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)
Emergency Procedures Do Not Adequately Address Opening Certain High Head Safety Injection Valves Following An Accident In Hot Shutdown (Mode 4)

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)
									Sequoyah, Unit 2	0 5 0 0 0 3 2 8
1 2 2 2	8 7		8 7	0 7 4	0 0	0 1 2 1	8 8			0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
5		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0 0		20.405(a)(1)(ii)	50.36(c)(2)	XX 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)	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)

On December 22, 1987, with units 1 and 2 in mode 5 (cold shutdown), it was identified that the Sequoyah Nuclear Plant (SQN) emergency procedures may not sufficiently address the required operator actions following a postulated loss of coolant accident (LOCA) during mode 4 operation.

Since the SQN technical specifications require the boron injection (BIT) to be operable in modes 1 through 3 only, General Operating Instruction (GOI)-3, "Plant Shutdown from Minimum Load to Cold Shutdown," instructs plant operators to deenergize the BIT isolation valves following entry into mode 4 in order to preclude the possibility of a spurious safety injection signal causing an overpressurization of the reactor coolant system (RCS). Isolation of the BIT also results in the isolation of the high head safety injection system flow path required by Limiting Condition for Operation (LCO) 3.5.3. However, LCO 3.5.3 allows realignment of the emergency core cooling system (ECCS) during mode 4. Further investigation has shown that emergency procedure E-0, "Reactor Trip or Safety Injection," requires the plant operators to verify at least one train of high head safety injection is providing flow through the BIT; however, it does not provide specific instructions for reenergizing and opening the BIT isolation valves in the event of a LOCA. In addition, E-0 does not provide specific guidance for the realignment of the residual heat removal (RHR) system from the decay heat removal mode to the ECCS mode. Guidance for realignment of RHR system is provided in several operating instructions including System Operating Instructions, General Operating Instructions, and Abnormal Operating Instructions.

TVA will revise the appropriate SQN instructions to provide specific details to the plant operators to reenergize and open the BIT isolation valves and realign the RHR system to the ECCS mode of operation following a mode 4 or mode 5 LOCA.

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

DESCRIPTION OF EVENT

On December 22, 1987, with units 1 and 2 in mode 5 (0 percent power, 4 psig, 123 degrees F and 0 percent power, 241 psig, 131 degrees F, respectively), it was determined that the Sequoyah Nuclear Plant (SQN) emergency procedures may not sufficiently address the required operator actions necessary to ensure that the emergency core cooling system (ECCS) equipment required by Technical Specification (TS) 3.5.3 will perform its designed safety function following a postulated loss of coolant accident (LOCA) during mode 4 operation.

During an informal review of General Operating Instruction (GOI)-3, "Plant Shutdown from Minimum Load to Cold Shutdown," by the on-shift shift technical advisor (STA), it was identified that during a planned reactor coolant system (RCS) (EIIS Code AB) cooldown to cold shutdown (mode 5) conditions, plant operators are instructed to deenergize the inlet and outlet boron injection tank (BIT) isolation valves following entry into mode 4. The SQN TSs require the BIT to be operable in modes 1 through 3 only. Isolating the BIT during mode 4 is intended to preclude the possibility of a spurious safety injection (SI) signal (EIIS Code JE) actuating the centrifugal charging pumps (CCPs) and causing an overpressurization of the RCS. Deenergizing of these valves, however, results in the isolation of the high head safety injection system (EIIS Code BQ) flow path required by Limiting Condition for Operation (LCO) 3.5.3. However, LCO 3.5.3 allows realignment of the emergency core cooling system (ECCS) during mode 4. Further investigation into this event has revealed that emergency procedure E-0, "Reactor Trip or Safety Injection," requires plant operators to verify at least one train of high head safety injection is providing flow through the BIT; however, it does not provide specific instructions for reenergizing and opening the BIT isolation valves or realigning the residual heat removal (RHR) (EIIS Code BP) from the decay heat removal mode to the emergency core cooling system (ECCS) mode in the event of a LOCA. Guidance for realignment of RHR system is provided in several operating instructions including System Operating Instructions, General Operating Instructions, and Abnormal Operating Instructions.

This event is applicable to both units since the SQN emergency procedures are applicable to both units.

CAUSE OF EVENT

This event was caused by an inadequate procedure for ensuring that the ECCS equipment required by TS 3.5.3 would be available to mitigate the consequences of a postulated LOCA during mode 4 operation. Although SQN Operations personnel were cognizant of the steps required to manually realign the RHR system and the BIT isolation valves, the proper instructions to complete this evolution were not adequately covered by the SQN emergency procedures.

ANALYSIS OF EVENT

This event is reportable under 10 CFR 50.73, paragraph a.2.ii, as a condition not covered by the plant's operating or emergency procedures.

Mode 4 is generally considered as a transitory operating state existing only when the plant is cooling down to cold shutdown (mode 5) conditions or heating up to hot standby (mode 3) conditions. Thus, in relation to other plant operating modes, there is a very small percentage of time that the unit is in mode 4.

During the cooldown through mode 4 conditions in accordance with GOI-3, the high head safety injection system flow path is isolated only when the pressurizer pressure is less than 400 psig and the RCS temperature is less than 350 degrees F. Under these conditions, the internal energy of the primary system is relatively low, and consequently, the probability of a LOCA occurring is also relatively low. Even if a LOCA occurred during the period of time when SQN was in mode 4 and the BIT isolation valves were deenergized, plant operators are directed by emergency procedure E-0 to verify at least one train of emergency core cooling system (ECCS) is operating by verifying that at least one CCP is running and providing flow through the BIT. If this step of E-0 could not be verified, plant operators have sufficient training and understanding of the SQN safety injection system to take the actions necessary to restore high head safety injection system flow path and realign the RHR system to the ECCS mode of operation.

Therefore, given the combination of (1) the small amount of time that SQN is in mode 4 with the high head safety injection flow path isolated, (2) the low probability of a LOCA occurring when the primary system has such low internal energy, (3) E-0 requiring verification that at least one CCP is providing flow through the BIT, and (4) operator training and knowledge of the ECCS, TVA does not consider that this event had a significant effect on the overall safety of the plant.

CORRECTIVE ACTION

The determination of the corrective action and recurrence control for this report is continuing. A supplemental report will be submitted detailing the corrective action by February 29, 1988.

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TENNESSEE VALLEY AUTHORITY
Sequoyah Nuclear Plant
Post Office Box 2000
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January 21, 1988

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-50-327/87074

The enclosed licensee event report provides details concerning emergency procedures which do not adequately address opening certain high head safety injection valves following a postulated accident during hot shutdown. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.ii.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

S. J. Smith
Plant Manager

Enclosure
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