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SUBJECT: LER 94-002-00:on 940215,Fire barrier penetration seals
 declared inoperable.Caused by less than adequate
 engineering,drawing & procedure control.Design documents
 reviewed & revised.W/940317 ltr.

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March 17, 1994
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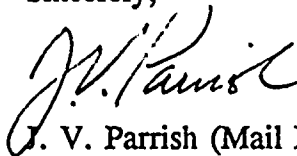
Docket No. 50-397

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: **NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21
LICENSEE EVENT REPORT NO. 94-002**

Transmitted herewith is Licensee Event Report No. 94-002 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Sincerely,



J. V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

JVP/MGE/lr
Enclosure

cc: Mr. K. E. Perkins, Jr., NRC - Region V
Mr. R. Barr, NRC Resident Inspector (Mail Drop 927N, 2 Copies)
INPO Records Center - Atlanta, GA
Mr. D. L. Williams, BPA (Mail Drop 399)

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LICENSEE EVENT REPORT (LER)

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TITLE (4) <h2 style="text-align: center;">FIRE BARRIER PENETRATION SEALS</h2>

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 NUMBERS(S)	
0	2	1	5	9	4	9	4	0	0	2	0	0
0	3	1	7	9	4	0	3	1	7	9	4	0

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) 1 0 0	20.402(b)			20.405(C)			50.73(a)(2)(iv)			77.71(b)		
	20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)			73.73(c)		
	20.405(a)(1)(ii)			50.36(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)(x)					

LICENSEE CONTACT FOR THIS LER (12)									
NAME M. G. Eades, Licensing Engineer								TELEPHONE NUMBER	
								AREA CODE 5 0 9 3 7 7 - 4 2 7 7	

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		
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ABSTRACT (16)

During December, 1993, the Supply System initiated an investigation of an employee concern related to fire barrier penetration seals. Information collected during the initial stages of the investigation led to an in-depth evaluation of the fire barrier penetration seal (seal) program. On February 15, 1994, following the completion of a preliminary analysis of the seal program, the seals were declared inoperable. This action was taken based upon the determination that some installed seal configurations cannot be qualified, and that sufficient documentation had not been assembled to demonstrate the qualification of the remainder of the seals. The analysis has indicated that less than adequate engineering, drawing, and procedural controls have been established. In summary, the Supply System has not, in some cases, implemented or maintained the commitment reflected in Appendix F of the FSAR to have fire tests or appropriate engineering evaluations to demonstrate the qualifications of seals. The fire watches established in accordance with the commitments in Appendix F of the FSAR will be continued until seal qualification has been established and verified.

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TITLE (4) FIRE BARRIER PENETRATION SEALS							

Plant Conditions

Power Level - 100%
Plant Mode - 1 (Power)

Event Description

During December, 1993, the Supply System initiated an investigation of an employee concern related to fire barrier penetration seals. Information collected during the initial stages of the investigation led to an in-depth evaluation of the fire barrier penetration seal (seal) program. On February 15, 1994, following the completion of a preliminary analysis of the seal program, the seals were declared inoperable. This action was taken based upon the determination that some installed seal configurations cannot be qualified, and that sufficient documentation had not been assembled to demonstrate the qualification of the remainder of the seals. The analysis has indicated that less than adequate engineering, drawing, and procedural controls have been established.

The term qualified means "qualified by tests that are comparable to tests used to rate fire barriers" (Appendix R, Section III.M) and that "penetration seal design configuration and design parameters are consistent with those validated by initial qualification tests" (NRC Information Notice 88-04).

During the evaluation, it was determined that certain penetration seal designs do not have qualification test documentation. This was determined by conducting a review of penetration details, reviewing seal design and installation information, evaluating information on the Penetration Seal Tracking System (PSTS), and verifying as-built configurations in the field. The following seal configurations are representative of those that led the Supply System to questions the qualification of the seals:

- Penetration seals with less than 12 inches depth of BISCO SF-20 sealant utilizing nonqualified permanent damming material;
- PVC sleeved penetrations;
- Blockout penetrations greater than 30" x 30" that are not subdivided to provide structural support during a fire exposure;
- Penetrations with inadequate separation between penetrants (or barriers to penetrants) to ensure adequate foam installation.

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A review of PSTS, the initial installation QC records, and as-built configurations revealed that these documents may not currently represent complete and accurate records of existing seal conditions. In addition, some penetration seals were installed, during the construction completion phase at WNP-2 in 1983, by a vendor/installer not previously identified in the seal program.

In summary, the Supply System has not, in some cases, implemented or maintained the commitment reflected in Appendix F of the FSAR to have qualification fire tests or appropriate engineering evaluations to demonstrate the qualifications of seals.

Immediate Corrective Actions

A Problem Evaluation Request (PER) was written to document the discovery of the problems with the seals. As a compensatory action, the seals were declared inoperable and fire watches were established in the affected areas, in accordance with the commitments of Appendix F of the FSAR.

Further Evaluation, Root Cause, and Corrective Actions

On February 15, 1994, at approximately 1330 hours, this event was reported to the NRC by telephone in accordance with 10CFR50.72(b)(1)(ii)(B). The failure to have qualified seals without compensatory measures represents a condition outside the design basis of the plant. In addition, the event is reported in accordance with 10CFR50.73(a)(2)(ii)(B) and 50.73(a)(2)(v)(A) because the failure of a seal could have prevented the functions needed to "shut down the reactor and maintain it in a safe shutdown condition."

Root Causes and Contributing Causes:

An analysis has indicated that less than adequate engineering, drawing, and procedural controls have been established. The following root causes are based on the preliminary evaluation of deficiencies in the seal program.

1. Original Construction Less Than Adequate

Some of the fire barrier penetration seals were installed in a manner which did not conform to approved design detail drawings supported by fire tests. All subsequent seal installation and inspection practices, as well as development of the data base, were based on the assumption that original penetration seals as installed were supported by fire tests.

2. Managerial Methods Less Than Adequate

Several programmatic controls were in place at the Supply System which should have prevented or identified the problems with the seal program. The Problem Resolution and the Operating Events Review Programs did not adequately address concerns identified during the construction and operation of the plant.

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The following causes contributed to the seal qualification program deficiencies.

1. Written Procedures and Documents Less Than Adequate

Installation and inspection procedures did not contain adequate acceptance criteria to assure that the seals were capable of performing the intended function.

The PSTS was developed based on critical information obtained from BISCO installation documents. However, not all seals were installed to BISCO documents.

2. Design Configuration and Analysis Less Than Adequate

Drawing Change Only design packages were issued in 1987 and 1988 that made changes to penetration seal configuration drawings to reflect the as-built conditions. However, not all of these configurations were supported by fire tests.

3. Work Practices Less Than Adequate

During construction, installation practices resulted in recessed seals, creating a condition where the actual seal depth cannot be determined through a review of the existing documentation.

4. Resource Management Less Than Adequate

Division of the responsibilities for the support of the seal program led to inadequate communication between the different on-site Supply System organizations.

The root cause investigation is ongoing. The results of the investigation will be reported in a supplement to this LER.

Further Corrective Actions

The Supply System is continuing to investigate the causes and to identify corrective actions. An evaluation and qualification program is under development. This program will include:

- a review and revision of the appropriate design documents to ensure that installation details provide necessary information;
- inspections, evaluations, and modifications, as necessary, to ensure the installation of qualified configurations; and

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- a review and revision of procedures and drawings which control seal installation and repair to ensure the requirements for restoring seals to a qualified configuration are clear.

Until the extent of the problems with the seal program has been determined, the extent of the necessary corrective actions can not be defined. The seals will be considered to be inoperable and the required compensatory actions will be taken until the seals are documented to be qualified. A supplement to this LER will be submitted after the scope of the root causes and corrective actions has been fully defined.

Safety Significance

Fire protection for WNP-2 relies upon a defense-in-depth philosophy. Although the ability of some of the seals to mitigate the spread of a fire may be degraded, these seals would have provided some control or delay in the spread of fire. Additionally, systems which provide detection and suppression remained operable and administrative controls for fire loading and combustible materials have remained in place. The extent of the problems with the seals has not yet been determined; however, compensatory actions have been taken to assure the early detection of fires. Prior to the implementation of the compensatory actions, the defense-in-depth provided by the fire protection system at WNP-2 would have limited the potential adverse consequences to the health and safety of the public. However, at this time, because the extent of the problem with the seals has not been fully defined, the safety significance can not be fully assessed. A supplement to this LER will provide a more complete analysis of the safety significance of this event.

Similar Events

The investigation initiated due to the employee concern and the following evaluation of the seal program at WNP-2 have identified several similar events. Four of these were reported as LERs and are summarized below. However, it has not been determined why the corrective actions described in these LERs failed to preclude this event.

- LER 87-04 A system engineer discovered two unsealed fire penetrations and a fire door that had not been included in the surveillance program. Corrective actions included a review to ensure that doors, barriers and penetrations were properly identified on drawings and in procedures and that associated drawings and documentation would be updated.
- LER 87-29 A seal was impaired during the implementation of a design change and not restored. The seal had passed a surveillance inspection one month after impairment. Training on various aspects of the fire protection program was provided.
- LER 87-30 During a design verification, it was discovered that a fire wall was not qualified and that a penetration was not sealed. The corrective actions included an effort to verify the accuracy of the PSTS.

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LER 88-08 Impaired seals were identified during the effort to verify the accuracy of PSTS (LER 87-30). As a corrective action, the review of the documentation and physical walkdown of the applicable accessible seals was documented in a supplemental LER.

Several other PERs, determined to be not reportable, were discovered which identified problems with degradation, impairment or damage to seals. Operating events reviews concerning seals also failed to lead to an earlier resolution of the problems. These similar events will be evaluated during the root cause analysis of the deficiencies in the seal program.

EIIS Information

Text Reference

Fire Barrier Penetration Seals

EIIS Reference

System

Component

KP

Pen