

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)										DOCKET NUMBER (2)										PAGE (3)					
Callaway Plant Unit 1										0 5 0 0 0 4 8 3										1 OF 0 9					
TITLE (4)																									
Missing 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 NUMBER(S)										
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OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																							
6		20.402(b)				20.406(e)				50.73(a)(2)(iv)				73.71(b)											
POWER LEVEL (10)		0 0 0				20.405(a)(1)(i)				50.36(e)(1)				50.73(a)(2)(v)				73.71(e)							
		20.405(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 355A)											
		20.405(a)(1)(iii)				X 50.73(a)(2)(i)				50.73(a)(2)(vii)(A)															
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)															
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(c)															
LICENSEE CONTACT FOR THIS LER (12)																									
NAME										TELEPHONE NUMBER															
William R. Campbell - Manager, Nuclear Engineering										AREA CODE 3 1 4 6 7 6 - 8 4 6 9															
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)															
YES (If Yes, complete EXPECTED SUBMISSION DATE)										MONTH DAY YEAR															
X NO																									

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

On 3/18/86 while in Mode 6 (Refueling), 23 fire barrier penetrations were identified which did not have internal conduit seals installed. The fire barriers were declared inoperable and firewatch patrols verified to be in place. Subsequent inspections of the plant's internal conduit seals were completed on 8/18/87 and identified 308 conduits which were missing at least one seal. These conduits were not sealed during construction. Of these 308 conduits, 39 were determined to constitute violations of the Limiting Condition for Operation for Technical Specification (T/S) 3.7.11. Although it was determined that firewatch patrols had been assigned for a majority of the affected areas since receipt of the Operating License, total compliance with the ancillary T/S's cannot be determined due to the compounding aspect of the T/S Action Statements. Therefore, the condition is assumed to be reportable.

The seals were repaired by 8/24/87. The appropriate administrative procedure was revised to assure future conduit seals are installed per design requirements.

Union Electric joined a group of utilities to analyze the necessity of seals in all cases. Although the analysis showed that seals are not necessary in many configurations, Union Electric determined that no modifications to the fire protection program are necessary.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)  Callaway Plant Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 8 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 6	— 0 0 7	— 0 2 0	2	OF	0 9

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

Description of Event

On 3/18/86 while in Mode 6 (Refueling), 23 fire barrier penetrations<sup>(1)</sup> were identified which did not have internal conduit seals<sup>(2)</sup> installed. The missing conduit seals were discovered during an inspection of fire barrier penetrations initiated as a result of a potential penetration design deficiency identified at the Waterford 3 Plant. Upon discovery, the associated fire barrier penetrations were assumed to be breached and immediately declared inoperable. Firewatches were verified for the fire barriers required by the Technical Specifications. No fires have been encountered that challenged the operability of the fire barrier.

On 8/18/87, an inspection of the Callaway Plant's internal conduit seals was completed. A total of 308 conduits were found to be missing smoke/fire seals either on one or both sides of the barrier or at the penetration.

In accordance with the Standard Review Plan, the plant design requires that smoke or fire seals be installed in all conduits that pass through fire barriers. Omission of the conduit seals in some configurations may have allowed the passage of smoke and gas through the barriers between safety-related fire areas. As described in the "Analysis of Event" section of this report, an individual analysis for each conduit determined that 39 of the 308 conduits identified as missing internal seals constituted violations of the Limiting Condition for Operation (LCO) of Technical Specification (T/S) 3.7.11.

Cause of Event

The cause of the missing seals appears to be a deficiency in the construction program to properly identify all conduits requiring internal seals. The constructor walked down the fire barriers near the end of construction to physically locate conduits penetrating fire barriers. Some conduits may not have been found during the walkdown due to error or because they were not installed at the time of the walkdown.

Analysis of Event/Safety Significance

The 39 conduits missing internal seals which do not meet the T/S 3.7.11 LCO are listed in Table 1 and categorized in three sections. Missing conduit seals were found between: (A) areas containing the same trains, (B) areas containing redundant safe shutdown components, and (C) areas containing redundant safe shutdown circuits in which at least one train is protected by a 3 hour fire wrap.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)  Callaway Plant Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 8 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 6	0 0 7	0 2	0 3	OF	0 9

TEXT (If more space is required, use additional NRC Form 365A's) (17)

The penetrations listed in Table 1, Section A are located between areas containing separation groups or equipment of the same train. However, these penetrations do not separate trains of safe shutdown equipment. Fire damage in both areas would not have prevented redundant equipment from safely shutting down the plant.

The fire barriers between areas containing redundant trains and missing conduit seals (refer to Table 1, Section B) are protected by smoke detection<sup>(3)</sup> and either manual or automatic fire suppression<sup>(4)</sup> on both sides of the barrier. In addition, these conduits have at least one conduit seal and run continuously for at least 20' between the redundant trains. Transmission of smoke or gas through these conduits is not likely and the detection and fire suppression would have protected the safe shutdown circuits and components. Thus, safe shutdown of the plant would not have been affected.

The remaining fire barrier conduits without internal seals are between areas containing redundant safe shutdown circuits in which at least one train is protected by a 3 hour fire wrap (refer to Table 1, Section C). In these cases, transmission of smoke or gas through the penetration would not have prevented safe shutdown of the plant since one train of the safe shutdown circuit is protected by a 3 hour fire wrap.

Conduits less than 3" in diameter are not expected to allow the propagation of fire or allow the passage of detrimental amounts of smoke and hot gas. Based on this, conduits less than 3" in diameter and missing seals are considered operable and the requirements of the T/S's are considered satisfied. The 39 conduits, which are 3" or greater in diameter and are missing seals, are considered to be breached. Firewatch patrols were assigned since receipt of the Operating License for a majority of the areas affected by the 39 conduits. However, due to the compounding requirements for firewatches when combinations of inoperable barriers, inoperable detection, or inoperable suppression are considered, it is virtually impossible to ascertain if all T/S requirements have been satisfied continuously since receipt of the Operating License.

In conclusion, the conduits found without seals would not have prevented the safe shutdown of the plant. However, the condition is considered reportable since conformance to the T/S LCO or the applicable Action Statements cannot be totally demonstrated.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)  Callaway Plant Unit 1	DOCKET NUMBER (2)  15000418386	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Corrective Action

T/S fire barrier penetrations containing conduits were investigated for the presence of internal conduit seals. The investigation involved a review of fire barrier penetration seals and conduit seal documentation and field inspection where necessary. Out of approximately 2000 conduit penetrations reviewed, 308 penetrations were identified as missing at least one seal and are within T/S fire barriers. 173 penetrations with missing seals were located in the Control Building, 121 in the Auxiliary Building, and the remainder located either in the Fuel Building, Radwaste Building, Essential Service Water Pump House, or Ultimate Heat Sink Cooling Tower. Thirty-nine of the 308 conduits are 3-inches or greater in diameter. These 39 penetrations are considered breached based on the discussion in the "Analysis of Event" section. On 8/24/87, work requests to install the missing conduit seals were completed.

In addition, affected procedures were reviewed to assure future conduit seals are installed per design requirements. As a result of this review, the procedure governing fire barrier integrity was revised to administratively verify required conduit seals are installed.

Union Electric joined a group of utilities performing a test and analysis since the actual necessity of seals in all cases was in question. Although the analysis showed that seals are not necessary in many configurations, Union Electric determined that no modifications to the fire protection program are necessary.

Previous Occurrences: None

Footnotes

The system codes below are from IEEE Standard 805-1983 and the component codes below are from IEEE Standard 803A-1983.

- (1) System - FA, Component - PEN
- (2) System - FA, Component - SEAL
- (3) System - IC, Component - DET
- (4) System - KP, KQ

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION  
APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)

Callaway Plant Unit 1

DOCKET NUMBER (2)

0500048

YEAR

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ER NUMBER (5)

SEQUENTIAL  
NUMBER

007

REVISION  
NUMBER

02

PAGE (3)

05 OF 09

TEXT (If more space is required, use additional NRC Form 2664's.) (17)

TABLE 1

Section	Penetration Identification Number	Conduit Size (Inches)	Rooms Separated by Fire Barrier	Equipment Class	Conduit Seal Installed	Smoke Detection in Room	Fire Suppression System in Room	Remarks
A. Missing conduit seals in fire barriers between areas containing the same train	19148	4	1408 1312	2&4 None	? ?	Yes Yes	Auto Auto	
	10638	3	1408 1314	2&4 4	Yes ?	Yes Yes	Manual Auto	
	P07613	3	3403 3410	2&4 2&4	Yes No	Yes Yes	Auto Halon Auto Halon	
	15986	4	1507 1504	None None	No ?	Yes Yes	Manual Manual	
	P07097	4 3	6301 6304	None None	? ?	Yes Yes	Manual Manual	
	P06055	4	3801 3801EC	2&4 4	No No	Yes Yes	Auto Auto	EC - Electrical Chase
	P06058	4	3801 3801EC	2&4 4	No No	Yes Yes	Auto Auto	
	P07092	3 3 4	6104 6203	4 4	? Yes	Yes Yes	Manual Manual	
	17461	3	3302 3305	4 4	No No	Yes Yes	Auto Halon Auto	
	17476	3	3302EC 3302	2 4	Yes ?	Yes Yes	Auto Auto Halon	
	P03633	3	1204 1320	1 1	Yes No	No Yes	Manual Auto	

The question mark (?) in the "Conduit Seal Installed" column indicates that some obstacle prevented inspection of the seal. The penetration was conservatively treated as missing the seal and arrangements were made to install a seal if it was missing.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION  
APPROVED ONE NO. 3150-0104  
EXPIRES 8/31/88

FACILITY NAME (1)

Callaway Plant Unit 1

DOCKET NUMBER (2)

0500048386-0070120609

LER NUMBER (6)

YEAR  
SEQUENTIAL  
NUMBER  
REVISION  
NUMBER

PAGE (3)

TEXT (If a note appears in required, use additional NRC Form 366A (1) (17))

TABLE 1

Section	Penetration Identification Number	Conduit Size (Inches)	Rooms Separated by Fire Barrier	Equipment Class	Conduit Seal Installed	Smoke Detection in Room	Fire Suppression System in Room	Remarks
A. (continued)	P07651	3	3419 3414	1 1&3	Yes Yes	Yes Yes	Auto Auto halon	Previously identified in LER 86-007-00 as 7P341C0550
	P07784	4	3501 3501EC	1&3 1	Yes No	Yes Yes	Auto Auto	Previously identified in LER 86-007-00 as 2P351C0563
	P06054	3	3801 3801EC	2&4 2	No No	Yes Yes	Auto Auto	Previously identified in LER 86-007-00 as 0P371W1023
B. Missing conduit seals in fire barriers between areas containing redundant safe shutdown components	14645	3	1403 1301	123&4 1&4	Yes No	Yes Yes	Auto Halon Auto	
	14515	4	1403 1301	123&4 1&4	Yes No	Yes Yes	Auto Halon Auto	
	11511	3	1410 1408	1&3 2&4	Yes No	Yes Yes	Auto Halon Auto	
	17787	3	1410 1408	1&3 2&4	Yes No	Yes Yes	Auto Halon Auto	
	19540	3	1408 1320	2&4 1&4	Yes No	Yes Yes	Auto Auto	
	14231	3	1401 1301	2&4 1&4	Yes ?	Yes Yes	*Manual Auto	

\* The conduit terminates near the chain link fence separating rooms 1401 & 1402. The auto sprinkler system for room 1402 would provide protection.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION  
APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)

Callaway Plant Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 9 4 8 3 8 6 — 0 0 7 — 0 2 0 7 0 9

LER NUMBER (6)

YEAR

SEQUENTIAL  
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NUMBER

PAGE (3)

TEXT (If more space is required, use additional NRC Form 266A's (17))

TABLE 1

Section	Penetration Identification Number	Conduit Size (Inches)	Rooms Separated by Fire Barrier	Equipment Class	Conduit Seal Installed	Smoke Detection in Room	Fire Suppression System in Room	Remarks
B. (continued)	P04506	4	3605	123&4	?	Yes	**Manual	
			3501	1&3	Yes	Yes	Auto	
	19420	3	1410	1	Yes	Yes	Auto	
			1320	1&4	No	Yes	Auto	
	17964	3	3410	2&4	No	Yes	Auto	Previously iden- tified in LER 86-007-00 as 2P341C0519
			3414	1&3	Yes	Yes	Auto Halon	
	P07342	3	3414	1&3	Yes	Yes	Auto Halon	Previously ider- tified in LER 86-007-00 as 0P341C0551
			3410	2&4	No	Yes	Auto Halon	
	14516	4	1403	123&4	Yes	Yes	Auto Halon	
			1301	1&4	No	Yes	Auto	
C. Missing conduit seals in fire barriers between areas containing redundant safe shutdown circuits in which at least one train is protected by 3 hour fire wrap	17571	4	1323	1&AFWP B Circuit	No	Yes	Manual	AFWP = Auxiliary Feedwater Pump
			1335	1	No	Yes	Auto	
	P06799	4	1413	Aux Shut- down panel	No	Yes	Manual	
			1408	1&4	No	Yes	Auto	
	9753	4	1411	12&4	Yes	Yes	Manual	
			1127	1&4	?	Yes	Manual	

\*\* The conduit terminates in the bottom of a panel located in the control room. A fire would be detected and quickly suppressed by control room personnel.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION  
APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)

Callaway Plant Unit 1

DOCKET NUMBER (2)

05000048386007020809

LER NUMBER (6)

YEAR  
SEQUENTIAL  
NUMBER  
REVISION  
NUMBER

PAGE (3)

TEXT (If more space is required, use additional NRC Form 266A (1) (17))

TABLE 1

Section	Penetration Identification Number	Conduit Size (Inches)	Rooms Separated by Fire Barrier	Equipment Class	Conduit Seal Installed	Smoke Detection in Room	Fire Suppression System in Room	Remarks
C. (continued)	14243	4	1320	164	No	Yes	Auto	
			1127	164	No	Yes	Manual	
	12465	4	1411	1264	Yes	Yes	Manual	
			1127	164	?	Yes	Manual	
	14232	4	1320	164	No	Yes	Auto	
			1127	164	No	Yes	Manual	
	14176	4	1325	1	Yes	Yes	Manual	
			1127	164	No	Yes	Manual	
	8050	4	1206	Motor & Turbine Driven	Yes	Yes	Manual	
			1411	AFWP Cir- cuits & 12364	No	Yes	Manual	
	10807	3	1326	Motor Driven	Yes	Yes	Manual	
			1331	AFWP-A Turbine Drive AFWP	?	Yes	Manual	
	14172	3	1331	Turbine Driven AFWP-B	No	Yes	Manual	
			1326	Motor Driven AFWP-A	Yes	Yes	Manual	
	14138	3	1324	AFWP A&B Circuits	No	No	Manual	
			1323	AFWP A&B Circuits	No	Yes	Manual	



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION  
APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/98

FACILITY NAME (1)

Callaway Plant Unit 1

DOCKET NUMBER (2)

05000488386-007020909

LER NUMBER (6)

YEAR  
SEQUENTIAL  
NUMBER  
REVISION  
NUMBER

PAGE (3)

TEXT (If more space is required, use additional NRC Form 366A (1) (17))

TABLE 1

Section	Penetration Identification Number	Conduit Size (Inches)	Rooms Separated by Fire Barrier	Equipment Class	Conduit Seal Installed	Smoke Detection in Room	Fire Suppression System in Room	Remarks
C. (continued)	8051	4	1207	Motor Driven AFWP A&B	Yes	No	Manual	
			1326	1	No	Yes	Manual	
	P07618	3	3404	2&4	No	Yes	Auto Halon	Previously identified in LER 86-007-00 as 2P341C0559
			3401	1	Yes	No	Manual	
	P07985	4	1127	1&4	No	Yes	Manual	Previously identified in LER 86-007-00 as 2P112C0562
			1320	1&4	No	Yes	Auto	



Callaway Plant

April 8, 1988

U. S. Nuclear Regulatory Commission  
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Washington, DC 20555

ULNRC-1751

Gentlemen:

DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 86-007-02  
MISSING FIRE BARRIER PENETRATION SEALS

The enclosed Licensee Event Report is submitted as a second supplemental report to LER 86-007-00 transmitted via ULNRC-1298, dated April 17, 1986. Also reference LER 86-007-01 transmitted via ULNRC-1365, dated August 29, 1986. This supplemental report provides an overall update to the event.

*J. D. Blosser*  
J. D. Blosser  
for Manager, Callaway Plant

*gjh*  
TPS/SEMe/jlh

Enclosure

cc: Distribution attached

*IF22*  
*11*

cc distribution for ULNRC-1751

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