TOLEDO EDISON

EDISON PLAZA
300 MADISON AVENUE
TOLEDO, OHIO 43652-0001

October 16, 1989

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Gentlemen:

LER 89-004, Revision 1
Davis-Besse Nuclear Power Station, Unit No. 1
Date of Occurrence - February 7, 1989

Enclosed is Revision 1 to Licensee Event Report 89-004. The revisions to the report are indicated by a revision bar in the left margin of each page.

Please destroy or mark superseded any previous copies of this report and replace with the enclosed revision.

Yours truly,

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

LFS/plg

Enclosure

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

Mr. Paul Byron
DB-1 NRC Sr. Resident Inspector

IE22
1/1

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Davis-Besse Unit No. 1	0 5 0 0 0 3 4 6	1 OF 0 4

TITLE (4)
Potential for Circulating Water Line Break to Cause Loss of Service Water Pumps

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 2	0 6	8 9	8 9	— 0 0 4	— 0 1	1 0	1 6	8 9		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
POWER LEVEL (10)	1 0 0		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		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)		
			20.405(a)(1)(iv)	X	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 (AREA CODE)
Jan C. Stotz, Engineer - Maintenance Planning	4 1 9 2 4 9 - 5 0 0 0

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

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)

On April 11, 1989, after completing an evaluation for one of two concerns raised by the Davis-Besse NRC Resident Inspectors on February 6, 1989, Toledo Edison determined that a circulating water line break would result in loss of service water, due to flooding of the service water pumps allowed by a construction blockout that had existed since original plant construction. Thus the plant had operated outside its design basis since April 22, 1977. The Davis-Besse Final Safety Analysis Report (FSAR) did not address flooding via this pathway since this construction blockout was overlooked.

On February 6, 1989, the Resident Inspectors informed Toledo Edison of a hole in the wall between the condenser pit and the Service Water (SW) tunnel, which was contrary to USAR Section 3.6.2.7.2.13, and that there was no procedural guidance for operators to isolate the SW tunnel from the SW pump room in the event of flooding in the SW tunnel, which was contrary to USAR Section 9.2.1.2. After Toledo Edison's submittal of the initial LER on May 10, 1989, the NRC Resident Inspector pointed out that the effect of submergence on the operability of other equipment should be addressed in the analysis of the LER.

As a precaution, until an evaluation of the potential concerns could be performed, a Standing Order was issued on February 10, 1989, to instruct operators to plug the floor drains in the SW pump room in the event of SW tunnel flooding. Additionally, appropriate abnormal procedures were changed on March 23, 1989, to add guidance for operators responding to SW tunnel flooding. The construction blockout was sealed by August 31, 1989.

U.S.GPO:1984-0-454-481/18759

DESCRIPTION OF OCCURRENCE:

On April 11, 1989, after evaluating the condition created by two nonconformances between the plant and the Updated Safety Analysis Report (USAR), it was determined that a complete rupture in the Circulating Water (CW)(KE) Expansion Joint in the Condenser Pit (without operator action) would cause flooding of SW pump room and subsequent loss of all Service Water (SW)(BI) pumps. These nonconformances were first identified on February 6, 1989, by an NRC Resident Inspector with the Unit at 100 percent power. This condition has existed since original plant construction and startup (April 22, 1977).

The first nonconformance is that the USAR states that there is no significant flowpath from the condenser pit below the 585 ft. elevation. However, a path existed from the condenser pit to the SW tunnel via the Condensate Demin Holdup Tank Room (CDHUT). Once the level in the condenser pit reaches the 577 ft. elevation, water would flood over the open wall into the CDHUT room. Once the level in this room reaches the 571 ft. elevation, water would run into an open pipe chase and into the SW tunnel. Once the tunnel floods to the 576 ft. elevation, water would then backup through the floor drains into the SW pump room.

The second nonconformance was that the USAR states that in the event of flooding in the SW tunnel, due to SW system return piping rupture, operators will seal up the SW pump room floor drains. However, these actions had not been incorporated into Station Procedures and would not have been completed in a timely manner. Toledo Edison's evaluation determined that operator action was not needed since piping in the SW tunnel was Seismic Category I, therefore, piping failures in the tunnel need not be postulated. However, this evaluation did not take into consideration flooding by outside sources (i.e., circulating water line break and intrusion into the SW tunnel via the construction blockout).

Subsequent to the initial LER submittal, the NRC Resident Inspector expressed concern that Toledo Edison's analysis did not address the effect on the operability of other equipment that could be submerged due to this flooding scenario. Toledo Edison's evaluation determined that SW 1395 and SW 1399 would not function if flooded. These are the SW supply valves to the secondary SW loads. These valves are supposed to close on a low SW header pressure. If the SW tunnel floods before these valves have closed, they will remain out of their desired position. An interim Safety Evaluation performed on August 1, 1989, concluded that given current and expected SW supply requirements through August 31, 1989, that isolation could be assumed prior to flooding until the blockout could be filled.

The two-month difference between the discovery date and the reportability date is due to the time it took to determine whether the nonconformances could

actually result in flooding. The personnel responsible for determining reportability were unable to make a reportability determination with the information available and requested additional time to determine whether a credible scenario existed to cause flooding of the SW pump room via SW pump room floor drain due to SW tunnel flooding. Subsequent evaluation (March 15, 1989) by Nuclear Engineering concluded that since piping in the SW tunnel was Seismic Category I that piping failures in the tunnel need not be postulated, therefore, operator action for sealing drains in the SW pump area for a SW system pipe break was not required. (Note: This evaluation did not consider flooding of the SW tunnel by outside sources.) Based on this information, the responsible department concluded on March 21, 1989, that the condition was not reportable as an LER.

Concurrently, PCAQR 89-0083, which addressed the open pipe chase, was evaluated for significance by the Systems Engineering Group. Their initial evaluation concluded that flooding of the SW pump room was not a concern. However, this evaluation had taken credit for installing a floor drain plug. On March 3, 1989, the PCAQRB directed Systems Engineering to perform a calculation for SW pump room flooding assuming no floor drain plug was installed to determine reportability. After review of Systems Engineering's calculation and associated response on April 7, 1989, which concluded that a circulating water line break would result in flooding of the SW pumps and cause a loss of SW, the condition was determined reportable on April 11, 1989.

APPARENT CAUSE OF OCCURRENCE:

These nonconformances have existed since original construction and startup. The exact cause is unknown. The open blockout is not directly open to the condensate pit and is separated from it by the north and west walls of the Condensate Demin Holdup Tank Room. Anyone surveying the condenser pit may not have recognized this pathway. Not having operator actions spelled out in abnormal procedures may have been due to the original cause for that action, that being to mitigate the effects of break in the SW lines in the SW tunnel, no longer needed when the SW lines were determined to be seismically installed.

ANALYSIS OF OCCURRENCE:

Based on industry experience, the probability of a rupture of the Circulating Water System piping is very small. The more likely occurrence would be in the form of cracks which would probably be controlled by the condenser pit sump pumps and flood pumps. High sump level switches in the condenser pit and in the SW tunnel provide alarms for the operators. Additionally, pressure switches on the discharge of the CW pump discharge lines should sense a break and isolate the discharge isolation valve and shut off the pump to minimize the inventory of water. The USAR analyses show that under assumed single failure conditions (failure of discharge isolation valve to close) the flood level does not go above 585 ft. elevation. Since the blockout is below this elevation, there would be enough available water to cause SW tunnel and pump room flooding. Safety Evaluation 89-0177 was performed to evaluate concerns with operability of valves SW 1395 and SW 1399.

Although this evaluation did not cover the entire operating cycle, it can be concluded that the flooding will not impact safety, provided that the total SW system loads (both trains) is below 13,000 gpm or the automatic transfer of SW system loads takes place before the valves get flooded. The calculations performed in support of SE 89-0177 show that more than ten minutes (after the break) are available before the flood level is a concern for valve operability.

CORRECTIVE ACTION:

Standing Order 89-026 was written and in place on February 10, 1989, to instruct operators to plug the floor drains in the SW pump room in the event of a SW tunnel flooding event. Abnormal Procedures AB 1203.17, Loss of Service Water Pumps/Systems, and AB 1203.24, Circulating Water Pump Trip/ Circulating Water System Ruptures, were changed on March 23, 1989, to add guidance for the operators in response to SW tunnel flooding.

The pipe chase has been sealed under Maintenance Work Order 7-89-0083-01. Work was completed on August 31, 1989.

A review of the USAR for other operator actions has been completed. Although the need for improvements to procedures and changes to the USAR were identified, there were no other significant operator actions that were not already covered in procedures.

FAILURE DATA:

This is the first report where operator action was expected by the USAR but had not been incorporated in procedures.

REPORT NO.: NP-33-89-005 PCAQ NOs.: 89-0082, 89-0083