



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

Ken Powers  
Vice President, Sequoyah Nuclear Plant

April 12, 1994

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) 50-327/94004

The enclosed LER provides details concerning an inadvertent feedwater  
isolation that occurred while the steam generators were in wet lay-up.  
This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv) as  
an automatic engineered safety feature actuation.

Sincerely,

Ken Powers

Enclosure

cc: See page 2

100000  
3404120001 340412  
PDR ADDCK 05000327  
S PDR

*JEZ*

U.S. Nuclear Regulatory Commission

Page 2

April 12, 1994

cc (Enclosure):

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

Mr. D. E. LaBarge, Project Manager  
U.S. Nuclear Regulatory Commission  
One White Flint, North  
11555 Rockville Pike  
Rockville, Maryland 20852-2739

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



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)	
		YEAR	NUMBER	REVISION NUMBER			
Sequoyah Nuclear Plant (SQN), Unit 1	0500032794	0	4	0	0	0	2 OF 5

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

I. PLANT CONDITIONS

Unit 1 was in cold shutdown, Mode 5.

II. DESCRIPTION OF EVENT

A. Event

On March 14, 1994, at 1813 Eastern standard time (EST), an inadvertent feedwater isolation (FWI) occurred because of an indicated high-high Loop 1 steam generator (S/G) (EIIIS Code SB) level. The FWI occurred during the drain-down of the S/G for the removal of water containing layup chemicals. Before draining the Loop 1 S/G, a nitrogen cover gas was applied to the secondary side of the S/G. The pressure increase from the nitrogen resulted in a narrow-range level transmitter showing an increased level from 79.5 percent to 81.1 percent, which was above the FWI setpoint. Before the addition of the nitrogen, one of three narrow-range level transmitters was already indicating a level above the FWI setpoint; the other two level indications were 79.5 percent and 78 percent. The FWI was initiated as a result of two out of three transmitters indicating a S/G level above the high-high setpoint. The actual S/G level was below the FWI setpoint of 81 percent.

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

Before the event, one narrow-range level transmitter on the Loop 1 S/G indicated 95 percent when the actual level was below the high-high alarm set point. This condition was identified by the control room operators. The operators realized that the instrument indication was incorrect and determined that the reference leg of the level transmitter required backfilling. Maintenance personnel were contacted and Operations was informed that the level channel was scheduled for backfilling. Because two other level channels were providing correct level indication, it was believed that the risk of an FWI actuation was minimal and the drain-down of the S/G would resolve the condition.

C. Dates and Approximate Times of Major Occurrences

March 13, 1994  
at 2300 EST                      Nitrogen cover pressure is increased from 0 pounds per square inch (psig) to 6 psig on the Loop 1 S/G. One of the S/G narrow-range level transmitters showed an increased indicated level above the high-high setpoint.

March 14, 1994  
at 1231 EST                      Loop 1 S/G actual level increased to 78 percent (3 percent below the high-high setpoint) because of leakage through an isolation valve.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)	
		YEAR	NUMBER	REVISION	NUMBER		
Sequoyah Nuclear Plant (SQN), Unit 1		1994	004	00	00	3	5

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

March 14, 1994 at 1810 EST The nitrogen system was aligned to provide the Loop 1 S/G with a cover gas and to pressurize the S/G to facilitate the draining of the layup water.

March 14, 1994 at 1812 EST The Loop 1 S/G blowdown valve was opened to start lay-up water drain-down.

March 14, 1994 at 1813 EST A second S/G narrow-range level transmitter indicated over 81 percent level resulting in a two-out-of-three high-high S/G logic. A FWI signal was initiated.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

Various annunciators alarmed on the main control room panels. The control room operators determined that a FWI occurred.

F. Operator Actions

No operator action was required in response to the FWI. The FWI signal closed the feedwater regulation valves, resulting in a loss of condensate recirculation and hotwell pump flow. Before the FWI signal, the main feedwater isolation valves were in the closed position, in support of condensate recirculation. Operations personnel shut down the running hotwell pump for pump protection. Pump operation and flow path were reestablished after the FWI signal was cleared.

G. Safety System Response

No safety system responses were required. Most of the equipment receiving the FWI signal was either deenergized or positioned to the desired FWI configuration, in support of Mode 5 operation. Upon receipt of the FWI signal, the remaining equipment responded as designed.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of the FWI signal was high-high S/G level indication on two of three narrow-range level transmitters. Before the FWI signal, one narrow-range level transmitter was in the tripped condition, indicating approximately 95 percent level as a result of gas entrainment in the reference leg sense line of the transmitter. When operators aligned the S/G to the

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)	
		YEAR	NUMBER	REVISION NUMBER			
Sequoyah Nuclear Plant (SQN), Unit 1	0500032794	--	004	--	0004	OF	05

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

nitrogen system, before the drain-down of the SG, the additional gas pressure tripped a second level transmitter. Actual level in the Loop 1 S/G was approximately 78 percent at the time of the FWI signal, approximately 3 percent below the FWI setpoint.

B. Root Cause

The cause of the FWI was an inadequate procedure for wet lay-up of the S/G. The procedural guidance allowed the S/G to be filled to the high-high level setpoint without consideration of level channel operability during Modes 5 and 6. No guidance was provided to ensure either operability of the level channels or bypass of the FWI signal or to ensure that sufficient level margin was maintained when filling the S/G to prevent a FWI actuation.

C. Contributing Factors

Operators realized that S/G level was near the FWI actuation setpoint but believed that the setpoint would not be reached during the drain-down process. Additionally, it was not known that the level transmitters were pressure sensitive when the reference leg of the transmitters' sense line contained gas pockets. Therefore, before the drain-down of the S/G, a nitrogen blanket was applied in accordance with the applicable procedure without taking action to ensure that a FWI signal was not initiated.

IV. ANALYSIS OF EVENT

When the unit is in power operation, a FWI signal on high-high S/G level is provided to limit the amount of mass in the S/G in the event of a main steam line break. This limits the energy of a blowdown and prevents the over-cooling of the primary system. Additionally, the FWI signal on high-high S/G level protects the main steam piping from excessive dead-weight loading. In the event described by this licensee event report, the FWI had no effect because the main feedwater isolation valves were closed before the FWI signal and the S/G was isolated in the lay-up condition. Also, the indicated level was conservatively high; the actual SG level had not exceeded the high-high setpoint. At no time was there a threat to the health and safety of plant personnel or the general public.

V. CORRECTIVE ACTION

A. Immediate Corrective Action

No immediate corrective actions were required.

B. Corrective Action to Prevent Recurrence

The appropriate procedures will be revised to provide operators with S/G level channel-operability guidance during wet lay-up conditions.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
		SEQUENTIAL	REVISION
		YEAR	NUMBER
Sequoyah Nuclear Plant (SQN), Unit 1	050003 27 94	-- 0 0 4 --	0 0 0 5 OF 0 5

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

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A review for previous events did not identify any similar events where a FWI was initiated during cold-shutdown operation with the S/Gs in a lay-up condition.

VII. COMMITMENTS

The appropriate procedures will be revised by July 8, 1994, to provide operators with S/G level channel-operability guidance during wet lay-up conditions.