

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

R.J. Adney
Site Vice President
Sequoyah Nuclear Plant

December 18, 1996

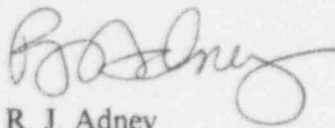
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN)
UNIT 1 - DOCKET NO. 50-327 - FACILITY OPERATING LICENSE NO. DPR-77 -
LICENSEE EVENT REPORT (LER) 50-327/96011

The enclosed report provides details concerning an event where the rod position indicating system was more than 12 steps different than the demand step counter for two control rods in Control Bank D. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as a condition prohibited by technical specifications.

Sincerely,



R. J. Adney

Enclosure
cc: See page 2

9612260291 961218
PDR ADDCK 05000327
S PDR

U.S. Nuclear Regulatory Commission
Page 2
December 18, 1996

Enclosure

cc (Enclosure):

Mr. R. W. Hernan, Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

INPO Records Center
Institute of Nuclear Power Operations
700 Galleria Parkway
Atlanta, Georgia 30339-5957

NRC Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy-Daisy, Tennessee 37379-3624

Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323-2711

NRC FORM 366 (4-95)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>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</small>																														
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)																																		
FACILITY NAME (1) Sequoyah Nuclear Plant (SQN) Unit 1				DOCKET NUMBER (2) 05000327	PAGE (3) 1 OF 6																													
TITLE (4) Rod Position Indication System Out of Step with Demand Position Indication System																																		
EVENT DATE (5) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td>11</td> <td>18</td> <td>96</td> </tr> </table>			MONTH	DAY	YEAR	11	18	96	LER NUMBER (6) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>YEAR</th> <th>SEQUENTIAL NUMBER</th> <th>REVISION NUMBER</th> </tr> <tr> <td>96</td> <td>011</td> <td>00</td> </tr> </table>		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	96	011	00	REPORT DATE (7) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td>12</td> <td>18</td> <td>96</td> </tr> </table>		MONTH	DAY	YEAR	12	18	96	OTHER FACILITIES INVOLVED (8) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td>NA</td> <td>NA</td> </tr> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td>NA</td> <td>NA</td> </tr> </table>		FACILITY NAME	DOCKET NUMBER	NA	NA	FACILITY NAME	DOCKET NUMBER	NA	NA
MONTH	DAY	YEAR																																
11	18	96																																
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER																																
96	011	00																																
MONTH	DAY	YEAR																																
12	18	96																																
FACILITY NAME	DOCKET NUMBER																																	
NA	NA																																	
FACILITY NAME	DOCKET NUMBER																																	
NA	NA																																	
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)																																
POWER LEVEL (10) 015		20.2201(b)		20.2203(a)(2)(v) <input checked="" type="checkbox"/>		50.73(a)(2)(i) <input type="checkbox"/>		50.73(a)(2)(viii) <input type="checkbox"/>																										
		20.2203(a)(1)		20.2203(a)(3)(i) <input type="checkbox"/>		50.73(a)(2)(ii) <input type="checkbox"/>		50.73(a)(2)(x) <input type="checkbox"/>																										
		20.2203(a)(2)(i)		20.2203(a)(3)(ii) <input type="checkbox"/>		50.73(a)(2)(iii) <input type="checkbox"/>		73.71 <input type="checkbox"/>																										
		20.2203(a)(2)(ii)		20.2203(a)(4) <input type="checkbox"/>		50.73(a)(2)(iv) <input type="checkbox"/>		OTHER <input type="checkbox"/>																										
		20.2203(a)(2)(iii)		50.36(c)(1) <input type="checkbox"/>		50.73(a)(2)(v) <input type="checkbox"/>		Specify in Abstract below or in NRC Form 366A																										
20.2203(a)(2)(iv)		50.36(c)(2) <input type="checkbox"/>		50.73(a)(2)(vii) <input type="checkbox"/>																														
LICENSEE CONTACT FOR THIS LER (12)																																		
NAME S. D. Gilley, Licensing Engineer				TELEPHONE NUMBER (Include Area Code) (423) 843-7427																														
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).				X NO																														
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)																																		
<p>On November 18, 1996 at 0218 Eastern standard time (EST), with Unit 1 in Mode 1 at approximately 15 percent reactor power, Limiting Condition for Operation (LCO) 3.0.3 was entered when the rod position indicators (RPIs) for Control Bank D Rods M4 and M12 were more than the required 12 steps out from their respective demand position indicators (step counters). The RPI for Control Bank D rod M12 was out of service because it had exceeded the 12 step limit at 2352 EST on November 17, 1996. Maintenance was being performed on the M12 indicator when a second RPI (Control Bank D rod M4) exceeded the 12 step limit. TS 3.1.3.2 requires that the rod position indication system and the demand position indication system be capable of determining the control rod positions with plus or minus 12 steps. The LCO action for TS 3.1.3.2 allows a maximum of one rod to exceed the 12 step limit. LCO 3.0.3 was entered when the second RPI exceeded the 12 step limit. Dilution of the reactor coolant system began, to allow the rods to be inserted where the effect of the nonlinear RPI response was less pronounced. The deviation returned to less than the plus or minus 12 steps required by TSs. The root cause for this event was that the response of the analog RPI is nonlinear, and the resulting difference between the RPI readout and the actual rod position results in the RPI indicating higher than actual rod position between 20 and 215 steps and lower than actual rod position below 20 steps and above 215 steps. This situation in conjunction with the calibration tolerance of the RPI instruments can result in exceeding the TS requirement of plus or minus 12 steps.</p>																																		

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
SQN Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 6
		96 --	007 --	00	

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

I. PLANT CONDITIONS

Unit 1 was in Mode 1 at approximately 15 percent power following completion of a planned shutdown to facilitate maintenance activities.

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

On November 18, 1996, at 0218 Eastern standard time (EST), with Unit 1 in Mode 1 at approximately 15 percent reactor power and Control Bank D (EHS Code AA) at 121 steps, Limiting Condition for Operation (LCO) 3.0.3 was entered. Entry occurred because the rod position indicator (RPI) for Control Bank D Rod M4 drifted, indicating that M4 was at 135 steps which was more than the required 12 steps out from its respective demand position indicator (step counter). While this was occurring the RPI for Control Bank D Rod M12 was out of service for maintenance.

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

None.

C. Dates and Approximate Times of Major Occurrences:

November 17, 1996 LCO 3.1.3.2 Action A was entered when the RPI for M12
at 2352 EST in Control Bank D was more than 12 steps different from its
demand position indicator. A work request was initiated.

November 18, 1996 LCO 3.0.3 was entered when the rod position indicator
0218 EST for M4 in Control Bank D drifted to more than 12 steps
different from the demand position indicator (step counter).

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
SQN Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 of 6
		96 --	007 --	00	

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

at approximately
0219 EST

Dilution of the reactor coolant system was initiated so that the rods could be inserted. This action moved the rods into a region which is more linear with respect to the RPI versus demand position indicator readings.

at 0241 EST

LCO 3.0.3 was exited for the M4 RPI. M4 was at 114 steps as indicated by the demand counter and was within 12 steps of the RPI.

at 0300 EST

The RPI for M12 returned to within 12 steps of its demand counter. LCO 3.1.3.2 was exited.

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The mismatch between the demand position indicator and the rod position indication system for the two Control Bank D indicators was discovered by operators during the performance of their duties.

F. Operator Actions:

Dilution of the reactor coolant system was initiated to allow Control Bank D to be repositioned inward to allow the rods to move into a region where the RPI readout is more linear.

G. Safety System Responses:

No safety system response occurred, nor was one required.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
SQN Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 of 6
		96 --	007 --	00	

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

III. CAUSE OF THE EVENT**A. Immediate Cause:**

The immediate cause for this event was incorrect position indication on the analog rod position indication system.

B. Root Cause:

The response of the analog RPI is nonlinear, the difference between the RPI readout and the actual rod position results in the RPI indicating higher than actual rod position between 20 and 215 steps and lower than actual rod position below 20 steps and above 215 steps. In this event the RPI was indicating 135 steps for rod M4 in Control Bank D, while the actual rod position was 121 as indicated by the demand position indicator.

This situation in conjunction with the calibration tolerance of the RPI instruments can result in exceeding the TS requirement of plus or minus 12 steps.

IV. ANALYSIS OF THE EVENT

SQN has two separate systems to provide control rod position indication, the analog rod position indication system and the demand position indication system (step counter). Each system serves as a backup for the other. In this event, the demand position indication system provided correct indication. The actual position of the rods was indicated by the demand position indication system and was not in error. Therefore, there were no adverse consequences to the health and safety of plant personnel or the general public as a result of this event.

V. CORRECTIVE ACTIONS**A. Immediate Corrective Actions:**

The immediate corrective actions were to enter TS 3.0.3 and to begin dilution of the reactor coolant system to allow rod motion to bring the RPI into a range where the nonlinear effect of the response was reduced.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
SQN Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 of 6
		96 --	007 --	00	

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

B. Corrective Actions to Prevent Recurrence:

A TS change was previously initiated to request that the 12-step limit be increased to 18 steps. The TS change would minimize entry into LCO 3.0.3 when the plant is operating in the nonlinear RPI region. Before this TS change request can be submitted to NRC for approval, an analysis must be performed to support the change. That analysis would be performed by the new fuel vendor (Sequoyah is transitioning to Framatome Cogema Fuel during the upcoming cycle 9 operation for both units). The analysis will also evaluate the impact on hot channel factors and shutdown margin. This analysis is expected to be completed by mid-1997 and, assuming an acceptable integrated operational effect, a TS change is planned for the third quarter of 1997.

VI. ADDITIONAL INFORMATION**A. Failed Components:**

None.

B. Previous LERs on Similar Events:

LER 50-327/95009 documents two similar events that occurred in June and July of 1995. Both of these events involved two rod position indicators being greater than 12 steps out from their respective demand position indicators. The corrective actions included a review of lessons learned (i.e., when practical, limit the amount of operating time in the subject region) with operators and Reactor Engineering personnel and a TS change which had been initiated to request that the 12-step limit be increased to 18 steps in the upper and lower portions of the range or possibly over the entire range.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SQN Unit 1	05000327	96 --	007 --	00	6 of 6

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

LER 50-327/96007 documents a similar event in June 1996. This event also involved two rod position indicators being greater than 12 steps out from their respective demand position indicators. The corrective action was to have a vendor perform an analysis to support a technical specification change that would allow an 18 step limit versus the current 12 step limit between the RPI and Demand Position Indicator systems. This corrective action is as described in section V.B.

VII. COMMITMENTS

None.