



Progress Energy

MAY 23 2003

SERIAL: BSEP 03-0074

10 CFR 50.73

U. S. Nuclear Regulatory Commission
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BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-324/LICENSE NO. DPR-62
LICENSEE EVENT REPORT 2-03-002

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

CRE/cre

Enclosure: Licensee Event Report

IE22

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cc (with enclosure):

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LICENSEE EVENT REPORT (LER)

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1. FACILITY NAME Brunswick Steam Electric Plant (BSEP), Unit 2										2. DOCKET NUMBER 05000324		3. PAGE 1 OF 5		
4. TITLE Reactor Protection System Instrumentation Out of Calibration Results in Operation Prohibited by Technical Specifications														
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			
03	24	2003	2003	-- 002 --	00	05	23	2003	FACILITY NAME		DOCKET NUMBER			
9. OPERATING MODE 5			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)											
10. POWER LEVEL 000			20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)			
			20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)		50.73(a)(2)(x)			
			20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)		73.71(a)(4)			
			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)		73.71(a)(5)			
			20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A			
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)					
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)					
			20.2203(a)(2)(v)			X 50.73(a)(2)(i)(B)			X 50.73(a)(2)(vii)					
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)					
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)					
12. LICENSEE CONTACT FOR THIS LER														
NAME Charles R. Elberfeld, Lead Engineering Technical Support Specialist										TELEPHONE NUMBER (Include Area Code) (910) 457-2136				
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT														
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX					
14. SUPPLEMENTAL REPORT EXPECTED										15. EXPECTED SUBMISSION DATE		MO	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE). X NO														
16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)														
<p>In March 2003, during a refueling outage, calibration surveillance activities resulted in the discovery of Main Steam Isolation Valve (MSIV) – Closure Reactor Protection system (RPS) instrumentation setpoints exceeding the Technical Specification (TS) Allowable Value (AV) on four out of eight limit switch assemblies.</p> <p>The cause of the condition is attributed to having the required as-left setpoint value for the switches set too close to the TS AV for the calibration method being used. A revised required as-left setpoint value and an improved calibration method were implemented in the calibration procedure and initially used during the March 2003, refueling outage.</p> <p>The safety significance of this occurrence is considered minimal. Although considered TS inoperable, the degree to which the affected channels were found to be outside the TS AV has been evaluated and it has been determined that the as-found condition resulted in no appreciable decrease in fuel thermal margin nor could it significantly impact peak transient system pressurization.</p> <p>The limit switch assembly setpoints were adjusted to required as-left values below the TS AV in accordance with plant procedures using the improved calibration method and required as-left value. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(vii)(A).</p>														

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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 March 24, 2003, instrumentation and controls (I&C) technicians recorded as-found calibration data on outboard main steam isolation valve (MSIV) – Closure Reactor Protection system (RPS)[JC] instrumentation [33]. The as-found data for MSIV – Closure RPS instrumentation for two of the four outboard MSIVs exceeded the Technical Specifications (TS) Allowable Value (AV) for the instrumentation setpoint. At the time of the testing, the plant was in Mode 5, (i.e., Refueling) at zero percent of rated thermal power (RTP). On March 26, 2003, I&C technicians recorded as-found calibration data on inboard MSIV – Closure RPS instrumentation. The as-found data for MSIV – Closure RPS instrumentation for two of the four inboard MSIVs exceeded the TS AV for the instrumentation setpoint. At the time of the testing, the plant was in Mode 4, (i.e., Cold Shutdown) at zero percent RTP. A review of equipment history and the cause of the instruments being out of calibration indicated that the discrepancy most probably existed since the last calibration surveillance of the switches, approximately two years before. The instrumentation is required to be operable in Mode 1 (i.e., Run) in accordance with TS Limiting Condition for Operation (LCO) 3.3.1.1. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TS, and in accordance with 10 CFR 50.73(a)(2)(vii)(A) as an event where a single condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to shut down the reactor and maintain it in a safe shutdown condition.

EVENT DESCRIPTION

On March 24, 2003, during a refueling outage, I&C technicians commenced the performance of Maintenance Surveillance Test, "RPS Main Steam Line Isolation Valve Closure Chan Cal" (i.e., 2MST-RPS22R), which among other requirements, meets TS Surveillance Requirement (SR) 3.3.1.1.13 for the performance of a 24-month channel calibration for MSIV – Closure instrumentation listed in Table 3.3.1.1-1, Function 5. Testing activities were limited to the outboard MSIVs. As-found data for the RPS instrumentation associated with MSIVs 2-B21-F028B and 2-B21-F028C indicated that the setpoints exceeded the TS AV for the instrumentation setpoints.

On March 26, 2003, I&C technicians continued the performance of 2MST-RPS22R on the instrumentation associated with the inboard MSIVs. As-found data for the RPS instrumentation associated with MSIVs 2-B21-F022A and 2-B21-F022C indicated that the setpoints exceeded the TS AV for the instrumentation setpoints. By March 31, 2003, I&C technicians adjusted the instrumentation setpoints and completed performance of 2MST-RPS22R.

The instrumentation consists of a limit switch assembly mounted on each of the four inboard and four outboard MSIVs. Each limit switch contains two sets of contacts that make up the channels that feed two trip systems. Each limit switch assembly setpoint is adjusted to provide inputs to the RPS logic when the associated MSIV starts to close. The TS AV for the instrumentation setpoint is less than or equal to 10 percent closed. The MSIVs have a stroke of 16 inches; therefore, the TS AV is less than or equal to 1.60 inches.

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

EVENT DESCRIPTION (continued)

The data below shows the results of the testing.

Instrumentation/Valve #	As-Found Setpoint*	As-Left Setpoint*	TS AV
2-B21-F022A	1.71 in.	1.15 in.	≤ 1.60 in.
2-B21-F022B	1.14 in.	1.16 in.	≤ 1.60 in.
2-B21-F022C	2.02 in.	1.16 in.	≤ 1.60 in.
2-B21-F022D	1.24 in.	1.24 in.	≤ 1.60 in.
2-B21-F028A	1.32 in.	1.36 in.	≤ 1.60 in.
2-B21-F028B	1.72 in.	1.35 in.	≤ 1.60 in.
2-B21-F028C	1.62 in.	1.28 in.	≤ 1.60 in.
2-B21-F028D	1.04 in.	1.35 in.	≤ 1.60 in.

* Data rounded to the nearest .01 inches

EVENT CAUSE

The cause of the condition is attributed to having the required as-left setpoint value for the switches set too close to the TS AV for the calibration method being used. Previous calibration checks for these switches required the switches to be set with a required as-left setpoint at 1.50 inches (+ 0, - 0.25 inches). The method previously used to check the calibration of the switches utilized a technician at the MSIV to measure the valve travel while the valve was in motion and an additional technician to monitor relays in the control room and provide a verbal "mark" to the technician at the valve when the relays de-energized, indicating that the setpoint was reached. This method had the potential to introduce accuracy and repeatability issues to the calibration checks and adjustments. Due to previous test results in which this instrumentation was found to be out of calibration, corrective actions were developed to move the required as-left setpoint further away from the TS AV and to implement a more accurate method for obtaining calibration data. These corrective actions had not been developed at the time that the instrumentation was checked during the previous outage.

A revised required as-left setpoint value of 1.25 inches (± 0.15 inches) and an improved calibration method were implemented in 2MST-RPS22R, Revision 15 and initially used during the March 2003, Unit 2 Refueling Outage. The improved calibration method utilizes a digital dial indicator with a test box that locks the indication when the limit switch changes state. The improved method eliminates most human-induced sources of inaccuracy and is very repeatable. Based on engineering evaluation of potential reasons for the four limit switch assemblies exceeding their TS AV, it was determined that there was firm evidence that the condition had most probably previously existed.

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EVENT CAUSE (continued)

TS LCO 3.3.1.1 requires that eight channels per trip system (i.e., 16 sets of switch contacts, two for each of the eight MSIVs) of MSIV – Closure RPS instrumentation be operable when the plant is in Mode 1. With eight MSIV – Closure RPS instrumentation channels inoperable (i.e., two channels per limit switch assembly on four MSIVs), LCO 3.3.1.1 required actions include tripping the channels/trip systems, restoring trip system capability, and entering Mode 2 if the other required actions and completion times are not met. Since it was not known that the condition existed during previous operation in Mode 1, the LCO 3.3.1.1 required actions were not met.

Engineering personnel addressed the potential effect of the condition on Unit 1 MSIV – Closure instrumentation since the improved calibration method and required as-left value had not been implemented during the last calibration surveillance. Assessment of documented calibration activities as well as heightened sensitivity to potential inaccuracies associated with calibration methodology provides confidence in the performance of the last Unit 1 instrument calibration check, in March 2002, and provides reasonable assurance that the Unit 1 instrumentation was properly calibrated.

CORRECTIVE ACTIONS

1. The limit switch assembly setpoints were adjusted to required as-left values below the TS AV in accordance with the revised plant procedures using the improved calibration method and required as-left value.
2. Maintenance Surveillance Test 1MST-RPS22R, "RPS Main Steam Line Isolation Valve Closure Chan Cal," will be revised for use in the next Unit 1 refuel outage to include the new required as-left setpoint value and calibration method.

SAFETY ASSESSMENT

The safety significance of this occurrence is considered minimal.

The MSIV - Closure trip function is anticipatory in nature and is intended to initiate a scram prior to a significant reduction in steam flow; thereby, reducing the severity of the subsequent pressure transient and its affect on critical power ratio. Although considered TS inoperable, the degree to which the affected channels were found to be outside the TS AV of ≤ 1.60 inches (i.e., $\leq 10\%$ closed) has been evaluated and it has been determined that the as-found condition resulted in no appreciable decrease in fuel thermal margin nor could it significantly impact peak transient system pressurization. The MSIV - Closure function is not credited in the BSEP overpressure analysis. Additionally, a sufficient number of in-specification signals were available to produce the trip within the required timeframe.

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PREVIOUS SIMILAR EVENTS

Action Request (AR) 29967 documented a condition on Unit 2, in March 2001, in which the MSIV – Closure RPS instrumentation setpoint associated with inboard MSIV 2-B21-F022B exceeded the TS AV when checked during calibration surveillance testing. The condition was attributed to failure to tighten fasteners after maintenance on attached components and, potentially, to performance of work on attached components prior to taking as-found data. The instrumentation setpoint was adjusted to within the required as-left value. Corrective actions to prevent recurrence focused on proper sequencing when scheduling work and procedural guidance development to ensure mounting hardware is properly tightened. Based on the understanding of the issue at the time, the corrective actions could not reasonably be expected to prevent the condition documented by LER 2-03-002.

AR 58398 documented a condition on Unit 1, in March 2002, in which the MSIV – Closure RPS instrumentation setpoint associated with outboard MSIVs 1-B21-F028A, C, and D exceeded the TS AV when checked during calibration surveillance testing. The condition was attributed to having the required as-left setpoint value too close to the TS AV for the calibration method used. The instrumentation setpoints were adjusted to within the required as-left value using the previous calibration method and procedural guidance. Corrective actions focused on moving the required as-left setpoint value further from the TS AV, and developing an improved method of obtaining calibration data. The corrective actions for this AR were first applied to Unit 2 in March 2003, and resulted in the discovery of the condition documented by LER 2-03-002.

COMMITMENTS

Those actions committed to by Progress Energy Carolinas, Inc. (PEC) in this document are identified below. Any other actions discussed in this submittal represent intended or planned actions by PEC. They are described for the NRC's information and are not regulatory commitments. Please notify the Manager – Support Services at BSEP of any questions regarding this document or any associated regulatory commitments.

- Maintenance Surveillance Test 1MST-RPS22R, "RPS Main Steam Line Isolation Valve Closure Chan Cal," will be revised for use in the next Unit 1 refuel outage (i.e., by February 27, 2004) to include the new required as-left setpoint value and calibration method.