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December 17, 1993

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License Event Report 12-2-93-024, docket 050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(i)B.

Gary F. Spedl
Station Manager
Dresden Station

GFS/cfq

Enclosure

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

280[illegible]

IE22

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Dresden Nuclear Power Station, Unit 2	0 5 0 0 0 2 3 7	1 of 0 4

Title (4)

Type B and C Primary Containment Local Leak Rate Testing Limit of 0.6L_a Exceeded Due to Conservatively Assumed Leakage Past Drywell Equipment Drain Sump Containment Isolation Valve 2-2001-6

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)
1 1	2 3	9 3	9 3	--- 0 2 4	--- 0 0	1 2	2 3	9 3	N/A	
									N/A	

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIRMENTS OF 10CFR (Check one or more of the following) (11)									
POWER LEVEL (10)	0 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)	
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii) (A)			
			20.405(a)(1)(iv)		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)			

LICENSE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
M. McGivern, Local Leak Rate Test Coordinator Ext. 2526	AREA CODE 8 1 5 9 4 2 - 2 9 2 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
D	W K	I S V	I 1 9 2						

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)

At approximately 0600, on November 23, 1993 with Unit 2 shutdown for maintenance, the Drywell Equipment Drain Sump (DWEDS) Outboard Containment Isolation Valve 2-2001-6 was disassembled to determine the cause of an unusually low flow in the Drywell Equipment Drain Sump system. Upon disassembly, it was discovered that the valve diaphragm had become disconnected from the valve stem. In addition, when the diaphragm was removed from the valve body, it was found to be damaged with a cut that penetrated through the diaphragm creating a potential leakage path. This damage was attributed to incorrect setting of valve stroke length. Because 10 CFR 50 Appendix J does not require "as found" Local Leak Rate Tests (LLRT) for mid-cycle maintenance, an "as found" LLRT was not performed. Due to the fact that the diaphragm was badly damaged and that an as-found LLRT had not been performed, it was conservatively assumed that the valve may have failed an as-found LLRT with an undetermined amount of leakage and therefore would have exceeded Technical Specification leakage limit of 0.6L_a. The safety significance of the leakage past the DWEDS Isolation Valve 2-2001-6 was considered to be minimal, since the redundant DWEDS Isolation Valve 2-2001-5 leaked 0 scfh. The leakage out of containment, as determined on a minimum pathway basis, would not cause the maximum off-site dose rates established in 10 CFR 100 to be exceeded in the event of a LOCA. The final LLRT after repairs and stroke length adjustments to both DWEDS Isolation Valves yielded 0 scfh leakage.

PLANT AND SYSTEM IDENTIFICATION:

General Electric-Boiling Water Reactor-2527 MWt rated core thermal power.

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

EVENT IDENTIFICATION:

Type B and C Primary Containment Local Leak Rate Testing Limit of 0.6L_a Exceeded Due to Conservatively Assumed Leakage Past Drywell Equipment Drain Sump Containment Isolation Valve 2-2001-6

A. CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 11/23/93 Event Time: 0600 hrs

Reactor Mode: N Mode Name: Refuel Power Level: 0%

Reactor Coolant System (RCS) Pressure: 0 psig

B. DESCRIPTION OF EVENT:

During the last Refuel Outage, D2R13, the Drywell Equipment Drain Sump (DWEDS) Isolation Valves 2-2001-5 and 2-2001-6 and the Drywell Floor Drain Sump (DWFDS) Isolation Valves 2-2001-105 and 2-2001-106 were replaced under Work Request number D16126. The old gate valves had a high rate of failure of local leak rate tests, so they were replaced with a new valve with a diaphragm style seat. During reactor operation, an unusually low flow rate for the Drywell Equipment Drain Sump Pump was observed. When the unit was shut down for maintenance outage D2F21, trouble shooting to find the cause of the low flow commenced. Operating the Drywell Equipment Drain System with pressure gauges installed at every available test tap, low pressure was discovered downstream of the DWEDS Outboard Containment Isolation Valve 2-2001-6. At approximately 0600 hours on November 23, 1993, the 2-2001-6 valve was disassembled to determine the nature of the obstruction blocking the piping. Upon disassembly, it was discovered that the valve diaphragm had become disconnected from the valve stem. In addition, when the diaphragm was removed from the valve body, it was found to be damaged in the area corresponding to the valve seat. The damage appeared to be caused by an excessive stroke length on the valve. The Shift Engineer was notified and a Problem Identification Form (PIF) was initiated per Dresden Administrative Procedure (DAP) 02-27, Integrated Reporting Process. Work Request D22928 was written to repair both the 2-2001-5 and 2-2001-6 DWEDS Isolation Valves. Due to the fact that the diaphragm was badly damaged and that an as-found Local Leak Rate Test (LLRT) had not been performed, it was conservatively assumed that the valve may have failed an as-found LLRT with an undetermined amount of leakage and therefore would have exceeded the Technical Specification leakage limit of 0.6L_a for Type B and C leakage. The Shift Engineer was informed about this new concern and it was included with the PIF previously written.

After replacement of the diaphragm and proper adjustment of the stroke on valve 2-2001-6 and prior to any another local leak rate test was performed. The results of this leak rate test showed a leakage of 0 scfh for the volume.

Due to the concerns that the stroke length may have also been incorrectly adjusted on the 2-2001-5 valve, the valve was disassembled and inspected. The diaphragm on the 2-2001-5 valve exhibited some damage, but it did not have any cuts penetrating the diaphragm and it had not separated from the stem. The diaphragm was replaced and the stroke was corrected. Another leak rate test was performed and the leakage for the volume was shown to be 0 scfh.

Concerned that there was a generic problem with the stroke lengths of all four diaphragm valves, Work Request number D22976 was written to repair both the 2-2001-105 and 2-2001-106 DWFDS Isolation Valves. An as-found LLRT, which yielded 0 scfh leakage, was performed on the DWFDS Isolation Valves 2-2001-105 and 2-2001-106 prior to disassembly and inspection of their diaphragms. The 2-2001-106 valve diaphragm support sheet was broken, but the diaphragm was not cut or separated from the stem. The diaphragm on the 2-2001-105 valve was not damaged. The diaphragms were replaced on both valves and the stroke was readjusted. The final leakage rate for this volume was 0 scfh.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i) which requires the reporting of any operation or condition prohibited by the Technical Specifications.

The apparent direct cause of the damage to the valve diaphragms was improper adjustment of the valve stroke length. When the new diaphragm style replacement valves were welded into the system, the internals of the valves were removed. This was done in accordance with vendor recommendations to prevent damage of the diaphragm and other non-metallic components not intended for the temperature extremes experienced during welding. In addition to the internal disassembly the valve operators were also disassembled to install new operator diaphragms. When the valves were reassembled, the stroke length of the valve stem was not correct. The vendor sets the stroke length at the factory by adjusting the stroke with the valve on a test bench until no flow is passed through the valve. Disassembly of the valve nullified the factory set stroke length. The incorrect stroke length caused the diaphragm to be smashed into the seat causing the diaphragm to be cut by the valve seat. In addition, this action caused the valve stem-to-diaphragm connection screw to be pushed out of the molded diaphragm. Once the connection screw was pushed out of the diaphragm, operation of the valve stem did not reposition the diaphragm, which stayed in the closed position inside the valve body.

The direct cause of the valve damage was due to incorrect setting of the stroke length. The root cause of the valve damage was insufficient detail in the work instructions contained in the work package for the replacement of this valve. The work instructions simply referred to the vendor manual for the reassembly of the valve. The vendor manual was included in the package but the instructions given for the adjustment of stroke were vague and incomplete for the installed configuration.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of the leakage past Drywell Equipment Drain Sump Isolation Valve 2-2001-6 was considered to be minimal since the redundant DWEDS Isolation Valve leaked 0 scfh. Therefore, the total leakage out of the penetration, on a minimum pathway basis, was 0 scfh.

Since the current as-left leakage (Type A test) of .9694 wt%/day is still less than the Technical Specification limit of 0.75L_a (1.2 wt%/day), the maximum off-site dose rates established in 10 CFR 100 would not be exceeded in case of a LOCA.

E. CORRECTIVE ACTIONS:

The immediate corrective actions to address this problem are as follows:

Under Work Request D22928, a new diaphragm was installed and the DWEDS Isolation Valve 2-2001-6 was reassembled. Under the reassembly the stroke length was adjusted to ensure that no more than 1/8" seat compression will be experienced in seating of this valve, a greater seat compression than this may result in the damage experienced in the 2-2001-6 valve. The DWEDS Isolation Valve 2-2001-5 was then disassembled, repaired and upon reassembly had a proper stroke length set. The final leakage test yielded 0 scfh leakage for the volume.

Under Work Request D22976, the same repairs and stroke length adjustments were performed on the Drywell Floor Drain Sump (DWFDS) Isolation Valves 2-2001-105 and 2-2001-106. The final leakage test yielded 0 scfh leakage for the volume.

In order to prevent reoccurrence of this problem the packages for installation of these valves on Unit 3 (currently scheduled for D3R13) will include detailed instructions for the adjustment of stroke (237-180-93-02401A). Also to prevent the possibility of this problem in future stroke adjustments on these valves a maintenance procedure will be prepared to detail the rebuilding and stroke adjustment of these valves.(237-180-93-02401B) The maintenance staff shall also ensure that the file for the ITT Grinnell model 3DA92R valve contained in the Vendor Technical Information Program (VETIP) includes a sufficient level of detail for the stroke adjustment of the valves and that it agrees with the developed station procedure. (237-180-93-02402)

F. PREVIOUS OCCURRENCES:

LER/Docket Numbers	Title
90-009/0500237	Type B and C Primary Containment Local Leak Rate Test Requirements Exceeded Due to Leaking Isolation Valves
93-002/0500237	Type B and C Primary Containment Local Leak Rate Testing Limit Exceeded Due to Leakage Past Head Cooling Inlet Isolation Valve 2-205-2-4

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number	Mfg. Part Number
ITT Grinnell	Drywell Equipment Drain Sump Isolation Valve 2-2001-6	3DA92R	N/A

An industry - wide data base search revealed eight failures for the ITT Grinnell Diaphragm Valve utilized as a Primary Containment Isolation Valve. Four of these failures were leakage test failures. These failures were attributed to wear and aging of the valve diaphragm.