

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Davis-Besse Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 4 6 1				PAGE (3) 1 OF 0 4		
TITLE (4) Inoperable Fire Detection Due to Inadequate Design																
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)			
0	4	19	88	88	0 1 3	0	0	0 5 8 8					0 5 0 0 0			
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																
OPERATING MODE (9)			20.402(b)				20.406(e)				50.73(a)(2)(iv)				73.71(b)	
POWER LEVEL (10) 0 1 0 1 0			20.406(a)(1)(i)				50.36(a)(1)				50.73(a)(2)(v)				73.71(e)	
			20.406(a)(1)(ii)				50.36(a)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 365A)	
			20.406(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)					
			20.406(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)					
			20.406(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)					
LICENSEE CONTACT - OR THIS LER (12)																
NAME C. S. Gordon, Senior Nuclear Specialist, Technical Planning										TELEPHONE NUMBER 411 19 214191-15101010						
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						
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)																
<p>On April 19, 1988, following the review of the Fire Detection and Sprinkler Systems it was determined that the deficiencies identified with the detection systems in the Roving Area, the Heater Bay Area and in the Turbine Building were significant enough to require compensatory measures. With these deficiencies and other related detection systems inoperable, thirteen barriers were required to have continuous fire watches instead of roving fire watches. The deficiencies have existed since the fire barriers were declared inoperable on September 6, 1986. Additionally, the preaction sprinklers in the Turbine Building were inoperable as they could not be actuated by the inoperable detectors. This review also identified that the detector in the Low Voltage Switchgear Room is operable for general fire protection but is not capable of initiating automatic closure of door 427A due to the location of the detector relative to the door. This condition has existed since this automatic closure device was installed January 9, 1984.</p> <p>This occurrence was caused by an inadequate design which did not fully implement the applicable fire codes.</p> <p>Eleven fire barriers were inspected and returned to operable status in March 1988 and continuous fire watches were initiated for the remaining two inoperable fire barriers. The roving fire watch required due to the inoperable closing device on door 427A was already in place due to other deficiencies. The preaction sprinklers were converted to a wet-pipe system by tripping their deluge valves. The design process has been significantly improved since the original design and installation of these detection systems and should prevent recurrence of this type of design problem.</p>																
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Description of Occurrence:

In response to a request for additional information from the NRC, Toledo Edison conducted a review of the fire detectors and sprinklers in areas containing redundant safe shutdown equipment required in the event of a fire. On April 19, 1988, Toledo Edison determined that deficiencies in certain fire detector zones (FDZ) were significant enough to impair the adequate operation of the FDZs discussed further below. The deficiencies were documented on Potential Condition Adverse to Quality (PCAQ) Report 88-0302. During initial review of this PCAQ, these conditions were determined not to be reportable. However, during a subsequent review of this PCAQ on June 3, 1988, it was determined that these conditions should have been reported under 10CFR50.73(a)(2)(i)(B). Therefore, this report is being submitted in excess of 30 days from the event date. Additionally, a letter sent to the NRC dated May 23, 1988, serial 1497, describes these deficiencies in detail.

Low Voltage Switchgear Room 428 - FDZ428

The review identified that the detectors for Room 428 were adequate for general area fire detection and are operable. However, the detector used to actuate the automatic door closing mechanism for Door 427A on the Room 428 side of the door did not meet NFPA-72E - 1978 requirements as it was located too far from the door. Therefore, this door cannot be considered operable when held open. From January 9, 1984, the original installation of the automatic closing device, to September 6, 1986, no fire watch was established as required by Technical Specification 3.7.10. This condition is reportable in accordance with 10CFR50.73(a)(2)(i)(B).

Turbine Building Heater Bay and Roof Truss Areas - Panels: C3501, C4501, C5501, C5106, C6501, C7501, C7502

The review identified that the detectors for the Turbine Building Heater Bay and Roof Truss Areas are not adequate for general area detection according to NFPA-72E - 1978. The detectors are installed on the bottom of beams, under grated ceilings, and their coverage is inadequate. Although these fire detectors are not addressed by the Davis-Besse Technical Specifications, the fire detectors were the only detection available on either side of inoperable fire barriers 425-E/430-W, 430-N/429A-S, 501DC-E/604W, 501DC-E/707W and 327-N/326-S. When these fire barriers were declared inoperable on September 6, 1986, a continuous watch on at least one side of these inoperable fire barriers was required by Technical Specification 3.7.10. Between September 6, 1986 and April 19, 1988 hourly fire watch patrols, rather than continuous watches were established for these barriers. This condition is reportable in accordance with 10CFR50.73(a)(2)(i)(B).

These detectors also actuate the Turbine Building Heater Bay and Roof Truss Areas preaction sprinklers. The detectors are rated at 190 Degrees F while the sprinklers at the lowest level are rated at 165 Degrees F. The heat detectors should actuate at a lower temperature than the sprinklers.

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APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

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TEXT (If more space is required, use additional NRC Form 305A's) (17)

Although the detectors and the preaction sprinklers are not required by the Davis-Besse Technical Specifications, they were installed to satisfy License Condition 2.C.(4). This installed condition is contrary to the License Condition and is being voluntarily reported.

Turbine Building - Areas - TB565, TB585, TB603

The review identified that the detectors for the Turbine Building elevations below the operating floor of the turbine are not adequate for general area detection according to NFPA-72E - 1978. These detectors are installed on the bottom of beams, under grated ceilings, and their coverage area is inadequate. Although this detection is not addressed by the Davis-Besse Technical Specifications, the fire detectors were the only detection available on either side of inoperable Technical Specification fire barriers EL2-E/431-W, 123-E/252-W, 327-E/334-W, EL2-E/334-W, 429A-E/431W, 329-E/334-W and 422-E/431-W. When these fire barriers were declared inoperable on September 6, 1986, a continuous fire watch on at least one side of these inoperable fire barriers was required by Technical Specification 3.7.10. Between September 6, 1986 and April 19, 1988, hourly fire watch patrols, rather than continuous watches, were established for these inoperable fire barriers. This condition is reportable in accordance with 10CFR50.73(a)(2)(i)(B).

These detectors also actuate Turbine Building preaction sprinklers. The detectors are rated at 190 degrees F while most of the sprinklers are rated at 165 degrees F. The heat detectors should actuate at a lower temperature than the sprinklers.

Although the detectors and the preaction sprinklers are not required by Davis-Besse Technical Specifications, they were installed to satisfy License Condition 2.C.(4). This installed condition is contrary to the License Condition and is being voluntarily reported.

FDZ-412A - Robing Area

The review identified several deficiencies within FDZ-412A. Four small rooms in this area are not provided with detection while the detectors in three other rooms are located too close to supply air registers to operate properly according to NFPA-72E. Although this FDZ is not addressed by the Davis-Besse Technical Specifications, this FDZ is the only detection available on either side of inoperable Technical Specification fire barrier AB2-E/418-W. When this fire barrier was declared inoperable on September 6, 1986, a continuous fire watch on at least one side of this inoperable fire barrier was required by Technical Specification 3.7.10. Between September 6, 1986 and April 19, 1988, hourly fire watch patrols, rather than continuous fire watches, were established for this inoperable fire barrier.

This condition is reportable in accordance 10CFR50.73 (a)(2)(i)(B).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Davis-Besse Unit 1	0500034688	88	013	00	04	OF 04

TEXT (If more space is required, use additional NRC Form 385A's) (17)

Designation of Apparent Cause of Occurrence:

This occurrence was caused by an inadequate design which did not fully implement the applicable fire codes.

Analysis of Occurrence:

With the detection system for these areas impaired and a roving fire watch instead of a continuous fire watch, the potential existed for a fire to have started and increased in magnitude prior to the fire being detected. The probability of this was low because equipment operators routinely transversed these areas during their Door 427A would have functioned, however the potential existed for a fire to increase in magnitude prior to the automatic door closer being actuated.

Corrective Action:

Continuous Fire Watches were established where required on April 19, 1988.

An hourly fire watch was established for Room 428 on September 6, 1986 due to other deficiencies with the associated fire barrier. The new deficiency for door 427A was added to the deficiency list which describes why a roving fire watch is required.

The preaction sprinkler systems have been converted to wet-pipe sprinkler systems by tripping the deluge valve, thereby eliminating the need for the operation of the FDZs. Hourly fire patrols of these converted systems have been established and will remain in place until flow alarms are installed.

The design process has been significantly improved since the design and installation of these detection systems and should prevent recurrence of this type of design problem.

Failure Data:

This is the second report of inadequate design for a fire detection system.

REPORT NO: NP-33-88-14

PCAQ NO(s): 88-0302

July 5, 1988



Log No: KA88-0279
NP-33-88-14

Docket No. 50-346
License No. NPF-3

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

Gentlemen:

LER No. 88-013
Davis-Besse Nuclear Power Station Unit No. 1
Date of Occurrence April 19, 1988

Enclosed is Licensee Event Report 88-013, which is being submitted in accordance with 10CFR50.73 to provide written notification of the subject occurrence.

Yours truly,

Louis F. Storz
Plant Manager
Davis-Besse Nuclear Power Station

LFS/ed

cc: Mr. A. Bert Davis
Regional Administrator
USNRC Region III

Mr. Paul Byron
DB-1 NRC Resident Inspector