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 AUTH. NAME      AUTHOR AFFILIATION  
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 RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 94-002-01: on 940215, seals conservatively declared .  
 inoperable, following completion of preliminary analysis of  
 seal program. Caused by original const inadequate in some  
 initial seal. Fire watch established. W/940701 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

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July 1, 1994  
G02-94-150

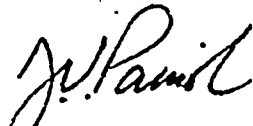
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Washington, D.C. 20555

Subject: **NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21  
LICENSEE EVENT REPORT NO. 94-002-01**

Transmitted herewith is Revision 1 to Licensee Event Report No. 94-002 for the WNP-2 Plant. This revision is being submitted to provide information that was not available when the original LER was developed.

Sincerely,



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

JVP/MGE/my  
Enclosure

cc: LJ Callan, NRC-RIV  
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NRC Sr. Resident Inspector (Mail Drop 927N, 2 Copies)  
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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   7										PAGE (3) 1   OF   4								
TITLE (4)  FIRE BARRIER PENETRATION SEALS																																	
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   1		0   7   0		1   9   4												0   5   0   0   0   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)					X 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)					X 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		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS											
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SUPPLEMENTAL REPORT EXPECTED (14)															EXPECTED SUBMISSION DATE (15)																		
YES (If yes, complete EXPECTED SUBMISSION DATE) X NO																																	
ABSTRACT (16)																																	
<p>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 conservatively declared inoperable. This action was taken based upon the determination that some installed seal configurations could not readily be qualified with the available fire test reports, and that sufficient documentation had not been assembled to demonstrate the qualification of the remainder of the seals. 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 the seal qualification issue has been resolved. This event has minimal safety significance at WNP-2 because of the defense in depth protection provided by the fire protection program and because the seals, although not fully qualified, provide a substantial level of fire resistance.</p>																																	

LICENSEE EVENT REPORT (R) TEXT CONTINUATION									
FACILITY NAME (1)  Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2)  0   5   0   0   0   3   9   7			LER NUMBER (8)			PAGE (3)		
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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 conservatively declared inoperable. This action was based upon the determination that some installed seal configurations could not be readily qualified, and that sufficient documentation had not been assembled to demonstrate the qualification of some of the remainder of the seals.

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). The design parameters are those features which the seal must have to provide the required level of fire resistance.

During the evaluation, it was determined that certain penetration seal designs do not appear to have qualification test documentation. This was determined by conducting a review of penetration details, reviewing seal design and installation information, evaluating information in the seal database, and verifying as-built configurations in the field. The review of design parameters such as seal depth, sleeving material, blockout structural support, and separation between penetrants led the Supply System to question the qualification of some seals.

A review of the seal database, the initial installation QC records, and as-built configurations revealed that these documents may not currently represent complete and accurate records of existing seal configurations. 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 conservatively declared inoperable and fire watches or tours were established in the affected areas, in accordance with the commitments of Appendix F of the FSAR.

<b>LICENSEE EVENT REPORT (100R)</b> <b>TEXT CONTINUATION</b>							
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### 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 required, 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 required 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:

The first root cause was that the original construction was inadequate in that some of the initial seal installations did not conform to the design drawings which were supported by fire tests; some of the accepted design configurations were not supported by fire tests; and some seals were installed to configurations that were not maintained as design drawings. All subsequent seal installation and inspection practices; as well as development of the database, were based on the assumption that original penetration seals as installed were supported by fire tests.

The second root cause was that engineering, procedures, and drawings were inadequate to provide the controls necessary to maintain the qualification of the seals. Drawing change packages were issued to reflect as-built seal configurations. However, no verification was made to ensure that the configurations were supported by fire tests or evaluations. A database was established to provide control of the design and maintenance of the seals. However, some of the seals installed in the plant were not covered by the installation drawings which were used to develop the database. Installation and inspection procedures did not contain sufficient acceptance criteria to ensure that the seals complied with the critical design parameters.

A contributing cause was that deficiencies in the seal program and the database identified by the problem resolution process were not adequately corrected.

Another contributing cause was that the division of responsibilities for the different aspects of the seal program and inadequate communication between the different on-site Supply System organizations led to inadequate implementation of the seal program.

### Further Corrective Actions

The Supply System has developed an action plan to address fire seal concerns. This plan includes walkdowns, engineering evaluations, and evaluation of potential alternative resolutions. Engineering efforts to assemble the needed seal qualification documentation are on-going. This plan will be modified, if necessary, to incorporate new resolution methods and lessons learned.



LICENSEE EVENT REPORT (R) TEXT CONTINUATION							
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The problem resolution process has gone through significant changes during the past year. The Supply System expects these changes to improve the effectiveness of the process in assuring the adequacy and timeliness of corrective actions for deficiencies such as those in the seal program.

To preclude further problems which might result from a division of responsibilities, the responsibilities for the fire protection program for the Supply System have been consolidated under one manager in the Technical Programs Department.

#### Safety Significance

The WNP-2 fire protection program relies upon defense in depth to minimize the probability of fires and to limit the consequences of fires which might occur. Defense in depth is provided in the prevention of fires and by active and passive mitigating features. This includes detection and suppression systems along with barriers and electrical separation. The program also requires that compensatory actions be taken if part of the program cannot provide the protection necessary. Penetration seals are only one element of the passive features of the WNP-2 fire protection program. Since declaring all seals inoperable, the Supply System has compiled available penetration seal fire test reports. The Supply System is confident that the majority of installed penetration seal designs can be qualified by available industry fire test reports or by engineering analysis. Although the seals have been declared inoperable, the Supply System is also confident that the seals provide a substantial level of fire resistance relative to the hazards. Even when including transient combustibles, most plant areas would not experience a long duration fire, even without manual suppression activities.

Based upon these considerations, the Supply System believes that the condition of the existing seals do not represent a safety significant issue and would have no impact on the health and safety of the public.

#### Similar Events

The investigation performed for this LER identified no similar events in the previous three years.

#### EIIS Information

##### Text Reference

Fire Barrier Penetration Seals

##### EIIS Reference

<u>System</u>	<u>Component</u>
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