



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

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Vice President, Sequoyah Nuclear Plant

May 14, 1992

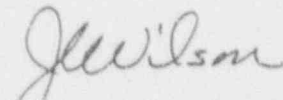
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET
NO. 50-328 - FACILITY OPERATING LICENSE DPR-79 - LICENSEE EVENT REPORT
(LER) 50-328/92 05

The enclosed LER provides details concerning the inoperability of a main steam check valve. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as an operation prohibited by technical specifications and 10 CFR 50.73(a)(2)(ii) as a condition that was outside the design basis of the plant.

Sincerely,


J. L. Wilson

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission
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cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Sequoyah Nuclear Plant, Unit 2

DOCKET NUMBER (2) | PAGE (3)

05101013 | 2 | 8 | 1 | 0 | 0 | 5

TITLE (4) Inoperability of a Main Steam Check Valve as a Result of Interference Between the Counter-Weight Arm and a Packing Gland Stud.

EVENT DAY (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)			
0	4	92	0	0	0	5	1	4	9	2	05101013	2

OPERATING MODE (9) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following)(11)

POWER LEVEL (10)	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366/

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Jan Bajraszewski, Compliance Licensing	615843-7749

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
D	S	B	V						
			A	5	B	5			Y

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)

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

On April 14, 1992, at approximately 0230 Eastern daylight time, during the Unit 2 Cycle 5 refueling outage, the Loop 3 main steam check valve (MSCV) was found stuck in the open position during routine maintenance on the valve. The valve's inoperable condition was a result of an interference between the counter-weight arm assembly and a packing-gland stud. After valve repacking during the Unit 2 Cycle 4 refueling outage, free movement of the counter-weight arms was verified. This event occurred because the work instructions for packing the MSCV did not provide detailed instruction for maintaining sufficient clearance between the counter-weight arm assembly and the packing-gland studs to account for axial shaft movement resulting from operational forces and internal tolerances. Unit 1 and remaining Unit 2 MSCVs were visually inspected and found to have adequate external clearance. Work instructions for the Unit 2 MSCVs were revised to ensure that proper clearance is maintained. The related maintenance procedure for packing the MSCVs will be revised to provide the specific details necessary to maintain sufficient valve component clearances.

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TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
Sequoyah Nuclear Plant, Unit 2	105000131218	SEQUENTIAL	REVISION				
		YEAR	NUMBER	NUMBER			
TEXT (If more space is required, use additional NRC Form 366A's) (17)		10	0	0	0	0	2 OF 5

I. PLANT CONDITIONS

Unit 2 was in Mode 6; fuel movement had been completed.

II. DESCRIPTION OF EVENT

A. Event

On April 14, 1992, at approximately 0230 Eastern daylight time (EDT), with Unit 2 in the Cycle 5 refueling outage, the Loop 3 main steam (EISS Code SB) check valve (EISS Code V) (MSCV) was found stuck in the open position during routine maintenance on the valve. The bonnet to Check Valve 2-VLV-1-625 was removed to facilitate maintenance activities and inspection of the valve internal components. During inspection of the valve, it was observed that a 1/16-inch interference between the counter-weight arm assembly and a 3/4-inch packing-gland stud existed. The valve disk was found in the horizontal (open) position. An attempt was made to push the disk closed without success. Operations notified NRC of the condition at 0327 EDT.

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

None.

C. Dates and Approximate Times of Major Occurrences

November 1, 1990	New Electric Power Research Institute packing was installed during the Cycle 4 refueling outage, and following work activities, the valve was cycled through its full arc of travel with no interference.
December 1990	The check valves were partially stroked manually during unit operation in Mode 1, and no interference was observed.
March 13, 1992	The Unit 2 Cycle 5 refueling outage began.
April 13, 1992 at 1030 EDT	The bonnet of the Loop 3 MSCV was removed to facilitate maintenance activities.
April 13, 1992 at 1145 EDT	The Technical Support system engineer discovered that an interference between a packing gland stud and the counter-weight arm existed. An attempt was made to push the disk closed without success.
April 14, 1992 at 0327 EDT	NRC was notified of the inoperable condition of the MSCV.

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Sequoyah Nuclear Plant, Unit 2	0500032892	0	0	5	0	0	0
		3	2	8	9	2	5

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

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The condition of the Loop 3 MSCV was discovered during performance of routine maintenance activities on the valve.

F. Operator Actions

No operator action was required; the unit was in mode 6.

G. Safety System Responses

Not applicable - no safety system responses were required.

III. CAUSE OF THE EVENT

A. Immediate Causes

The valve was unable to close because of a 1/16-inch interference between the valve's counter-weight arm assembly and a packing gland stud.

B. Root Cause

The work instruction for packing this valve did not contain detailed instructions for maintaining sufficient clearance between the counter-weight arm assembly and the packing gland studs to account for axial shaft movement. The potential for axial movement of the valve shaft because of operational forces and internal component tolerances (1/16 inch between the swing-arm to bushing and 7/32 inch between the shaft key to keyway) was not previously recognized.

C. Contributing Factors

The specific configuration (counter-weight arm and packing-stud configuration, internal tolerances providing potential for axial shaft movement, and turbulent flow conditions providing lateral forces on the valve internals) is unique, or at least uncommon.

IV. ANALYSIS OF EVENT

Analytical attempts were made to determine if the packing-gland stud to swing-arm interference would have prevented the disk from closing for an upstream main steam line break (MSLB). Calculation results indicate that the packing stud would not have broken or bent and accordingly would not have allowed the valve to close. A safety evaluation was performed on the affects of the loss of the complete closure

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		YEAR	NUMBER	REVISION NUMBER	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE	OF	PAGES										
										YEAR	NUMBER	REVISION NUMBER	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE	OF	PAGES		
Sequoyah Nuclear Plant, Unit 2		05	00	03	28	9	2	--	0	0	5	--	0	0	0	4	OF	0	5

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

ability of one check valve. The design bases of the plant described in the Updated Final Safety Analysis Report states that the plant has been designed for the uncontrolled blowdown of only one steam generator (SG). If a break were to occur in the steam line upstream of the main steam isolation valve (MSIV) without a functional check valve, a two-SG blowdown would occur if an MSIV on another steam line failed to close. The failure of the MSIV is considered as the single failure that is required to be assumed when evaluating any accident. A two-SG blowdown is outside of the design basis of the plant.

An evaluation of the effects of a two-SG blowdown on the design of the plant was performed. The evaluation showed that the effect on pressure inside and outside containment, temperatures outside containment, fuel temperatures and departure from nucleate boiling ratio, and the evaluation of a SG tube rupture would not result in any plant design parameters being exceeded. However, the temperature inside containment that results from steam line breaks on the order of 0.1 square foot would not be enveloped by current equipment qualification temperature profiles. A review of the margin in the equipment qualification test profiles indicates that sufficient margin exists to demonstrate acceptable operation of 10 CFR 50.49 equipment required to mitigate a MSLB inside containment. It is therefore concluded that, if such a break were to actually occur, automatic plant safety features and plant operators, following the guidance in the emergency operating procedures, would successfully mitigate the event and the loss of closure capability of the MSCV does not represent a significant risk to the plant or the public.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Unit 1 and other Unit 2 MSCVs were visually inspected and found to have adequate external clearance, and additional margin was obtained on the Unit 1 valves by cutting the packing studs approximately flush with the packing nuts.

Work instructions for the Unit 2 MSCVs were revised to ensure that proper clearance is maintained between the counter-weight arm assembly and the packing-gland studs.

B. Corrective Action to Prevent Recurrence

The applicable maintenance procedure will be revised, or a new procedure will be developed to provide details necessary to maintain sufficient valve component clearances. Because of the uniqueness of this valve and installation configuration, it is believed no other valves exist that could experience this condition. However, a review is being performed to determine if packing stud to counter-weight arm clearance problems may exist on other safety-related valves because of inadequate work instructions.

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TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Sequoyah Nuclear Plant, Unit 2							
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		0	0	5	0	0	0
		5	0	5	0	0	5

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

VI. ADDITIONAL INFORMATION

A. Failed Components

Atwood & Morrill Company, 600-pound rated, 32-inch main steam check valve.

B. Previous Similar Events

A review of previous events identified two LERs associated with MSCV failures. Both LERs (327/82126 and 90024) addressed the failure of the valve disk where the disk separated from the post. Corrective actions taken in those events would not have prevented the event described in this LER.

VII. COMMITMENTS

Revise the applicable maintenance procedure, or develop a new procedure to provide details necessary to maintain sufficient valve component clearances by January 22, 1993 (which is before the next Unit 1 or Unit 2 refueling outage).