NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Sequoyah Nuclear Plant (SQN), Unit 1	05000327	1 of 05

TITLE (4) Power Range Neutron Flux Monitor Inoperable Longer Than Allowed by Technical Specifications

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
07	18	95	95	011	00	08	16	95	FACILITY NAME	DOCKET NUMBER

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
OPERATING MODE (9)	1		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)	13		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A		(Specify in Abstract below and in Text, NRC Form 366A)
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B		
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
J.W. Proffitt, Compliance Licensing Engineer	(615)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)			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)

On July 18,1995, at approximately 2200 Eastern daylight time (EDT), with Unit 1 operating at 13 percent power, it was determined that Delta I, the difference between the upper and lower flux in the core, on one channel of the power range neutron flux monitor was not indicating correctly. The power range channel was declared inoperable, and the action statement for Limiting Condition for Operation 3.3.1.1 was entered. Technical specifications require that with less than the required number of channels operable, start-up and power operation may continue provided the inoperable channel is placed in the tripped condition within 6 hours. It was determined that the signal cable from the lower detector to the monitor had become disconnected. The cause of the event was determined to be the result of moving the monitor in and out and disconnecting and reconnecting the cable over time. The cable was reconnected, and the channel was returned to service at 0255 EDT on July 19, 1995. A review of computer data indicated that the channel actually failed at 1806 EDT. The appropriate plant procedures have been revised to require a periodic inspection of the tightness of the cables.

I. PLANT CONDITIONS

Unit 1 was in power operation at approximately 13 percent.

II. DESCRIPTION OF EVENT

A. Event

On July 18,1995, at approximately 2200 Eastern daylight time (EDT), with Unit 1 operating at 13 percent power, it was determined that Delta I, the difference between the upper and lower flux in the core, on one channel of the power range neutron flux monitor was not indicating correctly. The power range channel (EIIS Code IG) was declared inoperable, and the action statement for Limiting Condition for Operation (LCO) 3.3.1.1 was entered. Technical specifications require that with less than the required number of channels operable, start-up and power operation may continue provided the inoperable channel is placed in the tripped condition within 6 hours. A work request and corrective action document were initiated to correct and evaluate the condition. It was determined that the signal cable (EIIS Code CBL) from the lower detector to the monitor had become disconnected. The cable was reconnected, and the channel was returned to service at 0255 EDT on July 19, 1995. A review of computer data indicated that the channel failed at 1806 EDT. It appears that the power range cable became disconnected during the performance of the poststart-up nuclear instrumentation system calibration. A calibration was performed with the unit at 4 percent power. It is hypothesized that the cable became disconnected when the detector drawer was opened to allow access for the coarse gain potentiometer adjustment.

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

None.

C. Dates and Approximate Times of Major Occurrences

July 18,1995 at 1750 EDT	Instrument Maintenance personnel started the performance of a nuclear instrumentation system calibration with the unit at approximately 4 percent power.
July 18,1995 at 2200 EDT	It was determined that a power range neutron flux channel monitor was inoperable, and LCO 3.3.1.1 was entered.
July 19,1995 at 0255 EDT	The inoperable power range neutron channel was returned to service, and LCO 3.3.1.1 exited.

July 19,1995 From a review of computer data, it was determined that the power range neutron channel had became inoperable at 1806 EDT on July 18, 1995.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

During power ascension, the on-shift crew observed a difference in Delta I, the difference between the upper and lower flux in the core, on one channel of the power range neutron flux monitors.

F. Operator Actions

The channel was declared inoperable, and the action statement for LCO 3.3.1.1 was entered. A work request and corrective action document were initiated to evaluate and correct the condition.

G. Safety System Responses

No safety system response was required.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this event was the power range detector cable unexpectedly becoming disconnected.

B. Root Cause

The root cause of the event was determined to be the result of moving the monitor in and out and disconnecting and reconnecting the cable over time. Technical specifications require the power range monitors to be functionally tested every 92 days.

C. Contributing Factors

None.

IV. ANALYSIS OF EVENT

The power range neutron flux channels provide overpower protection. The power range neutron flux trip circuit trips the reactor when two of the four power range channels exceed the trip setpoints. There are two independent detectors per channel, an upper detector to monitor the upper portion of the core and a lower detector to monitor the lower portion of the core. The power range neutron flux channels provide an input to the power range low flux trip (25 percent power), the power range high flux trip (109 percent power), the

positive rate trip, the negative rate trip, and the over-temperature delta temperature (OTDT) trip.

The channel with the cable disconnected would have been available to perform the following trip functions with the upper detector functional: 25 percent, 109 percent, and the positive rate trip. The upper detector would have performed this function because of the increased gain that was adjusted into the channel during the performance of the calibration. The increased gain would have compensated for the loss of the lower detector. The negative rate trip could have been adversely affected if Control Bank D was deeply inserted (i.e., well below the area monitored by the upper detector) and a rod from Bank D fell into the core in the quadrant being monitored by the inoperable channel. However, these conditions did not exist at the time of the event. Additionally, the other three channels were operable and available to monitor the condition of the core. The two of four overpower trip logic will ensure an overpower trip if needed even with an independent failure of another channel. The OTDT trip would have occurred as required because the input to the OTDT trip signal for axial power imbalance was very conservative.

In addition, channel deviation signals in the control system will give an alarm if any neutron flux channel deviates significantly from any of the other channels. Finally, an overpower signal from any nuclear channel will block automatic rod withdrawal. Therefore, it can be concluded that there were no adverse consequences to plant personnel or to the general public as a result of this event.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Action

The signal cable from the lower detector to the monitor was reconnected, and the channel was returned to service. The power range monitor cables on Unit 1 were inspected and were determined to be acceptable. The cable that was reconnected was determined to have been installed incorrectly, and the deficiency was corrected. The Unit 2 power range monitor cables were inspected, two cables were determined to be loose, and the remaining cables were determined to be acceptable. The loose cables were tightened. The deficiencies identified did not affect the operability of the associated power range channels.

B. Corrective Action to Prevent Recurrence

The appropriate plant procedures have been revised to require inspecting the power range monitor cables for tightness on a periodic basis.

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A review of previous reportable events identified no LERs associated with the failure of power range monitors resulting from loose or disconnected cables.

VII. COMMITMENTS

None.