

Iowa Electric Light and Power Company

June 5, 1992

NG-92-2635

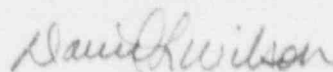
Mr. A. Bert Davis
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License DPR-49
Licensee Event Report #92-007

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject Licensee Event Report.

Very truly yours,



David L. Wilson
Plant Superintendent - Nuclear

DLW/SA/eah

cc: Director of Nuclear Reactor Regulation
Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D. C. 20555

NRC Resident Inspector - DAEC

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Duane Arnold Energy Center • 3277 DAEC Road • Co. Iowa 52324 • 319/851-7611

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LICENSEE EVENT REPORT (LER)

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 30.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1): Duane Arnold Energy Center
DOCKET NUMBER (2): 0500003311 1 OF 06

TITLE (4): Fire Barrier Degraded as a Result of Unsealed 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
05	07	92	92	007	0006	07	09	92	None
									DOCKET NUMBER (5): 050000

OPERATING MODE (9): N
POWER LEVEL (10): 096
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11):

20.402(a)	20.406(a)	30.73(a)(2)(iv)	73.71(a)
20.406(a)(1)(ii)	30.73(a)(1)	30.73(a)(2)(iv)	73.71(a)
20.406(a)(1)(iii)	30.73(a)(2)	30.73(a)(2)(iv)	OTHER (Specify in Abstract and in Text, NRC Form 306A)
20.406(a)(1)(iv)	X 30.73(a)(2)(ii)	30.73(a)(2)(v)(A)	
20.406(a)(1)(v)	30.73(a)(2)(iii)	30.73(a)(2)(v)(B)	
20.406(a)(1)(vi)	30.73(a)(2)(iii)	30.73(a)(2)(iv)	

LICENSEE CONTACT FOR THIS LER (12):
NAME: Scott Arebaugh, Technical Support Specialist
TELEPHONE NUMBER: 319 851-7648
AREA CODE: 319

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13):

CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC
B	KP	PE, N		NO					

SUPPLEMENTAL REPORT EXPECTED (14):
 YES (If yes, complete EXPECTED SUBMISSION DATE) NO
 EXPECTED SUBMISSION DATE (15): 090492

ABSTRACT (Limit to 1400 spaces. If approximately fifteen single space typewritten lines) (16):

On May 7, 1992, during maintenance on an instrument air pipe, its fire barrier penetration was found unsealed. After this discovery, a limited number of additional fire barrier penetration inspections were performed and five additional unsealed penetrations were identified. Upon discovery of unsealed penetrations, appropriate fire watches were initiated. Review of the analysis for the barriers in which the unsealed penetrations are located determined the open penetrations had not been previously evaluated. Therefore the barriers were considered inoperable.

The penetrations in question appear to have been open since original plant construction.

Improvements have been made to the fire protection program at the Duane Arnold Energy Center to help ensure fire penetrations are adequately inspected.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

FACILITY NAME (1) Duane Arnold Energy Center	DOCKET NUMBER (2) 05000331	LER NUMBER(S)			PAGE(S)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		92	- 007	- 00	2	OF 6

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

I. DESCRIPTION OF EVENT:

On May 7, 1992, while performing maintenance on an instrument air pipe, its fire barrier penetration was found unsealed. The penetration is circular in shape, approximately 5 inches in diameter and penetrates a concrete wall which separates the turbine building from the heater bay. It is positioned approximately 14 inches above a cable tray. The tray is located 17 feet above the floor. Several electrical cables are run through the cable tray. The penetration has a metal sleeve through it with the instrument air pipe inside the sleeve. Gaps of approximately 1 1/2 inches exist between the concrete wall and outer wall of the sleeve and between the inner sleeve wall and the air pipe.

Upon discovery of the initial unsealed penetration, a limited number of additional fire barrier inspections were performed that included 280 penetrations. Five additional unsealed penetrations were identified. The penetration descriptions are listed below:

1. A circular penetration, approximately 6 inches in diameter, (containing a 4 inch floor drain pipe) penetrating the concrete wall between the heater bay and the turbine building. It is approximately 6 feet from a ladder type steel cable tray. The penetration has a metal sleeve through it with the drain pipe inside the sleeve. Gaps of approximately 1 1/2 inches exist between the concrete wall and the outer wall of the sleeve and between the inner sleeve wall and the drain pipe. The penetration is located approximately 16 feet above the floor.
2. A 1 1/2 inch rubber hose was cast in the concrete wall that separates the division I emergency service water pump room and the circulating water pump room. The penetration is located approximately 15 feet above the floor.
3. The turbine building sample sink cooler cooling water supply and return pipes penetrate the concrete wall that separates the heater bay and the turbine building. The penetrations are circular in shape, approximately 3 inches in diameter with metal sleeves. Gaps of approximately 1/2 inch exist between the concrete wall and the outer sleeve walls and between the inner sleeve walls and the piping. The penetrations are positioned approximately 18 inches above a cable tray. The cable tray is located 16 feet above the floor.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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

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

4. A circular penetration, approximately 3 inches in diameter, containing a 2 inch conduit penetrates the concrete wall that separates the heater bay and the turbine building. The penetration is positioned above a personnel airlock.
5. A rectangular penetration (expansion gap between walls), approximately 2 inches wide by 12 feet long, exists between the concrete boundary walls separating the south heater bay and the south turbine building. The penetration is positioned above a personnel airlock.

The five barriers are considered "C" barriers, for the purpose of fire hazard analysis. When barriers are used to meet Appendix R separation requirements, a rated fire barrier is required. At DAEC this is accomplished using a rated fire barrier or more than one type "C" barrier. A type "C" barrier is a barrier which is not rated but is capable of being an effective firestop.

It is acceptable for "C" barriers to have unsealed penetrations provided existing fire barrier evaluations take the unsealed portions into account. These penetrations had not been previously identified as unsealed and therefore were not included in the existing evaluation.

Technical Specification 3.13.F.1 states: "All fire barrier penetration seals protecting safety-related areas shall be intact." If the specification cannot be met: "Verify operability of the fire detectors on at least one side of the non-functional fire barrier and establish an hourly fire watch patrol." As a fire watch had not been in place to compensate for the degraded barrier as required by Technical Specifications, a condition prohibited by Technical Specifications existed.

II. CAUSE OF EVENT:

The systems associated with the penetrations were installed during original plant construction indicating the penetrations have been open since that time. There are no physical indications that the penetrations were ever sealed. The cause of the penetrations being left unsealed appears to be insufficient procedural controls during original construction installation.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

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

A review of previous fire barrier penetration inspection surveillances determined that four of the six unsealed penetrations were not included in the surveillance test database, and therefore were not discovered on previous inspections. It is suspected that the physical location of these penetrations was a major contributor to not identifying them during the walkdown which created the test database in 1985. While viewing the barriers from the floor, five of the penetrations are hidden from view or difficult to identify and the remaining penetration is colored such that it appears to be completely sealed. This represents a weakness in the initial test preparation.

III. ANALYSIS OF EVENT:

The barriers in question are classified as type "C" fire barriers. When "C" barriers are used to meet 10 CFR Appendix R requirements, more than one "C" barrier must exist between fire zones containing different divisions of safe shutdown equipment.

An engineering analysis of the six penetrations identified that less than two "C" barriers existed between fire zones containing different divisions of safe shutdown equipment due to these unsealed penetrations. However, the analysis determined it would be highly unlikely for a fire in the affected fire zones to propagate to areas containing opposite divisions of safe shutdown equipment. The unlikeliness of this event is based on the relative locations of the penetrations to combustibles and installed fire detection and suppression systems and physical distance between safety related divisions. This event had a minimal effect on the safe operation of the plant.

IV. CORRECTIVE ACTIONS:

Following discovery of the unsealed penetrations, a fire watch was initiated for the affected fire zones in accordance with Technical Specifications until final disposition of the barrier penetrations is completed.

The fire penetration inspection program inspects approximately 35% of the penetration seals per operating cycle with 100% of the penetration seals inspected within a five year period. The fire barrier penetration inspection surveillance process has been improved to help ensure fire penetrations are better identified and inspected. At this time 35% of penetration seal inspections have been completed under the improved program. The five additional unsealed penetrations were discovered in fire zones that had not been inspected with the enhanced program.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50 8 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

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Improvements to the fire barrier penetration surveillance include:

- A) The surveillance test directs the use of ladders and scaffolding so that penetrations and fire barriers can be thoroughly viewed and inspected. The surveillance also requires inspection of entire barriers to identify penetrations not previously included.
- B) The surveillance test provides better guidance on initiating corrective maintenance, fire protection impairment requests, fire watches, and requires notification of the fire marshal when a seal is found to be unsatisfactory.
- C) The surveillance requires submittal of updates to the fire protection engineer whenever additional penetrations or modifications to seals are identified.
- D) An engineer is now required to assist in performance of the penetration inspections to address questions on seal acceptability as they arise.

As a precautionary measure an hourly roving fire watch has been initiated in all accessible technical specification required fire zones other than those fire zones recently inspected with the new fire barrier penetration inspection enhancements. The fire watch will be maintained until inspections of the remaining accessible fire zones are completed. Review of the current inspection schedule and options for accelerating fire barrier inspections will be completed by August 15, 1992. The results of this review will be communicated in an LER supplemental report to be submitted by September 4, 1992.

VI. ADDITIONAL INFORMATION:

A. Previous Similar Events

A review of DAEC LERs since 1984 identified two other events involving inadequate fire penetration seals have been reported (LER 92-003 & 90-009).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 36.8 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

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TEXT (if more space is required, use additional NRC Form 366A & 17)

B. EIIS SYSTEM AND COMPONENT CODES

Systems: FA - Cable Raceway System
 NM - Turbine Building
 MK - Essential Service Water Pump Building
 IC - Fire Detection System
 KP - Fire Protection System (Water)

Components: PEN - fire barrier penetration

This event is being reported pursuant to 10CFR50.73 (a)(2)(i).