



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

July 8, 2005

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

10 CFR 50.73

Gentlemen:

**TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN)
UNIT 2 - DOCKET NO. 50-328 - FACILITY OPERATING LICENSE
DPR-79 - LICENSEE EVENT REPORT (LER) 50-328/2005-002-00**

The enclosed LER provides details concerning the incorrect calibration of two Unit 2 nuclear instrumentation system components. This event is being reported, in accordance with 10 CFR 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by the plant's technical specification.

Sincerely,

P. L. Pace
Manager, Site Licensing and
Industry Affairs

Enclosure

cc (Enclosure):

INPO Records Center
Institute of Nuclear Power Operations
700 Galleria Parkway, SE, Suite 100
Atlanta, Georgia 30339-5957

IE22

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: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects@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 (SQN) Unit 2	2. DOCKET NUMBER 05000328	3. PAGE 1 OF 7
--	-------------------------------------	--------------------------

4. TITLE
Incorrect Unit 2 Nuclear Instrumentation System Calibration

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	01	2005	2005	- 002 -	00	07	08	2005		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE 0	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)						
10. POWER LEVEL 000	<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)(ii)(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 type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A						

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME J. W. Proffitt, Nuclear Engineer	TELEPHONE NUMBER (Include Area Code) 423-843-6651
---	--

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

During a Unit 2 refueling outage, on May 10, 2005, Maintenance personnel were performing a channel calibration of the Unit 2 power range Nuclear Instrumentation System (NIS) Channel N41 and determined the channel was out of technical specification limits. Prior to this, during the same refueling outage on May 4, 2005, Maintenance personnel had performed a channel calibration of the Unit 2 power range NIS Channel N42 and determined the channel was out of technical specification limits. A problem evaluation report (PER) was initiated to evaluate these two out of limits conditions. It was determined that the condition was the result of an incorrect calibration performed during the last functional test. The root cause of the incorrect calibration was inadequate work practices by the individual performing the functional test. The remaining NIS channels on both units were verified to be within calibration. Maintenance management held standown meetings with Maintenance Instrument Group (MIG) personnel concerning this event and instructed MIG personnel to have the technical specification compliance equipment calibration data verified by a minimum of two people before making any adjustments. Appropriate disciplinary action for personnel involved was taken.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	2 OF 7
		2005 --	002 --	00	

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

I. PLANT CONDITION(S)

Unit 2 was in a refueling outage with no fuel in the core.

II. DESCRIPTION OF EVENT

A. Event:

During a Unit 2 refueling outage, on May 10, 2005, Maintenance personnel were performing a channel calibration of the Unit 2 power range Nuclear Instrumentation System (NIS) Channel N41 [EIS Code IG] and determined the channel was out of technical specification limits. Prior to this, during the same refueling outage on May 4, 2005, Maintenance personnel had performed a channel calibration of the Unit 2 power range NIS Channel N42 and determined the channel was out of technical specification limits. A problem evaluation report (PER) was initiated to evaluate these two out of limits conditions. It was determined that the condition was the result of an incorrect calibration performed during the last functional test, resulting in the instruments be inoperable for a period longer than allowed by Technical Specification (TS) 3.3.1.1.

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

None.

C. Dates and Approximate Times of Major Occurrences:

- February 1, 2005 Maintenance personnel performed a quarterly functional test of power range NIS Channel N42. The channel rate circuit was determined to be out of tolerance, but within TS limits. The channel was adjusted and returned to service.
- April 22, 2005 Maintenance personnel performed a quarterly functional test of power range NIS Channel N41. The channel rate circuit was determined to be out of tolerance, but within TS limits. The channel was adjusted and returned to service.
- April 25, 2005 The Unit 2 Cycle 13 refueling outage started.
- May 3, 2005 Maintenance personnel started a channel calibration of power range NIS Channel N42.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	3 OF 7
		2005 --	002	-- 00	

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

- May 4, 2005 During channel calibration of power range NIS Channel N42, the rate circuit was found out of tolerance and exceeded TS limits. Maintenance personnel notified Operations of the condition. The calibration was stopped. A work order was initiated to determine if the rate circuit was malfunctioning. No problem was identified.
- May 5, 2005 Maintenance Personnel completed the channel calibration of power range NIS Channel N42 and returned the channel to within tolerances and within TS limits.
- May 10, 2005 Maintenance personnel started a channel calibration of power range NIS Channel N41. During channel calibration of power range NIS Channel N41, the rate circuit was found out of tolerance and exceeded TS limits. Maintenance personnel notified Operations of the condition. The calibration was stopped. A work order was initiated to determine if the rate circuit was malfunctioning.
- May 10, 2005 A review of the last time these two channels had been adjusted was performed. During the review of the functional tests, it was determined that the calculations for the rate circuits had been performed incorrectly. Site management was notified of the condition and a corrective action document was initiated to document the identified condition.

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The condition was discovered during a review of the functional test following identification that two channels were out of TS limits.

F. Operator Actions:

No operator actions were required.

G. Safety System Responses:

Not applicable – no safety system response was required.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	4 OF 7
		2005 --	002 --	00	

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

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of the condition was an incorrect calibration of the instruments' rate circuit.

B. Root Cause:

The root cause of the incorrect calibration was inadequate work practices by the individual performing the calibration. The same individual made the same mistake twice.

C. Contributing Factor:

Contributing to the event was the lack of barriers in the procedure to help prevent this error.

IV. ANALYSIS OF THE EVENT

The power range high neutron flux trip circuit trips the reactor when two of the four power range channels exceed the trip setpoint. There are two independent bistables each with their own trip setting (a high and a low setting) per channel (four channels total). Technical Specification (TS) indicates that the reactor trip setpoints for the power range neutron flux high positive rate and high negative rate protection functions are based on an instrument time constant greater than or equal to 2 seconds. The as-found value for the Unit 2 N41 and N42 instrument channels was 1.90 and 1.82 seconds, respectively.

The as-found values for the positive and negative rate trip bistable actuations for these instrument channels were reviewed and were found well within acceptable values (i.e., a "step" change through the non-conservative rate circuit card had little affect on the bistable trip setpoints.) Based on this result, it is expected that the time constant problem for these channels would only be apparent as a slightly slower response for a "ramp" change in power. For a "step" change in power, the function of the channels is not affected.

The power range neutron flux high positive rate and high negative rate protection functions are credited as protection mechanisms for the rod ejection event and a rod cluster control assemblies (RCCA) misalignment event. Evaluation of these events for the subject condition is provided below.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	5 OF 7
		2005 --	002	-- 00	

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

The ejected rod event is initiated by an assumed mechanical failure of the rod pressure housing which results in a rapid reactivity insertion. The responses are rapid with the power spike occurring over a small fraction of a second. Given the rate of the nuclear power response and the fact that the flux rate trip bistable actuators respond as expected, for the simulation of step changes in the neutron flux, the response of the flux rate trips would not be affected by the as found condition. Additionally, the Final Safety Analysis Report (FSAR) indicates that the events analyzed are mitigated by a high neutron flux level reactor trip. As such, the limiting cases analyzed do not rely on the flux rate trip for performing the initial reactor protection function. Therefore, the analysis of the ejected rod event is not affected by the instrument channel condition.

The RCCA misalignment analysis described in the FSAR is subdivided into analyses of (1) one or more dropped RCCAs and (2) a statically misaligned RCCA. Since the statically misaligned RCCA event is not a transient event, the dropped RCCA is the only event that could be affected by a change in the power range neutron flux rate reactor trip response. The dropped RCCA event is evaluated for each core design. The only reactor protection function assumed in this approach is the power range high neutron flux level reactor trip. For RCCA drops which result in a negative reactivity insertion that is detected by the power range negative neutron flux rate trip circuitry, the reactor is tripped within approximately 2.7 seconds following the drop of the RCCA(s). Since the dropped rod represents a step change in power, the negative rate trip bistable actuators will occur as required and the as-found rate circuit time constants will not adversely affect the core response.

For those dropped RCCAs that do not result in a negative flux rate reactor trip, power may be reestablished either by reactivity feedback or control bank withdrawal. Following a dropped rod event of this type in manual rod control, the plant will establish a new equilibrium condition. The equilibrium process without control system interaction is monotonic, thus removing power overshoot as a concern and establishing the automatic rod control mode of operation as the limiting case. In the automatic rod control mode, the rod control system detects the drop in power and initiates control bank withdrawal. The FSAR shows a typical transient response to a dropped RCCA (or RCCAs) in automatic control. In all cases, the minimum DNBR remains above the safety analysis limit value without actuation of the power range high neutron flux level reactor trip. Therefore, the analysis of the RCCA misalignment event is not affected by the instrument channel condition.

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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	6 OF 7
		2005 --	002 --	00	

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

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

Immediate action taken was to verify the channel calibration on the remaining Unit 2 and the four channels on Unit 1 were within calibration. No problems were identified. Maintenance management held standown meetings with Maintenance Instrument Group (MIG) personnel concerning this event and instructed MIG personnel to have the technical specification compliance equipment calibration data verified by a minimum of two people before making any adjustments. Appropriate disciplinary action for personnel involved was taken.

B. Corrective Actions to Prevent Recurrence:

SQN has implemented a procedure change for the NIS Power Range Functional Test and Channel Calibration procedures to require a verification of the chart data.

Briefing for lessons learned will be conducted to appropriate Maintenance personnel.

VII. ADDITIONAL INFORMATION

A. Failed Components:

None

B. Previous LERs on Similar Events:

A review of previous reportable events for the past three years did not identify any previous similar events.

C. Additional Information:

Contributing factors discussed in this LER are being addressed within the Corrective Action Program under Problem Evaluation Report Number 82360.

D. Safety System Functional Failure:

This event did not result in a safety system functional failure in accordance with 10 CFR 50.73(a)(2)(v).

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant (SQN) Unit 2	05000328	YEAR	SEQUENTIAL NUMBER	REVISION	7 OF 7
		2005 --	002 --	00	

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

E. Loss of Normal Heat Removal Consideration:

This event did not result in a loss of normal heat removal.

VIII. COMMITMENTS

None.