

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 1	PAGE (3) 1 OF 0 6
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TITLE (4)
Surveillance Requirement Was Not Being Fulfilled Because Four Essential Raw Cooling Water Valves Were Not Being Verified In The Correct Position Due To Procedural Error

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 NAMES		DOCKET NUMBER(S)
0 6	0 9	8 7	8 7	0 2	7	0 4	2 1	8 8	Sequoyah, Unit 2		0 5 0 0 0 3 2 8
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OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 0 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.73(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.73(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)

NAME Don Siska B. E. Kilgore, Plant Operations Review Staff	TELEPHONE NUMBER AREA CODE: 6 1 1 5 8 7 1 0 - 1 7 1 0 8 7
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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
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO		

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

This LER is being revised to (1) describe deficiencies that were discovered during the most recent performance of Surveillance Instruction (SI)-682, "ERCW Flow Balance Valve Position Verification," and (2) provide additional information regarding the corrective action taken by TVA.

On June 9, 1987, with units 1 and 2 in mode 5 (cold shutdown), it was determined that four essential raw cooling water (ERCW) valves, which provide raw cooling water to the main control room and electrical board room air conditioning systems, were not being verified to be in their correct position with the frequency required by Surveillance Requirement 4.7.4.a. SI-33, "ERCW Valves Servicing Safety-Related Equipment," improperly verified that the subject valves were "open" every 31 days. SI-682 correctly verified these valves were "throttled;" however, SI-682 was performed only every 92 days. This condition was determined to be the result of a procedural deficiency. Because the valves were being verified in the correct position every 92 days, there is a high degree of confidence that the valves were never placed in the full open position. In order to correct this deficiency, SI-682 has been revised to fulfill SR 4.7.4.a, and SI-33 has been revised to delete the subject valves from the procedure.

Upon further investigation of this event, it was determined that the subject ERCW valves were still being mispositioned. This investigation also revealed several other deficiencies in the recent performances of SI-682. As a result of these deficiencies, TVA has formed a new Operations SI performance group to improve the performance and subsequent review of SI-682 and other Operations SIs. In addition to the formation of this SI group, TVA has made provisions to lock the subject ERCW valves in their required position following the yearly ERCW flow balance. This action, in combination with recently completed procedure changes, should prevent recurrence of this event.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	LER NUMBER (6)			PAGE (3)	
		YEAR 8 7	SEQUENTIAL NUMBER - 0 2 7	REVISION NUMBER - 0 2	0 2	OF 0 6

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

This LER is being revised to provide (1) describe deficiencies that were discovered during the most recent performance of Surveillance Instruction (SI)-682, "ERCW Flow Balance Valve Position Verification," and (2) provide additional information regarding the corrective action taken by TVA.

DESCRIPTION OF EVENT

On June 9, 1987, with units 1 and 2 in mode 5 (0 percent power, 4 psig, 131 degrees F and 0 percent power, 250 psig, 130 degrees F, respectively), it was determined that four essential raw cooling water (ERCW) (EIS system code BI) valves were not being verified to be in their correct position with the frequency required by Technical Specification (TS) Surveillance Requirement (SR) 4.7.4.a (i.e., at least once every 31 days). SI-33, "ERCW Valves Servicing Safety-Related Equipment," verified that ERCW valves 0-67-618A/B, and 0-67-623A/B were "open." However, SI-682 verified that the subject valves were "throttled." Since SI-33 was performed every 31 days and SI-682 was performed only every 92 days (and "throttled" is the correct position of these valves), SR 4.7.4.a was not being satisfied. ERCW valves 0-67-618A/B supply raw cooling water (i.e., river water) to the electrical board room (EBR) coolers. ERCW valves 0-67-623A/B, which are also common to SQN units 1 and 2, supply raw cooling water to the main control room (MCR) coolers.

Further investigation of this event has determined that the subject valves were being used to throttle the cooling water flow to the EBR and MCR air conditioning units in order to prevent the compressors in these units from tripping. This action was allowed by a note in SI-682 provided that the subject valves were not opened more than the SI-682 required position. The manipulation of these valves was necessary because the temperature control valves (TCVs) located upstream of the subject ERCW valves were inadequate.

In order to ameliorate the problem with the TCVs, TVA implemented Temporary Alteration Change Form (TACF)-0-87-0010-67. This TACF installed new manual valves to temporarily serve the function of the TCVs. However, the most recent performance of SI-682 (March 1988) documented additional discrepancies between the "as-found" position of the ERCW flow balance valves and the valve position required by SI-682. During this SI performance, it was determined that three of the four ERCW flow balance valves were positioned as follows:

Valve No.	SI-682 Required Position	As-Found Position
0-67-618A	18 turns (from full open)	full open
0-67-618B	20 turns	full open
0-67-623B	19 turns	4 turns from full open

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 15 0 0 0 3 2 7 8 7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 7	- 0 2 7	- 0 2	0 3	OF	0 6

TEXT (If more space is required, use additional NRC Form 368A's) (17)

The previous performance of SI-682 (February 1988) also documented deficiencies in as-found position of three of the four ERCW valves. These valves were positioned as follows:

Valve No.	SI-682 Required Position	As-Found Position
0-67-618B	20 turns (from full open)	1 1/2 turns (from full open)
0-67-623A	20 turns	5 1/4 turns
0-67-623B	19 turns	11 turns

In addition to the deficiencies described above, the March 1988 performance of SI-682 also documented the incorrect position of valve 1-67-564B, which is used to supply ERCW flow to unit 1 lower compartment containment ventilation cooler B. SI-682 requires this valve to be 12 1/4 turns from full open while the as-found position of this valve was only 9 turns from full open.

During further review of the February 1988 performance of SI-682, a second deficiency was documented. This deficiency involved the incorrect position of a 90 degree plug valve. There are eight plug valves that are verified by SI-682 to be in the correct position; one valve on each of the four reactor coolant pump (RCP) motor coolers and one valve on each of the four control rod drive mechanism (CRDM) coolers. The required position of these valves is listed in SI-682 in "percent from full open" rather than "number of turns from full open." Since SI-682 provides no special instructions for positioning these valves and, upon field inspection, these valves were not found to have any means of accurately measuring the actual valve position, one of the valves was found to be mispositioned.

Upon further investigation of previously documented deficiencies in SI-682 performances, it was determined that the June 1986 performance had resulted in five deficiencies. Two of these deficiencies were the result of a coincident performance of SI-682 and SI-566, "ERCW Flow Verification Test." SI-566, which is performed once a year, balances the train "A" and "B" ERCW flow (one train at a time) to ensure there is adequate cooling water flow supplied to required plant components. Following the completion of SI-566, SI-682 is revised, if necessary, to reflect the most recent ERCW flow balance results. In this case, however, work being performed on train "B" of the ERCW system delayed the completion of SI-566. As a result, the new valve positions of two train "A" ERCW throttle valves did not get incorporated into SI-682 before it was performed in June 1986. A third deficiency documented during June 1986 performance of SI-682 involved ERCW valve 0-67-555A, which provides cooling water to the train "A" shutdown board room coolers. This valve was found approximately 20 turns closer to the full open position than allowed by SI-682. Of the other two deficiencies, one valve was found to be only 1/4 turn from its required position, and the second valve (0-67-623A) was acceptable based on the note in SI-682 that allows these valves to be throttled down to prevent tripping of the compressors.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 8 7 - 0 2 7 - 0 2 0 4 OF 0 6	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

During the September 1986 performance of SI-682, 15 valves were found to be out of position; however, no deficiency log was generated. Four of these deficiencies were the result of differences between revision 15 and 16 of SI-682 (which was revised to incorporate the results of the most recent performance of SI-566). A subsequent review of the SQN configuration control log revealed one deficiency was due to MOVATS testing, and three other deficiencies were because of Workplan 12151, which was being implemented to modify hangers and snubbers on the containment upper compartment coolers. No documented explanation could be determined as to why the remaining seven valves were found to be mispositioned; however, since all were within two turns of their correct position, it was assumed different techniques of valve positioning (used by different operators performing SI-682) could have resulted in these deficiencies.

A review of the December 1986 performance of SI-682 discovered 22 valves that were found to be out of position. However, in 16 of these deficiencies, the "as found" valve position was less than two turns from the SI-682 required position; thus, these deficiencies were attributed to individual operator's techniques for valve positioning. Following a review of the SQN configuration logs, five of the remaining six deficiencies were determined to be covered by Hold Order 1902, which had been issued to rebuild several valves. The remaining deficiency had no apparent explanation.

CAUSE OF EVENT

The cause of not verifying the correct position of ERCW valves 0-67-618A/B and 0-67-623A/B within the frequency required by the TS was inadequate procedures. SI-33 was incorrectly written to verify that the subject ERCW valves were "open" instead of "throttled," and the assistant unit operators (AUOs) that performed this procedure misinterpreted the word "open" to include both "full open" and "throttled" (i.e., open was interpreted to mean "not closed"). A contributing cause of this event was poor communication among the personnel that performed SI-682 and SI-33. If better communication had existed between the groups that performed these SIs, the discrepancy between the two procedures would have been identified in a more timely manner.

The subject ERCW valves were repeatedly mispositioned primarily because the original TCVs that were upstream of the ERCW throttle valves were not adequate to control ERCW flow to the EBR and MCR air conditioning units. When the TCVs were replaced with manual throttle valves, Operations personnel continued to use the ERCW flow balance valves (in combination with the manual throttle valves) to control the ERCW flow and ensure that the compressors did not trip.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 8 7 - 0 2 7 - 0 2	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
					0 5	OF 0 6

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

A combination of hardware and procedural deficiencies was identified as the cause of the mispositioned 90-degree plug valve. The position indicators (i.e., templates) on these valves were found to have only six holes in which the valve handles could be aligned, and in some cases, the templates were missing entirely. In addition, since SI-682 listed the required position of these valves in percent from full open, it was not clear exactly what valve position was required.

The failure to include a deficiency log with the September 1986 performance of SI-682 was the result of an inadequate SI review. Personnel performing and reviewing SIs are instructed by SI-1, "Surveillance Program," to ensure all test deficiencies are recorded in a deficiency log, which is then maintained with applicable SI package data sheets. Thus, when this procedure was reviewed for technical adequacy, the deficiency log should have been generated.

ANALYSIS OF EVENT

This event was originally reported in accordance with 10 CFR 50.73, paragraph a.2.i.b, as an operation prohibited by the SQN TSs.

The SQN TS require the ERCW system to be operable only when the plant is in modes 1 through 4; however, ERCW is required as attendant equipment to safety-related systems that the SQN TS does require to be operable in mode 5 (i.e., diesel generators, centrifugal charging pumps, residual heat removal pumps, etc.). The yearly ERCW flow balance performed by SI-566 ensures that adequate ERCW flow will be available to provide adequate cooling for the required safety-related systems during the most severe ERCW heat loads (i.e., one unit in hot standby (mode 3) and the other unit in a loss of coolant accident (LOCA) condition). During the period of time covered by this report, SQN unit 1 was in mode 5. Since minimal ERCW flow would be required to maintain unit 1 in a safe condition, the unit 2 safety-related systems would receive adequate ERCW flow.

If the deficiencies described herein existed and a design basis LOCA occurred, the ERCW flow balance would have been slightly different from that established by SI-566. However, since most of the deficiencies in valve positions would cause only relatively small changes to the actual ERCW flow rate, it is not likely that there would be a significant effect on SQN safety-related systems.

CORRECTIVE ACTION

As immediate corrective action, all valves found mispositioned during the most recent performance of SI-682 (March 1988) were immediately returned to their correct position. In addition, SI-33 has been revised to remove all ERCW valves that are required by SI-566 to be "throttled." SI-682 has also been revised to verify that the subject ERCW valves are in their correct position at least once every 31 days.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 7	- 0 2 7	- 0 2	d 6	OF 0 6

TEXT (If more space is required, use additional NRC Form 306A's) (17)

To prevent recurrence of this event, TVA has formed a dedicated Operations SI group. The formation of this group will limit the number of persons performing the Operations SI packages, increase each persons exposure to the SIs, and enhance the internal communication within the group. In addition, since personnel from this group will also assist in the performance of SI-566, the problem that occurred previously during the coincident performance of SI-566 and SI-682 should not recur.

To ensure that the 90-degree plug valves in the lines providing ERCW flow to the RCP motor coolers and CRDM coolers will not be mispositioned, TVA has initiated SQN Work Request (WR) B288242. This WR will install "7-hole" templates on the plug valves that do not now have a template and ensure that templates on all valves are consistent. In addition, SI-682 will be revised to replace the current "percent from full open" requirement for these valves with a specific hole number (i.e., 1 through 7), thereby removing the potential for an operator to misinterpret the SI-682 required valve position. Both the installation of templates and the revision of SI-682 will be complete by May 31, 1988.

To ensure that the ERCW flow balance valves on the EBR and MCR coolers (O-67-618A/B and O-67-623A/B) are maintained in their correct position, the subject valves will be locked in their required position following the performance of SI-566. Instruction Change Form (ICF)-88-0694, which was approved on March 31, 1988, permanently changed SI-566 to require the subject valves to be locked following each performance of the subject SI.

To ensure the valves on the containment lower compartment coolers (i.e., FCV-67-564A, B, C, and D) are not mispositioned, these valves are now required by SI-682 to be locked in position during all modes of plant operation. These valves were previously required to be locked only during plant operation in modes 1 through 4.

ADDITIONAL INFORMATION

There have been no previously reported occurrences where safety-related valves have been repeatedly mispositioned because of inadequate equipment.

COMMITMENTS

1. TVA will install templates on the plug valves supplying ERCW flow to the RCP motor coolers and CRDM coolers by May 31, 1988.
2. TVA will revise SI-682 to specify valve position of above described plug valves in "hole number" rather than "percent from full open" by May 31, 1988.

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TENNESSEE VALLEY AUTHORITY
Sequoyah Nuclear Plant
Post Office Box 2000
Soddy-Daisy, Tennessee 37379

April 21, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE REPORT
SQRO-50-327/87027 REVISION 2

The enclosed licensee event report is being revised to (1) describe deficiencies that were discovered during the most recent verification of essential raw cooling water valve positions and (2) provide additional information regarding the corrective action taken by TVA. This event was originally reported in accordance with 10 CFR 50.73, paragraph a.2.i.b, on July 9, 1987, and revised on March 18, 1988.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


S. J. Smith
Plant Manager

Enclosure
cc (Enclosure):

J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

Records Center
Institute of Nuclear Power Operations
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

NRC Inspector, Sequoyah Nuclear Plant

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