

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 3
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TITLE (4)  
Improper Crimps on Safety Related Electrical Cable Lugs

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		
09	09	88	88	01	9	09	14	88	DOCKET NUMBER(S) 0 5 0 0 0		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

OPERATING MODE (9) 6	20.402(b)	20.405(e)	50.73(a)(2)(iv)	73.71(c)
POWER LEVEL (10) 0	20.405(a)(1)(ii)	50.38(a)(1)	X 50.73(a)(2)(v)	73.71(e)
	20.403(a)(1)(ii)	50.38(a)(2)	50.73(a)(2)(vi)	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)	10CFR21
	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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME C. S. Gordon, Senior Nuclear Specialist	TELEPHONE NUMBER AREA CODE: 4119, 2491-5010
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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
B	E	J C IOIN	WIL 2 IO	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On May 16, 1988, loose cable termination lugs were discovered while performing maintenance on breaker 0216 in the DC Low Voltage Switchgear MCC2. Subsequent inspection of the DC Low Voltage Switchgear MCC1 revealed a similar condition for other connectors. An inspection was initiated for low voltage DC Switchgear MCC1 loose connections on both DC MCC1 and DC MCC2. During a seismic event, this condition could potentially have caused a loss of both vital DC buses which would have resulted in loss of DC control power to essential AC distribution breakers, and the inability to start the Emergency Diesel Generators. The loose connections were apparently caused by poor workmanship during the initial manufacturing process. All loose defective lugs have been replaced and properly crimped. This condition is being reported in accordance with 10CFR21 and 10CFR50.73(a)(2)(v).

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		88	019	00	02	OF	03

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

DESCRIPTION OF OCCURRENCE:

On May 16, 1988, with the reactor defueled, loose cable lugs were discovered while performing maintenance on breaker D216 in the DC Low Voltage Switchgear MCC2 (Westinghouse Electric Corporation Type W MCC). Subsequently further investigation revealed that the crimps for these cable lugs had been improperly performed by the manufacturer. This equipment was installed during initial construction in 1972. An inspection was initiated in July, 1988, for all like configurations in the two DC Motor Control Centers (DC MCC1 and DC MCC2). This inspection was completed in August, 1988, and identified 32 lugs which were loose. Four of these lugs were sent to the manufacturer for analysis. On September 1, 1988, the manufacturer responded that these defective lugs would perform their intended function. Subsequent evaluation performed by Toledo Edison determined that during a seismic event, there is a possibility of a significant increase in contact resistance between the lug and cable. This would produce a voltage reduction at the downstream (load side) of the terminals, and would also create a local temperature rise due to I squared R heating. The process of arcing and the elevated temperature can cause pitting and accelerated oxidation which will aggravate the high resistance condition and lead to further voltage drop and increased heating, which can ultimately lead to failure of the connection. The voltage reduction and/or open circuit could progress to a point sufficient to cause a loss of both vital DC buses. This would have disabled DC control power to essential AC distribution breakers, and prevented starting of the Emergency Diesel Generators. This condition is being reported in accordance with 10CFR21 and 10CFR50.73(a)(2)(v) as an event which alone could have prevented the fulfillment of a safety function. This condition was verbally reported to the NRC (Director, Office of Nuclear Reactor Regulation) by P. C. Hildebrandt, Engineering General Director, under 10CFR21 on September 9, 1988.

APPARENT CAUSE OF OCCURRENCE:

This occurrence was apparently caused by poor workmanship by the manufacturer during the manufacturing of these motor control centers.

ANALYSIS OF OCCURRENCE:

During a seismic event, it is postulated that the likelihood of a significant increased resistance and a temperature rise at the loose connections would be increased to a point that a reduction in voltage and deterioration of the copper conductor could occur. This could have caused a loss of both vital DC buses which would result in a loss of breaker control power and the ability to start the Emergency Diesel Generators. However, the probability of this postulated failure is low because the cables are relatively thick, enclosed at both ends, and some force was required to separate the cable and its lug. A visual inspection of these loose connections indicated that no overheating had occurred. Therefore, since there were no indications of overheating and the probability of failure during a seismic event is considered low, this condition did not significantly compromise plant safety.

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

CORRECTIVE ACTIONS:

The loose lugs on DC-MCC1 and DC-MCC2 were replaced and properly crimped. This was completed on August 15, 1988, in accordance with the guidance provided in MWOs 7-88-0359-01 through 7-88-0359-09.

FAILURE DATA:

This is the first report of loose lugs in vital DC Motor Control Centers.

REPORT NO. NP-33-83-24

PCAQR 88-0359

September 14, 1988



Log No: KA88-0288  
NP-33-88-24

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

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

Gentlemen:

LER No. 88-019  
Davis-Besse Nuclear Power Station Unit No. 1  
Date of Occurrence September 9, 1988

Enclosed is Licensee Event Report 88 019, which is being submitted in accordance with 10CFR21 to provide 5 day written notification and 10CFR50.73(a)(2)(v) to provide 30 day written notification of the subject occurrence.

Yours truly,

A handwritten signature in cursive script, appearing to read 'Louis F. Storz'.

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

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