

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Davis-Besse Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 0 1 OF 0 3									
TITLE (4) Potential Design Deficiencies in Auxiliary Feedwater Pump Turbine Governor																			
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	9	2	6	8	6	8	6	0	3	8	0	0	1	0	0	1	8	6	0 5 0 0 0 0
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																	
5		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)					
POWER LEVEL (10)		20.405(a)(1)(i)				50.36(c)(1)				X 50.73(a)(2)(v)				73.71(c)					
0 0 0		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)				10 CFR21					
		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									
Henry W. Stevens Extension 4365										AREA CODE 4 1 1 9 2 4 9 1 - 1 5 1 0 1 0									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs									
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)				MONTH DAY YEAR					
X YES (If yes, complete EXPECTED SUBMISSION DATE)										NO				1 1 1 3 1 0 8 6					

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

The Auxiliary Feedwater Pump Turbine (AFPT) 1-2 governor speed setting motor was found to be drawing abnormally high current. Arcing with accompanying current spikes and wisps of smoke were observed. Engineering and vendor evaluation determined that this may indicate motor failure and the speed setting motor was therefore considered inoperable. Loss of the speed setting motor prevents automatic control or control from the control room of the AFPT speed which is used to control feed flow to the steam generators. The AFPT 1-1 governor is identical so both Auxiliary Feedwater trains were affected.

The root cause of the inoperability is not currently known and is being investigated. The vendor has postulated that since the motors are a non-sealed design located in an oil mist/spray environment, oil is entering the motor producing motor degradation.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Davis-Besse Unit #1	0500034686	—	038	—	00	02	OF 03

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

Description of Occurrence:

On September 26, 1986 Toledo Edison (TED) Engineering determined that the Auxiliary Feedwater System, AFW, (BA), Turbine Governor, MK0031/32, (65) speed setting motors should be considered inoperable. This was based on information supplied by the governor vendor. The Auxiliary Feedwater Pump Turbine (AFPT) Governor is a Woodward Governor Company model PGG with speed setting motor part #36627-23 supplied to TED by Terry Corporation for use on the AFPT's. The plant was in Mode 5 (Cold Shutdown) so the AFW system was not required and in a shutdown lineup. The motor problem was discovered during inspection of the AFPT 1-2 governor by a Woodward service representative and TED Engineering. When the governor upper housing cover was removed and the speed setting motor was operated, light wisps of smoke were observed emitting from the vent holes in the motor casing. Current measurements taken showed amperage of 150ma to 250ma with intermittent higher spikes. Measurements taken on the spare governor for comparison were 70-80ma with no spiking. The AFPT 1-2 speed setting motor was removed and the no load current was measured at 150ma. Arcing and associated current spikes were observed. Woodward stated that 114ma at no load is the maximum acceptable current and that continued operation of the motor should not be relied upon. The AFPT 1-1 governor is identical in design. Failure of the speed setting motor would result in loss of the ability to control AFPT speed in automatic ('Auto Essential') or in manual from the control room. This results in the loss of the ability to control feedwater flow to the steam generator from the control room. Only local manual control of the AFPT would be available. This event is being reported per 10CFR50.73(a)(2)(v) and as a potential 10CFR21 report.

Designation of Apparent Cause of Occurrence:

The root cause of the inoperability is not currently known and is being investigated. The speed setting motor is not a sealed design and is located in an oil mist/spray environment. Once the investigation is completed, a revision to this report will be submitted. Woodward Governor Company has postulated that oil and/or contaminants may be entering the motor through vent holes in the motor and causing premature degradation of the motor.

Analysis of Occurrence

The Woodward PGG Governor was installed on AFPT 1-2 with the system in an operable status from January 1985 to June 1985. The speed setting motor operated satisfactorily during this period based on results of surveillance testing. The PGG governor was installed on AFPT 1-1 during the current outage and the system has not yet been required to be operable.



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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   6	—   0   3   8	—   0   0	0   3	OF	0   3

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The defect had no immediate safety consequence at the time of discovery, because the Plant was in Mode 5 (Cold Shutdown) and the AFW System is not required to operate.

Had the defect gone undetected and the speed setting motor failed during a higher plant mode, a degradation in the reliability of the AFW System could have existed. Motor failure would have resulted in loss of AFW flow control. Operator action would be required to either minimize an overcooling transient or initiate feedwater flow to the steam generator for decay heat removal. Local normal control of AFPT governor would be available as well as the newly installed Motor Driven Feedwater Pump to supply Auxiliary Feedwater to mitigate the consequences of the speed setting motor failure.

Corrective Action:

Woodward Governor Company supplies speed change motors which are modified to resist oil penetration and vibration. These modified motors will be qualified for use and installed in the AFPT governors. A detailed inspection and testing will be performed by Woodward to identify the root cause of the AFPT 1-2 speed setting motor inoperability. Terry Corporation was informed of the speed setting motor failure. Northeast Utilities was also informed of the problem on September 27, 1986 when Terry Corporation notified TED that Millstone 3 has a PGG Governor in that facility.

A review of all other governors at Davis-Besse were performed and none of the others have open speed setting motors in an oil mist/spray environment.

Failure Data:

Previous failures and problems with the AFPT governors have been reported in LER 77-18, 77-61, 80-03, 81-45, 83-40, and 85-07.

REPORT NO: NP-33-86-49

PCAQ NO(s): 86-412





October 1, 1986

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

Gentlemen:

LER No. 86-038  
Davis-Besse Nuclear Power Station Unit No. 1  
Date of Occurrence September 26, 1986

Enclosed is Licensee Event Report 86-038 which is being submitted in accordance with 10CFR21, to provide 5 day written notification of the subject occurrence. This report is also being submitted in accordance with 10CFR50.73.

Yours truly,

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

LFS/ed

Enclosure

cc: Mr. James G. Keppler  
Regional Administrator  
USNRC Region III

Mr. Paul Byron  
DB-1 NRC Resident Inspector