



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

Ken Powers  
Vice President, Sequoyah Nuclear Plant

May 9, 1994

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET  
NO. 50-328 - FACILITY OPERATING LICENSE DPR-79 - LICENSEE EVENT REPORT  
(LER) 50-328/94004

The enclosed LER provides details concerning an event resulting in an inadvertent cooldown of the pressurizer exceeding the technical specification limits and not restoring the temperature within the required timeframe. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation prohibited by technical specifications.

Sincerely,

Ken Powers

Enclosure  
cc: See page 2

170083

9405170203 940509  
PDR ADDOCK 05000328  
S PDR

1E22 1

U.S. Nuclear Regulatory Commission  
Page 2  
May 9, 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)

FACILITY NAME (1)

Sequoyah Nuclear Plant (SQN), Unit 2

DOCKET NUMBER (2) | PAGE (3)

050003 2 8 1 OF 0 6

TITLE (4)

Pressurizer Cooldown Rate Exceeded

EVENT DAY (5)				LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)						
				SEQUENTIAL	REVISION						FACILITY NAMES		DOCKET NUMBER(S)				
MONTH	DAY	YEAR	YEAR	NUMBER	NUMBER			MONTH	DAY	YEAR							
0	6	1	8	9	3	9	4	0	0	4	0	0	5	0	9	9	4

OPERATING | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5:

MODE | (Check one or more of the following)(11)

(9) | 5 | 20.402(b) | 20.405(c) | 50.73(a)(2)(iv) | 73.71(b)

POWER | 20.405(a)(1)(i) | 50.36(c)(1) | 50.73(a)(2)(v) | 73.71(c)

LEVEL | 20.405(a)(1)(ii) | 50.36(c)(2) | 50.73(a)(2)(vii) | OTHER (Specify in

(10) | 0 | 0 | 0 | 20.405(a)(1)(iii) | XX | 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) | Abstract below and in

| 20.405(a)(1)(iv) | 50.73(a)(2)(ii) | 50.73(a)(2)(viii)(B) | Text, NRC Form 366A)

| 20.405(a)(1)(v) | 50.73(a)(2)(iii) | 50.73(a)(2)(x) |

LICENSEE CONTACT FOR THIS LER (12)

NAME | TELEPHONE NUMBER

AREA CODE |

J. W. Proffitt, Compliance Licensing

6 | 1 | 5 | 8 | 4 | 3 | - | 6 | 6 | 5 | 1

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 | MONTH | DAY | YEAR

SUBMISSION |

YES (If yes, complete EXPECTED SUBMISSION DATE) | X | NO

DATE (15) | | | |

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

On April 8, 1994, during a review of historical data on the pressurizer, it was determined that the technical specification pressurizer cooldown limit had been exceeded on June 18, 1993, and was not restored within the required timeframe. The performance of a surveillance instruction associated with safety injection system check valve testing requires the starting of a safety injection pump. This surveillance instruction injects water into the reactor coolant system (RCS). When the water is injected into the RCS, the water in the RCS is forced into the bottom of the pressurizer, displacing the water at the bottom of the pressurizer. The RCS was at a lower temperature than the water in the pressurizer, resulting in the lowering of the water temperature in the pressurizer. The temperature in the bottom of the pressurizer went from approximately 368 degrees Fahrenheit (F) to approximately 150 degrees F in about 22 minutes. The surveillance instruction alerted Operations personnel to monitor the pressurizer level and pressure but did not include any precaution about the pressurizer temperature. The cause of the event was an unanticipated condition. The corrective actions included revising the surveillance instruction to include lessons learned and evaluating other system interaction for potential adverse conditions.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
Sequoyah Nuclear Plant (SQN), Unit 2		SEQUENTIAL	REVISION
	YEAR	NUMBER	NUMBER
	0500032894	004	0002 OF 06

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

I. PLANT CONDITIONS

Unit 2 was in Mode 5 on June 18, 1993, when the event occurred.

II. DESCRIPTION OF EVENT

A. Event

On April 8, 1994, a review of historical data on the pressurizer was performed as a result of a pressurizer cooldown event on February 23, 1994. It was determined that the technical specification pressurizer cooldown limit had been exceeded on June 18, 1993, and that the temperature was not restored within the required timeframe. The performance of a surveillance instruction associated with safety injection system check valve testing requires the starting of a safety injection pump. This surveillance instruction injects water into the reactor coolant system (RCS). This results in the pressurizer level being increased. When the water is injected into the RCS, the water in the pressurizer surge line is forced into the bottom of the pressurizer, displacing the water at the bottom of the pressurizer. The RCS was at a lower temperature than the water in the pressurizer, resulting in the lowering of the water temperature in the pressurizer. The temperature in the bottom of the pressurizer went from approximately 368 degrees Fahrenheit (F) to approximately 150 degrees F in about 22 minutes. The surveillance instruction alerted Operations personnel to monitor the pressurizer level and pressure but did not include a precaution about the pressurizer temperature. Operations personnel did not observe the temperature decrease.

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

None.

C. Dates and Approximate Times of Major Occurrences

June 18, 1993 at 1737 Eastern daylight time (EDT)	Limiting Condition for Operation (LCO) 3.4.12 was entered for performance of the safety injection system check valve surveillance.
June 18, 1993 at 1754 EDT	The testing of the check valves had begun and the pressurizer water temperature was at approximately 368.9 degrees F.
June 18, 1993 at 1818 EDT	Pressurizer water temperature had decreased to approximately 167.5 degrees F, exceeding the 200 degrees per hour limit.
June 18, 1993 at 1837 EDT	Pressurizer water temperature had decreased to approximately 153 degrees F.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)			
		YEAR	NUMBER	REVISION					
Sequoyah Nuclear Plant (SQN), Unit 2	050003 12 18 94	00	04	00	00	00	30	00	6

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

June 18, 1993 The surveillance was completed, and the injection of water into the RCS was terminated.

June 18, 1993 at 1848 EDT The pressurizer water temperature had decreased to approximately 152 degrees F. At this point, the water temperature began increasing.

June 18, 1993 at 1906 EDT The pressurizer temperature had increased to approximately 169 degrees F, returning to the required temperature.

February 23, 1994 During full-flow testing of the 1B-B centrifugal charging pump (CCP), water was being injected into the RCS. The CCP suction was aligned to the refueling water storage tank (RWST). The RWST water temperature was approximately 100 degrees F. This resulted in the pressurizer water temperature decreasing and exceeding the 200-degrees per hour cooldown rate. The pressurizer water temperature was restored to the required temperature within the required timeframe.

April 8, 1994 During a review of other surveillances as a result of the event on February 23, 1994, it was determined that the pressurizer cooldown rate had been exceeded and not restored within the required timeframe on June 18, 1993.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The condition was discovered during a review of other surveillances as a result of the event on February 23, 1994. It was determined that the pressurizer cooldown rate had been exceeded on June 18, 1993.

Operator Actions

No operator action was required.

G. Safety System Response

No safety system responses were required.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)			
		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER					
Sequoyah Nuclear Plant (SQN), Unit 2	05000328	94	--	004	--	00	04	06	06		

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

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this condition was the failure to properly recognize the potential system interaction during the development of the procedure.

B. Root Cause

The cause of the event was an unanticipated system interaction that occurred during surveillance testing. The unanticipated system interaction resulted in the surveillance instruction not alerting Operations personnel to monitor the pressurizer temperature and operator training not including information regarding the potential effects on the pressurizer when injecting RCS into the pressurizer during low RCS temperature conditions.

C. Contributing Factors

The contributing factor to this event was that the out-of-limit condition was not identified by Operations personnel.

IV. ANALYSIS OF EVENT

The concerns involved in the cooldown event are associated with the structural integrity of the pressurizer vessel. An engineering evaluation was performed to determine the effects of the out-of-limit condition on the structural integrity of the pressurizer. The evaluation determined that the pressurizer nozzle geometry is the most limiting component in the affected region and concluded that the fatigue damage, in terms of usage factor, was minimal. Assuming that a transient of this type had occurred once every refueling outage, the total fatigue usage predicted would have been less than 2 percent of the overall life expectancy of the nozzle. Therefore, it can be concluded that there were no adverse consequences to plant personnel or the general public as a result of this event.

V. CORRECTIVE ACTION

A. Immediate Corrective Action

The Unit 1 surveillance instruction for check valve opening tests on the safety injection system was revised to incorporate the lessons learned from the event. The water temperature in the pressurizer will be reduced before the performance of the surveillance to prevent exceeding the technical specification cooldown rate.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)			
		YEAR	NUMBER	REVISION					
Sequoyah Nuclear Plant (SQN), Unit 2	05000328	94	004	0	0	0	5	OF	6

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

E. Corrective Action to Prevent Recurrence

A review of other procedures that require water to be injected into the RCS via the safety injection pumps or the centrifugal charging pumps will be performed to determine whether the potential exists for the condition to occur. Procedures that are determined to require revision will be subsequently revised as appropriate.

This event and the lessons learned will be reviewed with the appropriate Operations personnel.

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A review of previous reportable events identified some similar occurrences. LERs 50-327/91002, 50-328/92007, and 50-328/92016 identify examples of inadequate status monitoring by Operations personnel. These events and related issues have been evaluated regarding operator performance. The Operations Improvement Plan has been revised to outline specific personnel performance expectations. These expectations have been reviewed by Operations personnel. The review included barrier analysis and how it pertains to specific operation positions (such as reactor operator, assistant shift operations supervisor, etc.). To ensure that expectations are understood and to monitor the effectiveness, management personnel are providing shift oversight and coaching. As shown by the February 23, 1994, event, Operations personnel identified the cooldown and were able to recover from the event within the required timeframe; therefore, no further corrective actions are required.

The review of previous similar events also identified a potential trend that system interactions have not been completely addressed. LERs 50-328/92016 and 50-328/94001 identified unique system interactions that occurred as a result of testing that had been performed. A review of other systems will be performed to identify other potential interactions.

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
Sequoyah Nuclear Plant (SQN), Unit 2		SEQUENTIAL	REVISION
		YEAR	NUMBER
		NUMBER	
	050003 12 89 4	004	006 OF 06

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

**VII. COMMITMENTS**

1. A review of other procedures that require water to be injected into the RCS via the safety injection pumps or the centrifugal charging pumps will be performed to determine whether the potential exists for the condition to occur. This action will be completed by July 15, 1994. Procedures that are determined to require revision will be subsequently revised as appropriate.
2. This event and the lessons learned will be reviewed with the appropriate Operations personnel. This action will be completed by July 1, 1994.
3. A review of other systems will be performed to identify other potential interactions. This action will be completed by September 2, 1994.