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SUBJECT: LER 89-026-00:on 890619,potential failure of penetration
 seals could cause failure of safety equipment.

W/8 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Docket No. 50-397

July 19, 1989

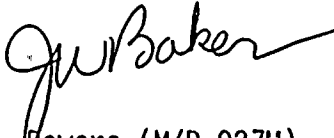
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Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 89-026

Dear Sir:

Transmitted herewith is Licensee Event Report No. 89-026 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and 10CFR Part 21 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,



C.M. Powers (M/D 927M)
WNP-2 Plant Manager

CMP:lg

Enclosure:
Licensee Event Report No. 89-026

cc: Mr. John B. Martin, NRC - Region V
Mr. C.J. Bosted, NRC Site (M/D 901A)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI
Mr. D.L. Williams, BPA (M/D 399)

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Washington Nuclear Plant - Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 9 1 7 1 OF 0 4										PAGE (3) 1 OF 0 4			
TITLE (4) POTENTIAL FAILURE OF PENETRATION SEALS COULD CAUSE FAILURE OF SAFETY EQUIPMENT IN SECONDARY CONTAINMENT FOLLOWING POSTULATED DESIGN BASIS STEAMLINE BREAK IN STEAM TUNNEL																							
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)								
0 6	1 9	8 9	8 9	0 2	6	0 0	0 7	1 9	8 9							0 5 0 0 0 0 0 0 0 0 0 0							
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																					
5		20.402(b)					20.405(c)					50.73(a)(2)(iv)					73.71(b)						
POWER LEVEL (10)		20.405(a)(1)(i)					50.36(c)(1)					50.73(a)(2)(v)					73.71(c)						
0 0 0		20.405(a)(1)(ii)					50.36(c)(2)					50.73(a)(2)(vii)					X 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)					10CFR Part 21						
		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 R.E. Fuller, Compliance Engineer										TELEPHONE NUMBER 510 9 317 1 71-12 1 719 17													
AREA CODE																							
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		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	
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)

On June 19, 1989 testing confirmed that selected penetrations in the Steam Tunnel could fail to perform as a pressure boundary following a design basis Main Steamline break in the Steam Tunnel. As a result, qualification limits could be exceeded for safety equipment in the Reactor Building (Secondary Containment). Review and identification of this condition occurred as part of by the current review process of Plant design changes. Also, this event is reportable per 10CFR Part 21 as a deficiency in the seal design of the Steam Tunnel Penetrations by the Plant Architect/Engineer Burns & Roe, Inc.

During review of a design change to core drill and seal two new 2 and 1/2-inch diameter penetrations from the Steam Tunnel to the Reactor Building, it was determined that the proposed sealant was not pressure rated for diameters greater than 3/4-inch. Existing penetrations in the Steam Tunnel were inspected and representative sample testing was performed on the sealant. The inspection and testing determined eleven existing penetrations in the Steam Tunnel required modification to resist the postulated design basis pressures.

An urgent Plant Modification Request was initiated to modify the eleven penetrations prior to Plant startup.

The root causes of inadequate pressure boundaries in the Steam Tunnel include 1) less than adequate design, and 2) management programs of the Architect/Engineer (i.e., Burns & Roe, Inc.) did not ensure the seal designs were compatible with the design basis requirements.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Abstract (cont'd)

The corrective actions include 1) revision of appropriate drawings to include pressure requirements on Steam Tunnel penetrations, and 2) the Architect/Engineer (Burns & Roe, Inc.) will be notified of the deficiency per 10CFR Part 21.

The actual safety significance of the postulated event is unknown because the severity of the environmental conditions in the Reactor Building and corresponding equipment operability was not determined for a design basis steamline break in the Steam Tunnel and corresponding loss of the pressure boundary of the eleven penetrations. There was no actual safety significant event associated with this discovery, since a Main Steamline break did not occur during the event period.

Plant Conditions

- a) Power Level - 0%
- b) Plant Mode - 5 (Refueling)

Event Description

On June 19, 1989 testing confirmed that selected penetrations in the Steam Tunnel could fail to perform as a pressure boundary following a design basis Main Steamline break in the Steam Tunnel. As a result, qualification limits could be exceeded for safety equipment in the Reactor Building (Secondary Containment). Review and identification of this condition occurred as part of the current review process of Plant design changes.

A design change was proposed to core drill and seal two new 2 and 1/2-inch diameter spare penetrations from the Steam Tunnel to the Reactor Building on the 501-foot elevation. The penetration sealant specified in the design change was Dow-Corning Silicone Foam DC3-6548. During the review of the design, a Design Engineer determined that a maximum Steam Tunnel internal pressure of 26 psia for 0.2 second and 20 psia continuous pressure for several seconds (FSAR Figure 3.6-130) would occur following an FSAR design basis accident of a Main Steamline break inside of the Steam Tunnel at 100% of rated reactor power. The Design Engineer discovered the proposed sealant was not pressure tested for penetrations greater than 3/4-inch in diameter. This discovery resulted in inspection of existing penetrations in the Steam Tunnel and representative sample testing of a 4-inch diameter penetration sealed with DC3-6548.

The inspection found 65 penetrations from the Steam Tunnel to the Reactor Building where the Dow Corning Silicone Foam was used as a pressure boundary. The representative sample testing qualified the sealant for penetrations up to 4 inches inside diameter and a maximum internal pressure of 27.7 psia without restraint. Eleven of the 65 penetrations required modification to satisfy the design requirements. Identification of the eleven penetrations are R310-4001, -4002, -4025, -4028, -4038, -4039 and -4040, and, R308-4005, -4007, -4009, and -4024.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Immediate Corrective Action

An urgent Plant Modification Request (PMR) was initiated to modify the eleven penetrations. All eleven penetrations were modified prior to Plant restart (July 2, 1989) from the refueling outage.

Further Evaluation and Corrective ActionA. Further Evaluation

1. This event is reportable per 10CFR 50.73(a)(2)(ii)(B) as a condition outside of the Plant design basis. A design basis of the Steam Tunnel is to channel steam from a Main Steamline break in the Steam Tunnel to the Turbine Building through blowout panels. The condition cited in this report would have allowed steam from a postulated break to enter areas of the Reactor Building.

Reportability per 10CFR 50.73(a)(2)(ii)(A) and 10CFR 50.73(a)(2)(v) would require a significant number of manhours to analyze the effect of this postulated event on Plant equipment with no improvement in Plant Safety. Some of the Reactor Building areas adjacent to the Steam Tunnel through which steam from the postulated event would have leaked contain Plant equipment which may not be qualified for the post event environment.

This event is also reportable per 10CFR Part 21 as a deficiency in the seal design of the Steam Tunnel penetrations by the Plant Architect/Engineer Burns & Roe, Inc. The deficiency resulted in a major reduction of the containment system to perform its design function.

2. There were no structures, components, or systems inoperable prior to the event which contributed to the event.
3. The root causes of inadequate pressure boundaries in the Steam Tunnel include 1) less than adequate design, and 2) management programs of the Architect/Engineer (i.e., Burns & Roe, Inc.) did not ensure the seal designs were compatible with the design basis requirements.
 - a) Three blowout panels in the Steam Tunnel are designed to open and vent into the Turbine Building at a pressure of 0.5 psig. As a result, pressure requirements of penetration fire seals in the Steam Tunnel were not thought to be required.
 - b) The Plant Architect/Engineer Burns & Roe, Inc., designed the penetration seals. The management programs Burns & Roe, Inc. had in effect at the time of the seal design are unknown.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

B. Further Corrective Action

1. Appropriate Plant drawings were revised to include pressure requirements on Steam Tunnel penetrations.
2. The Architect/Engineer (Burns & Roe, Inc.) will be notified of the 10CFR Part 21 determination.
3. Other areas of the Plant with the potential for pressurization will be reviewed to identify and modify penetration seals that do not satisfy the design basis requirements.

Safety Significance

The actual safety significance of the postulated event is unknown because the severity of the environmental conditions in the Reactor Building and corresponding equipment operability was not determined with failure of the eleven penetrations following a design basis steamline break in the Steam Tunnel. There was no actual safety significant event associated with this discovery, since a Main Steamline break did not occur during the event period.

Also, the FSAR analyses were performed with the conservative assumption that only the ceiling panel in the Steam Tunnel blew out and the two wall blowout panels remained in place. This conservatism was included to maximize the predicted radionuclide release to the environment from this event and not establish a pressure requirement for the Steam Tunnel penetration seals. However, it is postulated that the Steam Tunnel depressurization rate would be greater than predicted in the FSAR with all three blowout panels releasing at the designed pressure of 0.5 psig. Therefore, the severity of the environmental conditions in the Reactor Building would be decreased because of a lower average driving pressure in the Steam Tunnel, reducing the probability of equipment failure.

Since this condition did not actually occur, this condition did not threaten the health and safety of the public or Plant personnel.

Similar Events

None

EIIS InformationText ReferenceEIIS Reference

	System	Component
Main Steam System	SB	---
Reactor Building	NG	---
Turbine Building	NM	---