CP&L

Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461-0429

September 23, 1994

SERIAL: BSEP-94-0353
10CFR50.73

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

BRUNSWICK NUCLEAR PLANT UNIT 1
DOCKET NO. 50-325/LICENSE NO. DRP-71
SUPPLEMENTAL LICENSEE EVENT REPORT 1-94-005

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 and was submitted in accordance with the format set forth in NUREG-1022, September 1983.

Please refer any questions regarding this submittal to Mr. M. A. Turkal at (910) 457-3066.

Very truly yours,

J. Cowan, Director-Site Operations
Brunswick Nuclear Plant

JFM/jfm

Enclosures
1. Supplemental Licensee Event Report

cc: Mr. S. D. Ebneter, Regional Administrator, Region II
Mr. P. D. Milano, 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

290014

IE22

NRC FORM 366 (5/92) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 5/31/95

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant, Unit 1	05000325	1 of 6

TITLE (4)
Potential Use of Less-Conservative Pressure-Temperature Limits Curves

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
03	30	94	94	- 05 -	02	09	15	94	BSEP Unit 2	05000324
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

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

	20.402(b)		20.405(c)		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)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)
	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
Tony Harris, Senior Licensing Specialist	(910) 457-3312

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

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)

The original report was issued to provide the NRC staff with information relative to apparently switched Technical Specification Pressure-Temperature Limits (PTL) Curves for Brunswick Units 1 and 2 (Technical Specification Figures 3.4.6.1-1, 3.4.6.1-2, and 3.4.6.1-3b), resulting in the potential use of less-conservative curves on Unit 1 during past heat-up/cooldown evolutions. The issue was raised following removal of a surveillance capsule from the Unit 1 reactor vessel during the recently completed Unit 1 refuel outage. Supplement 1 to this report updates the switched PTL curve issue and provides a 30-day report on one event discovered where Unit 1 was operated outside of the Technical Specifications for the PTL curves (Technical Specification 3.4.6.1). This 1992 Unit 1 event is reportable under 10 CFR 50.73(a)(2)(i). The primary causal factor for this event was inadequate procedural guidance provided to the control room operators with respect to the proper parameters to be monitored for PTL curve compliance. Allowable stress values, fatigue, and fracture toughness margins required by 10 CFR 50 Appendix G were evaluated as acceptable for the 1992 Unit 1 event; therefore, continued operation of the unit is justified. The NUREG-1022 cause code for this event is defective procedures. Information in the original LER is not being revised. Supplemental information updating the switched PTL curve issue and the 30-day report where Unit 1 operated outside of the Technical Specifications for the PTL curves is presented under the Supplement 1 Information section. Supplement 2 provides information regarding a corrective action committed in Supplement 1.

TITLE

Potential Use of Less-Conservative Pressure-Temperature Limits Curves

INITIAL CONDITIONS

Unit 1 and Unit 2 are currently operating at 100% reactor power.

EVENT NARRATIVE

On August 17, 1993, during the recently completed Unit 1 outage, a surveillance capsule was removed from the Unit 1 reactor pressure vessel (RPV) for metallurgical analysis. This capsule was the first capsule removed for either Brunswick unit. General Electric Company (GE) was contracted to perform the testing on the capsule. GE informed CP&L on February 17, 1994, that they believed the capsule being examined should have been located in the Unit 2 vessel.

CP&L immediately began an investigation of this issue. Preliminary results indicate that the surveillance capsule provided to GE was indeed the correct capsule for the Unit 1 vessel; however, further review of the NEDO documents which form the basis of the Technical Specification Pressure-Temperature Limits (PTL) curves indicates that the Unit 1 PTL curves are based on Unit 2 vessel material data and the Unit 2 PTL curves are based on Unit 1 vessel material data. As a result, Unit 1 may have operated in the past with less-conservative PTL curves.

An Adverse Condition Report (ACR) was initiated to document this potential concern. The ongoing investigation is focusing on three main aspects:

1. Researching reactor vessel fabrication and site turnover records to determine if a documentation error did occur.

2. Reviewing heatup and cooldown records to determine compliance with Technical Specifications. These reviews are focusing on Unit 1 data, since the Unit 2 curves provide more conservative operating parameters.

3. Determining additional corrective actions, if necessary.

Review of reactor fabrication history and site turnover records is continuing. Based on review to date, it appears that the GE NEDO documents are reversed. Review of the heatup and cooldown records is also continuing. Initial reviews indicate one Unit 1 hydrostatic test (conducted January 24, 1991) which would have been outside the more conservative Unit 2 Technical Specification PTL curves. The test exceeded the limits of the more conservative Unit 2 curves by 1 to 2 degrees for a period of two and one-half hours; however, no safety limits were exceeded.

CAUSE OF EVENT

Unit 2 was the first reactor constructed at the Brunswick site. General Electric had designated equipment for this unit as Carolina I. The Unit 1 equipment was designated as Carolina II. These GE "Carolina" designations were employed for designating

fabrication/shipping sequences for materials/components at the GE Brunswick project.

Two vessels were constructed for the Brunswick project by Chicago Bridge & Iron (CB&I); Carolina I (CB&I Contract #2471) and Carolina II (CB&I Contract #2472). The Carolina I vessel was originally intended to be installed in Unit 2, and the Carolina II vessel installed in Unit 1. CB&I also fabricated surveillance specimens for each of the vessels. The surveillance specimens were installed into surveillance baskets and designated as G1, G2, and G3 for Carolina I (#2471) vessel and G4, G5, and G6 for the Carolina II (#2472) vessel. The specimens were marked with a binary code representing "38" for Carolina I and "39" for Carolina II.

In 1971, a decision was made to set the Carolina II (#2472) vessel in Brunswick 2 and Carolina I (#2471) vessel in Unit 1. In order to accommodate this change, a Field Disposition Instruction (FDI) was issued, directing site personnel to install the surveillance baskets G1, G2, and G3 into vessel # 2471 and G4, G5, and G6 baskets into vessel #2472, consistent with fabrication records.

The capsule removed from Unit 1 in August, 1993, was G1, with a binary code "38", representing the Carolina I vessel (#2471); however, the GE NEDO documents used as the basis of the current Technical Specification PTL curves incorrectly indicate that Vessel #2471 is in Unit 2 and #2472 is in Unit 1; therefore, GE believed that the G1 capsule, which is associated with vessel #2471, should have come from Unit 2. Preliminary review of this issue indicates that the cause of this event was inadequate review of the design documentation used in the development of the GE NEDO documents.

CORRECTIVE ACTIONS

Immediate corrective actions included the following:

1. Initiation of an ACR to document the concern and identify further corrective actions needed.

2. Issuance of a memorandum on 2/23/94 to the Brunswick Operations Managers from the Technical Support Manager recommending that until the investigation is complete, both Brunswick units be operated to the more conservative Unit 2 Technical Specification PTL curves. A Standing Instruction was issued to implement this recommendation.

3. Performance of an initial safety significance review to ensure that no significant safety issue exists with respect to the potential operation of Unit 1 with less-conservative PTL curves.

4. Development of an Action Plan to ensure the appropriate issues are addressed in a timely manner.

Further corrective actions are being identified as the reviews are completed. These actions include verification of the installed vessels by visual examination of the nameplate data on the Unit 2 vessel and performance of a final safety assessment of the issue following review of plant operating data. The nameplate verification will take place after shutdown of Unit 2 for the upcoming outage, currently planned to begin March 25, 1994. A supplement to this report, including corrective actions and date of completion, will be submitted prior to Unit 2 startup from the upcoming refuel outage.

SAFETY ASSESSMENT

An initial safety assessment of this issue has been completed by GE. This assessment involved a review of the conservatisms involved in the calculations for the PTL curves, and a comparison of the Unit 1 and Unit 2 PTL curves to determine whether any significant differences exist between the curves. Based on this initial safety assessment, no significant safety issue has resulted from the switched curves.

A final safety assessment will be completed following review of plant operating data.

PREVIOUS SIMILAR EVENTS

No previous similar events involving switched unit design information have been identified at this time; however, the investigation is continuing.

SUPPLEMENT 1 INFORMATION

Investigation of the impact of the switched PTL curves is continuing. On 4/15/94, CP&L verified the nameplate data of the Unit 2 reactor pressure vessel as CB&I Contract No. 68-2472. This verification confirms that the design information contained in the NEDO documents used in development of the Technical Specification PTL curves (NEDO-24161 and NEDO-24157) is reversed. Therefore, the Unit 1 and Unit 2 Technical Specification PTL curves are switched. The interim corrective action established upon identification of the potentially switched PTL curves (use of the more conservative Unit 2 PTL curves for both Unit 1 and Unit 2) will remain in place. The status of remaining corrective actions identified in the original LER response follows:

- Performance of a final safety assessment of the issue following review of plant operating data. The final safety assessment is in progress and will be completed prior to the end of the current Unit 2 refuel outage.
- Submittal of a supplement to the original LER, including corrective actions and date of completion prior to the end of the current Unit 2 refuel outage (B211R1). This supplemental report satisfies this commitment.

Additional corrective actions include:

- Completion of the final engineering evaluation for the issue by the end of the current Unit 2 refuel outage (B211R1).
- Revision of NEDO documents which form the basis for the PTL curves. The revisions will be made prior to the end of the current Unit 2 refuel outage (B211R1).
- Correction of the switched curves in Amendment 13 of the Updated FSAR and submittal of a Technical Specification amendment request to address the switched curve issue prior to Unit 2 startup from the current refuel outage (B211R1).

In addition to the above actions, as a part of the Generic Letter 92-01, "Reactor Vessel Structural Integrity" request for additional information (NRC Letter dated April 1, 1994), the RPV information for the Brunswick Plant will be verified with respect to the switched design information. Results of this review will be reported, as requested, in CP&L's response to the April 1, 1994 NRC request for additional information.

On March 30, 1994, during investigation of the impact of the switched PTL curves on unit operation, CP&L identified a 1992 event during which Unit 1 operated outside of the existing Unit 1 Technical Specifications. The event followed a Unit 1 reactor scram on January 17, 1992, during which time the RPV bottom head temperature dropped to less than 100 degrees Fahrenheit while pressure remained at 500 to 635 psig (Reference LER 1-92-003). This condition continued for approximately 3 hours. Since this event exceeded the applicable Technical Specification PTLs and Action Requirements, the event should have been recognized and evaluated for safety significance relative to its impact on RPV brittle fracture toughness properties; however, the event was not recognized during the scram or subsequent event reviews nor evaluated. This event is being reported under 10 CFR 50.73 (a)(2)(i)(B), any operation or condition prohibited by the plant's Technical Specifications.

The safety significance of the 1992 event has been evaluated. The event was evaluated as being acceptable regarding allowable stress, fatigue, and compliance with 10 CFR 50 Appendix G fracture toughness margins; therefore, continued operation of Unit 1 is justified.

The root cause analysis for the 1992 event indicated that the causal factors for this event were the lack of appropriate guidance and level of understanding of the parameters to be monitored in determining PTL curve compliance. During the 1992 event, Control Room operators were monitoring saturation temperature for compliance with the cooldown limitations. This action led the operators to believe that saturation temperature should also be used for determining PTL curve compliance. Therefore, the control room operators did not recognize and evaluate bottom head area parameters for compliance with the PTL curves. A lack of appropriate guidance also led to the Site Incident Investigation Team not reviewing the 1992 event for compliance with the PTL curves.

Corrective actions for the 1992 event include the following:

- Revision of GP-05, Unit Shutdown Procedure, to include guidance on the parameters to be monitored for assessing compliance with Pressure-Temperature curve limits. This revision will be completed by October 31, 1994. In the interim, a Standing Instruction has been issued to control room operators to address this concern.

- Revision of the Post-Trip Investigation Procedure, OI-22, to provide guidance on reviewing PTL curve compliance during post-trip investigations. This revision will be completed by October 31, 1994.

- The 1992 event and the basis for the heatup/cooldown curves and the pressure-temperature limit curves will be included in training for Senior Reactor Operators and Operations Shift Technical Advisors. This training will be completed by August 1, 1994.

Supplement 2 Information

Corrective actions listed in Supplement 1 included training for Senior Reactor Operators and Operations Shift Technical Advisors on the 1992 event. The training was to be completed by August 1, 1994. The training was conducted on July 25 - July 31, 1994 as on-shift training. Twenty-six Senior Reactor Operators and Shift Technical Advisors were not available on shift during the training sessions. An action item was initiated by the

Training Unit to provide training to the twenty-six individuals not initially trained. Training was performed for those individuals in August and was completed on August 25, 1994.

The required training was not completed by the committed date due to the following factors:

1. The individual responsible did not adequately track and follow-up on the due date for this item. There was a lack of sensitivity regarding the action item due date when the package was being developed and scheduled for Licensed Operator Requalification (LOR). The action item identifying the requirement to train on the 1992 event was sent to the LOR lead instructor to develop and schedule the training package. The instructor wanted to incorporate several industry reports concerning heatup/cooldown into the training package with the 1992 event. To allow time for preparation, he requested that the training be rescheduled for the next cycle of LOR (LOR 94-05), which would be held between August 8 - September 8, 1994, without consideration for the due date. He obtained appropriate approvals but again failed to identify the need for the completion prior to the due date.

2. The instructor also did not understand what was required to successfully close the action item. When he became aware of the committed date, available licensed operators were trained between July 25 - 31. An action item was initiated by Training to track the 26 individuals which did not receive the on-shift training and to complete the required training by August 30, 1994. The on-shift training coupled with the internal tracking item for the remaining 26 individuals was considered sufficient to meet the commitment and the paperwork to close the commitment was initiated. During review of the closure package, it was realized that the commitment was missed.