NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Sequoyah, Unit 1	0 5 0 0 0 3 2 7	1 OF 0 3

TITLE (4) The Containment Spray Pumps Will Not Deliver The Design Basis Flow Rate Due To A Design 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 7	2 3	8 7	8 7	0 5 0	0 1	0 1	0 7	8 8	Sequoyah, Unit 2	0 5 0 0 0 3 2 8
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 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)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	XX 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
K. E. Meade, Plant Operations Review Staff	6 1 5 — 8 7 0 - 6 2 5 0

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	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	XX NO				

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

This LER is being revised to change a part of the corrective action. It was originally determined that verifying the containment spray system (CSS) pumps develop a head pressure of 157 psid at 4,750 gallons per minute (gpm) would ensure compliance with Surveillance Requirement (SR) 4.6.2.1.b. However, a more precise calculation has concluded only 143 psid is required to meet the SR.

On July 23, 1987, with units 1 and 2 in mode 5 (0 percent power, 4 psig, 133 degrees F and 0 percent power, atmospheric pressure, 134 degrees F, respectively), it was determined that the CSS pumps could not deliver the 4,750 gpm flow specified in the Sequoyah Nuclear Plant (SQN) Final Safety Analysis Report (FSAR) and accident analysis. Due to an undersized flow orifice and a pump discharge pressure acceptance criteria which was too low, the pumps may only deliver a flow rate of 4,400 gpm at the CSS headers.

This condition was determined to be the result of a design deficiency. DNE could not locate the original design calculation, and when new calculations were generated, the existing design could not be justified. To correct this deficiency, the flow orifice has been bored out such that essentially, no orifice will remain in the CSS line. Also, a technical specification change has been submitted to increase the acceptance criteria for the pumps' total discharge head pressure.

Existing analysis indicates that if a design basis accident occurred, which required the use of the CSS with the reduced flow rate, the maximum containment pressure would not have increased above the SQN containment design basis pressure rating.

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

This LER is being revised to change a part of the corrective action. It was originally determined that verifying the containment spray system (CSS) pumps develop a head pressure of 157 psid at 4,750 gallons per minute (gpm) would ensure compliance with Surveillance Requirement (SR) 4.6.2.1.b. However, a more precise calculation has concluded only 143 psid is required to meet the SR.

DESCRIPTION OF CONDITION

On July 23, 1987, with units 1 and 2 in mode 5 (0 percent power, 4 psig, 133 degrees F and 0 percent power, atmospheric pressure, 134 degrees F, respectively), it was determined by the Division of Nuclear Engineering (DNE) that the CSS (EIIS Code BE) pumps would not be capable of delivering the 4,750 gpm flow rate required by the Final Safety Analysis Report (FSAR) and assumed in the accident analysis. The CSS is used in an accident mitigation capacity only. In the event of a design basis accident inside containment, such as a loss of coolant accident, the CSS is used to reduce containment pressure and temperature. Due to a CSS pump discharge pressure acceptance criteria of only 140 psig and a flow orifice in the CSS headers, the CSS may only deliver a flow rate of 4,400 gpm to containment. This is outside the plant's design basis and accident analysis. No immediate operator actions were necessary since both units were in mode 5 and the postulated event cannot occur in this mode.

CAUSE OF CONDITION

This condition was caused by a design deficiency. During a DNE calculation review and verification of technical specification criteria, calculations could not be located which supported the orifice size in the CSS lines and the pump discharge pressure acceptance criteria. New calculations were generated which revealed the orifice size was too small and the pump discharge pressure acceptance criteria was too low. Since existing calculations could not be located, the cause of the design deficiency is not known.

ANALYSIS OF CONDITION

This condition is being reported under 10 CFR 50.73, paragraph a.2.ii.b, as a condition that resulted in the plant being outside its design basis. This condition applies to units 1 and 2.

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

Presently, both units are in mode 5 and there is not sufficient energy in this mode to create the postulated condition. Had the plant been operating and a design basis accident occurred that required the use of the CSS, the safety consequences of the event would not have changed from that assumed in the accident analysis. This is because the containment spray pumps were estimated to be able to provide 4,400 gpm during a design basis accident. Recent analysis performed by Westinghouse indicates for the 2.1×10^6 pounds of ice in the Sequoyah ice condenser, the peak containment pressure is 8.2 psig. The Sequoyah containment has a design pressure rating of 12 psig. The design spray rate at Watts Bar Nuclear Plant (WBN), which has a similar containment and CSS design, is 4,000 gpm. At that spray flow rate, the current analyzed WBN peak containment pressure is 11.25 psig. Therefore, based on the WBN analysis, there is a high degree of confidence that decreasing the spray flow rate by less than 10 percent would not have increased the containment pressure above the 12 psig design value.

CORRECTIVE ACTION

The subject flow orifice has been bored out such that essentially, no orifice will remain in the CSS lines. Also, a technical specification change has been requested to Surveillance Requirement 4.6.2.1.b to change the requirement of verifying that the CSS pumps develop a discharge pressure of 140 psig to verifying a head pressure of 143 psid at 4,750 gallons per minute. Surveillance Instruction (SI)-37, "Containment Spray Pump Test," will be revised before restart of the respective units to implement the corrected pump head pressure.

ADDITIONAL INFORMATION

There have been no previous design deficiencies related to the CSS.

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO. 50-327 - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE REPORT SQRO-50-327/87050 REVISION 1

The enclosed licensee event report is being revised to provide a change in the corrective action. This was previously reported in accordance with 10 CFR 50.73, paragragh a.2.ii.b, on August 24, 1987.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

S. J. Smith
Plant Manager

Enclosure
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NRC Inspector, Sequoyah Nuclear Plant

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