NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort Calhoun Station Unit No. 1	0 5 0 0 0 2 8 5	1 OF 0 5

TITLE (4)
Nonfunctional Fire Barrier Penetrations

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)
											N	0 5 0 0 0
0 9	0 7	9 0	9 0	—	0 2 2	—	0 2	0 2	0 6	9 1		0 5 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)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		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)	Special and Voluntary Report
		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	TELEPHONE NUMBER
	AREA CODE
Craig Fritts, System Engineer	4 0 2 5 3 3 - 6 5 5 4

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	

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 September 7, 1990, approximately 460 fire barrier penetration seals, 60 fire dampers and 6 fire doors associated with 25 fire areas were declared nonfunctional due to either lack of documentation to qualify non-verifiable penetration critical parameters, or penetration "as built" configurations which did not match typical configurations previously qualified by fire tests. These nonfunctional penetrations were discovered through a special design basis verification walkdown prompted by NRC Information Notice 88-04.

As required by Technical Specifications, the appropriate compensatory measures were implemented. On November 27, 1990 and on January 2, 1991, additional barrier penetrations were determined to be nonfunctional and the required compensatory measures were established. The compensatory measures will remain in place until the affected fire barrier penetrations are restored to functional status through engineering evaluation, repair, or replacement.

This report is submitted pursuant to Technical Specification 2.19(7) because most of the nonfunctional fire barrier penetrations were not restored to functional status within 7 days. It is being submitted also as a Voluntary LER due to potential regulatory and industry interest.

NRC Information Notice 88-04, Inadequate Qualification and Documentation of Fire Barrier Penetration Seals, requested utilities to verify the design basis of their fire barrier penetration seals. Omaha Public Power District (OPPD) began a comprehensive walkdown and assessment of all Technical Specification required fire barriers in April of 1990. This walkdown and assessment effort was conducted by contractor personnel under the provisions of OPPD Special Procedures SP-DEN-FP-0001, SP-DEN-FP-0002 and SP-DEN-FP-0003. The scope of the project included fire barrier penetration seals, fire doors, and fire dampers.

The walkdown portion was performed to document the "as built" condition of fire barrier penetration seals, fire doors, and fire dampers. On September 7, 1990 OPPD Systems Engineering and Design Engineering completed the assessment of fire barrier configurations as documented by the Special Procedures. These procedures required that fire barriers penetrations be considered inoperable if no prior documentation of installation was found for critical parameters that could not be field verified, or if any "as built" penetration barrier did not match a fire-tested and qualified configuration. For this screening, each penetration barrier was considered functional if it was considered to meet a minimum 3-hour fire rating.

Based on this assessment, the following fire barrier penetrations associated with 25 fire areas were determined to be nonfunctional:

(1) approximately 460 of 3500 penetration seals,

(2) 60 of 79 fire dampers, and

(3) 6 of 79 fire doors.

As a result, System Engineering initiated Fire Protection Impairment Permits for all areas of the plant where fire barrier penetrations were considered to be nonfunctional. Compensatory measures required by Technical Specification 2.19(7) for inoperable fire barrier penetrations were established. Revision 0 of this report was submitted as required by the Technical Specification on October 8, 1990 because most of the nonfunctional fire barrier penetrations were not restored to functional status within 7 days. It was submitted also as a Voluntary LER due to potential regulatory and industry interest.

A walkdown assessment of seals determined to be nonfunctional continued concurrent with a Quality Control verification of individual penetration as-built drawings. Consequently, additional sealing devices were identified as nonfunctional. On November 27, 1990, one additional barrier impairment permit was issued and the required compensatory measures were established. Revision 1 of this report fulfilled the Special Report requirement of the Technical Specification for the additional nonfunctional penetrations identified.

The additional assessments added 92 to the total number of inoperable seals, while another 129 seals previously identified were resolved as operable, resulting in a net decrease of 37 for the total. In addition, the number of fire areas involved was increased from 25 to 26. As of the writing of Revision 1 to this report (submitted December 31, 1990), the numbers of nonfunctional fire barrier penetrations were:

(1) approximately 423 of 3500 penetration seals,

(2) 60 of 79 fire dampers, and

(3) 7 of 79 fire doors.

On January 2, 1991, the walkdown inspections were completed. As a result, additional nonfunctional sealing devices were identified and appropriate compensatory measures were verified as implemented. This second revision fulfills the Special Report requirement of the Technical Specification for the additional nonfunctional penetrations identified.

The additional assessments added 36 to the total number of inoperable seals, while another 18 seals previously identified were resolved as operable, resulting in a net increase of 18 for the total. An additional nonfunctional fire damper was discovered. As of the writing of this report revision, the numbers of nonfunctional fire barrier penetrations are:

(1) 441 of approximately 3500 penetration seals,

(2) 61 of 79 fire dampers, and

(3) 7 of 79 fire doors.

The noted fire barrier penetration sealing devices were declared nonfunctional because no prior documentation existed for them, or their configurations did not match those qualified by fire testing. These criteria were used as a result of NRC Information Notice 88-04, and were different from the criteria utilized in performance of periodic fire barrier penetration surveillances as required by Technical Specification 3.15(5).

Previous Technical Specification surveillances (the last completed in March of 1990) have verified that fire barrier penetrations were functional (intact) at least once per 18 months by visual inspection. When degraded barriers were found in the course of these surveillances, Technical Specification compensatory measures were established until the barriers were restored to functional status. Therefore, the cause of the reportable nonfunctional status of the fire barrier penetrations was not an actual short term deterioration of the barriers, but the identification of design basis deficiencies in the construction and/or documentation of the barriers.

As compensatory actions in compliance with Technical Specification 2.19(7), hourly fire watches were established based upon verification of operable automatic fire detection on at least one side of the affected fire barriers. These measures assure prompt response by the station fire brigade to preclude the spread of fire across any degraded fire barrier.

As noted in the Fire Hazards Analysis, Fort Calhoun Station overall has low fixed combustible loadings within its different fire areas, with the exception of the diesel rooms and the turbine building. The predominant share of inoperable fire barrier penetrations were found in those areas where the total fixed combustible loading is low. In the diesel rooms, additional protection is provided by an automatic dry pipe sprinkler system. The turbine building, which adjoins the auxiliary building, is provided with automatic fire detection and automatic water suppression for most areas where combustible loading is high. Transient combustibles and hot work activities are controlled by plant administrative procedures. OPPD management personnel are required by Standing Order G-6 to perform regular plant inspections for general housekeeping. An explicit purpose stated for this inspection is to "reduce to a minimum the amount of combustible material stored in safety related areas."

Many of the fire barrier penetrations determined to be inoperable are related only to licensing commitments made in response to Appendix A to Branch Technical Position 9.5-1. These barriers do not correspond to those committed to under the Fort Calhoun Station 10CFR 50, Appendix R analysis, and thus are not required to preserve safe shutdown capability. These barriers do not separate redundant trains of safe shutdown equipment and, therefore, the postulated breach of these barriers by a fire would have minimal safety impact.

The results of the fire barrier walkdown and assessment effort have been handled conservatively. As immediate corrective action, applicable technical specification LCO action statements were implemented for all fire barrier penetrations considered nonfunctional (inoperable). These measures will remain in place until the affected penetrations are restored to a functional (operable) status.

It is estimated that approximately 35 percent of the penetrations can be evaluated as functional. Guidance given in NRC Generic Letter 86-10 allows for evaluations to be performed for penetrations not sealed to the fire rating required of the boundaries. The purpose of the evaluation is to determine whether the fire area boundaries are sufficient to withstand the hazards associated with the fire area. Some barrier penetrations may be evaluated as justifiable in their current configuration. This work is on-going through 1991. Restoration of these penetrations to operable status through engineering evaluation is expected to be fully complete within 2 months following the end of the 1991 refueling outage.

The approximately 65 percent of installed fire barrier penetrations which cannot be evaluated as functional will be repaired or replaced. A modification (MR-FC-90-072) has been initiated to perform this work. Implementation of this modification will be on-going through 1991. Because certain nonfunctional penetration sealing devices are inaccessible due to plant radiological conditions and energized electrical equipment, a plant outage will be required to implement required repairs or replacements. For this reason, the modification is expected to be completed within 2 months following the end of the 1991 refueling outage.

The upgrade of procedural controls and fire barrier as-built drawing information will be completed concurrent with the engineering evaluations and modification implementation discussed above. Drawings reflecting as-built configurations for repaired or replaced penetration sealing devices will be processed as part of the modification closeout. Upgrades planned for existing procedures with respect to fire barrier configuration control will be implemented separately but concurrently with the activities described above.

Other Special Reports have been submitted because of non-related instances of inoperable fire barriers; however, there have been no Special Reports or LERs submitted due to a generic cause affecting many barriers.