

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Sequoyah, Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 3 2 7 1 OF 0 4

PAGE (3)

Operating Procedures Do Not Adequately Address ECCS Requirements In Mode 4 Contrary To
The Requirements Of Technical SpecificationsEVENT DATE (5)
MONTH DAY YEAR
1 2 2 2 8 7 8 7
LER NUMBER (6)
YEAR SEQUENTIAL NUMBER REVISION NUMBER
0 7 4 0 1
REPORT DATE (7)
MONTH DAY YEAR
0 2 2 5 8 8
OTHER FACILITIES INVOLVED (8)
FACILITY NAMES
Sequoyah, Unit 2
DOCKET NUMBER(S)
0 5 0 0 0 3 2 8
0 5 0 0 0THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)
OPERATING MODE (9) 5
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) 50.38(c)(1) 50.73(a)(2)(v) 73.71(c)
20.405(a)(1)(ii) 50.38(c)(2) 50.73(a)(2)(vii) OTHER (Specify in Abstract below and in Text, NRC Form 356A)
20.405(a)(1)(iii) XX 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)(ix)

LICENSEE CONTACT FOR THIS LER (12)

NAME
K. E. Meade, Plant Operations Review Staff
TELEPHONE NUMBER
AREA CODE 6 1 5 8 7 0 - 1 6 2 5 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) ☒ NO ☒
EXPECTED SUBMISSION DATE (15)
MONTH DAY YEAR

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

The LER was revised in its entirety to add a section concerning residual heat removal (RHR) manual realignment for emergency core cooling system (ECCS) operation in mode 4 and to change the reporting criteria of the original report.

On December 22, 1987, with units 1 and 2 in mode 5 (cold shutdown), it was identified that the boron injection tank inlet and outlet valves were deenergized in mode 4 contrary to the requirements of TS 3.5.3. This TS requires one centrifugal charging pump (CCP) capable of injecting emergency core cooling water into the cold legs of the reactor coolant system while the plant is in mode 4.

Also, the plant emergency instructions do not address manual realignment of the RHR system in mode 4 in order to comply with TS 3.5.3. TS 3.5.3 allows manual realignment of the RHR system for ECCS operation in mode 4.

The cause of this event was an inadequate review of a procedure change and an inadequate procedure for preparing and reviewing procedure changes. The cause of the inadequate emergency instruction was a failure to write specific instructions for the transitory mode 4 condition that required RHR to be both a decay heat removal system and an ECCS. Administrative instructions have been revised to ensure this type of condition does not occur in the future. The appropriate Operations instructions including General Operating Instruction (GOI)-1, "Plant Startup From Cold Shutdown to Hot Standby, - Units 1 and 2," and GOI-3, "Plant Shutdown from Minimum Load to Cold Shutdown," as well as Abnormal Operating Instruction (AOI)-6, "Small Reactor Coolant System Leak (Modes 1, 2, or 3) or Shutdown LOCA (Mode 4 or 5)," have been revised to correct the subject deficiencies.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

This LER was revised in its entirety to change the reporting criteria under which the original report was submitted. Further review of the incident determined the original condition should have been reported as an operation prohibited by the plant's technical specifications (TSs). The original report was submitted as a condition not covered by the plant emergency procedures. The LER was also revised to add a section concerning residual heat removal (RHR) manual realignment for emergency core cooling system (ECCS) operation in mode 4 which is being reported as a condition not covered by the plant's emergency procedures.

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 identified that the boron injection tank inlet and outlet valves were deenergized in mode 4 contrary to the requirements of TS 3.5.3. This TS requires one centrifugal charging pump (CCP) (EIIS Code BQ) capable of injecting emergency core cooling water into the cold legs of the reactor coolant system (RCS) (EIIS Code AB) while the plant is in mode 4.

During 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 RCS 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 Sequoyah Nuclear Plant (SQN) TSs require the BIT to be operable in modes 1 through 3 only. Isolating the BIT during mode 4 was intended to preclude the possibility of a spurious safety injection (SI) signal (EIIS Code JE) actuating the CCPs and causing an overpressurization of the RCS. Deenergizing of these valves, however, results in the isolation of the high head safety injection system flow path required by Limiting Condition for Operation (LCO) 3.5.3.

A further review of operating procedures determined that the operating instruction specifically GOI-3 and System Operating Instruction (SOI)-74.1, "Residual Heat Removal System," allow closure of FCV-63-93 or FCV-63-94. These two valves are the RHR cold leg injection isolation valves. FCV-63-93 allows injection into loops 2 and 3. FCV-63-94 injects into loops 1 and 4. During preoperational testing, a deficiency was found with certain throttle valves in the RHR system (EIIS Code BP). Specifically, if the RHR system is in decay heat removal operation at low system pressure with four cold legs injecting, several throttle valves may cavitate. To resolve this deficiency, it was determined that since TS 3.5.3 allowed manual realignment of RHR in mode 4 to meet the ECCS requirement, isolation of a cold leg injection line (either FCV-63-93 or FCV-63-94) would decrease the flow through the throttling valves and alleviate the cavitation. However, the plant's emergency instructions failed to address opening the closed injection line in the event of a valid mode 4 safety injection signal.

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The events are applicable to both units.

CAUSE OF EVENT

The original condition was caused by an inadequate review of a procedure change. The GOI involved was changed in October of 1981 on a plant instruction temporary change form without an adequate review/evaluation to deenergize the BIT valves in mode 4.

A secondary cause to the event was that Administrative Instruction (AI)-4, "Preparation, Review, Approval, and Use of Site Procedures/Instructions," was inadequate. The procedure did not address the necessary requirements for performing a procedural change or review of a change. The procedure only addressed what form to make the change on and who is supposed to review the change, thus not providing the necessary guidance to perform an adequate procedure change.

The cause of the inadequate emergency instruction was a failure to write instructions for the transitory mode 4 condition that required RHR to be both a decay heat removal system and an ECCS. Instructions should have been written to address TS operational modes.

ANALYSIS OF EVENT

This event has been determined to be reportable in accordance with the requirements of 10 CFR 50.73, paragraph a.2.i, as an operation prohibited by TSs and paragraph a.2.ii.c as a condition not covered by the plant's 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 was 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. Further, in the event of a LOCA in mode 4, plant operators are directed by emergency procedure E-0 to verify at least one train of ECCS is operating by verifying that at least one CCP is running and providing flow through the BIT. If flow can not be verified, plant operators have been trained 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. TSs allow manual realignment of RHR for ECCS operation in mode 4.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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Therefore, TVA does not consider that this event had a significant effect on the overall safety of the plant.

CORRECTIVE ACTION

The appropriate Operations instructions including GOI-1, "Plant Startup From Cold Shutdown to Hot Standby, - Units 1 and 2," and GOI-3 have been revised to ensure the BIT isolation valves remain energized in mode 4. A subsequent review of all the GOIs was performed to determine if any other conditions such as this exist. The review found no additional deficiencies.

AI-4 has been revised and the creation of AI-43, "Independent Qualified Review," will ensure the appropriate technical review of this type of procedure occurs. The summary sheet, Appendix L of AI-4, which is initiated by an Independent Qualified Reviewer will also ensure changes to the procedure are adequately identified and reviewed. This action will serve as recurrence control for this event.

Abnormal Operating Instruction (AOI)-6, "Small Reactor Coolant System Leak (Mode 1, 2, or 3) or Shutdown LOCA (modes 4 or 5)," has been revised to add the section for the shutdown LOCA issue. The section provides specific guidance for modes 4 and 5 that the emergency instruction E-0 did not provide.

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TENNESSEE VALLEY AUTHORITY
Sequoyah Nuclear Plant
Post Office Box 2000
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February 26, 1988

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

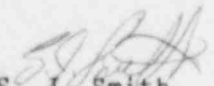
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE REPORT
SQRO-50-327/87074 REVISION 1

The enclosed licensee event report provides details concerning operating procedures which do not adequately address ECCS requirements in mode 4 contrary to the requirements of technical specifications. 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
cc (Enclosure):

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