

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Brunswick Steam Electric Plant Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 2 4 1	PAGE (3) 1 OF 0 3
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TITLE (4)
Reactor Scram Resulting From Closure of Main Steam Isolation Valve B21-F022A

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 NAMES		DOCKET NUMBER(S)																																																										
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9)</td> <td style="width:15%;">1</td> <td colspan="10">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="6">POWER LEVEL (10) 0 9 9</td> <td></td> <td>20.402(b)</td> <td></td> <td>20.406(c)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(iv)</td> <td></td> <td>73.71(b)</td> </tr> <tr> <td></td> <td>20.405(a)(1)(i)</td> <td></td> <td>50.36(c)(1)</td> <td></td> <td>50.73(a)(2)(v)</td> <td></td> <td>73.71(c)</td> </tr> <tr> <td></td> <td>20.405(a)(1)(ii)</td> <td></td> <td>50.33(c)(2)</td> <td></td> <td>50.73(a)(2)(vii)</td> <td></td> <td rowspan="4">OTHER: Specify in Abstract below and in Text, NRC Form 366A</td> </tr> <tr> <td></td> <td>20.405(a)(1)(iii)</td> <td></td> <td>50.73(a)(2)(i)</td> <td></td> <td>50.73(a)(2)(viii)(A)</td> <td></td> </tr> <tr> <td></td> <td>20.405(a)(1)(iv)</td> <td></td> <td>50.73(a)(2)(ii)</td> <td></td> <td>50.73(a)(2)(viii)(B)</td> <td></td> </tr> <tr> <td></td> <td>20.405(a)(1)(v)</td> <td></td> <td>50.73(a)(2)(iii)</td> <td></td> <td>50.73(a)(2)(ix)</td> <td></td> </tr> </table>												OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)										POWER LEVEL (10) 0 9 9		20.402(b)		20.406(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)		50.33(c)(2)		50.73(a)(2)(vii)		OTHER: Specify in Abstract below and in Text, NRC Form 366A		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)			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)(ix)	
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LICENSEE CONTACT FOR THIS LER (12)

NAME M. J. Pastva, Jr., Regulatory Technician	TELEPHONE NUMBER 9 1 9 4 5 7 - 2 3 1 5
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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	SIB	ISOL	X 9 9 9	Y	X	SIB	ISOL	X 9 9 9	Y
X	SIB	ISOL	X 9 9 9	Y	X	SIB	ISOL	X 9 9 9	Y

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On 10/15/85, at 0811, Unit 2 main steam isolation valve B21-F022A auto closed. Reactor pressure spiked and the unit auto scrambled on high power. A scram recovery was carried out. A reactor low level No. 1 was encountered causing primary containment Groups 2, 6, and 8 isolations to occur. Emergency ac diesel generators auto started. Reactor pressure was controlled by the Main Steam Bypass System and reactor level was controlled by the Reactor Condensate System.

The event resulted during the performance of periodic test PT-01.1.12P. When the ac solenoid on the three-way solenoid valve of assembly F022A deenergized, F022A closed because the corresponding dc solenoid of the three-way valve had unknowingly failed at a prior indeterminate time.

The three-way solenoid valve assembly, ASCO Valves Part No. NPL8323A36V, was replaced and F022A was returned to service.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

On October 15, 1985, at 0811, an unplanned closure of Unit 2 main steam isolation valve B21-F022A occurred while the unit was operating at a power level of 99%. Reactor pressure spiked (1,017 psig recorded) and an automatic reactor scram occurred due to high power (approximately 120% recorded). A reactor scram recovery was carried out. Reactor level initially increased to a maximum of 195 inches recorded and consequently decreased to where a low level No. 1 signal was generated causing primary containment Groups 2, 6, and 8 to isolate. Emergency ac diesel generators automatically started due to a reverse power lockout of the unit main turbine generator. Reactor pressure was controlled by the Main Steam Bypass System and reactor level was controlled by use of the Reactor Condensate System steam-driven reactor feed pump B. At the time of this event, a channel alignment and functional test of the unit main steam line radiation instrumentation for the Reactor Protection System and Primary Containment Isolation System was in progress (periodic test PT-01.1.12P).

Closure of B21-F022A occurred when the ac solenoid coil on the actuation air supply three-way solenoid valve for F022A was deenergized in accordance with the test procedure. At the time, it was not known that the corresponding dc coil, ASCO Valves Part No. 220-339-1G, on the three-way solenoid valve assembly, ASCO Valves Part No. NPL8323A36V, had failed at a prior undeterminable time. Consequently, when the ac coil was deenergized, closure of F022A resulted. A coil failure of this nature is similar to the receipt of a half-Group 1 primary containment isolation signal on F022A but without Control Room alarm annunciation. The three-way solenoid valve assembly to F022A was replaced.

On October 2, 1985, the double solenoid valve assemblies of the operators for the Unit 2 MSIVs were replaced with others utilizing a different type solenoid valve seating material. This action followed failure of the Unit 2 F028A, F022C, and F028C MSIVs to close during surveillance testing on September 27, 1985. While operability testing the replacement double solenoid valve assemblies, it was determined that two respective 125 Vdc coils were defective. One of these coils was inadvertently disposed of after removal from its respective assembly. (For more information regarding the replacement of the MSIV double solenoid valve assemblies, please refer to LER 2-85-008.)

Following the unplanned closure of Unit 2 MSIV F022A, a surveillance program, utilizing electrical resistors in the logic circuitry of the MSIVs on Units 1 and 2, was initiated to temporarily monitor operation of the MSIVs' solenoid valve assemblies. On October 20, 1985, the program revealed a failure of the 125 Vdc coil on the solenoid valve assembly of Unit 2 MSIV F028C.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Laboratory analysis of the failed dc coils from MSIVs F022A and F028C and the defective dc coil found during initial operability testing of the replacement double solenoid valve assemblies determined the subject dc coil problems resulted from chloride corrosion of the coils' wires. The three subject dc coils were manufactured by Wabash (WIM) with a dated code of manufacture of B82. The manufacturer of the dc coil, which was inadvertently discarded after removal, could not be determined. When contacted, the coil supplier, ASCO Valves, provided input that failure of the coils, attributable to chloride corrosion, had not been previously identified to them as a failure mechanism.

During the ongoing Unit 2 1985-1986 refueling/maintenance outage, the Unit 2 outboard MSIV actuation solenoids were removed and analyzed by the Carolina Power & Light Company test and analytical facility. The dc coils of these solenoids were operable at the time of removal. Two of the dc coils were of the WIM manufacture code and B82 date, while the other two dc coils were of a different manufacture and date code. One of the WIM/B82 coded coils was found to be severely corroded, attributed to chlorides, with 20 percent of the coil lead remaining. The other WIM/B82 coded coil showed no signs of corrosion; however, an analysis for chlorides had not yet been completed.

ASCO Valves is presently ascertaining whether Wabash-manufactured dc coils are currently employed in solenoid valve applications.

The Unit 2 MSIV actuation air supply solenoids are being replaced. Installation of these solenoids is expected to be completed during the ongoing unit 1985-1986 refueling/maintenance outage. A similar installation was made on Unit 1 during the unit 1985 refueling/maintenance outage. To date, no dc coil failures have been identified on Unit 1 since replacement of the solenoids.

The temporary surveillance program to monitor the units' MSIV actuation air supply solenoids has been made permanent by installation of a plant modification on Unit 1 during the recent unit refueling/maintenance outage. A similar modification is planned for installation during the current Unit 2 refueling/maintenance outage.



Carolina Power & Light Company

Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461-0429
February 24, 1986

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SERIAL: BSEP/86-0145

NRC Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
SUPPLEMENT TO LICENSEE EVENT REPORT 2-85-011

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Supplemental Licensee Event Report is submitted. 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.

Very truly yours,

C. R. Dietz, General Manager
Brunswick Steam Electric Plant

MJP/jo

Enclosure

cc: Dr. J. N. Grace

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