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Ken Powers
Vice President, Sequoyah Nuclear Plant

May 19, 1994

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET NO. 50-328 - FACILITY OPERATING LICENSE DPR-79 - LICENSEE EVENT REPORT (LER) 50-328/94005

The enclosed LER provides details concerning the loss of containment integrity as a result of a relief valve failure. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as an operation prohibited by technical specifications.

Sincerely,

Ken Powers

Ken Powers

Enclosure
cc: See page 2

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cc (Enclosure):

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NRC Form 366 (5-92)

U.S. NUCLEAR REGULATORY COMMISSION

Approved OMB No. 3150-0104
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LICENSEE EVENT REPORT (LER)

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TITLE (4)
Loss of Containment Integrity as a Result of a Relief Valve Failure

EVENT DAY (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 4	1 9	9 4	9 4	0 0 5	0 0	0 5	1 9	9 4		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)			
POWER LEVEL (10)	1 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, NRC Form 366A)
		20.405(a)(1)(iii)	XX 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)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
J. Bajraszewski, Compliance Licensing	6 1 5 8 4 3 - 7 7 4 9

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
X	B 2	R V	C 7 1 0	Y					

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)

On April 19, 1994, at 1440 Eastern daylight time, it was determined that the technical specification for containment leak rate limits was exceeded as a result of a failed relief valve bellows and a check valve leaking through its seat. Prompted by an inability to maintain pressurizer relief tank (PRT) pressure, relief valves outside of containment that discharge to a line that is connected to the PRT inside containment were inspected. One relief valve was found to be leaking gas through the bonnet vent hole. Testing of the relief valve quantified the leakage. Leakage from the relief valve in combination with containment integrated leakage resulted in a leakage greater than allowable limits. Limiting Condition for Operation (LCO) 3.6.1 was entered. The relief valve was replaced and the LCO was exited. Upon disassembly of the failed relief valve, the bellows was found to have a 30 percent circumferential crack. The cause of the bellows failure was undetermined.

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

I. PLANT CONDITIONS

Unit 2 was in power operation at approximately 100 percent.

II. DESCRIPTION OF EVENT

A. Event

On April 19, 1994, at 1440 Eastern daylight time (EDT), it was determined that the technical specification (TS) for containment leak rate limits was exceeded as a result of a failed relief valve bellows (EIIS Code BD) and a check valve leaking through its seat. Prompted by an inability to maintain pressurizer relief tank (PRT) pressure, relief valves outside of containment that discharge to a line that is connected to the PRT inside containment were inspected (see attachment). One relief valve was found to be leaking gas through the bonnet vent hole. Testing of a relief valve quantified the leakage. Leakage from the relief valve in combination with containment integrated leakage resulted in a leakage greater than allowable limits. Limiting Condition for Operation (LCO) 3.6.1 was entered. The relief valve was replaced, and the LCO was exited. For reporting purposes it is assumed that leakage limits were exceeded when relief valve problems were identified on March 30, 1994. Therefore, the event was considered as an operation prohibited by TS.

B. Inoperable Structures, Components, or Systems that Contributed to the Event

A relief valve installed in the medium-head safety injection system was found to be leaking through its bellows allowing PRT cover gas (nitrogen) to leak to the auxiliary building area. The relief valve discharges to a line that connects to the PRT in containment. It was concluded that the check valve on this line (inside containment) was leaking; because of piping configuration, the check valve cannot be independently tested for seat leakage. The combination of relief valves and the check valve are tested as part of the containment integrated leak rate test. Also, the check valve is disassembled on a periodic frequency for a visual inspection to identify component degradation.

C. Dates and Approximate Times of Major Occurrences

March 30, 1994	Relief valve was found relieving during pump testing. PRT pressure and level increase was noted.
April 7, 1994	System Engineering was informed that the PRT was not maintaining pressure. Initial diagnosis was that the tank's rupture disk may have been leaking. Trending of related parameters was initiated. Began analysis of PRT gas for hydrogen and oxygen content.

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

April 14-18, 1994	Nitrogen addition to the PRT increased. Auxiliary building radiation activity did not increase during the period. Containment pressure and radiation did not increase during the period. A decision was made to inspect auxiliary building relief valves that discharge to the PRT.
April 19, 1994 at 1123 EDT	A relief valve was identified to be leaking gas from the bonnet vent hole.
April 19, 1994 at 1130 EDT	The leaking relief valve was tested to quantify the leakage.
April 19, 1994 at 1440 EDT	Extrapolation of test results to 12 pounds per square inch gauge (psig) indicated total containment leakage exceeded TS limits. LCO 3.6.1.1 was entered.
April 19, 1994 at 1848 EDT	The replacement of the relief valve was completed. LCO 3.6.1.1 was exited.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The condition was discovered during the inspection of relief valves for leakage as a result of the PRT not holding pressure.

Operator Actions

None.

G. Safety System Response

No safety system responses were required.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this condition was the failure of a relief valve bellows and a check valve leaking through its seat. The failure of the valve's bellows resulted in a leakage path from the PRT to the auxiliary building atmosphere.

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B. Root Cause

The root cause of the relief valve bellows failure could not be determined.

It is believed that the containment isolation check valve inboard of the piping penetration leaked through the valve seat because of the low pressure (less than 6 psig) and flow rate involved. The valve is inspected in accordance with American Society of Mechanical Engineers (ASME) Section XI requirements and no component degradation has been observed in the past inspection. The check valve will continue to be inspected within the ASME Section XI program.

C. Contributing Factors

None.

IV. ANALYSIS OF EVENT

The primary containment is designed to withstand the pressures and temperatures of a limiting design basis accident (DBA) without exceeding the design leakage rates. The maximum allowable leakage rate (La) is defined at the calculated peak containment internal pressure resulting from a DBA. As an added conservatism, the maximum allowable leakage rate is further limited (.75La) to account for possible degradation of the containment leakage barriers between containment integrated leak-rate tests. Although check valve leakage and relief valve bellows failure resulted in containment leakage above the .75La limit, total leakage described by this LER was below the La limit. As a result of the condition, an evaluation was performed on the impact to the Auxiliary Building Gas Treatment System (ABGTS). It was determined that the leakage was small and the ABGTS was capable of mitigating the consequence in the unlikely event of an accident. Therefore, there were no adverse consequences to the health and safety of plant personnel or the general public as a result of this event.

V. CORRECTIVE ACTION

A. Immediate Corrective Action

The failed valve was replaced.

B. Corrective Action to Prevent Recurrence

None.

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VI. ADDITIONAL INFORMATION

A. Failed Components

The failed relief valve was a Crosby relief valve, Model JMAK-BS-SPEC-B, Serial No. RV-2-8853B.

B. Previous Similar Events

A review of previous events identified one similar event (LER 50-327/93004). In that event, leakage at a personnel airlock blind flange was determined to be greater than allowable. The cause was improper installation of the blind flange. The actions taken for that event would not have prevented the event described in this LER.

VII. COMMITMENTS

None.

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ATTACHMENT