



Tennessee Valley Authority, Post Office Box 2000, Soddy Daisy, Tennessee 37384-2000

April 15, 2011

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Sequoyah Nuclear Plant, Unit 1 and 2
Facility Operating License Nos. DPR-77 and DPR-79
NRC Docket Nos. 50-327 and 50-328

Subject: License Event Report 327 and 328/2011-001, "Both Trains of Control Room Air Conditioning Systems Inoperable"

The enclosed licensee event report provides details concerning the failure of the "B" train main control room chiller unit in conjunction with the "A" train main control room chiller unit out of service for planned maintenance.

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by Technical Specifications. The condition has also been determined to be a condition that could have prevented the fulfillment of the safety function in accordance with 10 CFR 50.73(a)(2)(v)(D).

There are no regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact G. M. Cook, Sequoyah Site Licensing Manager, at (423) 843-7170.

Respectfully,

Michael D. Skaggs
Site Vice President
Sequoyah Nuclear Plant

Enclosure: Licensee Event Report - Both Trains of Control Room Air Conditioning Systems Inoperable

**cc: NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Sequoyah Nuclear Plant**

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NRR

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GMC:JWP:NRT:SKD

Enclosure

bcc (Enclosure):

NRC Project Manager – Sequoyah Nuclear Plant
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LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resources@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME
Sequoyah Nuclear Plant Unit 1**2. DOCKET NUMBER**
05000327**3. PAGE**
1 OF 6**4. TITLE:**
Both Trains of Control Room Air Conditioning Systems Inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	15	2011	2011	001	00	04	15	2011	Sequoyah Nuclear Plant Unit 2	05000328
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE
1**10. POWER LEVEL**
100**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:** (Check all that apply)

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(iii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below
or in NRC Form 366A |

12. LICENSEE CONTACT FOR THIS LERFACILITY NAME
Norm ThomasTELEPHONE NUMBER (Include Area Code)
(423) 843-7749**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	VI	TT		Y					

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

On February 15, 2011, at 0705 Eastern Standard Time (EST), Sequoyah Nuclear Plant (SQN) Unit 1 and 2 entered Technical Specification Limiting Condition for Operation (LCO) 3.0.3 due to both trains of control room air conditioning systems inoperable. LCO 3.0.3 was entered because "B" train Main Control Room (MCR) chiller failed and "A" train MCR chiller was tagged out of service for scheduled maintenance. Actions were expedited to return both trains of MCR chillers to service. At 1005 EST on February 15, 2011, the "A" train MCR chiller was returned to operable status and LCO 3.0.3 was exited on both units. An investigation discovered that the "B" train MCR chiller failed because of a ruptured air supply line in a temperature transmitter on the chiller control circuit. The cause was determined to be an inadequate preventative maintenance procedure. The inoperability of both trains of control room air conditioning systems is reportable as a condition which was prohibited by Technical Specifications in accordance with 10 CFR 50.73(a)(2)(i)(B). In addition, this condition is reportable as a condition that could have prevented the fulfillment of the safety function per 10 CFR 50.73(a)(2)(v)(D).

U.S. NUCLEAR REGULATORY COMMISSION
**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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Sequoyah Nuclear Plant Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 6
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NARRATIVE**I. PLANT CONDITION(S)**

Unit 1 and Unit 2 were operating at 100 percent power.

II. DESCRIPTION OF EVENT**A. Event:**

On February 15, 2011, at 0705 Eastern Standard Time (EST), Sequoyah Nuclear Plant (SQN) Unit 1 and 2 entered Technical Specification Limiting Condition for Operation (LCO) 3.0.3 due to both trains of control room air conditioning systems inoperable. Technical Specification 3.7.15, "Control Room Air-Conditioning System (CRACS)," Action b requires immediate entry into LCO 3.0.3 when both trains of control room air conditioning systems are inoperable. In this case, the "B" train Main Control Room (MCR) chiller [EIS Code VI] failed and "A" train MCR chiller was tagged out of service for scheduled maintenance. At SQN, the control room air conditioning systems are shared between Units 1 and 2. LCO 3.0.3 requires action to be initiated within 1 hour to place the units in non-applicable Modes. In addition, the 1A-A Emergency Diesel Generator (EDG) [EIS Code EK], which supplies emergency power for the "A" train MCR chiller, was also inoperable for maintenance inspections and testing. With the 1A-A EDG and the "B" train MCR chiller inoperable, LCO 3.0.5 required action to be initiated within two hours to place the units in non-applicable Modes. Actions were expedited to return both trains of MCR chillers and the 1A-A EDG to service. At 1005 EST on February 15, 2011, the "A" train MCR chiller was returned operable status and LCO 3.0.3 was exited on both units. However, both units remained in Technical Specification 3.7.15 Action a, which required the remaining inoperable control room air conditioning system to be restored to operable status within 30 days. In addition, both units remained in LCO 3.0.5 because the 1A-A EDG and the "B" train MCR chiller remained inoperable. The 1A-A EDG was returned operable at 1030 on February 15, 2011, following an operability evaluation of load swings that were identified during a surveillance test. Both units exited LCO 3.0.5 at this time. The "B" train MCR chiller was returned to operable status at 1801 on February 15, 2011, and Technical Specification 3.7.15 Action a was exited for both units, following a technical evaluation and installation of a temporary jumper across an open temperature switch, which provides a start permissive for the chiller. Later investigation revealed that there was ruptured tubing internal to the temperature transmitter, which resulted in the open temperature switch.

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

None.

C. Dates and Approximate Times of Major Occurrences:

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NARRATIVE

Date	Description
February 14, 2011 2015 EST	1A-A EDG was removed from service for maintenance inspections. LCO 3.0.5 actions were not required at this time.
February 15, 2011 0459 EST	A train MCR chiller was removed from service for scheduled maintenance.
February 15, 2011 0611 EST	1A-A EDG inoperable because of load swings identified during surveillance test.
February 15, 2011 0705 EST	Unit 1 and 2 enter LCO 3.0.3 as directed by Technical Specification 3.7.15 Action b because "B" train MCR chiller failed, with "A" train MCR chiller inoperable because of scheduled maintenance. LCO 3.0.5 actions were required to be taken due to the inoperable 1A-A EDG and the "B" train MCR chiller.
February 15, 2011 1005 EST	Unit 1 and 2 exit LCO 3.0.3 following "A" train MCR chiller returned to operable status after oil heatup from scheduled maintenance. Both units remain in LCO 3.0.5 due to 1A-A EDG, which supplies emergency power for the "A" train MCR chiller, inoperable while the "B" train MCR chiller remains inoperable.
February 15, 2011 1030 EST	Unit 1 and 2 exit LCO 3.0.5 following an operability evaluation of EDG 1A-A load swings that were identified during a routine surveillance test. The load swings were determined to not affect the emergency mode of EDG operation.
February 15, 2011 1801 EST	"B" train MCR chiller was returned to operable status and Technical Specification 3.7.15 Action a exited following a technical evaluation and installation of a temporary jumper across the open temperature switch.

D. Other Systems or Secondary Functions Affected:

No other systems or secondary functions were affected by this event.

E. Method of Discovery:

Control room personnel identified a failure of the "B" train MCR chiller. "A" train MCR chiller was inoperable because of scheduled maintenance.

F. Operator Actions:

Actions were expedited to return both trains of MCR chillers and the 1A-A EDG to service.

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G. Safety System Responses:

No safety systems were actuated during this event.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of the "B" train MCR chiller failure was a ruptured air supply line in a temperature transmitter on the chiller control circuit.

B. Root Cause:

The root cause was identified as inadequate preventative maintenance. Preventative maintenance procedures did not include the inspection of the internal tubing of the temperature transmitter.

C. Contributing Factor:

None.

IV. ANALYSIS OF THE EVENT

Initially, the 1A-A EDG and was removed from service for maintenance inspections. The "A" train MCR chiller was also removed from service for scheduled maintenance. The failure of "B" train MCR chiller caused both units to enter LCO 3.0.3 as directed by Technical Specification 3.7.15 Action b for both trains of control room air conditioning systems being inoperable. Both units were in LCO 3.0.3 for three hours until the "A" train MCR chiller could be restored to operable status from scheduled maintenance. Both units remained in LCO 3.0.5 at this time because the 1A-A EDG and the "B" train MCR chiller was inoperable. The 1A-A EDG was inoperable pending a prompt operability evaluation of load swings that were identified during surveillance testing. The prompt operability evaluation determined that the load swings did not affect the emergency mode of EDG operation, the 1A-A EDG was declared operable, and both units exited LCO 3.0.5.

The "B" train MCR chiller failed because of a ruptured air supply line to a temperature transmitter on the chiller control circuit. This caused a temperature switch to fail open, which prevented operation of the chiller. The cause was determined to be an inadequate preventative maintenance procedure. The preventative maintenance procedure did not have instructions to inspect the temperature transmitter internal air tubing.

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The loss of MCR air conditioning for the short period of time in this event was of minimal safety significance. In the unlikely event a train of MCR air conditioning could not be restored, TVA calculations demonstrate that more than 16 hours exist before the main control room would reach its maximum allowable temperature during summer conditions. In addition, shutdown of both units can be accomplished from the backup control room. The backup control room is located outside the main control room and is supplied by a different air-conditioning system that was available during the time both MCR air conditioning systems were unavailable.

The condition of both trains of control room air conditioning systems inoperable is reportable per 10 CFR 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by Technical Specifications. Both trains of control room air conditioning systems being inoperable is also a condition that could have prevented the fulfillment of the safety function in accordance with 10 CFR 50.73(a)(2)(v)(D).

V. ASSESSMENT OF SAFETY CONSEQUENCES

Based on the above "Analysis of The Event," this event did not adversely affect the health and safety of plant personnel or the general public.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The immediate corrective action was to re-establish MCR air conditioning by returning the "A" train MCR chiller to service. The "B" train MCR chiller was returned to service with a technical evaluation to bypass the failed temperature switch. The "B" train MCR chiller temperature transmitter was later repaired by replacing the ruptured tubing.

B. Corrective Actions to Prevent Recurrence:

Corrective actions will be implemented to ensure there are preventative maintenance instructions in place to perform the required tubing inspections on the "B" train MCR chiller temperature transmitter. Preventative maintenance instructions were verified to be in place to perform the required tubing inspections on the "A" train MCR chiller temperature transmitter. A review of tubing applications in ventilation systems will be conducted to ensure adequate preventative maintenance instructions are in place to prevent other tubing failures.

VII. ADDITIONAL INFORMATION

A. Failed Components:

The failed component was a ruptured tube internal to a temperature transmitter from Johnson Controls Inc., model number T-5002-201.

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B. Previous LERs on Similar Events:

A review of previous reportable events for the past three years identified that SQN reported under LER 2008-002-01 a failure of the "B" train MCR air handling unit in conjunction with planned maintenance on EDG 1A-A. The cause of the LER 2008-002-01 event was that the risk associated with swapping the MCR air conditioning units while the 1A-A EDG was inoperable was not adequately addressed.

In this event the failure of the "B" MCR chiller was caused by component failure that was not associated with swapping the units. The 2008 event did not have the same underlying cause, so the corrective actions would not have prevented this event.

C. Additional Information:

A Problem Evaluation Report was written in 2003 to document age related tubing failures at SQN. The corrective actions revised several preventative maintenance (PM) procedures to incorporate tubing inspections. The PM procedure revisions did not include the internal tubing inspections "B" train MCR chiller temperature transmitter. If these inspections had been added to the PM procedure for the "B" train MCR chiller, this event may have been prevented. The PM procedures in the scope of the Problem Event Report will be reviewed to determine that they include all required tubing inspections.

D. Safety System Functional Failure:

This event resulted in a safety system functional failure in accordance with 10 CFR 50.73(a)(2)(v).

E. Unplanned Scram with Complications:

This event did not result in an unplanned scram with complications.

VIII. COMMITMENTS

None.