

Detroit
Edison

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10CFR50.73

March 7, 1996
NRC-96-0016

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

References: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

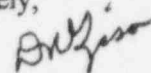
Subject: Licensee Event Report (LER) No. 96-002

Pursuant to 10 CFR 50.73, Detroit Edison is submitting the enclosed LER No. 96-002 regarding an Engineered Safety Feature (ESF) actuation, a suppression chamber to drywell vacuum breaker opened during a surveillance test due to personnel error.

There are no commitments made in this LER.

If you have any questions, please contact Ken Riches at (313) 586-5529.

Sincerely,



cc: T. G. Colburn
M. J. Jordan
H. J. Miller
A. Vogel
M. V. Yudas, Jr.
Region III
Wayne County Emergency Management Division

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LICENSEE EVENT REPORT (LER)

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TITLE (4) **ESF Actuation of Torus to Drywell Vacuum Breaker**

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MON	DAY	YR	YR	SEQUENTIAL NUMBER		REVISION NUMBER	MON	DAY	YR	FACILITY NAMES		DOCKET NUMBER (8)	
02	07	96	96	-	0 0 2	- 0 0	03	07	96			0 5 0 0 0	
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OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)		
POWER LEVEL (10) 0 9 6	<input checked="" type="checkbox"/> 10 CFR <u>10CFR50.73(a)(2)(iv) & 10CFR50.73(a)(2)(i)(B)</u> <input type="checkbox"/> OTHER _____ (Specify in Abstract below and in text, NRC Form 366A)		

LICENSEE CONTACT FOR THIS LER (12) Ken Riches - Compliance Engineer		TELEPHONE NUMBER AREA CODE 313 NUMBER 586-5529	
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD

SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (16)

On February 7, 1996, at 2145 hours, during a surveillance test on the Division I Thermal Recombiner System (TRS), operators observed a pressure divergence between the suppression chamber (torus) and drywell. Torus pressure was increasing slowly and drywell pressure was decreasing slowly, with torus pressure exceeding drywell pressure by approximately 3.5 inches of water. A torus to drywell vacuum breaker was observed to cycle as expected for this condition. This operation of the vacuum breaker is considered an unplanned engineered safety feature actuation. An abnormal valve line-up was identified with TRS inlet aligned to both the torus and drywell with TRS discharge aligned to the torus. Drywell suction valves were immediately closed and the pressure divergence stopped.

The cause of this event was personnel error in that procedure steps were not followed correctly. A contributor to this event was that the procedure steps were not completely clear.

Corrective actions taken include: (1) The involved Operator received discipline per Detroit Edison's Positive Discipline Program; and (2) the TRS procedure will be enhanced to improve the human factors aspect of using the procedure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (17)

Initial Plant Condition:

Operational Condition: 1 (Power Operation)
 Reactor Power: 96 Percent
 Reactor Pressure: 1020 psig
 Reactor Temperature: 540 degrees Fahrenheit

Description of the Event:

A. Background

Technical Specification (TS) 3.6.2.1.b, "Depressurization Systems: Suppression Chamber," requires that the total leakage between the suppression chamber and drywell be less than the equivalent leakage through a 1-inch diameter orifice at a differential pressure of approximately 1 psid. Action (g) states "With the drywell-to-suppression chamber leakage in excess of the limit, restore the bypass leakage to within the limit prior to increasing reactor coolant temperature above 200 degrees Fahrenheit."

TS 3.6.4.1, "Vacuum Relief: Suppression Chamber - Drywell Vacuum Breakers," requires all suppression chamber - drywell vacuum breakers [BF][VACB] to be closed and operable. Action (b) states that with one or more suppression chamber drywell vacuum breakers open, close the open vacuum breaker(s) within 2 hours or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours.

B. Event Description

On February 7, 1996, at approximately 2116 hours, following the normal execution of Surveillance Procedure 24.409.01, "Post LOCA Thermal Recombiner Functional Test," on the Division I Thermal Recombiner (TR) [KE][RCB], the TR was shutdown normally in accordance with System Operating Procedure (SOP) 23.409 to a temperature just below 200 degrees Fahrenheit. After completion of the TR shutdown, the temperature exceeded 210 degrees Fahrenheit due to post testing residual heat. The Nuclear Supervising Operator (NSO) (utility-licensed) initiated the next scheduled surveillance on the plan of the day schedule, Surveillance Procedure 24.409.02, "Post LOCA Thermal Recombiner System Valve Operability Test." Surveillance Procedure 24.409.02 has a prerequisite that the TR be in standby mode in accordance with SOP 23.409, which requires a temperature range of 125 to 175 degrees Fahrenheit. Because the prerequisite temperature range was not met, the Nuclear Assistant Shift Supervisor (NASS)(utility-licensed) directed that the surveillance test not be commenced. The NASS elected to initiate an additional cooldown to the TR in accordance with SOP 23.409 to achieve the 125 to 175 degree Fahrenheit temperature range.

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TEXT (17)

On February 7, at 2145 hours, after the NSO completed the valve line-up, the NSO and NASS observed an abnormal pressure divergence on control room instrumentation [NA][PDR]. Torus pressure was observed to be increasing slowly, and drywell pressure was decreasing slowly. Torus pressure exceeded drywell pressure by approximately 3.5 inches of water, and a torus to drywell vacuum breaker was observed to cycle as indicated by control room instrumentation. The control room indication also showed evidence that this was the second operation of a torus to drywell vacuum breaker. The NASS subsequently recognized an abnormal valve line-up with suction for the TR being taken simultaneously from the torus and drywell with all return being discharged to the torus. The vacuum breaker functioned as expected for this system misalignment. Drywell suction valves [KE][V] were immediately closed and the pressure divergence was stopped. All vacuum breakers were verified to be closed as indicated in the control room. Torus level was verified to be within allowable limits. The total time the torus to drywell bypass leakage path existed through the TR system was less than one hour.

On February 7, 1996, at 2337 hours, a four-hour notification was made to the NRC because the cycling of a torus to drywell vacuum breaker is classified as an engineered safety feature (ESF) actuation. In addition, after review of the associated TS, this event is being reported as a condition prohibited by TS 3.6.2.1.b due to the 4-inch interconnection having been established between the torus and drywell.

Investigation into the as-left opening pressure setpoints determined that the vacuum breaker that was observed to operate (T23F400A) was the vacuum breaker with the lowest equivalent force setting (force is proportional to the differential pressure required for opening, which is indicated in the control room as inches of water). Therefore, vacuum breaker T23F400A would be the first vacuum breaker expected to operate for a pressure differential between the drywell and suppression chamber.

In addition, a quantitative review verified that the valve line-up observed at the time of the pressure divergences would result in the observed drywell and suppression chamber pressure trends with the drywell and suppression chamber interconnected through the thermal recombiner unit.

Cause of the Event:

The cause of this event is personnel error due to inattention to detail, in that a licensed operator did not follow or complete the procedural steps correctly as outlined in the SOP. A contributor to this event was that the SOP procedure steps were not as clear as they could have been in that the procedure did not explicitly preclude establishing simultaneous normal and emergency flow paths from the drywell and torus.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (17)

Analysis of the Event:

The maximum allowable torus to drywell leakage area is described in the Updated Final Safety Analysis Report (UFSAR) as 0.25 square feet, which is equivalent to a 7-inch diameter line. The line connecting the path that was open between the torus and the drywell, through the TR, is 4-inches in diameter (approximately 0.09 square-feet).

Investigation into the last refueling outage surveillance testing for torus to drywell bypass leakage showed that the as-left leakage rate for the drywell-to-suppression chamber bypass leakage test was 0.05 inches of water decrease per minute, much less than the 0.20 inches acceptance criteria. Even assuming the total TS allowed bypass leakage equivalent to a 1-inch orifice (approximately 0.005 square-feet), combined with the approximate 0.09 square-foot (4-inch diameter pipe equivalent) drywell-to-suppression chamber interconnection as described above for this event, the total bypass leakage area was approximately 0.095 square-feet, which is bounded by the UFSAR analyzed 0.25 square-foot maximum allowable bypass leakage area. The suppression capability design basis of the torus was maintained throughout this evolution.

Therefore, the health and safety of the public were not adversely affected by this event.

Corrective Actions:

A. Immediate Corrective Actions

The drywell to thermal recombiner suction isolation valves were closed and the drywell to torus interconnection was eliminated.

B. Corrective Actions to Prevent Recurrence

1. The Operator involved in this event received discipline in accordance with Detroit Edison's Positive Discipline Program.
2. Procedure 23.409 will be enhanced to improve the human factors aspect of using the procedure.

Additional Information

Previous LERs on Similar Problems

LER 91-022-00: On December 11, 1991, Operations personnel were proceeding with the planned plant shutdown for replacement of the 2A main unit transformer. At 1212 hours, drywell pressure started decreasing from 15.2 psia to 14.4 psia. The torus to drywell and reactor building to torus vacuum breakers began lifting at 1226 hours, as designed, to control the negative pressure. Investigation established that the cause of this event was a reverse flow through the safety relief valves (SRVs) and the SRV vacuum breakers.