



JAN 20 2003

SERIAL: BSEP 03-0011

10 CFR 50.73

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1
DOCKET NO. 50-325/LICENSE NO. DPR-71
LICENSEE EVENT REPORT 1-2002-001

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Progress Energy Carolinas, Inc. submits the enclosed Licensee Event Report. This report fulfills the requirement for a written report within sixty (60) days of a reportable occurrence.

Please refer any questions regarding this submittal to Mr. Edward T. O'Neil,
Manager – Support Services, at (910) 457-3512.

Sincerely,

W. G. Noll
Plant General Manager
Brunswick Steam Electric Plant

MAT/mat

Enclosure:

Licensee Event Report 1-2002-001

IE22

Document Control Desk
BSEP 03-0011 / Page 2

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Luis A. Reyes, Regional Administrator
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Theodore A. Easlick, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission
ATTN: Ms. Brenda L. Mozafari (Mail Stop OWFN 8G9) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738

U. S. Nuclear Regulatory Commission
ATTN: Mr. Leonard N. Olshan (Mail Stop OWFN 8H12) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738

U. S. Nuclear Regulatory Commission
ATTN: Mr. Allen G. Howe (Mail Stop OWFN 8G9) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738

Ms. Jo A. Sanford
Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-051

1. FACILITY NAME: Brunswick Steam Electric Plant (BSEP), Unit 1
 2. DOCKET NUMBER: 05000325
 3. PAGE: 1 OF 4

4 TITLE: Oscillation Power Range Monitor (OPRM) Inoperability Due To Non-Conservative Setpoint

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	22	2002	2002	-- 001 --	00	01	xx	2003	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	10. POWER LEVEL	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)												
		1	94	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)
		<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 50.73(a)(2)(v)(E)	<input type="checkbox"/> 50.73(a)(2)(v)(F)	<input type="checkbox"/> 50.73(a)(2)(v)(G)	<input type="checkbox"/> 50.73(a)(2)(v)(H)	<input type="checkbox"/> 50.73(a)(2)(v)(I)	<input type="checkbox"/> 50.73(a)(2)(v)(J)	<input type="checkbox"/> 50.73(a)(2)(v)(K)

12. LICENSEE CONTACT FOR THIS LER
 NAME: Mark A. Turkal, Lead Engineer - Licensing
 TELEPHONE NUMBER (Include Area Code): (910) 457-3066

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> X	<input type="checkbox"/> NO		MO	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On November 22, 2002, GE Nuclear Energy (GE) identified a reportable condition in accordance with 10 CFR 21.21(d) (i.e., SC02-21, "Stability Option III: OPRM Tmin Specification"). SC02-21 states that the Stability Option III period based detection algorithm (PBDA) range for minimum period of detection (i.e., Tmin) values specified in Licensing Topical Report NEDO-31960-A, "BWR Owner's Group Long-Term Stability Solutions Licensing Methodology (Supplement 1)," was non-conservative and recommended that the Oscillation Power Range Monitor (OPRM) be considered inoperable if the Tmin value is set greater than 1.2 seconds. Stability Option III is installed on Unit 1 and the Tmin value was set at 1.4 seconds. Therefore, at 1328 Eastern Standard Time (EST) on November 22, 2002, all OPRM channels were declared inoperable in accordance with Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," and an alternate method to detect and suppress thermal hydraulic instability oscillations was placed into effect as directed by Condition I of TS 3.3.1.1. Subsequently, the Tmin value was changed to 1.2 seconds and all OPRM channels were declared operable at 0917 EST on November 27, 2002. The safety significance of this occurrence is considered minimal.

The apparent cause of the event is an incomplete analysis, performed by GE, when establishing oscillation period ranges to be used for the PBDA.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2002	-- 001 --	00	

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

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

INTRODUCTION

On November 22, 2002, GE Nuclear Energy (GE) identified a reportable condition in accordance with 10 CFR 21.21(d) (i.e., SC02-21, "Stability Option III: OPRM Tmin Specification"). SC02-21 states that the Stability Option III period based detection algorithm (PBDA) range for minimum period of detection (i.e., Tmin) values specified in Licensing Topical Report NEDO-31960-A, "BWR Owner's Group Long-Term Stability Solutions Licensing Methodology (Supplement 1)," was non-conservative and recommended that the Oscillation Power Range Monitor (OPRM) [IG] be considered inoperable if the Tmin value is set greater than 1.2 seconds. At the time of the notification, Unit 1 was in Mode 1, operating at approximately 94 percent of rated thermal power (RTP), the maximum achievable power level based on the current status of extended power uprate (EPU) implementation.

Progress Energy Carolinas, Inc. confirmed that the Tmin value was set at 1.4 seconds for the Unit 1 OPRM channels and, at 1328 Eastern Standard Time (EST), declared the OPRM Upscale trip (i.e., Function 2.f of Technical Specification (TS) Table 3.3.1.1-1) inoperable in accordance with TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation" [JC]. An alternate method to detect and suppress thermal hydraulic instability oscillations was placed into effect as directed by Condition I of TS 3.3.1.1.

At 1629 EST on November 22, 2002, the NRC was notified (i.e., Event Number 39397), in accordance with 10 CFR 50.72(b)(3)(v)(A), of this event. Based on the information contained in SC02-21, this was considered a condition that could have prevented the fulfillment of the safety function of a system that is needed to shut down the reactor and maintain it in a safe shutdown condition.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented the fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident. Additionally, the event is being reported in accordance with 10 CFR 50.73 (a)(2)(i)(B) as operation which was prohibited by the plant's TSs. The OPRM Upscale trip has been considered operable, with the non-conservative value for Tmin, since startup from the Spring, 2002, refueling outage when the Stability Option III modification was implemented.

EVENT DESCRIPTION

In support of EPU, Progress Energy Carolinas, Inc. is implementing modifications to revise the Brunswick Steam Electric Plant (BSEP) thermal-hydraulic stability long-term solution from the Boiling Water Reactor Owners' Group (BWROG) Enhanced Option I-A to the BWROG Option III solution. Stability Option III was implemented on Unit 1 in Spring, 2002, but has not been implemented on Unit 2.

Stability Option III relies upon the OPRM Upscale trip function to automatically detect and suppress anticipated thermal-hydraulic power oscillations, thus providing protection from exceeding the fuel Minimum Critical Power Ratio (MCPR) Safety Limit. One of three algorithms (i.e., the algorithm credited by the safety analysis and governed by the TSs) used in generating the OPRM Upscale trip is the PBDA. The PBDA is an algorithm which provides a scram if there are a sufficient number of neutron flux

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
		2002	-- 001	-- 00	

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

oscillations, in a given period of time, with a period of oscillation between the Tmin and Tmax values. Oscillations outside of the Tmin/Tmax range will not be evaluated by the PBDA. In accordance with NEDO-31960-A, the Unit 1 values for Tmin and Tmax were set at 1.4 seconds and 3.0 seconds, respectively.

SC02-21 states that the Stability Option III PBDA range for Tmin values, specified in NEDO-31960-A, was non-conservative and recommended that the OPRM be considered inoperable if the Tmin value is set greater than 1.2 seconds. This recommendation was based on a GE calculation which demonstrates that, at high core flow conditions (i.e., approximately 60 percent of rated flow), the expected neutron flux oscillation period for a thermal-hydraulic instability event can be less than 1.4 seconds. Therefore, with Tmin set to 1.4 seconds, the potential existed that the PBDA may not detect an expected oscillation.

Upon receipt of SC02-21, Progress Energy Carolinas, Inc. confirmed that the Tmin value was set at 1.4 seconds for the Unit 1 OPRM channels. The OPRM Upscale trip function was declared inoperable and actions were initiated to change the Tmin value to 1.2 seconds. This modification was completed on November 27, 2002 and, at 0917 EST, the OPRM Upscale trip function was returned to operable status.

SC02-21 also states that the OPRM is considered operable for values of Tmax set to 3.0 seconds. Upon receipt of SC02-21, Progress Energy Carolinas, Inc. confirmed that the Tmax value was set at 3.0 seconds for the Unit 1 OPRM channels.

EVENT CAUSE

Although GE has not performed a formal root cause evaluation for this condition, based on available information, it is believed that the root cause is an incomplete analysis, performed by GE, when establishing oscillation period ranges to be used for the PBDA.

CORRECTIVE ACTIONS

1. A modification was completed, on November 27, 2002, to revise the Unit 1 PBDA Tmin value from 1.4 seconds to 1.2 seconds.
2. The engineering change (i.e., EC 46730) for installing the Unit 2 Stability Option III modification has been revised to change the required Tmin value to 1.2 seconds. This modification will be implemented during the Unit 2 refueling outage in March 2003.

SAFETY ASSESSMENT

The safety significance of this occurrence is considered minimal.

The condition when the expected neutron flux oscillation period for a thermal-hydraulic instability event can be below 1.4 seconds exists only at high core flow conditions (i.e., approximately 60 percent of rated flow). This is a region in which the plant typically does not operate for an extended time and for which the probability of thermal-hydraulic instabilities occurring is low. Even if an instability had occurred under

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Brunswick Steam Electric Plant (BSEP), Unit 1	05000325	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2002	-- 001	-- 00	

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

these conditions, SC02-21 states that the failure of automatic detection at these conditions is not expected to result in fuel failures but may lead to violation of the TS MCPR Safety Limit.

In addition, although considered inoperable with Tmin set greater than 1.2 seconds, the OPRM Upscale trip function was fully operational and would have continued to protect the plant from thermal-hydraulic instabilities throughout the operating range. If such protection was not provided, operators are trained to recognize instabilities and to take appropriate actions should an instability occur.

PREVIOUS SIMILAR EVENTS

A review of reportable events for the past three years has not identified any previous similar events.

COMMITMENTS

No commitments are being established in this report.