



## Nebraska Public Power District

COOPER NUCLEAR STATION  
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CNSS923511

January 7, 1992

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

Dear Sir:

Cooper Nuclear Station licensee Event Report 91-020, Revision 0, is being forwarded as an attachment to this letter.

Sincerely,

J. M. Meacham  
Division Manager of  
Nuclear Operations  
Cooper Nuclear Station

JMM/bjs

Attachment

cc: R. D. Martin  
G. R. Horn  
R. E. Wilbur  
V. L. Wolstenholm  
D. A. Whitman  
INPO Records Center  
NRC Resident Inspector  
R. J. Singer  
CNS Training  
CNS Quality Assurance

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## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)										DOCKET NUMBER (2)										PAGE (3)																													
Cooper Nuclear Station										0 5 0 0 0 2 9 8										1 OF 0 4																													
TITLE (4)																																																	
Failure Of The Primary Containment Integrated Leak Rate Test Due To Drywell Vent Monitor System and Containment Penetration Leakage																																																	
EVENT DATE (5)										LER NUMBER (6)										REPORT DATE (7)										OTHER FACILITIES INVOLVED (8)																			
MONTH			DAY			YEAR				SEQUENTIAL NUMBER			REVISION NUMBER			MONTH			DAY			YEAR				FACILITY NAME										DOCKET NUMBER(S)													
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THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																																																	
OPERATOR (12)										20.402(h)										20.405(c)										50.73(a)(2)(iv)										73.71(b)									
OWNER (13)										20.405(a)(1)(i)										50.36(c)(1)										50.73(a)(2)(iv)										73.71(c)									
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LICENSEE CONTACT FOR THIS LER (12)																																																	
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Donald L. Reeves, Jr.										AREA CODE										4 10 12 8 12 5 1-13 18 1 1																													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																	
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YES (If yes, complete EXPECTED SUBMISSION DATE)										X NO										EXPECTED SUBMISSION DATE (15)										MONTH DAY YEAR																			
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																																																	
<p>On December 16, 1991, the Containment Integrated Leak Rate Test (ILRT) leak rate was determined to be 437.5 Standard Cubic Feet per Hour (SCFH) or 1.38 La, where La is the allowable containment leak rate. This leak rate included an ILRT penalty equal to 192 SCFH and a Type B and C Local Leak Rate Test (LLRT) adjustment of 143 SCFH. The penalty was incurred due to leakage from the Drywell Vent Radiation Monitor when the gaseous detector breached its shield chamber at a containment pressure of 51.6 psig during pressurization for the ILRT. The 143 SCFH adjustment, accounting for penetration repairs made prior to conduct of the ILRT, was principally due to two leaking containment isolation valve penetrations for the Reactor Water Cleanup (RWCU) System and the Reactor Feedwater (RF) System.</p> <p>The cause of the Drywell Vent Radiation Monitor failure is attributed to design. Considerable periodic maintenance and testing, involving removal of the detectors from their shield chambers, has been performed over the years that the monitor has been in service. The numerous disassembly and reassembly evolutions resulted in the shield chamber threaded connections becoming degraded, such that when the unit was pressurized, the threaded engagement of the detector retaining bolts in the shield chamber failed. No definitive cause for the RWCU Isolation valve leakage was determined. The RF System leakage was due to normal wear of the soft seats of the two Reactor Feedwater check valves that comprise the penetration boundary.</p> <p>The Drywell Vent Monitor detector shield housings (gaseous, particulate, and iodine) were retapped and the detectors were bolted into place with larger bolts. New soft seats were installed in the RF check valves. Replacement RWCU Isolation valves were installed. LLRTs were subsequently conducted with satisfactory results.</p>																																																	

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Cooper Nuclear Station

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TEXT (if more space is required, use additional NRC Form 306A) (17)

A. Event Description:

On December 10, 1991, at 12:35 a.m., during performance of the Primary Containment Integrated Leak Rate Test (ILRT), the Drywell Vent Radiation Monitor gaseous detector mounting bolt threaded engagement failed. This resulted in the detector being ejected from the lead shield chamber enclosure. At the time, Primary Containment pressure was approximately 51.6 psig and was being raised to the ILRT test pressure of 58 psig.

The leakage from the Drywell Vent Monitor was quantified and determined to be 192 Standard Cubic Feet per Hour (SCFH). The monitor was then isolated and pressurization of the Primary Containment to the required test pressure was continued. Upon completion of the testing, the total as-found Primary Containment leak rate was calculated and determined to be 437.5 SCFH, equal to 1.38 La. This calculated leak rate included an adjustment of 143 SCFH from the previously performed Type B and C testing. The adjustment made was equal to the difference between the combined as-found and as-left local leak rates that had been determined.

The total as-found Local Leak Rate Test (LLRT) results for all of the Type B and C testing conducted was 236.1 SCFH, equal to 0.747 La. This leak rate exceeded the allowable Technical Specification test limit of 0.6 La specified in paragraph 4.7.A.2.f.1. Two penetrations accounted for just over one-half of the as found leak rate:

PENETRATION	VALVES	AS-FOUND MINIMUM PATH LEAK RATE
X-9B	RF-CV-14CV RF-CV-13CV	45.5 SCFH
X-14	RWCU-MOV-15 RWCU-MOV-18	79.2 SCFH

B. Plant Status

Determination that the ILRT results exceeded 0.75 La, the test limit specified in paragraph 4.7.A.2.d of the Technical Specifications, occurred immediately following completion of the ILRT on December 10, 1991. At this time, the plant was in cold shutdown. On December 16, 1991, calculations were completed indicating that the total as-found Primary Containment leak rate was 1.38 La. NRC notification was made in accordance with 10 CFR 50.72. A plant startup from the 1991 Refueling Outage was in progress at that time. With regard to local leak rate testing, the required testing was conducted throughout the course of the 1991 Refueling Outage.

C. Basis for Report

A condition found while shutdown wherein a principal safety barrier (Primary Containment) was determined to be seriously degraded, reportable in accordance with 10CFR 50.73(a)(2)(ii). In addition, the LLRT results are being reported in accordance with 10CFR 50.73(a)(2)(i)(B), a condition prohibited by Technical Specifications.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

TEXT (if more space is required, use additional NRC Form 366A (1/7))

D. Cause

Design. The Drywell Vent Monitor, model I-RAK-225-1F, manufactured by Nuclear Measurements Corporation, was designed, fabricated and installed as part of original plant equipment. Over the years, numerous detector calibration and maintenance efforts have required removal of the detector from the shield chamber, which is primarily constructed of lead. This frequent disassembly and reassembly resulted in degrading the shield chamber threaded connections into which the detector is bolted. When the unit was pressurized during performance of the ILRT, the threaded engagement of the retaining bolts in the shield chamber failed, resulting in ejection of the detector.

With regard to the two penetrations that were the principal contributors to the LLRT results being in excess of Technical Specification limits, no definitive cause was established for the leakage at penetration 14 involving Reactor Water Cleanup System Isolation Valve RWCU-MOV-15 and 18. Both valves were replaced. With regard to penetration X-9B, involving Feedwater Check Valves RF-CV-14CV and 13CV, the soft seats for both valves were worn and were replaced.

E. Safety Significance

The greatest release of radioactive material to the Primary Containment results from a complete circumferential break of one of the recirculation loop lines, the Design Basis Accident Loss of Coolant Accident (DBA-LOCA). The potential off-site radiological dose is conservatively based on a Primary to Secondary Containment leakage of La (316 SCFH, which is equal to 0.635 weight percent per day of the containment volume at 58 psig) for 30 days.

As previously noted in Section A, Event Description, an adjustment to the measured ILRT result equal to 143 SCFH was made to account for the as-found LLRT results. Of this adjustment, approximately 124 SCFH was due to the two (2) penetrations that were found to have leakage of significance (i.e., the Feedwater (RF) System and the Reactor Water Clean Up (RWCU) System). However, the integrity of these systems is not violated as a result of the DBA-LOCA. Thus, under the as-found LLRT conditions that existed, the maximum potential leak rate from containment would have been equivalent to the 316 SCFH design leak rate at 58 psig (437.5 SCFH minus 124 SCFH, equal to 313.5 SCFH), since there would have been no communication between either the RWCU or RF Systems and Secondary Containment. Therefore, the safety significance of the as-found conditions was bounded by the existing accident analysis.

F. Safety Implications

Had a DBA-LOCA occurred under the Primary Containment conditions that existed, the off-site radiological consequences would have been comparable to the highly conservative analyzed result, since the leak rate from Primary Containment would have been equivalent to the design leak rate.

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G. Corrective Action

With regard to the Drywell Vent Radiation Monitor, the existing mounting bolt holes for all three channels (gaseous, particulate, and iodine) were retapped to the next larger size, and larger bolts were used to mount the detectors, paper drive and filter. The unit was successfully leak rate tested at 58 psig and was returned to service. An evaluation of the system design is in progress.

With regard to the Type B and C test deficiencies, the RWCU Isolation Valves, RWCU-MOV-15 and 18, were replaced. The Feedwater Check Valves, RF-CV-14CV and 13CV, were refurbished. Subsequent leak rate testing was satisfactory.

H. Similar Events

Since 1984, two LERs associated with LLRT have been submitted.

LERDATETITLE

85-005, Rev. 1

01/16/86

Excessive Primary Containment  
Local Leakage Rate

87-004, Rev. 0

02/06/87

Excessive Primary Containment  
Leakage Discovered During Local  
Leak Rate Testing