



A Centenor Energy Company

EDISON PLAZA
300 MADISON AVENUE
TOLEDO, OHIO 43652-0001

AB-92-019
NP-33-92-002

Docket No. 50-346

License No. NPF-3

March 31, 1992

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

LER 92-002
Davis-Besse Nuclear Power Station, Unit No. 1
Date of Occurrence - March 1, 1992

Enclosed please find Licensee Event Report 92-002, which is being submitted to provide 30 days written notification of the subject occurrence. This LER is being submitted in accordance with 10 CFR 50.73(a)(2)(iv).

Very truly yours,

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

LFS/ed

Enclosure

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

Mr. William Levis
DB-1 NRC Sr. Resident Inspector

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F5/0), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545. AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1): Davis-Besse Unit No. 1 DOCKET NUMBER (2): 05000346 PAGE (3): 1 OF 04

TITLE (4): Reactor Trip from 40 Percent Power Due to Main Turbine Trip

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 (5)
03	01	92	92	002	00	03	03	92			05000
<p>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)</p>											

OPERATING MODE (9): <u>1</u>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(e)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
POWER LEVEL (10): <u>01410</u>	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(a)(1)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(e)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.38(a)(2)	<input type="checkbox"/> 50.73(a)(2)(v)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(vi)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: Andrew V. Antrassian, Associate Engineer - Nuclear Licensing TELEPHONE NUMBER: 4119 31211-17191018

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NPROS
E	SIB	IPICIV	F11310	Y					

SUPPLEMENTAL REPORT EXPECTED (14): YES (If yes, complete EXPECTED SUBMISSION DATE:) NO

EXPECTED SUBMISSION DATE (15): MONTH 05 DAY 08 YEAR 92

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

On March 1, 1992, at 1500 hours, the plant experienced a reactor trip from approximately 40 percent power. The reactor trip was initiated by an I&C technician troubleshooting the rewiring of the main turbine vacuum trip system. While checking the condition of the main turbine vacuum pressure switches, the technician incorrectly placed a short across the high exhaust hood temperature trip contact. This resulted in an Anticipatory Reactor Trip System trip of the reactor.

Failure of the position feedback arm on Turbine Bypass Valve (TBV) SP13B2 resulted in the valve failing open causing a slight post-trip overcooling of the Reactor Coolant System (RCS). Operator initiated actuation of the Steam and Feedwater Rupture Control System at 1503 hours terminated the RCS overcooling.

I&C Maintenance personnel will review this LER and receive training by June 26, 1992. Maintenance corrective actions associated with the main turbine vacuum trip circuitry were completed prior to plant startup. Repairs to the failed TBV were completed on March 2, 1992. The four remaining TBVs of the style that failed are scheduled for replacement during BRFO. The remaining corrective actions are being developed under PCAQR 92-0134, and will be provided in a revision to this LER by May 8, 1992.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Davis-Besse Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 3 4 6	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (if more space is required, use additional NRC Form 306A's) (17)

Description of Occurrence:

On March 1, 1992, at 1500 hours, the unit experienced an Anticipatory Reactor Trip System (ARTS) initiated reactor trip from approximately 40 percent power. The unit had been increasing power from approximately 6 percent after the completion of planned maintenance activities in the containment which were unrelated to the reactor trip.

Maintenance-I&C personnel were troubleshooting the rewiring of the main turbine vacuum trip system under Maintenance Work Order (MWO) 7-91-0395-01 by checking the condition of the vacuum pressure switches in junction box JT 5306. The I&C personnel were unaware that part of the rewiring under the MWO had introduced a redundant power source to the circuit they were checking and that the circuit was actually energized. The redundant power source had been added by the installation of a jumper between terminals 1 and 5 on terminal block EHC-E. Believing the circuit to be de-energized, the I&C technician performing the pressure switch check used a multimeter set in the ohms mode. The I&C technician incorrectly placed the leads of the multimeter across terminals 2 and 5 which effectively bridged an open contact resulting in actuation of the high exhaust hood temperature trip circuitry which triggered a main turbine trip. Because indicated reactor power was greater than the ARTS arming setpoint, the turbine trip resulted in an ARTS initiated reactor trip.

Unit response to the reactor trip was as designed with the exception of a slight Reactor Coolant System (RCS-AB) overcooling which resulted from Turbine Bypass Valve (TBV-PCV) SP13B2 failing open rather than throttling back to regulate Steam Generator outlet pressure. TBV SP13B2 failed open due to damage sustained to its position feedback arm.

Initial notification of the reactor trip was made on March 1, 1992, at 1736 hours, in accordance with 10CFR50.72(b)(2)(ii). This LER is being submitted in accordance with 10CFR50.73(a)(2)(iv).

Plant startup commenced on March 2, 1992, at 1450 hours, and the unit was returned to full power operation on March 3, 1992, at 0625 hours.

Apparent Cause of Occurrence:

Engineering has determined, based on past performance history, that the most probable cause of the failure of the position feedback arm on TBV SP13B2 is attributed to reaction forces resulting from moisture within the valve flashing to steam when it was challenged during the transient.

The primary cause of the reactor trip is attributed to personnel error. During troubleshooting of the rewiring of the main turbine vacuum trip system, an I&C technician incorrectly placed leads of a multimeter across the wrong two terminals. This action resulted in the actuation of the high exhaust hood temperature trip circuitry and a subsequent reactor trip.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Davis-Besse Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 3 4 6	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT IF more space is required, use additional NRC Form 386A's (17)

Apparent Cause of Occurrence (Continued):

Contributing to the cause of the reactor trip are several work control issues as they relate to the work performed under MWO 7-91-0395-01. The MWO was created to address concerns documented in Potential Condition Adverse to Quality Report (PCAQR) 91-0395. The PCAQR documents that the redundant turbine low vacuum trip pressure switches were not wired into the trip circuitry, and that the as-built wiring in the field did not correspond to the electrical connection drawings. MWO 7-91-0395-01 was to correct these wiring inconsistencies.

Several aspects of MWO 7-91-0395-01 reflect inadequate pre-job planning and evaluation. The MWO had been scheduled such that it could be performed during Mode 1 operation with the turbine on-line. During discussions between Maintenance and Engineering it was decided by Maintenance that the work should be performed with the turbine off-line, but the MWO did not reflect this decision. Additionally, the verification of computer alarms associated with the pressure switches could not be performed with leads lifted as specified in the MWO. The rewiring of the pressure switches resulted in the addition of a redundant power source to the turbine vacuum trip circuitry, which was unknown to the I&C Maintenance personnel performing the work.

Work practices during preparation for and performance of MWO 7-91-0395-01 were inadequate. Changes to the MWO description of work did not adequately describe the work to be performed. Changes were made to the work scope and the MWO was not changed. When unexpected conditions were encountered, troubleshooting in the field began without notifying Operations and without adequately reviewing electrical drawings. Documentation of the MWO of the work performed was incomplete.

In addition, the decision to continue work under the MWO with the turbine on-line was made without adequate consideration of alternatives and consequences. When planned maintenance activities were completed in containment, the work on the main turbine vacuum trip system was still in progress. Operations management decided to place the turbine on-line, increase power to a steady-state level below the ARIS arming setpoint, and assign two operators the responsibility of tripping the turbine manually in the event of a loss of main turbine vacuum. The schedule called for completion of turbine vacuum trip work prior to placing the turbine on-line. Deviation from the work schedule occurred without a thorough review by Davis-Besse management.

Compliance to station procedures was not maintained. Contrary to DB-PN-00007, Control of Work, the MWO was not reviewed to the Shift Supervisor/Shift Manager for review of changes made to the MWO or granting permission to commence work. Contrary to DB-MN-00001, Control of Maintenance, and DB-MI-05013, Plant Miscellaneous Pressure Switch Calibration, wires were disconnected and jumpers installed without completing the jumper and lifted wire log or contacting the Shift Supervisor.

The above work control issues and additional apparent causes, if any, will be further evaluated under PCAQR 92-0134.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Davis-Besse Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 3 4 6	LER NUMBER (6)			PAGE (3)	
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TEXT (if more space is required, use additional NRC Form 386A's) (17)

Analysis of Occurrence:

ARTS functioned properly to open the Control Rod Drive (AA) Breakers when the main turbine tripped. The Reactor Protection System (RPS-JC) trip circuitry functioned properly in response to low RCS pressure following the ARTS trip of the reactor. The Steam and Feedwater Rupture Control System (SFRCS-JB) functioned properly in response to operator actuation. The Auxiliary Feedwater System (BA) functioned properly upon initiation by the SFRCS. The Safety Features Actuation System (SFAS-JE) was not challenged during this event.

As a result of TBV SP13B2 failing open, a slight overcooling of the RCS occurred. The duration of the overcooling was approximately 3 minutes and was terminated by operator initiation of the SFRCS.

The transient is categorized as a B2 transient using B&WOG Transient Classification Criteria.

No safety concerns were identified during the review of this reactor trip.

Corrective Action:

With regard to the personnel error, this LER will be reviewed by I&C Maintenance personnel as part of the Continuous Training Program at Davis-Besse. In addition, training will be performed on the proper use of test equipment. This training will be completed by June 26, 1992.

PCAQR 92-0134 was written to document the non-compliance to procedures during the work related to MWO 7-92-0395-01. Corrective actions for the work control issues discussed in the Apparent Cause of Occurrence section will be developed through this PCAQR. Toledo Edison will provide documentation of these corrective actions in a revision to this LER to be submitted no later than May 8, 1992.

Prior to plant startup, maintenance corrective actions associated with the main turbine vacuum trip circuitry were completed.

Repairs to TBV SP13B2 (Fisher Valve Model 476D-5-1-EP, Bailey Positioner Model 5324090-2) were completed on March 2, 1992. Due to their past performance, Toledo Edison intends to replace the four remaining Fisher TBVs. This replacement is currently scheduled for the Eighth Refueling Outage (8RFO).

Failure Data:

Previous reports involving ARTS reactor trips initiated by a turbine trip are LER 89-005 and LER 87-010. However, the events which caused these trips are unrelated to the events reported in this LER. Previous reports involving post-trip TBV failures are LER 88-028, LER 87-011, and LER 85-013.

NP 33-92-002

PCAQ No. 92-0084