

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	PAGE (3) 1 OF 0 4
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TITLE (4)
Reactor Trip Signal Resulting From A Steam To Flow Feedwater Flow Mismatch With Low Steam Generator Level Signal Due To A Breakdown Of Management Systems and Procedural Inadequacy

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)
1	0	4	8	8	0 3 6	1	0	2				0 5 0 0 0
1	0	4	8	8	0 3 6	1	0	2				0 5 0 0 0

OPERATING MODE (9) 4	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	20.402(b)	20.405(c)	XX	90.73(a)(2)(iv)	73.71(b)					
	20.405(a)(1)(i)	90.38(e)(1)		90.73(a)(2)(v)	73.71(c)					
	20.405(a)(1)(ii)	90.38(e)(2)		90.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)					
	20.405(a)(1)(iii)	90.73(a)(2)(ii)		90.73(a)(2)(viii)(A)						
	20.405(a)(1)(iv)	90.73(a)(2)(ix)		90.73(a)(2)(viii)(B)						
	20.405(a)(1)(v)	90.73(a)(2)(iii)		90.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)									
NAME J. D. Smith, Plant Reporting Section							TELEPHONE NUMBER 6 1 1 5 8 7 1 0 - 1 6 6 7 1 2		

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	

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)

On October 4, 1988, at 1640 EDT, with unit 1 in mode 4, a reactor trip signal occurred. The trip signal was a result of a steam flow to feedwater flow mismatch of greater than 40 percent coincident with a low steam generator (SG) signal being present. The flow mismatch signal was a result of Surveillance Instruction (SI)-98.1 calibrational work. On October 4, 1988, at 0940 EDT, the IM personnel notified Operations that testing would be performed in accordance with SI-98.1 to calibrate the SG loop 4 steam pressure transmitter (PT)-1-27B (Channel II). At 1430 EDT, IM personnel also began work in accordance with IMI-118 to backfill the senseline for the loop 4 steam flow (Channel II) transmitter (FT)-1-28B which had been previously calibrated on October 3, 1988. System design logic is such that when the test signal for calibrating the steam pressure loop was injected concurrently with the backfilling of the flow transmitter, perturbations induced from the backfilling were allowed to trip the bistable for steam flow/feedwater flow mismatch. The SG low level signal was a result of a preexisting instrument failure whose bistable had been placed in the tripped condition until time could be allotted to perform necessary maintenance. A combination of a breakdown in management systems and procedural inadequacy allowed for this failure to identify the potential for logic interactions. To prevent recurrence, the Site Procedures Staff will complete a review and revise as necessary each reactor protection/engineered safety feature calibration procedure to ensure associated trip functions are identified and tripped before beginning work. In addition, this event will be reviewed with the appropriate Operations and Instrument Maintenance personnel.

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

DESCRIPTION OF EVENT

On October 4, 1988, at 1640 EDT, with unit 1 in mode 4 (0 percent power, 360 psig, 252 degrees F), a reactor trip signal occurred. The trip signal was a result of a steam flow to feedwater flow mismatch of greater than 40 percent of the nominal value of steam flow at full power coincident with a low steam generator (SG) (EIS Code AB) level (25 percent) signal being present on SG loop 4. Before the trip, Surveillance Instruction (SI)-98.1, "Channel Calibration for Engineered Safety Feature Instrumentation (Steam Flow and Pressure)," was being performed and work performed in this SI was found to have caused the event.

Performance of SI-98.1 began on September 15, 1988, at 1300 EDT and was performed by Instrument Maintenance (IM). This SI is performed on an 18-month frequency to partially fulfill the Technical Specification (TS) Channel Calibration Surveillance Requirements (SR) 4.3.2.1.1.B.1.e, B.1.f, B.4.d, and 4.3.3.7.B.7. SI-98.1, Step 8, requires the SG steam flow loop 4 (channel II) flow transmitter (FT)-1-28B to be calibrated in accordance with Instrument Maintenance Instruction (IMI)-99 CC 8.24. Step 16.2 of this instruction cautions personnel to reference IMI-118, "Filling of Sealed Instrument Systems: Backfilling, Venting, and/or Flushing of Instrument Senselines," for proper draining and backfilling instructions.

On October 4, 1988, at 0940 EDT, IM personnel notified Operations that testing would be performed in accordance with SI-98.1 to calibrate the SG loop 4 steam pressure transmitter (PT)-1-27B (Channel II), which provides a compensation signal for the steam flow signal. At 1430 EDT, IM personnel also began work in accordance with IMI-118 to backfill the senseline for the loop 4 steam flow (Channel II) transmitter FT-1-28B which had been previously calibrated on October 3, 1988. System design logic is such that when the test signal for calibrating the steam pressure loop was injected concurrently with the backfilling of the flow transmitter, perturbations induced from the backfilling were allowed to trip the bistable for steam flow/feedwater flow mismatch.

In June of 1987, Work Request (WR)-B243415 was written to troubleshoot level transmitter (LT)-3-107 (SG loop 4 level transmitter - Channel III) due to its reading higher than the other two channels. The associated SG low level bistable was in the tripped position at the time of the event since the WR had not been worked. The combination of the SG low level bistable being tripped concurrently with the performance of SI-98.1 (steam flow/feedwater flow bistable tripped) activated the necessary logic in the solid state protection system (EIS Code JC) to give a reactor trip signal.

The operators were able to quickly diagnose this event as the IM foreman overseeing the maintenance activities was in the control room at the time of the event, and the operators returned the plant to normal. The reactor trip breakers were already tagged open during this event as the unit resided in mode 4.

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

CAUSE OF EVENT

This reactor trip signal was a result of the combination of performing calibration work on FT-1-28B and PT-1-27B in accordance with SI-98.1 in conjunction with a low SG level signal existing in the same SG loop. The cause of the SI-98.1 calibration work error has been attributed to the fact that the procedures used during maintenance activities failed to adequately evaluate plant configurations for its impact, and the impact evaluation performed when scheduling this activity failed to identify the potential logic interactions. Further contributing to this event was the fact that IM management violated Administrative Instruction (AI)-4, "Preparation, Review, Approval, and Use of Site Procedures/Instructions," when they instructed the IM craft personnel to use both the IMI-99 CC 9.13 B and 8.24 B procedures while in mode 4 when they were cognizant of the fact that both instructions contained a note indicating that the instructions applied to modes 5 and 6 only.

ANALYSIS OF EVENT

This event is being reported in accordance with 10CFR50.73, paragraph a.2.iv, as an event which resulted in the receipt of an automatic actuation signal to the reactor protection system.

This event had no adverse affect on the health and safety of the public. The reactor trip signal was a result of maintenance activities and not an actual secondary side mismatch problem. This reactor trip signal (steam flow/feed flow mismatch coincident with low SG level) is required operable while in modes 1 and 2 and is present as an anticipation of a loss of secondary heat sink. The reactor trip breakers were tagged open during this event while the plant was in mode 4.

Operators were able to quickly diagnose this event as the IM foreman overseeing these maintenance activities was in the control room at the time of the event, and the operators returned the plant to normal. No abnormal component behaviors were noted. Had this event occurred while in a higher mode, the plant would have responded, as designed, with the control rods returning the plant to hot standby (mode 3).

CORRECTIVE ACTIONS

As immediate corrective actions, the control room operators assessed plant conditions subsequent to the event. Once determined to be a nonaccident condition, the plant was returned to normal.

WR B243415 was completed on October 17, 1988, with LT-3-107 returned to an operable status. The SI-98.1 calibrational package was completed on October 16, 1988, and the loops returned to normal.

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

To prevent recurrence of this event, the following actions will be or have been taken:

1. The Site Procedures Staff will complete a review and revise as necessary each reactor protection/engineered safety feature calibration procedure to ensure associated trip functions (i.e., bistables) are identified and tripped before beginning work. This work will be completed by March 1, 1989.
2. The Work Control Group (WCG) has since implemented an in-house measure to identify potential logic interactions before approving work performance by the use of a dynamic tracking system using the appropriate drawings to indicate out of service devices.
3. IM management will discuss with appropriate IM personnel the requirement to follow procedures and/or stop work activities when deficiencies are identified, emphasizing managements error in this event. This action will be completed by November 30, 1988.
4. Operations will issue a training letter to inform Operations personnel of this event and emphasize the importance of verifying logic interactions and the use of applicable procedures before initiation of work performance. This action will be completed by December 31, 1988.

ADDITIONAL INFORMATION

There have been three previous reported instances of a reactor trip from a steam flow/feedwater flow mismatch coincident with a low SG level: SQRO-50-327/84054, 328/88023, and 88027.

COMMITMENTS

1. The Site Procedures Staff will complete a review and revise as necessary each Reactor Protection/Engineered Safety Feature calibration procedure to ensure all associated trip functions (i.e., bistables) are identified and tripped prior to beginning work by March 1, 1989.
2. IM management will discuss with appropriate IM personnel the requirement to follow procedures and/or stop work activities when deficiencies are identified, emphasizing managements error in this event. This action will be completed by November 30, 1988.
3. Operations will issue a training letter to inform Operations personnel of this event and emphasize the importance of verifying logic interactions and the use of applicable procedures before initiation of work performance. This action will be completed by December 31, 1988.

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

October 28, 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 AND - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE
REPORT SQRO-50-327/88036

The enclosed licensee event report provides details concerning a unit 1 reactor trip signal resulting from a steam flow to feedwater flow mismatch with low steam generator level signal which was caused by a breakdown of management systems and procedural inadequacy. This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.iv.

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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