor possible premature SSPV degradation.

Review of the Unit 2 scram insertion time data indicates that there was no operational safety significance associated with the measured core average 5% scram insertion time. The actions taken at the time of this event met the requirements of the Technical Specification and the degraded SSPV condition would not have prevented the fulfillment of the Control Rod Drive system safety function. Additional GE analysis determined that: (1) the impact of slower scram speed at the core average 5% insertion point does not present a substantial safety hazard and (2) increasing the core average 5% insertion time to 0.49 seconds results in a less than .01 increase in the Critical Power Ratio. Thus this event is not considered reportable in accordance with the requirements of 10 CFR 50.73. Voluntary report 2-96-01 was submitted on March 1, 1996, because of the current generic issues involving SSPV diaphragms. This report supplements voluntary LER 2-96-01. Additionally, this event was reported to the industry in Operational Experience Report OE 7683 on February 13, 1996.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

TITLE

Control Rod Average 5% Insertion Time Exceeds Technical Specification Requirements

INITIAL CONDITIONS

On February 2, 1996, with Unit 2 operating at approximately 25% reactor power, a planned reactor manual scram was inserted to support the start of the Unit 2 B212R1 refueling outage.

EVENT NARRATIVE

On February 2, 1996, following insertion of a planned manual Unit 2 reactor scram, review of the control rod scram time data revealed that the core average 5% insertion time was 0.387 seconds which exceeds the limit of 0.358 seconds specified in Technical Specification 3.1.3.3. This time was primarily skewed by the 5% insertion times of 10 control rods with insertion times ranging from 0.53 to 1.078 seconds. Additionally, 10 two-by-two control rod arrays exceeded the Technical Specification 3.1.3.4 limit for average scram insertion time.

This event is not considered reportable in accordance with the requirements of 10 CFR 50.73 since the actions taken at the time of this event met the requirements of the Technical Specification and the degraded Scram Solenoid Pilot Valve (SSPV) condition would not have prevented the fulfillment of the Control Rod Drive system safety function. Voluntary report 2-96-01 was submitted on March 1, 1996, because of the current generic issues involving SSPV diaphragms. This report supplements voluntary LER 2-96-01. Additionally, this event was reported to the industry in Operational Experience Report 7683 on February 13, 1996.

CAUSE OF EVENT

A representative sample of those SSPV assemblies which exhibited normal and slow start of motion times were disassembled and inspected by both CP&L personnel and an independent laboratory. The investigations concluded that the degraded scram times resulted from accelerated aging of the Buna-N diaphragms. The accelerated aging was found to be caused by a less than optimal formulation of the Buna N diaphragm material. Specifically, the lack of antioxidant protectant in the formulation did not allow the material to resist oxidation induced degradation over a significant period of time in operation. This determination is consistent with the information regarding premature Buna-N diaphragm degradation provided in General Electric RICSIL 069.

A review of scram time history over the cycle revealed that indications of the failure mechanism were limited to a small number of degraded SSPVs. Out of the 56 control rods tested during the cycle, five SSPV assemblies were replaced to correct slow response times. Since these indications were manifested randomly rather than as widely occurring degradation, data review during the cycle did not identify a trend toward degrading scram times as the cycle progressed.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

CORRECTIVE ACTIONS

The Unit 2 SSPV assemblies were replaced with new assemblies during the B212R1 outage. The new assemblies utilize Buna-N exhaust diaphragms. From a review of industry data, the most limiting documented case of Buna-N diaphragm service life is 2.9 years (Operational Experience Report 7543). Thus, it is expected that the current SSPV configuration will provide acceptable scram time performance throughout the present cycle.

Both Unit 1 and Unit 2 currently have Buna-N diaphragms installed in the exhaust side of the SSPV assemblies. As an interim measure, monitoring equipment has been temporarily installed on Unit 1 to support scram time data collection during weekly Reactor Protection System functional tests. This increased monitoring will allow earlier detection of diaphragm degradation.

A sample population of the Unit 1 and Unit 2 Buna-N diaphragms will be inspected to determine if degradation has occurred (i.e., stiffening or cracking) and the need for exhaust diaphragm replacement during respective refuel outages.

SAFETY ASSESSMENT

Review of the Unit 2 scram insertion time data indicates that there was no operational safety significance associated with the measured core average 5% scram insertion time. The actions taken at the time of this event met the requirements of the Technical Specification and the degraded SSPV condition would not have prevented the fulfillment of the Control Rod Drive system (AA) safety function. Additional GE analysis determined that: (1) the impact of slower scram speed at the core average 5% insertion point does not present a substantial safety hazard and (2) increasing the core average 5% insertion time to 0.49 seconds results in a less than .01 increase in the Critical Power Ratio. The Unit 2 scram time average was much less than 0.49 seconds, with the actual time measured at 0.387 seconds.

PREVIOUS SIMILAR EVENTS

A similar event involving slow scram times was reported in LER 1-96-02; however, the cause of that event is attributed to the use of Viton SSPV exhaust diaphragms.

EIIS COMPONENT IDENTIFICATION

System/Component	EIIS Code
Control Rod Drive	AA

Enclosure
List of Regulatory Commitments

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
A sample population of the Unit 1 and Unit 2 Buna-N diaphragms will be inspected to determine if degradation has occurred (i.e., stiffening or cracking) and the need for exhaust diaphragm replacement during respective refuel outages.	B111R1/B213R1