

TENNESSEE VALLEY AUTHORITY

6N 38A Lookout Place
December 7, 1989

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT (LER)
50-327/89026

The enclosed LER provides details of an event wherein Limiting Condition for
Operation 3.0.3 was entered because more than one rod position indicator per
bank was inoperable. This event is being reported in accordance with
10 CFR 50.73, paragraph a.2.i.B.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



J. R. Bynum, Vice President
Nuclear Power Production

Enclosure

cc (Enclosure):

Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

INPO Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

NRC Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

8912140380 891207
PDR ADOCK 05000327
S PDC

JE22
1/1

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	PAGE (3) 1 OF 0 6
---	--	----------------------

TITLE (4) Entry into LCO 3.0.3 as a result of more than one RPI per bank being inoperable because of a lack of preventive maintenance to CRDM cooling system dampers.

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)														
1	1	0	7	8	9	8	9	0	2	6	0	0	1	2	0	7	8	9			0	5	0	0	0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)						
	20.405(a)(1)(ii)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)						
	20.405(a)(1)(iii)	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) XX	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)							
	20.405(a)(1)(iv)	50.73(a)(2)(B)	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			TELEPHONE NUMBER		
Geoffrey Hipp, Compliance Licensing Engineer			6 1 5 8 4 3 - 7 7 6 6		

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
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

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

On November 7, 1989, with Units 1 and 2 in Mode 1 at 100 and 30 percent power, respectively, Limiting Condition for Operation (LCO) 3.0.3 was entered on Unit 1 as a result of more than one rod position indicator (RPI) per bank being inoperable because they were not within the required 12-step tolerance. The control rod drive mechanism (CRDM) cooling system had been realigned for surveillance testing earlier and had apparently malfunctioned causing the RPIs to become overheated and drift out of tolerance. After the original CRDM cooling system alignment was restored, the RPIs were adjusted back to within the required 12-step tolerance and the LCO was exited. The root cause of this event is believed to have been a lack of preventive maintenance (PM) on the CRDM cooling system dampers resulting in a malfunction. Because these components are not accessible at power, verification of a malfunction will have to await the next outage. Two contributing causes of this event have also been identified: (1) equipment deficiencies that interfered with the verification of proper CRDM cooling system performance by operators following the system realignment, and (2) a lack of procedural guidance for the operators on indicators to monitor while realigning the system. As corrective action, the appropriate CRDM cooling system components (such as the dampers) will be placed in a PM system. In addition, a more appropriate description for Computer Point T1014A will be determined for its P-250 listing. A section will also be added to the system operating instruction to provide better guidance for the operators when swapping the fans for CRDM enclosure cooling.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD
COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS
AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR
REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO
THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	LER NUMBER (6)			PAGE (3)	
		YEAR 8 9	SEQUENTIAL NUMBER - 0 2 6	REVISION NUMBER - 0 0	0 2	OF 0 6

TEXT (If more space is required, use additional NRC Form 306A's) (17)

DESCRIPTION OF EVENT

At 2337 Eastern standard time (EST) on November 7, 1989, with Unit 1 in Mode 1 at 100 percent power, 2,235 pounds per square inch gauge (psig), 578 degrees Fahrenheit (F), and Unit 2 in Mode 1 at 30 percent power, 2,235 psig, 559 F, Limiting Condition for Operation (LCO) 3.0.3 was entered on Unit 1 as a result of more than one rod position indicator (RPI) (EIIS Code AA) per bank being inoperable.

Earlier in the same day, the A-A and B-B control rod drive mechanism (CRDM) cooling fans (EIIS Code CD) were in service with suction aligned to the CRDM enclosure. (See attached simplified sketch.) Preparations were being made to perform Surveillance Instruction (SI) 266.1.2, "18-Month Circuit Breaker Inspection (Westinghouse Type DS 480V)," to test Breaker SQN-1-BCTB-030-0092-B, which supplies power to the B-B CRDM cooler fan. At 2055, the unit operator (UO) swapped from the A-A and B-B CRDM cooling fans to the C-A and D-B fans, aligning their suction to the CRDM enclosure.

At 2121, Computer Point T1014A exceeded its alarm setpoint of 175 F. This computer point prints out in the main control room on the process monitoring computer (P-250) trend typer. At approximately 2200, when the surveillance testing was completed on the B-B CRDM cooling fan, the UO restored the CRDM cooling system to its original configuration, i.e., A-A and B-B CRDM cooling fans in service. After this cooling system realignment, the temperatures indicated by computer point T1014A rapidly returned to normal levels.

At 2337, RPIs for the following control rods were declared inoperable because they indicated more than a 12 step deviation from their respective group demand position indicators:

<u>Control Rod Location</u>	<u>Bank</u>	<u>Group</u>
F-10	Control C	2
K-10	Control C	2
F-14	Control B	2
P-08	Control C	1
K-06	Control C	2
H-08	Control D	2
G-13	Shutdown R	2

The RPIs are temperature sensitive and had drifted out of tolerance. Because LCO 3.1.3.2 contains only an action requirement for a maximum of one RPI per bank inoperable and more than one RPI per bank was inoperable, LCO 3.0.3 was entered as of 2337. A work request was written at 0030 on November 8, 1989, to adjust the RPIs back to within tolerance. At 0259 instrument maintenance technicians began adjusting the RPIs with SI-67, "Periodic Calibration of RPI System," utilizing the following general procedure, working on only one rod bank at a time. Each of the eight rod banks (four control banks and four safety banks) was inserted to 215 steps. When each control bank was inserted, LCO 3.1.3.6 (control bank insertion limits) was entered, and when each safety bank was inserted, LCO 3.1.3.5 (shutdown rod insertion limits) was entered. The

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 8 9	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0	2	6	0	0	0

TEXT (If more space is required, use additional NRC Form 388A's) (17)

DESCRIPTION OF EVENT (continued)

RPIs were then adjusted, and the rod bank was returned to 228 steps. The average length of time the rod banks were in LCO 3.1.3.5 or 3.1.3.6 was 12 minutes with a maximum duration of 17 minutes. By 0435 LCO 3.0.3 was exited when all but one bank of RPIs had been adjusted back within the allowable 12 step tolerance. By 0444, the last bank of RPIs had been adjusted, and all applicable LCOs were exited.

As the RPIs gradually cooled during the remainder of November 8, 1989, their indications were noted to be drifting in the opposite direction as when they were heating up earlier. Starting at approximately 2100 on November 8, 1989, and on into November 9, 1989, the RPI banks were again adjusted to stay within the allowable tolerance. LCOs 3.1.3.5 and 3.0.3 were entered each time a shutdown bank was inserted for adjustment, and LCO 3.1.3.6 was entered each time a control bank was inserted for adjustment.

CAUSE OF EVENT

The root cause of this event is believed to have been a lack of preventive maintenance (PM) on the CRDM cooling system dampers. Alignment of the CRDM cooling system to the C-A and D-B cooling fans failed to provide adequate cooling to the CRDM enclosure. The suspected reason for the inadequate cooling is a damper malfunction that aligned the cooling fan suction to bypass rather than to the CRDM enclosure. (See attached simplified sketch.) This reason is suspected because of previous problems with the dampers. In September 1988, the cognizant system engineer inspected the CRDM cooling system and identified a number of problems. Work requests were initiated to correct the problems, and the problems were subsequently fixed. However, because the dampers in the system are not covered by a PM program, it is suspected that they may have again experienced a malfunction. Because these components are not accessible at power, verification of a malfunction will have to await the next outage.

Two contributing causes of this event have also been identified. The first is equipment deficiencies that interfered with the verification of proper CRDM cooling system performance by operators following the swapover to the C-A and D-B cooling fans. The most useful temperature indication available to the operators following swapover would have been the CRDM enclosure exit temperatures measured by TE-30-211E and TE-30-211F, shown on the attached simplified sketch. However, the main control room display for these temperatures, the Morgan-1 recorder (TR-56-1), was inoperable at the time of this event. The temperature indication that was available to the operators in the main control room was the P-250 Computer Point T1014A. However, this computer point was vaguely labeled as containment air temperature opposite from the refueling gate, which reduced its usefulness to the operators. The second contributing cause of this event is a lack of guidance for the operators on indicators to monitor while swapping CRDM cooling fans in System Operating Instruction (SOI) 30.3, "Containment Upper and Lower Cooling, Heating and Ventilation". The UO used the CRDM cooling fan suction temperatures following swapover to verify system performance. These temperatures are measured between the essential raw cooling water coolers and the fan intake and are, therefore, not indicative of CRDM enclosure air temperatures.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	— 0 2 6	— 0 0	0 4	OF	0 6

TEXT (If more space is required, use additional NRC Form 388A's) (17)

ANALYSIS OF EVENT

This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.i.B, as an operation prohibited by technical specifications (TSs) because LCO 3.0.3 was entered. The CRDMs are described in Section 4.2.3 of the SQN Updated Final Safety Analysis Report (UFSAR) and the RPIs are described in Section 7.7.1 of the UFSAR.

Compliance with TS requirements for control rods and RPIs ensures that (1) acceptable power distribution limits are maintained; (2) minimum required shutdown margin is maintained; and (3) the potential effects of control rod misalignments are limited. The RPIs are required to be operable to indicate control rod positions, thereby enabling compliance with control rod alignment and insertion limits. LCO 3.1.3.2 contains provisions for continued operation with a maximum of one RPI per bank inoperable. When more than one RPI per bank became inoperable, LCO 3.0.3 was entered. The shift operations supervisor discussed the plant condition with the Operations Superintendent and the decision was made to begin a unit shutdown if it appeared that any problem would be encountered during the calibration of the RPIs. While still within the 1 hour/6 hour action requirements of LCO 3.0.3, the RPIs were restored to operability and LCO 3.0.3 was exited. The requirements of 13s were thereby complied with and there was no adverse effect on the health and safety of the public or plant personnel.

CORRECTIVE ACTIONS

As immediate corrective action, the RPIs were adjusted to within the required 12 step tolerance. Work requests have been initiated to investigate and repair as necessary any malfunction of the CRDM cooling system dampers or fans during the next scheduled outage for each unit.

As corrective action to prevent recurrence, the Technical Support group will initiate actions by January 2, 1990, to place the appropriate CRDM cooling system components (such as the dampers) in a PM system. In addition, by December 15, 1989, the Technical Support group will determine a more appropriate description for computer point T1014A and initiate actions to revise its P-250 listing. A section will also be added to SOI-30.3 by February 1, 1990, to provide better guidance for the operators when swapping the fans for CRDM enclosure cooling.

ADDITIONAL INFORMATION

One previous event has been identified that reported an entry into LCO 3.0.3 as a result of more than one RPI per bank being inoperable, as reported in LER 50-327/85009. This event was caused by an electrical anomaly and was unrelated to the CRDM cooling system.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 9	— 0 2 6	— 0 0	0 5	OF 0 6

TEXT (If more space is required, use additional NRC Form 386A's) (17)

COMMITMENTS

1. The Technical Support group will initiate actions by January 2, 1990, to place the appropriate CRDM cooling system components (such as the dampers) in a PM system.
2. By December 15, 1989, the Technical Support Group will determine a more appropriate description for computer point T1014A and initiate actions to revise its P-250 listing.
3. A section will be added to SOI-30.3 by February 1, 1990, to provide better guidance for the operators when swapping the fans for CRDM enclosure cooling.

0554y

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)

Seguoyah Nuclear Plant, Unit 1

DOCKET NUMBER (2)

0500032789

LER NUMBER (6)

YEAR	SEQUENTIAL NUMBER	REGION NUMBER	PAGE (3)
0	2	6	06
0	6	0	06
0	6	0	06

ESTIMATED BURDEN PER RESPONSE TO COMPLETE THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORM, RD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P.50) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555. AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

CRDM COOLING SYSTEM

SIMPLIFIED SKETCH (NOT TO SCALE)

