

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Davis-Besse Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 4 6	PAGE (3) 1 OF 0 3
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TITLE (4)
Reactor Trip During Zero Power Physics Testing

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 1	1 5	8 5	8 5	0 0 2	0 0 0	1	4	8 5			0 5 0 0 0
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OPERATING MODE (9) 2		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 1 0 0	20.402(b)	20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)						
	20.406(a)(1)(i)	50.36(e)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(e)						
	20.406(a)(1)(ii)	50.36(e)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 386A)						
	20.406(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)							
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)							
	20.406(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)

NAME Stan Batch	TELEPHONE NUMBER	
	AREA CODE 4 1 9	2 5 9 - 5 0 0 0

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
A	J A			N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On January 15, 1985, the Station was performing the Zero Power Physics Testing with the reactor in a critical condition. It was discovered the Integrated Control System was controlling Steam Generator #1 level below the desired setpoint. The main feedwater valves were placed in hand to allow adjustments in the Integrated Control System low level limit control. Steam Generator #1 level continued to decrease slightly down to the steam generator low level Steam and Feedwater Rupture Control System trip setpoint. This actuated the Anticipatory Reactor Trip System which deenergized the control rods.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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

Description of Occurrence: Davis-Besse Unit 1 was in the process of performing the Zero Power Physics Testing with the reactor in the critical condition. Since the Integrated Control System (ICS) was not controlling at the 35 inch low level limit setpoint, Instrument and Control (I&C) personnel were requested to investigate. The Control Room operators placed the main feedwater controls in manual to prevent the investigation from affecting the steam generator levels. The low steam generator level annunciator (30 inches) had been previously received but the steam generator levels were not raised in an effort to maintain a constant reactor coolant system (RCS) temperature for the physics testing. The level in the No. 1 Steam Generator slowly decreased until reaching the Steam and Feedwater Rupture Control System (SFRCS) trip setpoint (approximately 27 inches). A full SFRCS trip occurred at 12:28:30 hours. The SFRCS actuation caused an anticipatory reactor trip of the control rod drive trip breakers, which deenergized the control rods, allowing them to drop into the core.

Since the reactor was not at power, the reactor trip did not cause any significant plant transient. However, several problems occurred with the No. 1 Auxiliary Feed Pump operation. The No. 1 Auxiliary Feed Pump suction transferred to the Service Water System at approximately 30 seconds after the SFRCS actuation. At approximately four minutes after the trip, the Control Room operator noticed the abnormal supply to the auxiliary feed pump from the Service Water System and closed the service water supply. However, since the condensate storage tank supply had been isolated by the low suction pressure switch, this action inadvertently isolated the supply water to the No. 1 Auxiliary Feed Pump. The automatic low-low suction pressure trip closed the steam isolation valve which shut down the No. 1 Auxiliary Feed Pump Turbine.

Since the reactor had not been at power for over four months due to the refueling outage, there was no significant decay heat to be removed. Steam Generator 1 level was adequate until normal feedwater was restored at approximately 1240 hours. The No. 2 Auxiliary Feed Pump operated properly and maintained proper levels in the No. 2 Steam Generator throughout the event.

Designation of Apparent Cause of Occurrence: The cause of this occurrence is the steam generator level decreasing to the low steam generator SFRCS trip setpoint while in manual. Level control was in manual to allow the I&C technicians to investigate the cause of the lower than desired control while in automatic. Items contributing to the cause of this event was the desire to maintain a constant RCS temperature during physics testing and the small margin between the low level control setpoint and the SFRCS low level trip setpoint.

Analysis of Occurrence: The transient from a reactor trip at a zero power condition is not a substantial plant upset. Since no power was being produced by the core, insertion of the control rods did little other than terminate testing. Adequate steam generator levels were maintained at all times during the transient.

During any transient where significant decay heat was present, the isolating of the water supply to the auxiliary feed pump would be readily apparent to the Control

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U.S. NUCLEAR REGULATORY COMMISSION

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Room operator from his decreasing steam generator levels. Control switches are located in the Control Room to allow the operator to restore the supply water from either source to the Auxiliary Feed Pump.

The automatic transferring of the Auxiliary Feed Pump to the Service Water supply does not cause a safety concern since the Auxiliary Feedwater System is designed to operate from either source of water.

Corrective Action: The Auxiliary Feed Pump 1 strainer was blown down to insure no significant blockage was present. The No. 1 Auxiliary Feed Pump was then tested repeatedly on the test flowpath, and no additional transfers occurred. Per Maintenance Work Order 1-85-0096, the calibration of the low suction pressure transfer switches was checked and reset to the low end of the band to provide additional margin from inadvertent transfers.

An investigation is underway to determine the cause of the automatic transfers to the Service Water supply. It appears that this is due to a dip in suction pressure when the Auxiliary Feed Pump is accelerating up to speed. The review has also determined it is possible under some specific circumstances for the Auxiliary Feed Pumps to cavitate for short periods of time. Although this short duration cavitation has been determined to be acceptable, further review is being performed to determine if it is possible to eliminate all cavitation.

Toledo Edison is reviewing the possibility of installing a time delay in the transfer circuitry to prevent the transfer from a momentary low suction pressure. One other change under review is the opening of the breaker for the condensate storage tank supply valve to insure the auxiliary feed pump has a supply of water even if the service water supply is inadvertently isolated.

Enhancements to the SFRCS Control Room layout are currently being reviewed in the Control Room Design Review program. Modifications under review would assist the operator in determining that the Auxiliary Feedwater System is correctly lined up and operating as designed. This event was also reviewed with the Control Room operator present and will be reviewed with each operating shift.

Failure Data: Reactor trips during performance of the Zero Power Physics Testing have not occurred previously at Davis-Besse. Although there have been inadvertent SFRCS actuations in previous Davis-Besse Unit 1 transients, causes as identified in this report do not appear to have been repetitive.

Report No: NP-33-85-03DVR No(s): 85-020



February 14, 1985

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File: RR 2 (NP-33-85-03)

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

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

Gentlemen:

LER No. 85-002
Davis-Besse Nuclear Power Station Unit 1
Date of Occurrence: January 15, 1985

Enclosed is Licensee Event Report 85-002 which is being submitted in accordance with 10CFR50.73, to provide 30 day written notification of the subject occurrence.

Yours truly,

Stephen M. Quennoz
Plant Manager
Davis-Besse Nuclear Power Station

SMQ/ljk

Enclosure

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

Mr. Walt Rogers
DB-1 NRC Resident Inspector

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