



**Commonwealth Edison**  
Dresden Nuclear Power Station  
R.R. #1  
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October 21, 1991

EDE LTR #91-650

U.S. Nuclear Regulatory Commission  
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Licensee Event Report #91-009, Docket #050249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(i)(B).

  
E. D. Eenigenburg  
Station Manager

Dresden Nuclear Power Station

EDE/dwh

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III  
NRC Resident Inspector's Office  
File/NRC  
File/Numerical

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) <b>Dresden Nuclear Power Station, Unit 3</b>	Docket Number (2) <b>0 15 10 10 10 12 14 9 1</b>	Page (3) <b>1 of 0 7</b>
Title (4) Failure to Perform Post-Maintenance Local Leak Rate Test Due to Management Deficiency		

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	9	2	0	9	1	9	1	1	0	4	9	1
									N/A			
									N/A			

OPERATING MODE (9) <b>N</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)											
POWER LEVEL (10) <b>0 0 0</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)								
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)								
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)(c)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)								
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)									
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	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)									

LICENSEE CONTACT FOR THIS LER (12)											
Name <b>Jeffrey Boyar, Regulatory Assurance Engineer</b>								TELEPHONE NUMBER <b>Ext. 2707</b>			
								AREA CODE <b>8 1 1 5 9 4 2 - 2 19 12 10</b>			

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)								Expected Submission Date (15)	Month	Day	Year
Yes (If yes, complete EXPECTED SUBMISSION DATE)								<b>X</b>			

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

During performance of 10CFR50 Appendix J Local Leak Rate Testing (LLRT) with Unit 3 in a refuel outage, the test volume containing containment vent and purge system valves 3-1601-23, -24, -60, -61, -62 and -63 was identified to have excessive leakage. Further testing identified the 3-1601-24 valve as the leakage source. Further investigation revealed that maintenance work had been performed on the 3-1601-24 valve air operator during the previous refuel outage without completion of a proper post-maintenance LLRT as required by 10CFR50 Appendix J. The review determined that the air operator closure stroke was inadvertently misadjusted during installation of a new piston rod. The root cause was attributed to management deficiency in that inadequate controls were provided within the work package to prohibit activities affecting closure integrity without completion of a post-maintenance LLRT. Safety significance was mitigated by the fact that actual containment leakage under design basis accident conditions would have been prevented by redundant isolation valves which were proven intact via LLRT during the current refuel outage and during satisfactory performance of a Type A Integrated Leak Rate Test during the last refuel outage. Review of work packages from the last Unit 2 refuel outage was promptly initiated, and identified two additional LLRT violations. Corrective actions will include improvements to the work control process. A previous event involving an LLRT violation was reported by LER 90-018/050237.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

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-XXXX)

EVENT IDENTIFICATION:

Failure to Perform Post-Maintenance Local Leak Rate Test Due to Management Deficiency

A. CONDITIONS PRIOR TO EVENT:

Unit: 3	Event Date: September 20, 1991	Event Time: 1330 Hours
Reactor Mode: N	Mode Name: Refuel	Power Level(s): 0%
Reactor Coolant System (RCS) Pressure: 0 psig		

B. DESCRIPTION OF EVENT:

On September 16, 1991, with Unit 3 shutdown for refueling and maintenance, during performance of 10CFR50 Appendix J type C LLRT testing, the volume containing containment vent and purge system [BF] valves 3-1601-23, -24, -60, -61, -62 and -63 (see Figure 1) was identified to have excessive leakage. Further diagnostic testing concluded that valve 3-1601-24 was the leakage source. On September 20, 1991, at 1330 hours, while performing a maintenance history review, it was discovered that maintenance work had been performed on the 3-1601-24 valve during the previous refuel outage (D3R11) without completion of a proper post-maintenance LLRT as was required by 10CFR50 Appendix J. The valve operator cylinder was rebuilt on February 2, 1990, under Work Request (WR) 90166. The work package indicated that a new piston rod was installed and the cylinder was reassembled. The package required Post Maintenance Testing (PMT) as follows: (a) Dresden Technical Surveillance (DTS) 1600-29, Isolation valve Fail Safe Mode and Air Operator Accumulator System Integrity Test, (b) Dresden Operating Surveillance (DOS) 040-7, Remote Position Indication Verification, (c) DOS 1600-1, Quarterly Valve Timing. PMT did not require performance of DTS 1600-1, LLRT of Primary Containment Isolation Valves. An as found LLRT had been performed on this volume (12/5/89) and passed.

The Work Analyst that wrote the February, 1990, work instructions intended for the Mechanics to return the work package to him if parts affecting actuator stroke length were affected. This was not stipulated in the work instructions. Work instruction #5 read: "clean all of the parts and inspect the stem, cylinder, bushings, wipers, rod seals, and piston for any damage that may be evident, replace parts as required under supervisors inspection." The Mechanics and their Supervisor interpreted this work instruction to mean they could decide which parts required replacement. The Mechanics, performing the replacement of the piston rod, dimensionally verified the positioning of the piston rod during disassembly and re-assembly. However, the new piston rod was inserted one and three quarters turns too far.

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This corresponds to roughly 1/8 inch. This error was not caught because an LLRT was not performed on the valve following maintenance. The shaft and bonnet have punch marks to indicate the relative positioning required to achieve valve closure. These punch marks provide a reasonable approximation of valve closure; however, they are insufficient to ensure leak tight valve closure. When adjustments are performed which can affect valve closure, leak testing is required during the re-assembly to achieve the precise positioning required to achieve full closure. An LLRT is required as a Post Maintenance Test to ensure the valve does achieve proper closure. Dresden Maintenance Procedure (DMP) 1601-2, "Drywell and Torus Air Operated Butterfly Valve Maintenance," Revision 1 was not used as part of the work instructions because the work analyst believed that there were administrative restrictions on using only a portion of a procedure. DMP 1601-2 does contain a Limitation and Action which specifically allows for the use of only a portion of the procedure. However, the applicable steps are part of a section on removing the valve assembly and referencing the appropriate sub-steps could have lead to confusion. DMP 1601-2, Revision 1, Step 10, "Concluding Maintenance Activities," sub-step "a" reads "Obtain a final LLRT for valve." Had the Work Analyst reviewed DMP 1601-2 during the writing of the work instructions this requirement may have been included in the work instructions. The work package for WR 90166 contained a completed copy of Dresden Administrative Procedure (DAP) 15-6, Checklist C, "Post Maintenance Checklist." The line item for "Were Primary Containment Isolation Valves disturbed?" was marked YES by the Maintenance Supervisor. The desired tests to be completed prior to declaring the system/equipment operable listed the four tests which were performed but omitted an LLRT. This section was completed by the Shift Engineer on Checklist C. DAP 15-01 Rev. 22 and DAP 15-6 Rev. 0 were Dresden On-Site Reviewed (DOSRd) on January 12, 1990. DAP 15-1, Revision 21, (DOSRd 01/25/89) required the Operating Engineer/Designee to define the testing required to return the component to service following maintenance. DAP 15-6, Revision 0, (DOSRd 01/12/90) requires the Work Analyst/ENC Engineer to review the WR for Post Maintenance Testing/Verification (PMT/V) requirements. The work instructions were written on January 27, 1990. No training on the implementation or the accomplishment of this change was provided to the Work Analyst. When the Work Analyst wrote the work instructions on January 27, 1990, he used the Operating Engineer's recommended testing as specified on the Work Request. The PMT was later modified to incorporate the Shift Engineer's PMT requirements per checklist C of DAP 15-6. A barrier which could have prevented this event was follow-through on the part of the Technical Staff System Engineer, the Maintenance Supervisor, or the Maintenance Work Analyst. Any of these personnel could have prevented this event by following through and ensuring that an LLRT was performed. The reason why the problem with the 3-1601-24 valve was not discovered during the ILRT was that the inboard isolation valves of that volume were closed during the Integrated Leak Rate Test (ILRT). 3-1601-24 was also closed during the Type A Primary Containment Integrated Leak Rate Test (ILRT).

A review was performed of the primary containment valves which had maintenance performed on them during the last Unit 2 refuel outage, D2R12, to identify any primary containment boundary valves which should have required an LLRT as a PMT and did not receive one. This review utilized a printout from the Total Job Management (TJM) Maintenance history computer program of components having Primary Containment Isolation Equipment Identification (EID) numbers. This printout was used to generate a list of WR numbers for all EIDs that had work performed on them starting at the beginning of D2R12 and proceeding through September 1991. Printouts of the work performed was then obtained using TJM for each of the identified WRs. The work performed write-ups were reviewed to determine if an LLRT was required. If the TJM entry was not sufficiently detailed to determine if an LLRT was required, the work package was retrieved from Central File and reviewed. The reviewers then verified that an LLRT had been performed after the maintenance was completed. 207 work requests from D2R12 were reviewed. This review discovered two (2) valves which did not have a PMT LLRT. These valves were:  
 2-205-27 (WR 96777): Reactor Head Cooling [AA] Inlet Check Valve  
 2-1601-63 (WR 96813): Drywell Vent to Standby Gas Treatment [BH] Valve

The pathway containing the 2-205-27 valve was promptly isolated and an LLRT was performed satisfactorily on the 2-1601-63 valve.

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C. APPARENT CAUSE OF EVENT:

This event is reported in accordance with 10CFR 50.73(a)(2)(i)(B), which requires the reporting of any condition prohibited by the Technical Specifications. The root cause of this event is management deficiency in that a breakdown in administrative controls concerning post-maintenance LLRTs occurred. Contributing to this event were:

- DAP 15-1, "Work Requests" was split into DAP 15-1 and DAP 15-6 a month prior to this event. No training was provided to the Work Analyst on this revision to the DAPs.
- The Work Analyst failed to get proper assistance in assembling the PMT requirements due to a lack of system knowledge.
- The Shift Engineer that reviewed the Post Maintenance Checklist was unsure as to which procedure number covered LLRT and failed to verify the procedure number.
- The Technical Staff System Engineer did not ensure that an LLRT had been performed on the valve when the Maintenance Supervisor called requesting that the appropriate tests be performed on the valve.
- The Work Analyst failed to write work instructions that clearly delineated the work scope intended.

The cause of the failure to perform PMT LLRT on Unit 2 is similar to that described for Unit 3.

D. SAFETY ANALYSIS OF EVENT:

Concerning the 3-1601-24 valve, the safety significance was mitigated by the fact that the redundant isolation valves were proven intact via LLRT during the current refuel outage and ILRT during the previous refuel outage. The redundant isolation valves would have inhibited actual containment leakage under design basis accident conditions. The pathway containing the Unit 2 2-0205 valve identified as not receiving proper post-maintenance LLRT also was demonstrated to have satisfactory integrity during an ILRT performed at that refuel outage. The 2-1601-63 valve received an LLRT on October 3, 1991 to demonstrate that it has satisfactory integrity.

E. CORRECTIVE ACTIONS:

1. Quality Control (QC) will review Unit 3 work packages for D3R12 (current Unit 3 refuel outage) to ensure that appropriate post maintenance testing has been specified during the QC release review. (249-200-91-07001)
2. A multi-disciplined team will perform a final review of all D3R12 work packages on primary containment boundary components to ensure that the appropriate PMT has been performed. (249-200-91-07002)
3. All work packages are being reviewed by the Work Analysts against the PMT requirements listing generated by the Maintenance Improvement Team. (249-200-91-07003)

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4. A review was performed of the primary containment valves which had maintenance performed on them during the last Unit 2 refuel outage (D2R12) to identify any primary containment boundary valves which may have required an LLRT and did not receive one. This review identified two additional valves that did not receive an LLRT PMT.  
  
-The 2-0205-4 (Reactor Head Cooling Inlet Valve) was taken Out-of-Service (OOS) in the closed position on 10/02/91 to address the lack of an LLRT PMT on the 2-205-27 valve .  
  
An LLRT was satisfactorily performed on October 3, 1991, to address the lack of a PMT LLRT on the 2-1601-63 valve. (249-200-91-07004)
5. A booklet has been developed containing color coded Piping and Instrument Diagrams (P&IDs) and a description of LLRT/ILRT requirements. This booklet was distributed to the Work Analysts, the Operating Engineers and Quality Control in September, 1991. Additional copies of these P&IDs will be distributed to other Operating, Mechanical, and Electrical Maintenance Department personnel. (249-200-91-07005)
6. A multi-disciplined team has been developing an on-line data base of Post Maintenance Tests associated with maintenance activities in the plant. This catalogue will be a living document that will be updated as new requirements for PMT are developed. This catalogue will be available by January 1, 1992. (249-200-91-07006)
7. The Technical Staff Supervisor trained Technical Staff personnel on the need for follow-through to ensure proper resolution of concerns. This event will be high-lighted. This was accomplished on October 17, 1991. (249-200-91-07007)
8. The In-Service Inspection/In-Service Testing (ISI/IST) group will review each Nuclear Work Request to determine PMT requirements based on work requested. This review will be documented on the Nuclear Work Request. This began on October 15, 1991. As noted in item 2 above, all D3R12 work packages involving primary containment boundary components will also receive a final review to verify that proper post maintenance LLRTs have been performed. (249-200-91-07008)
9. A Maintenance Memo will be developed/revise to detail the requirements for assembling PMT requirements for Primary Containment Isolation Valves. These instructions will include the need to obtain the ISI/IST group's concurrence on all PMTs for Primary Containment volumes. This will be accomplished by November 1, 1991. (249-200-91-07009)
10. A multi-disciplined team will develop a training module on PMT that includes a section on LLRT. This module will emphasize that an LLRT is required anytime the "closing force of the valve is altered." This will be accomplished by January 1, 1992 . (249-200-91-07010a) Technical Staff, Mechanical and Electrical Maintenance Supervisors, and Operations Supervisors will receive training from this module. This will be accomplished by March 1, 1992. (249-200-91-07010b)
11. A request will be made to the committees responsible for developing the initial training programs for the Technical Staff, Operating Supervisors, Shift Engineers, and Work Analysts to include training on LLRT testing requirements. This will be performed by the Maintenance Improvement Team and will be accomplished by November 1, 1991. (249-200-91-07011)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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12. The PMT Maintenance Memo will be revised to specify a graded approach to determining PMT. During the Work Analyst's review of the WR for PMT requirements, any questions will be referred to the Technical Staff. Following work completion, the Work Analyst will compare the work done with the work instructions. Any discrepancies will cause a verification of the PMT requirements performed. Then, during Quality Control's review of the WR for QC release, any questions regarding PMT will be referred to the Technical Staff. Then, during the Operating Department's review of the Post Maintenance Checklist, any questions regarding PMT will be referred to the Technical Staff. This revision will be performed by the Maintenance Staff by November 1991. (249-200-91-07012a) A permanent DAP on PMT will be developed by January 1, 1992, and will include these requirements. (249-200-91-0712b).
13. A multi-disciplined team will evaluate the approaches used by other Commonwealth Edison nuclear stations to ensure that appropriate PMT requirements are included in the work package. This will be performed by the Maintenance Improvement Team and will be accomplished by January, 1992. (249-200-91-07013)

F. PREVIOUS EVENTS:

LER/Docket Numbers    Title

90-018/050237      On December 17, 1990, while performing a primary containment ILRT during the Unit 2 refuel outage, leakage in excess of the Technical Specification 3.7.A.2 ILRT requirement was measured due to a leaking reactor building to pressure suppression chamber vacuum breaker valve A02-1601-20A inboard flange. Further review on December 18, 1990, indicated that this vacuum breaker had been replaced during the previous refuel outage without proper testing of the inboard flange connection; 10CFR50.72 notification was then completed. Although this degraded condition potentially existed during the previous operating cycle, the secondary containment would have mitigated release to the environs under postulated design basis accident conditions. Analysis concluded that 10CFR100 requirements would not have been exceeded. The ILRT was completed satisfactorily after the flange was tightened. The underlying cause for not challenging this pathway upon earlier replacement of the vacuum breaker was attributed to management deficiency in that performance of an ILRT following this activity was not properly specified or identified. A previous Dresden Unit 2 ILRT failure due to unrelated causes is reported by LER 83-29/050237.

G. COMPONENT FAILURE DATA:

None.

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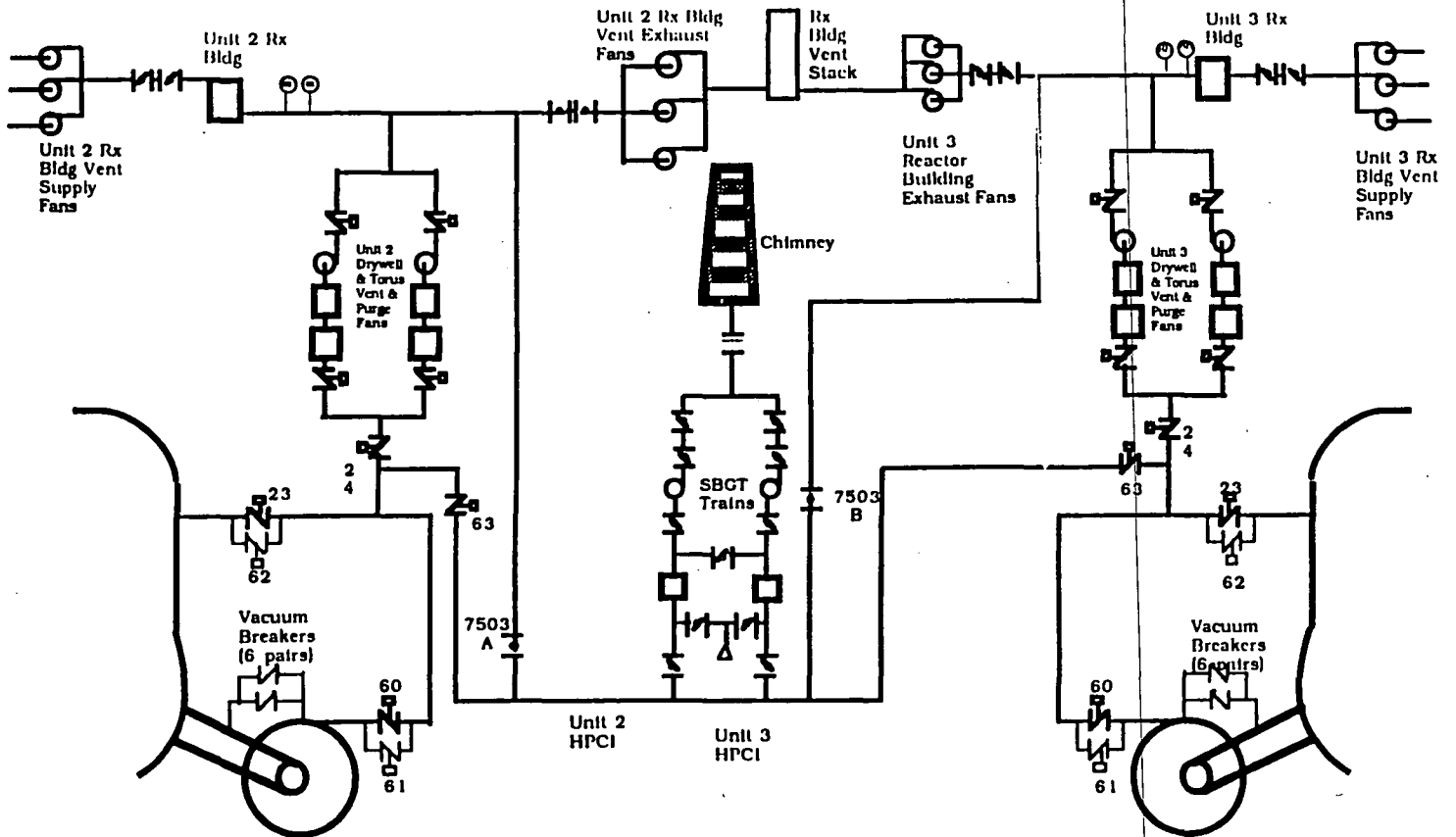


Figure 1 Drywell & Torus Vent Flowpaths