Commonwealth Edison Company
Dresden Generating Station
6500 North Dresden Road
Morris, IL 60450
Tel 815-942-2920

ComEd

March 3, 1995

TPJLTR 95-0026

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

Licensee Event Report 95-003, Docket 50-249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10CFR50.73(a)(2)(ii).

Sincerely,

T. R. Joyce

Thomas P. Joyce
Site Vice President

TPJ/MM:pt

Enclosure

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

090022

TPJ95\0026.95

IE22
1/1

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 3	05000249	1 OF 7

TITLE (4): Type B and C Test Leakage Limit Exceeded Due to Inadequate Surveillance Procedure

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 NAME	DOCKET NUMBER
02	03	95	95	-- 003 --	00	03	05	95	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	099		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
			20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
			20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
			20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
			20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
			20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
			20.2203(a)(2)(v)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
M. McGivern, Local Leak Rate Test Coordinator Ext. 2526	(815) 942-2920

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 15 single-spaced typewritten lines) (16)

At approximately 1820, on February 3, 1995, with Unit 3 operating at 99% power, the performance of Dresden Technical Surveillance (DTS) 1600-01, Local Leak Rate Testing Of Primary Containment Isolation Valves, identified the Torus to Reactor Building Vacuum Breaker [BF] Check Valve 3-1601-31B to be leaking an undetermined amount. This leakage rate resulted in the primary containment Type B and C maximum pathway leakage rate limit being exceeded. Twenty minutes later, the Torus to Reactor Building Vacuum Breaker Check Valve 3-1601-31A was also found to be leaking an undetermined amount. A Technical Specification required nuclear plant shutdown was started at 1905. Upon completion of torquing the hinge pin flange bolting, leak rate tests yielded leakage rates of 5.97 scfh and 2.03 scfh for the A and B vacuum breakers respectively and the nuclear plant shutdown was halted at 2000 on February 3, 1995. Calculations show that the leakage past valves 3-1601-31A and 3-1601-31B would not cause the maximum off-site dose rates established in 10 CFR 100 to be exceeded. The event was caused by an inadequate surveillance procedure which was performed a month earlier on January 6, 1995. The procedure will be revised.

EVENT IDENTIFICATION:

Type B and C Test Leakage Limit Exceeded Due to Inadequate Surveillance Procedure

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: February 3, 1995 Event Time: 1820

Reactor Mode: N Mode Name: Run Power Level: 99%

Reactor Coolant System Pressure: 1003 psig

B. DESCRIPTION OF EVENT:

On January 6, 1995, the Technical Specification required quarterly operability surveillance of the Torus to Reactor Building Vacuum Breakers 3-1601-31A and 3-1601-31B had been scheduled and was subsequently assigned to a B Operator during the shift briefing. The B Operator believed he was familiar with the surveillance because he had performed Dresden Operating Surveillance (DOS) 1600-13, Suppression Chamber to Reactor Building Vacuum Breaker Full Stroke Exercise Test For 2(3)-1601-31A and B, previously and did not request/require any additional assistance. However, the B Operator had only performed the surveillance to a previous procedure revision (rev 6) and not the current revision (rev 8). The B Operator received the Special Rotating Tool from the Unit 3 Field Supervisor along with a copy of DOS 1600-13 (rev 8) and was instructed to perform the surveillance. DOS 1600-13 was completed, documentation filled out, reviewed and signed off with no apparent discrepancies.

On February 3, 1995, the IST Engineer was reviewing the surveillance documentation and recognized that there had been no Site Engineering involvement when DOS 1600-13 was performed on January 6, 1995. The IST Engineer had been performing the Unit 3 vacuum breaker quarterly operability surveillance since October of 1992. At 1300 on February 3, 1995, the Unit 3 Shift Manager was notified that the possibility existed that the surveillance had been performed by the old method which would require an Local Leak Rate Test (LLRT) to be done to verify containment integrity. The Unit 3 Shift Manager then contacted the B Operator, who had performed the surveillance, and was informed that the old method had in fact been used when performing the surveillance.

The Unit 3 Shift Manager then entered Technical Specification 3.0.A at 1500 due to the uncertainty of Primary Containment integrity. The Shift Manager then initiated an immediate LLRT of the vacuum breaker boundaries.

At approximately 1820, on February 3, 1995, with Unit 3 operating at 99% power, the performance of Dresden Technical Surveillance (DTS) 1600-01, Local Leak Rate Testing Of Primary Containment Isolation Valves, identified the Torus to Reactor Building Vacuum Breaker [BF] Check Valve 3-1601-31B to be leaking an undetermined amount. This value when added to the existing maximum pathway leakage rate of 278.99 scfh resulted in the maximum pathway leakage rate limit for Type B and C primary containment leakage, 488.452 scfh ($0.6L_a$), being exceeded.

The Unit Supervisor was notified of the event. While gathering information for the ENS phone notification, another LLRT identified the Torus to Reactor Building Vacuum Breaker Check Valve 3-1601-31A to be leaking an undetermined amount. An ENS phone notification was made at 1907 on February 3, 1995, to report a degraded condition.

It was determined that Primary Containment was not established and in accordance with Technical Specifications 3.7.A.2 and 3.0.A an orderly Unit 3 nuclear plant shutdown commenced at 1905. An ENS phone notification was made at 1910 on February 3, 1995, to report a Technical Specification required nuclear plant shutdown.

C. CAUSE OF EVENT:

This LER is submitted in accordance with 10 CFR 50.73(a)(2)(ii) which requires the reporting of any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded or that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant.

The old method for testing (DOS 1600-13 rev 2) the 3-1601-31A(B) vacuum breaker, a split body style tilting disk check valve made by Crane/Chapman, uses a removable arm (Special Rotating Tool) to manually operate the valve. Prior to manual operation, a flange is removed allowing the removable arm to be inserted into the hinge pin. After cycling the check valve disk, the arm is removed and the flange replaced and bolting tightened down. This flange keeps leakage from around the hinge pin contained. This flange is part of Primary Containment.

Prior to January 29, 1987, an LLRT was required to be performed following the Technical Specification required quarterly vacuum breaker operability surveillance to ensure the flange was on tightly and there was no primary containment leakage. However, in 1987, an On-Site review of a procedure revision (rev 3) to Dresden Operating Surveillance (DOS) 1600-13, Suppression Chamber To Reactor Building Vacuum Breaker Full Stroke Exercise Test For 2(3)-1601-31A and B, improperly concluded that the hinge pin flanges were not part of Primary Containment and as such no LLRT was required as part of the surveillance.

During an investigation into Torus to Reactor Building vacuum breaker LLRTs (February 1990) it was concluded that the 1987 On-Site Review had been incorrect in their determination that the flange was not part of Primary Containment. In addition, DOS 1600-13 did not contain adequate instructions to verify proper installation of the flange. The investigation team recommended that the vacuum breaker's maintenance access ports, which are upstream of the check valve and allow access to the valve disk, should be used in the performance of the operability surveillance and that the corresponding DOS procedure be revised, thus eliminating the need to remove the hinge pin flange (and the subsequent required as-left LLRT). This procedure was revised (rev 7) on October 22, 1992.

Revision 7 to DOS 1600-13 was written with the intention of avoiding the need to perform an LLRT upon completion of the surveillance by using this maintenance access port, which is upstream of the check valve and thus outside of Primary Containment. One major change to DOS 1600-13, from revision 6 to revision 7,

was to state "remove this inspection plate upstream (Reactor Building Side) of vacuum breaker..." The previous revision stated "Remove the shaft cover..." The other significant revision was to change the name of the tool required to perform the test from "Special Rotating Tool" to "Special Extension Tool."

However, DOS 1600-13 (rev 8) (Note: revision 8 to DOS 1600-13 was for minor typographical changes) instructs the user to remove the inspection plate upstream of the vacuum breaker 3-1601-31A(B). The terminology used in the procedure is in conflict with labeling in the field. The field labeling of the port is "access door for check valve". In addition, the hinge pin flange (shaft cover) could be mistaken for being upstream of 3-1601-31A(B) and DOS 1600-13 does not state how far the inspection plate is upstream of the vacuum breaker. The surveillance procedure gives no descriptive details about either the Special Rotating Tool (old tool) or the Special Extension Tool (new tool). These names are vague enough to allow either name to be assigned to the removable arm.

The Operations Scheduler gave the Unit 3 Field Supervisor the Special Rotating Tool (old method). The Field Supervisor then gave the tool to the B operator, which confirmed to the B Operator that the tool he was using was correct. No information provided in the procedure would have alerted the B Operator to this error. Based on the B Operator's experience of performing this surveillance using the old method and being provided the old tool, he read and performed the procedure using the old method, which does not obviously conflict with DOS 1600-13 under revision 8. In order to perform DOS 1600-13 using the new method, an individual would have to be familiar with the procedure change to know what the non-descriptive terms in the procedure mean. Neither the Operations Scheduler, Field Supervisor, or the B Operator had received training on the new method.

Previous surveillances were conducted with or by the IST Engineer who was familiar with the changes made to DOS 1600-13 and the new method used for testing. The access port is outside of Primary Containment and allows for cycling of the vacuum breaker valve disk with a wooden broom handle (Special Extension Tool). In addition, no LLRT was performed because it was not recognized by the B Operator that he had disturbed Primary Containment and the DOS 1600-13 documentation would not have alerted the performer or reviewer of the violation of Primary Containment.

In summary, the root cause of the leaking flange and subsequent violation of primary containment integrity is the use of an inadequate surveillance procedure. A contributing cause was the lack of training given to Operations Department personnel following the procedure revision.

D. SAFETY ANALYSIS:

The safety significance of this event is mitigated by the integrity of Secondary Containment [NG] and the function of the Standby Gas Treatment System (SGTS) [BH]. The SGTS is used to maintain a slight negative pressure in the Reactor Building during accident conditions. Filters are provided in the system to remove radioactive particulates, and charcoal adsorbers are provided to remove radioactive halogens which may be present in concentrations significant to environmental dose criteria.

Upon a loss of Instrument Air, the inboard air-operated vacuum breaker butterfly valves 3-1601-20A and 3-1601-20B fail open. This is so that a 0.5 pound pressure differential across the check valve vacuum breaker will cause the valve to open. In an accident situation, there is only the outboard check valve vacuum breaker that would maintain Primary Containment.

The check valve hinge pin is a shaft within a shaft. The inner shaft is used for cycling the valve and the concentric outer shaft is for disk rotation. There is a housing concentric with the hinge pin which aligns the hinge pin with the valve body and the tilting disk. There is a gasket between the housing and the valve body so no leakage is suspected through that gap. Using the maximum clearance between the hinge pin and the housing and the maximum clearance between the inner and outer shaft, these two annular leakage paths have a combined surface area of 0.126 square inches. Since both check valve vacuum breakers were leaking from the flanges, the total maximum leakage cross section to Secondary Containment was 0.252 square inches.

Calculations were performed to determine the effects of a 1/2 inch opening (0.196 square inches) in Primary Containment discharging to Secondary Containment with primary containment pressure at the design basis Loss of Coolant Accident (LOCA) pressure of 48 psig. These calculations were performed for LER/Docket Number 90-003/0500237, Potential for Exceeding Leakage Design Basis During Containment Air Sampling Process Due to Management Deficiency. The 1/2 inch opening in Primary Containment equates to a leakage of 4.73 weight % per day. When added to the Technical Specification 3.7.A.2.a.(3) allowed leakage of 1.6 weight % per day, a total leakage of 6.33 weight % per day is obtained. The results were that the 10 CFR 100, 10 CFR 50 Appendix A and NUREG-0800 regulatory release limits were not violated with the 1/2 inch opening in Primary Containment.

Another study had been performed to calculate the as-found leakage rate past the air-operated valve 2-1601-20A flange and the off-site and control room doses that would have occurred had the leak occurred during a design basis LOCA. This study was performed for LER/Docket Number 90-018/0500237, Leakage Path Discovered During Primary Containment ILRT Due to Management Deficiency. The measured leak rate at a containment pressure of 14.6 psig was determined to be 24.6 weight % per day. This value was then extrapolated to determine the leakage rate at design basis pressure (48 psig). Using extrapolation methods which are valid for the turbulent flow regime (as opposed to choked or laminar flow conditions), the as-found leak rate at 48 psig was conservatively calculated at 31 weight % per day. This study concluded that 10 CFR 100 and GDC 19 limits would not have been exceeded.

The leakage from the vacuum breaker check valve hinge pin flanges is blanketed between the leakage described in the two studies. Since the leakage in these two studies demonstrated no limits to be violated, the leakage from the hinge pin flanges would not have violated 10 CFR 100 limits.

E. CORRECTIVE ACTIONS:

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

In order to verify that the inboard Torus to Reactor Building Vacuum Breaker Butterfly Valves 3-1601-20A and 3-1601-20B were still performing their functions as Primary Containment Isolation Valves, the valves had to be challenged with an LLRT. In order to do this, the leakage from around the check valve hinge pin flange needed to be stopped.

The Torus to Reactor Building Vacuum Breaker 3-1601-31A hinge pin flange bolting was torqued to 148 ft-lbs under Work Request D29548. A "snoop" check of the flange showed no leakage and an as-left LLRT yielded a leakage rate of 5.97 scfh.

The Torus to Reactor Building Vacuum Breaker 3-1601-31B hinge pin flange bolting was torqued to 148 ft-lbs under Work Request D29549. A "snoop" check of the flange showed no leakage and an as-left LLRT yielded a leakage rate of 2.03 scfh.

The Control Room was notified of the reestablishing of Primary Containment and the reactor shutdown was halted at 2000, February 3, 1995.

Dresden Operating Surveillance (DOS) 1600-13, Suppression Chamber To Reactor Building Vacuum Breaker Full Stroke Exercise Test For 2(3)-1601-31A and B, was then performed to demonstrate operability of the tilting disk check valve vacuum breakers.

DOS 1600-13 will be revised to improve procedure clarity (249-180-95-00301) and training concerning these procedural changes will be given to Operations Department personnel during continuous training (249-180-95-00302).

Field labeling will be modified to be consistent with the procedure enhancements (249-180-95-00303).

All Operating Department IST Surveillances are being reviewed to ensure the procedure steps are clear and appropriate. The procedures will be revised as necessary to ensure any special equipment or support is clearly delineated (249-180-95-00304).

The process for determining which Operations Department procedure revisions are included as continuous training topics will be evaluated and strengthened where appropriate (249-180-95-00305).

This incident will be tailgated prior to the next performance of DOS 1600-13 (249-180-95-00306).

F. PREVIOUS OCCURRENCES:

LER/Docket Number	Title
93-016/0500249	Type B and C Test Leakage Limit of 0.6L_a Exceeded Due to Leaking Valve
89-009/0500249	Local Leak Rate Testing "As Found" Limit Exceeded Due to Leakage From Primary Containment Valves

G. COMPONENT FAILURE DATA:

No component failure.