

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 03			
TITLE (4) Turbine/Reactor Trip During Turbine Control Valve 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 6	0 2	8 5	8 5	0 1 1	0 0	0 7	0 2	8 5							0 5 0 0 0								
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)																				
1			20.402(b)				20.405(e)				50.73(a)(2)(iv)				73.71(b)								
POWER LEVEL (10)			20.405(a)(1)(i)				50.36(e)(1)				50.73(a)(2)(v)				73.71(a)								
0 8 5			20.405(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 365A)								
			20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)												
			20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)												
			20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)												
LICENSEE CONTACT FOR THIS LER (12)																							
NAME										TELEPHONE NUMBER													
Stan N. Batch										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 NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS				
B	S J	S C	G 0 8 4	Y																			
X	B A	6 5	W 2 9 0	Y																			
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)																							

During main turbine control valve testing a high turbine vibration signal tripped the turbine. The Anticipatory Reactor Trip System tripped the reactor. Within four seconds after the turbine/reactor trip, both main feedwater pumps tripped. This loss of main feedwater caused steam generator levels to decrease to the Steam and Feedwater Rupture Control System low steam generator level setpoint at approximately 2.5 minutes after the turbine/reactor trip. The Steam and Feedwater Rupture Control System operated correctly and both auxiliary feedpumps operated to supply adequate feedwater for the remainder of the transient.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1) Davis-Besse Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 4 6 8 5 - 0 1 1 - 0 0 0 2 OF 0 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

Description of Occurrence: Davis-Besse Unit 1 was operating at 85% of full power to allow main turbine governor valve (JI) testing. Periodic test PT 5193.01, Main Turbine Steam Valves, was in progress. The No. 4 Turbine Governor Valve had been tested satisfactorily. When the No. 3 Main Turbine Governor Valve was reopened as part of the test, a high turbine vibration signal tripped the main turbine. The Anticipatory Reactor Trip System, ARTS, tripped the reactor. The No. 1 Main Feedpump turbine tripped at approximately one second after the turbine/reactor trip. At approximately two seconds after the turbine/reactor trip, a spurious half trip on low steam generator level was received on Steam and Feedwater Rupture Control System, SFRCS, Channel 2. The SFRCS half trip had little effect on the plant transient because it shuts normally closed valves. The No. 2 Main Feedpump Turbine tripped at approximately three seconds after the turbine reactor trip.

Steam generator levels decreased to the low level SFRCS setpoint (26.5 inches) at approximately one minute and forty seconds after the turbine/reactor trip. The SFRCS responded correctly and aligned each auxiliary feedpump to its respective steam generator. Steam generator levels were adequately maintained by the auxiliary feedpumps; however it was noted in the post trip review that the No. 1 Auxiliary Feedpump had responded at less than its full capacity. The pump did supply approximately 600 gallons per minute during the initial start.

As the decay heat load decreased, the operators used the electric driven Startup Feedpump to provide feedwater. At approximately three hours after the turbine/reactor trip, while removing the No. 1 Auxiliary Feedpump from operation, problems were experienced with the Auxiliary Feedpump No. 1 speed control. This did not affect the plant transient as the Start Up Feedpump was supplying the required feedwater.

Designation of Apparent Cause of Occurrence: The cause of this turbine/reactor trip was the main turbine tripping on high vibration when the No. 3 Turbine Control Valve was reopened. The turbine vendor (GE) has acknowledged that testing the turbine governor valves or stop valves can cause a momentary high vibration. The cause of the loss of the Main Feedpump turbines after the trip could not be positively identified. Several deficiencies with the main feedpumps were corrected as noted in the corrective actions.

The cause of the No. 1 Auxiliary Feedpump problems was determined to be a failure of the Bodine motor (armature winding was open) plus a bent roll pin which may have been caused by a slip clutch that would not operate properly.

The cause of the spurious half tripping of the SFRCS channel has not yet been determined.

Analysis of Occurrence: The reactor was tripped by the ARTS at the time of the high vibration signal that occurred on the main turbine. The SFRCS system actuated properly on low steam generator level. The Auxiliary Feedwater System maintained appropriate steam generator levels throughout the event. The response of the primary system was as expected from a reactor trip at approximately 85% of full power. Neither the power operated relief valve nor the primary safety relief valves

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were challenged. Adequate subcooled margin for the reactor coolant system existed at all times. The SFAS was not actuated.

Corrective Action: Davis-Besse has modified the Main Turbine Steam Valve Test to include bypassing the high vibration trips during the test.

The Auxiliary Feedpump No. 1 Bodine motor and the roll pin were replaced. The turbine governor clutch was disassembled, the Belleville washers were lubricated and the clutch reassembled. Proper operation of the No. 1 Auxiliary Feedpump was verified by the surveillance testing. The No. 1 Auxiliary Feedpump was declared operable at 2153 hours on June 3, 1985.

A detailed investigation was made into the cause of the loss of the main feedwater pumps after the trip. Station personnel worked with a vendor representative of the new main feedpump governor control (GE) for approximately five days. It was determined the rapid feedwater reduction main feedpump speed setpoint was higher than required. The main feedpump target voltage was reduced. Strip chart recorders were connected to all the electrical main feedpump trips on Main Feed Pump Turbine 1-1 for further analysis. The only main feedpump indication which was not monitored was the overspeed trip since it is a mechanical trip only. During the main feedpump trouble shooting it was determined the No. 1 Main Feedpump turbine had one of its main oil pump discharge check valves sticking. The valves were cycled several times by operating the oil pumps and the sticking would not reoccur. During the plant startup after both main feedpumps were placed in operation, one main feedpump was left in the manual control mode so that if a trip did occur, at least one main feedpump should be available.

A detailed review of the half trip of the SFRCS Channel was conducted. Troubleshooting performed after the trip on June 2 determined that a sequence of events point may have been defective. Subsequent to the event, Surveillance Test ST 5031.14 was successfully conducted on SFRCS Channels 2 and 4 high/low steam generator level trips to verify operability. The spurious half trip has only been noted to come in after a reactor trip and not during any other circumstances. It is suspected that transient pressure oscillations following the trip are resulting in spurious level spikes. It is believed these level spikes are now being sensed by the SFRCS because of modifications to the system made during the 1984 Refueling Outage which decreased the system response. Engineering has been requested to evaluate the possibility of adding a time delay to the low level trip similar to the SFRCS steam to feedwater differential pressure trip which had caused similar spurious actuations (prior to implementation of Facility Change Request 80-075 during the 1980 Refueling Outage.)

Failure Data: After the reactor tripped on April 24, 1985, the No. 1 Main Feedpump turbine tripped. The No. 2 Main Feedpump turbine had remained available after the reactor trip on April 24. On April 24, a false half-trip did also occur on the SFRCS Steam Generator low level on Channel 2.

This is the first trip that has occurred at Davis-Besse on turbine high vibration while performing turbine valve testing.

Report No: NP-33-85-15

DVR No(s): 85-084



July 1, 1985

Log No. K85-936
File: RR 2 (NP-33-85-15)

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

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

Gentlemen:

LER No. 85-011
Davis-Besse Nuclear Power Station Unit 1
Date of Occurrence: June 2, 1985

Enclosed is Licensee Event Report 85-011 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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