ILLINOIS POWER

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Clinton Power Station
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L45-92(03-31)-LP
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March 31, 1992
10CFR50.73

Docket No. 50-461

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

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 92-003-00

Dear Sir:

Please find enclosed Licensee Event Report No. 92-003-00: Local Leak Rate Test Failure of Feedwater Containment Isolation Valves Results in Total Leakage Rates in Excess of Technical Specification and 10CFR50 Appendix J Limits. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

F. A. Spangenberg

F. A. Spangenberg, III
Manager, Licensing and Safety

RSF/alh

Enclosure

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
NRC Region III, Regional Administrator
Illinois Department of Nuclear Safety
INPO Records Center

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, 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)
Clinton Power Station	0 5 0 0 0 4 6 1	1 OF 0 4

TITLE (4) Local Leak Rate Test Failure Of Feedwater Containment Isolation Valves Results In Total Leakage Rates In Excess Of Technical Specification And 10CFR50 Appendix J Limits.

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 3	0 4	9 2	9 2	— 0 0 3 —	0 0	0 3	3 1	9 2	None	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	4
POWER LEVEL (10)	0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

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, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	X 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)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
D. D. Chiou, Project Engineer, Extension 3909	2 1 7	9 3 5 - 8 8 8 1

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
B	S J	I S V	A 3 9 1	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 6	2 2	9 2

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

With the plant in COLD SHUTDOWN and a refueling outage in progress, local leak rate testing (LLRT) identified leakage rates in excess of 20,000 standard cubic centimeters per minute (sccm) for reactor feedwater (FW) line inboard containment isolation check valves, 1B21-F010A and B. As FW line outboard containment isolation check valves 1B21-F032A and B have had excessive leakage since initial plant startup, the leakage rate for the FW penetrations was indeterminate. Though indeterminate, these leakage rates result in total leakages that are believed to be significantly higher than those assumed in the plant safety analysis and limited by Technical Specification 3.6.1.2, item b and d as well as 10CFR50 Appendix J paragraph III.C.3. The cause of the 1B21-F010B, 1B21-F032A and 1B21-F032B LLRT failures is attributed to valve manufacturing tolerances which result in the valves not seating adequately. These valves will be rebuilt to more precise tolerances. The cause of the 1B21-F010A LLRT failure and the corrective actions to be taken will be determined after the valve is disassembled and examined.

DESCRIPTION OF EVENT

On March 4, 1992, the plant was in Mode 4 (COLD SHUTDOWN) with reactor temperature at about 95 degrees Fahrenheit (F) and pressure at about zero pounds per square inch gauge (psig), and the third refueling outage (RF-3) was in progress. At about 1005 hours, during performance of a local leak rate test (LLRT), test engineers identified that the leakage rate through reactor feedwater [SJ] header check valve [ISV] 1B21-F010A, an inboard containment isolation valve for containment penetration [PEN] 1MC-009, was in excess of the test instrument's range of 20,000 standard cubic centimeters per minute (sccm). In addition, the test boundary could not be pressurized to more than three psig. The Staff Assistant Shift Supervisor (SASS) was notified of the LLRT failure.

The indeterminate leakage rate of containment penetration 1MC-009 when combined with the previously determined secondary containment bypass leakage rate of 16,757 sccm (plus or minus 251 sccm) resulted in an excessive total secondary containment bypass leakage rate. Though indeterminate, the leakage is believed to be significantly higher than 0.08 La (0.08 La equals 29,638.3 sccm), the total secondary containment bypass leakage rate limit of plant Technical Specification 3.6.1.2, "Primary Containment Leakage", item d and as identified in the plant safety analysis.

Additionally, with the leakage rate through containment penetration 1MC-009 indeterminate, the combined leakage rate for all containment penetrations and valves subject to Type B and C tests is also believed to be excessive and likely in excess of La. La is the analytical limit determined or assumed by the plant safety analysis and is the basis for the 0.6 La limit provided in 10CFR50 Appendix J paragraph III.C.3 and Technical Specification 3.6.1.2, item b.

During an LLRT on March 5, 1992 at about 1445 hours, with the plant in Mode 4 at about 95 degrees F and zero psig, test engineers identified that the leakage rate through reactor feedwater header check valve 1B21-F010B, an inboard containment isolation valve for penetration 1MC-010, also exceeded 20,000 sccm. In addition, the test boundary could not be pressurized to more than five psig. The Shift Supervisor was notified of the LLRT failure. The 1B21-F010B LLRT failure further contributed to an excessive total leakage.

It should be noted that the outboard containment isolation valves for penetrations 1MC-009 and 1MC-010, 1B21-F032A and B respectively, have had identified leakage rates in excess of 20,000 sccm since initial plant startup. Until the second refueling outage (RF-2), the maximum pathway leakage rate reported for each of the feedwater penetrations was based upon a provision in the Updated Safety Analysis Report which allowed 1B21-F032A and B valve leakage rates to be excluded from the associated containment penetration leakage. This provision was based on allowing credit to be taken for additional valves associated with the feedwater penetrations that are regarded to be containment isolation valves. During RF-2, this provision was questioned and subsequently deleted.

Also during RF-2, LLRTs of 1B21-F032A and B identified leakage rates in excess of 20,000 sccm. After extensive rework of these valves, they successfully passed a 1000 psig water leak rate test. However, Illinois Power (IP) was unable to achieve acceptable nine psig air test leakage results. In response to this, IP requested and was granted a one-time exemption from 10CFR50 Appendix J and Technical Specification 3/4.6.1.2 requirements for penetrations 1MC-009 and 1MC-010 (IP letter U-601784 dated January 18, 1991). The exemption allowed the leakage rates of 1B21-F032A and B to continue to be excluded from the combined leakage rates but only for the third operating cycle. IP requested the exemption to provide adequate time for evaluation of solutions which would result in acceptable air leakages and ensure lasting performance of these valves.

During the occurrence of the event described in this LER, no automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other equipment or components were inoperable at the start of this event such that their inoperable condition contributed to this event (except as described above).

CAUSE OF EVENT

The 1B21-F010B, 1B21-F032A and 1B21-F032B valves (as well as the 1B21-F010A valve) are non-slam type tilting disc check valves. The 1B21-F010A and B valves have no external operator while the 1B21-F032A and B valves have an air assist closure feature. To satisfy the stringent leak tightness required by the nine psig air LLRT, a precise match between the valve seat and the valve disc is mandatory. However, the repeatability of such a precise match is difficult to obtain in tilting disc check valves because the manufacturing tolerances on the disc hinge pin, bushing and disc arms can make alignment of the valve's internal parts inconsistent.

Disassembly and examination of the 1B21-F010B, 1B21-F032A and 1B21-F032B valves have been completed. Based on this examination, the cause of the indeterminate leakage rates has been attributed to the valves' manufacturing tolerances and alignment. These conditions resulted in the valves' discs not seating adequately, thus resulting in excessive clearances that allowed air to leak past the seats.

The cause of the indeterminate leakage rate of 1B21-F010A has not yet been identified. To determine the cause, the valve will be disassembled and examined. Corrective actions will be determined following the disassembly and examination of the valve. Results of the examination and

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Clinton Power Station	0 5 0 0 0 4 6 1	9 2	— 0 0 3 —	0 0	0 4 OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

identified corrective actions will be provided in a supplemental report expected to be submitted by June 22, 1992.

CORRECTIVE ACTION

IP will rebuild the 1B21-F010B, 1B21-F032A and 1B21-F032B valves to the more precise tolerances and alignment required to obtain acceptable air leakages at nine psig. This will include installing new blank valve discs, machining valve discs and seats to the proper angle and align-boring the valve hinge assemblies to provide a more precise fit. Following the rebuilding of the valves, they will be leak rate tested to ensure acceptable nine psig air test leakage results are obtained.

These corrective actions will be completed prior to startup from RF-3.

The evaluation of the cause of the 1B21-F010A LLRT failure and a determination of corrective actions are also scheduled to be completed prior to startup from RF-3.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(ii) because it resulted in the plant's principal safety barriers being degraded.

An assessment of the safety consequences and implications of this event has not yet been completed. This information will be provided in the supplemental report.

The length of time the 1B21-F010A and B valves had unacceptable leakage rates is indeterminate; the valves had acceptable leakage rates when last tested during RF-2. (The 1B21-F032A and B valves have had unacceptable leakage rates since initial plant startup, as previously explained).

ADDITIONAL INFORMATION

For further information regarding this event, contact D. D. Chiou, Project Engineer, at (217)935-8881, extension 3909.

Valves 1B21-F010A and B are Model 15010, 18-inch non-slam type tilting disc check valves manufactured by the Anchor/Darling Valve Company. Valves 1B21-F032A and B are Model 15204, 20-inch air assisted non-slam type tilting disc check valves manufactured by the Anchor/Darling Valve Company.

Since all causes of the event have not been established, previous similar events cannot be determined at this time. This information will be provided in a supplement to this report.