

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Brunswick Steam Electric Plant Unit 1										DOCKET NUMBER (2) (8) 0 5 0 0 0 3 2 5 1 OF 0 4										PAGE (3) 1		
TITLE (4) Isolation of Core Spray System Pump Minimum Flow Valves																						
EVENT DATE (6)			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)			
06	13	84	84	-009-	00	07	27	84											0 5 0 0 0			
																				0 5 0 0 0		
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																				
1		20.402(b)				20.406(a)				<input checked="" type="checkbox"/> 60.73(a)(2)(iv)				73.71(b)								
POWER LEVEL (10)		<input type="checkbox"/> 20.406(a)(1)(B)				<input type="checkbox"/> 60.36(a)(1)				<input checked="" type="checkbox"/> 60.73(a)(2)(v)				<input type="checkbox"/> 73.71(a)								
		<input type="checkbox"/> 20.406(a)(1)(C)				<input type="checkbox"/> 60.36(a)(2)				<input checked="" type="checkbox"/> 60.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Test, NRC Form 356-A)								
		<input type="checkbox"/> 20.406(a)(1)(D)				<input type="checkbox"/> 60.73(a)(2)(ii)				<input type="checkbox"/> 60.73(a)(2)(viii)(A)												
		<input type="checkbox"/> 20.406(a)(1)(E)				<input type="checkbox"/> 60.73(a)(2)(iii)				<input type="checkbox"/> 60.73(a)(2)(viii)(B)												
		<input type="checkbox"/> 20.406(a)(1)(F)				<input type="checkbox"/> 60.73(a)(2)(iv)				<input type="checkbox"/> 60.73(a)(2)(ix)												
LICENSEE CONTACT FOR THIS LER (12)																						
NAME										TELEPHONE NUMBER												
M. J. Pastva, Jr. Regulatory Compliance Technician										9 1 9 4 5 7 - 9 5 2 1												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																						
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS												
E	B,G	F,C,V	A391	Yes																		
E	B,G	F,C,V	A391	Yes																		
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (16)				MONTH		DAY		YEAR				
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO												
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (18)																						
<p>During Unit 1 power operation on 6-1-84, the unit Core Spray System pumps' minimum flow valves, 1-E21-F031A and B, which are normally open, were declared inoperable as per an interpretation of Technical Specification (T/S) 3.6.3. The valves were closed, deactivated, and placed under an Operations Shift Foreman's clearance. At the time, the action taken was evaluated as having a minimal effect on the operability of the core spray pumps.</p> <p>Subsequent analysis of the action taken determined it resulted in greater risk of core spray pump inoperability due to lack of sufficient pump minimum flow protection. On 6-12-84 the valves were reopened and actuation power to them restored. While F031A and B were closed, the unit's high and low pressure Emergency Core Cooling Systems were operable except for approximately two hours on 6-8-84 when one LPCI pump was out of service for breaker maintenance, and from 6-10-84 through 6-12-84 the unit was shut down. During the subsequent Unit 1 startup on 6-13-84, appropriate administrative controls were in place to ensure closure of the valves when required.</p> <p>The concern of the Unit 1 F031A and B operability surfaced during local leak rate testing of Unit 2 drywell penetrations on 5-23-84. It was determined the valves, by original G. E. design, could not be maintained closed using the valves' remote manual controls.</p> <p>Appropriate modifications will be implemented to provide remote isolation capability for the valves.</p>																						

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Brunswick Steam Electric Plant Unit 1	0500032584	00	9	00	02	OF 04

TEXT (If more space is required, use additional NRC Form 366a) (17)

During Unit 1 power operation on June 1, 1984, the minimum flow valves of the Core Spray System pumps were declared inoperable. The valves, 1-E21-F031A and B, were then closed, deactivated, and placed under an Operations Shift Foreman's clearance. This action was taken based on an interpretation that the valves fall within the criteria of Technical Specification (T/S) 3.6.3 concerning primary containment isolation valves (PCIV). Technical Specifications require an inoperable PCIV be restored to an operable status within eight hours of the inoperability discovery or isolation of the affected penetration line.

The operability concern with the Unit 1 E-21A and B valves surfaced as a result of a discovery made while performing local leak rate testing (LLRT) of Unit 2 primary containment penetrations during the ongoing Unit 2 1984 refueling/maintenance outage. At the time there was no fuel in the Unit 2 reactor vessel. On or about May 23, 1984, while performing this testing, it was brought to the attention of the Operations Engineer that the minimum flow valve of 2A core spray pump, 2-E21-F031A, could not be maintained in the closed position for purposes of LLRT. The design logic of core spray pump minimum flow valves on Units 1 and 2 is such that when the valve control switch is moved to the "closed" position, the valve will close but will then immediately reopen when the pump is not operating or when an inadequate pump flow condition is sensed during pump operation.

Plant Engineering was requested to perform an evaluation of the operability status of the valve. On June 1, 1984, the engineering evaluation determined the valve logic did not appear to meet General Design Criteria (GDC) 57. Based on a formal, documented interpretation of Technical Specification 3.6.3 and the engineering finding concerning GDC-57, the action concerning the Unit 1 valves was taken. In accordance with the LCO procedure, each oncoming Operations Shift Foreman was required to maintain himself aware of the status of the closed valves on a once-per-shift basis to ensure operator action would be effective at minimizing potential pump damage. In addition, the following are indications and procedures which are available to the Control Operator to enable his determination of whether or not the pump is deadheaded.

1. Valve position indication for the injection valves.
2. Indicated pump pressure and flow rate.
3. Core spray pump "running" annunciator.
4. Core Spray System "initiated" annunciator.
5. Plant procedures require that, following an automatic start, the core spray pump discharge flow should be monitored and maintained between 489 and 4720 gpm.

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TEXT (If more space is required, use additional NRC Form 366a) (17)

6. Annunciator procedure for Core Spray System "initiated" requires verification of proper system operation when the system initiates.
7. Following a determination that the Core Spray System cannot be maintained within its normal parameters per procedure, the system may be shut down in accordance with plant annunciator procedures. The system may then be restarted manually, if required, in accordance with approved procedures. Note that if the Core Spray System is required by the flow path procedures, the procedures will only call for the Core Spray System when the reactor is depressurized.

At the time the decision was made to close the Unit 1 valves, there were discussions regarding pump operability with the minimum flow valves closed. At that time, the evaluation of the effect on the Core Spray System of closing the minimum flow valves was at an early stage, and no impact on pump operability had been identified. The decision to close E21-F031A and B was thus based on the fact that Technical Specification 3.6.3 required that the valve must be closed. The decision not to declare the Core Spray Systems inoperable following closure of the valve was based on the fact that the potential for pump damage due to the loss of the minimum flow valve was felt to be minimal; i.e., the minimal risk could easily be compensated for by operator action and any damage which could occur during short periods of operation without minimum flow capability would pose a long-term maintenance concern but would not prevent the pump from performing intended function. The basis for this determination was that operator action to maintain sufficient flow was clearly acceptable and would be effective at preventing damage during manual pump starts. During large break accidents, it was felt the short delay between pump start and injection valve opening was sufficient to ensure no damage to the pumps. During small break accidents or inadvertent initiation with the reactor at pressure, it was felt sufficient time was available for Operator action to provide for pump protection.

Following early consultations with the core spray pump vendor, it was determined that core spray pump damage could result within a one-minute run time if the pumps were run deadheaded.

During the subsequent startup of Unit 1 on June 13, 1984, appropriate administrative controls were put in effect to ensure closure of the valves when required. These controls provide that if the valves are needed to be closed, a plant Auxiliary Operator will be dispatched to the valve motor control center (MCC) to open the valve MCC breaker after the valve is remotely closed and indicates closed from the appropriate MCC valve position indication.

In addition, these controls will remain in effect until appropriate modifications to the Core Spray Systems on each unit are implemented which allow remote isolation of the subject minimum flow valves.

During the time period F031A and B were closed, the remaining Unit 1 high and low pressure Emergency Core Cooling Systems were operable except for

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TEXT (If more space is required, use additional NRC Form 366A (1-7))

approximately two hours on 6-8-84 when one LPCI pump was out of service for breaker maintenance. In addition, from June 10, 1984, through June 12, 1984, Unit 1 was shut down. ,

The pump vendor has performed a more detailed analysis concerning pump operation without minimum flow capability. Based on this analysis, it has been determined that the pumps can operate for three minutes without minimum flow capability and incur no degradation. Based on an analysis supplied by G. E., it has been ascertained that the core spray pumps remained operable with respect to their specified function for potential break sizes of 0.2 ft² or greater. For break sizes less than 0.2 ft², when the core spray pumps could have been required to operate deadheaded for more than three minutes, a potential existed for pump degradation. However, assuming that both core spray pumps were inoperable, computer calculations using the approved evaluation models SAFE AND REFLOOD predict peak cladding temperatures less than 2200°F for break sizes less than 0.2 ft². Thus, it is concluded that operation with the subject core spray minimum flow valves closed had no significant impact on the health and safety of the public.



Carolina Power & Light Company

Brunswick Steam Electric Plant
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July 27, 1984

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325
LICENSE NO. DPR-71
LICENSEE EVENT REPORT 1-84-9

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. In a letter dated July 12, 1984, Serial: BSEP/84-1626, it was conveyed that this event would be reported by July 27, 1984. This report is 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/mcg/LETGZ

Enclosure

cc: Mr. R. C. DeYoung
NRC Document Control Desk

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