

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

R.J. Adney  
Site Vice President  
Sequoyah Nuclear Plant

April 4, 1997

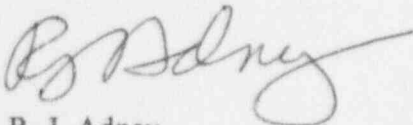
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN)  
UNITS 1 AND 2 - DOCKET NOS. 50-327 AND 50-328 - FACILITY OPERATING  
LICENSES DPR-77 AND DPR-79 - LICENSEE EVENT REPORT (LER) 50-327/97003

The enclosed report provides details concerning the failure to properly perform surveillance testing of the centrifugal charging pump inlet isolation valve logic (interlock) as required by technical specifications. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation prohibited by the plant's technical specifications.

Sincerely,



R. J. Adney

Enclosure  
cc: See page 2

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PDR ADOCK 05000327  
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11

U.S. Nuclear Regulatory Commission

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Enclosure

cc (Enclosure):

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## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK

FACILITY NAME (1)

Sequoyah Nuclear Plant (SQN) Unit 1

DOCKET NUMBER (2)

05000327

PAGE (3)

1 OF 6

TITLE (4)

Failure to Properly Perform Surveillance Testing on the Centrifugal Charging Pump Inlet Isolation Valve Logic.

| 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 NAME                 | DOCKET NUMBER |
| 3              | 5   | 97   | 97             | -- 003            | -- 00           | 4               | 4   | 97   | Sequoyah, Unit 2              | 05000328      |
|                |     |      |                |                   |                 |                 |     |      | NA                            | 05000         |

|                    |     |   |  |                   |                                     |                  |  |   |  |  |
|--------------------|-----|---|--|-------------------|-------------------------------------|------------------|--|---|--|--|
| OPERATING MODE (9) | 1   | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11) |  |                   |                                     |                  |  |   |  |  |
|                    |     | 20.2201(b)  |  | 20.2203(a)(2)(v)  | <input checked="" type="checkbox"/> | 50.73(a)(2)(i)   |  | 50.73(a)(2)(viii)                             |  |  |
| POWER LEVEL (10)   | 100 | 20.2203(a)(1)   |  | 20.2203(a)(3)(i)  |                                     | 50.73(a)(2)(ii)  |  | 50.73(a)(2)(x)                                |  |  |
|                    |     | 20.2203(a)(2)(i)  |  | 20.2203(a)(3)(ii) |                                     | 50.73(a)(2)(iii) |  | 73.71   |  |  |
|                    |     | 20.2203(a)(2)(ii)   |  | 20.2203(a)(4)     |                                     | 50.73(a)(2)(iv)  |  | OTHER   |  |  |
|                    |     | 20.2203(a)(2)(iii)  |  | 50.36(c)(1)       |                                     | 50.73(a)(2)(v)   |  | Specify in Abstract below or in NRC Form 366A |  |  |
|                    |     | 20.2203(a)(2)(iv)   |  | 50.36(c)(2)       |                                     | 50.73(a)(2)(vii) |  |   |  |  |

## LICENSEE CONTACT FOR THIS LER (12)

NAME

J. W. Proffitt, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(423) 843-6651

## 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)

|   |   |    |                               |       |     |      |
|---|---|----|-------------------------------|-------|-----|------|
| YES<br>(If yes, complete EXPECTED SUBMISSION DATE): | X | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|----|-------------------------------|-------|-----|------|

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On March 5, 1997, at 1040 hours eastern standard time, it was determined that surveillance testing of the centrifugal charging pump (CCP) inlet isolation valve logic (interlock) was not being performed as required by technical specifications. The logic isolates the volume control tank (VCT) flow path to the CCP after a safety injection signal fully opens the path from the refueling water storage tank (RWST). Following a review of the surveillance instruction and other documents, as committed in response to NRC Generic Letter 96-01, it was determined that the interlock was not adequately tested. Each VCT isolation valve has two parallel electrical initiation paths: one direct contact from the same train RWST valve and a separation relay contact from the opposite train RWST valve. The surveillance instruction requires a safety injection signal to be initiated, this signal opens the RWST valves which initiates a signal to close the VCT outlet valves. The surveillance instruction does not identify the contact that caused the valves to change state. The root cause was determined to be an inadequate surveillance instruction to test the CCP inlet isolation valve logic. A special test procedure was prepared to test the individual contacts in each circuit. The test was performed on both units and determined to be acceptable. The appropriate surveillance instruction has been revised to adequately test the circuit. Lesson learned from this condition will be communicated to the appropriate Engineering and Operations personnel.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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|                   |          | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |
| SQN Unit 1        | 05000327 | 97 --          | 003 --            | 00              | 2 of 6   |

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

**I. PLANT CONDITIONS**

Units 1 and 2 were in power operation at approximately 100 percent.

**II. DESCRIPTION OF EVENT**

**A. Event:**

On March 5, 1997, at 1040 hours eastern standard time (EST), it was determined that surveillance testing of the centrifugal charging pump (CCP) [EHS Code CB] inlet isolation valve logic (interlock) was not being performed as required by technical specifications (TSs). The logic isolates the volume control tank (VCT) flow path to the CCP after a safety injection signal fully opens the path from the refueling water storage tank (RWST). The surveillance instruction and other documents were reviewed and it was determined that the interlock was not tested adequately.

Each VCT isolation valve has two parallel electrical initiation paths: one direct contact from the same train RWST valve and a separation relay contact from the opposite train RWST valve. The direct contact from the same train is the required electrical initiation path to meet the accident analysis. The separation relay contact from the opposite train is a design enhancement feature. The surveillance instruction requires a safety injection signal to be initiated. This signal opens the RWST valves which initiates a signal that actuates the two contacts to close the VCT valves. The surveillance instruction did not identify the contact that caused the valves to change state.

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

None.

**C. Dates and Approximate Times of Major Occurrences:**

January 10, 1996      NRC issued GL 96-01, Testing of Safety- Related Logic Circuits.

April 18, 1996      TVA provides NRC with a response to the GL.

March 3, 1997      Review of procedures for compliance with guidelines set forth in NRC GL 96-01 identified that the CCP inlet isolation valve logic (interlock) was potentially not being adequately tested.

## LICENSEE EVENT REPORT (LER)

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|                   |          | 97 --          | 003 --            | 00              |          |

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

March 5, 1997  
at 1040 EST

It was determined that testing of CCP inlet isolation valve logic (interlock) was inadequate. Limiting conditions for operation (LCOs) 3.5.2.a, 3.1.2.2 and 3.0.3 actions were entered on both Units 1 and 2. LCO 4.0.3 was entered on both units.

March 5, 1997  
at 2040 EST

A special test procedure was prepared to test the individual contacts in each circuit. The test was performed on Unit 1 and determined to be acceptable. The LCOs were exited on Unit 1.

March 5, 1997  
at 2155 EST

A special test procedure was prepared to test the individual contacts in each circuit. The test was performed on Unit 2 and determined to be acceptable. The LCOs were exited on Unit 2.

**D. Other Systems or Secondary Functions Affected:**

None.

**E. Method of Discovery:**

The condition was identified during review of surveillance instructions for compliance with guidelines set forth in NRC GL 96-01.

**F. Operator Actions:**

Main Control room personnel entered the appropriate technical specification LCOs.

**G. Safety System Responses:**

No safety system responses were required for the condition identified in this LER.

**III. CAUSE OF THE EVENT**

**A. Immediate Cause:**

The immediate cause of the condition was inadequate surveillance instruction. The surveillance instruction did not contain steps necessary to ensure that the individual contacts actuated. The surveillance instruction requires the initiation of a safety injection signal. This signal opens the RWST valves which initiates a signal that actuates both contacts to close the VCT outlet valves. Therefore, it could not be determined which contact caused the valves to change state.

## LICENSEE EVENT REPORT (LER)

## TEXT CONTINUATION

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

**B. Root Cause:**

The root cause was determined to be an inadequate surveillance instruction to test the CCP inlet isolation valve logic. The technical specifications requires verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal and on an automatic switchover to containment sump test signal. This requirement does not state how to test the interlock / parallel circuit. Relative to Generic Letter 96-01, site procedures do not make it clear that the contacts that go from train to train component must be verified during the surveillance testing. The surveillance instruction did not contain steps necessary to ensure that the correct contacts are actuated.

**C. Contributing Factors**

A contributing factor was inadequate procedure preparation, including revisions, reviews and approvals. The preparer and reviewers did not know that train to train components must be verified during testing to satisfy design basis requirements.

**IV. ANALYSIS OF THE EVENT**

Upon receipt of a safety injection signal (SIS), the accident alignment for the CCPs to take suction from the RWST occurs. The valves are in a parallel configuration to ensure that no single failure of either valve can prevent flow from the RWST to the CCPs during an accident. The VCT isolation valves will close to prevent loss of the emergency core cooling system inventory to the VCT. During normal operation the VCT may be at a higher pressure than the RWST head pressure preventing flow. These valves are in series to ensure that no single failure of either valve will preclude isolation of the flowpath.

Each VCT isolation valve has two parallel electrical initiation paths: one direct contact from same train RWST valve and a separation relay contact from the opposite train RWST valve. The surveillance instruction required the initiation of a safety injection test signal resulting in both contacts being actuated. The test procedure did not identify the individual contact that caused the valves to change state. Assuming that a train of power circuit failed, then the associated RWST isolation valve will not open and the associated VCT isolation valve will not close. However, the appropriate actions will be completed by the other train components. This scenario also applies assuming only one of the train valves does not operate, the valve alignment is accomplished by the other train's components. The successful performance of the special test demonstrated that both contacts would have performed as required. Therefore, the condition did not adversely affect the health or safety of plant personnel or the general public.

## LICENSEE EVENT REPORT (LER)

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

## V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

Upon determination of the condition, appropriate LCOs were entered, a special test to ensure operability of the individual contact was prepared and performed. The testing demonstrated the operability of each contact.

B. Corrective Actions to Prevent Recurrence:

The appropriate surveillance instruction has been revised to adequately test the circuit.

Lessons learned from this condition will be communicated to the appropriate Engineering and Operations personnel.

SI reviews, for adequacy of testing of safety-related logic circuits, are continuing as committed in response to NRC GL 96-01.

Lessons learned from the other condition identified as a result of the Generic Letter 96-01 review have been provided to appropriate personnel to clarify that channels can be individual paths or redundant devices and are not necessarily independent circuits.

Lessons learned from the conditions identified as a result of the Generic Letter 96-01 review will be added to the appropriate training curriculum.

## VI. ADDITIONAL INFORMATION

A. Failed Components:

None.

B. Previous LERs on Similar Events:

A review of previous reportable events identified two LERs associated with inadequate testing of parallel circuits. LER 50-327/94013 that was associated with inadequate testing of essential raw cooling water pump start logic circuitry for safety injection and blackout signals. The cause of that condition was an inadequate revision of the surveillance instruction. The corrective actions taken for that LER would not have prevented the condition described in this LER.

## LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

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TEXT (if more space is required, use additional copies of NRC Form 366A) (17)

LER 50-327/97001 was identified during the review performed in response to Generic Letter 96-01. The review identified a failure to properly perform surveillance testing on the Emergency Diesel Generator start-timer relays. The review performed in response to Generic Letter 96-01 also identified the condition described in this LER.

**VII. COMMITMENT**

- 1) Lessons learned from this condition will be communicated to the appropriate Engineering and Operations personnel. This action will be completed by April 25, 1997.
- 2) Lessons learned from the conditions identified as a result of the Generic Letter 96-01 review will be added to the appropriate training curriculum. This action will be completed by June 27, 1997.