

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 5	
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TITLE (4)  
Incomplete Posting Of Signs Prohibiting The Use Of Portable Radios Resulted In Radio Transmission Interference And Subsequent Generation Of A Reactor Trip Signal

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)
04	11	88	88	018	01	07	29	88			0 5 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)												
OPERATING MODE (9)		20.402(b)			20.405(c)			XX 50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL (10)		20.405(a)(1)(i)			50.35(c)(1)			50.73(a)(2)(v)		73.71(c)		
0 0 0		20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(viii)		OTHER (Specify in Abstract below and in Text, NRC Form 365.1)		
		20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)				
		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)(ix)				

LICENSEE CONTACT FOR THIS LER (12)						TELEPHONE NUMBER					
NAME Don Siska K. E. Maade, Plant Operations Review Staff						AREA CODE 615 870-16250					

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)		
YES (If yes, complete EXPECTED SUBMISSION DATE)						XX NO		

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (14)

This LER is being revised to update the corrective action TVA has taken to prevent recurrence of this event.

On April 11, 1988, at approximately 0150 EDT, while unit 1 was in mode 5 (cold shutdown), a first out reactor trip annunciator was received in the main control room for steam flow/feed flow mismatch, coincident with low steam generator level. The alarm was acknowledged and then a similar first out reactor trip annunciator alarmed at approximately 0153 EDT. A reactor trip did not occur as a result of these signals because the reactor trip breakers had previously been opened.

The immediate cause of this event has been attributed to Modifications personnel making radio transmissions from the number 4 accumulator room to support valve testing. The number 4 accumulator room contains reactor protection system circuits from the number 3 steam generator level and steam flow transmitters. The root cause of this event has been attributed to inadequate posting of signs to prohibit the use of portable radios in or near the accumulator rooms.

As immediate corrective action, additional signs prohibiting radio transmissions around the accumulator rooms were posted. To prevent recurrence of this event, TVA has taken positive steps to ensure that plant personnel are cognizant of the requirements of SQ036, "Control and Use of Portable Radios." Radios that were being used by plant personnel (other than those personnel in departments required to permanently maintain radios) were required to be returned to a single location. Personnel that have a need to use a radio in the power block are now required to sign a form stating they are familiar with the SQ036 program before a radio will be issued. In addition, TVA will review available documentation to determine if SQ036 adequately addresses new electronic equipment that has been installed during the extended outage and will investigate the feasibility of reducing the maximum power level of portable radios currently in use.

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

This LER is being revised to update the corrective action TVA has taken to prevent recurrence of this event.

DESCRIPTION OF EVENT

On April 11, 1988, at approximately 0150 EDT and 0153 EDT, while unit 1 was in mode 5 (0 percent power, 5 psig, 127 degrees F), reactor trip signals were generated by the reactor protection system (EIIIS Code JC) when it received a low steam generator number 3 (EIIIS Code SB) level signal concurrent with a steam flow/feed flow mismatch signal. Reactor trips did not occur from these signals because unit 1 reactor trip breakers were already open.

At the time the reactor trip signals occurred, plant Modifications personnel were attempting to establish radio communication between the number 4 accumulator room and the main control room to support a functional test of flow control valve 1-FCV-90-109B. Radio communications could not be established and Modifications personnel resorted to the use of telephones to establish communications. 1-FCV-90-109B is an air sample valve for a lower containment radiation monitor (EIIIS Code IL). The functional test was being performed as part of a 10 CFR 50.49 cable splice replacement effort in accordance with Workplan (WP) 12581.

At 0150 EDT, the unit 1 reactor operator (RO) observed a first out reactor trip annunciator (EIIIS Code IB) alarm for number 3 steam generator low level steam flow/feed flow mismatch reactor trip. The alarm condition immediately cleared and was reset by the RO. At 0153 EDT, the RO witnessed a similar reactor trip signal as well as several bistable indicating lights which flashed on and off. The RO again acknowledged and reset the annunciator. Following the completion of testing, Modifications personnel went to the control room to obtain operator signatures in the workplan for the successful completion of the functional test. At that time, the RO and maintenance personnel were discussing the occurrence of the reactor trip alarms and the locations and time Modifications personnel were attempting to establish radio communications. The time of the reactor trip alarms coincided with the attempted use of the radios.

CAUSE OF EVENT

The immediate cause of this event has been attributed to the use of a portable radio in the number 4 accumulator room. The radio transmission created interference in the reactor protection system (RPS) circuits from the number 3 steam generator level and steam flow transmitters. The circuits from these transmitters run through the number 4 accumulator room. The radio transmission interference simulated a low steam generator level concurrent with a high steam flow in steam generator number 3. Since low feedwater flow already existed (i.e., the steam generators were in wet layup), the reactor trip logic was satisfied and a trip signal was generated.

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

The root cause of this event has been attributed to incomplete posting of signs prohibiting the use of portable radio in the accumulator rooms. Radio use is controlled at the Sequoyah Nuclear Plant (SQN) by Standard Practice SQ036, "Control and Use of Portable Radio Equipment." SQ036 controls the use of radios by limiting the operating frequency and output power level, and by specifying the minimum distance from open instrument and control cabinets and electronic instruments that must be adhered to by SQN personnel. Further, SQ036 requires posting of signs to prohibit radio use around the subject equipment and in specified rooms. The accumulator room was posted in accordance with this procedure but personnel operating the radios could not see the signs from where they were located. Modifications personnel also did not believe that radio transmissions could create an interference problem because the unit was in cold shutdown and previous use of radios in this area had not resulted in any known interference problems.

ANALYSIS OF EVENT

This report is submitted pursuant to the requirements of 10 CFR 50.73, paragraph a.2.i, as a condition that resulted in the actuation of the reactor protection system.

The steam generator steam flow/feed flow mismatch signal is processed with a low steam generator level signal by the RPS to generate a reactor trip. This trip is provided as an anticipatory trip to a low-low steam generator level trip (at 18 percent steam generator level) to protect the reactor from the potential loss of heat removal capabilities by a steam generator. The RPS compares steam generator steam flow signals to steam generator feedwater flow signals to determine if water inventory in the steam generators is decreasing. If the steam flow/feed flow mismatch exceeds a programmed setpoint, a signal will be provided to the reactor trip logic circuits. If the steam generator water inventory is actually decreasing from such a mismatch, the steam generator water level will decrease accordingly. Steam generator level is sensed by the RPS via steam generator level transmitters. If the steam generator level decreases to 25 percent, the low steam generator level bistables will also provide a signal to the reactor trip logic circuits. When a steam flow/feed flow mismatch signal is coincident with a low steam generator level signal from any one steam generator, the RPS will generate a reactor trip signal.

During this event, a steam generator steam flow/feed flow mismatch coincident with a low steam generator level did not actually occur since the unit was in mode 5 with the steam generators in wet layup. A reactor trip did not occur during this event because the reactor trip breakers were open before the receipt of the reactor trip signal. The RPS logic did provide a trip signal based on the artificial conditions caused by the radio transmission interference in the circuits; however, this signal is indicative of proper RPS operation. If this event had occurred during power operation, the RPS would have generated a trip signal and a normal reactor trip would be expected. Thus, this event did result in an adverse condition on the health and safety of the public.

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

CORRECTIVE ACTION

As immediate corrective action by the RO in response to the condition described herein, the alarms were acknowledged and reset. No further operator actions were required, as plant conditions did not warrant a reactor trip, and the reactor trip breakers were already open.

The SQ036 program addresses the required action that must be taken when radio transmissions are found to cause interference with electronic equipment that had not previously been identified as susceptible to radio transmission interference. That is, Attachment A to SQ036 is required to be revised to include the identified areas/equipment that are susceptible to interference. The SQ036 program also requires the identified areas be posted with signs prohibiting radio use. Since the instrumentation panels associated with the subject equipment are already included in SQ036, no procedure revision is necessary. However, to ensure personnel will be better informed regarding the prohibition of radio transmission around the accumulator rooms, additional signs prohibiting the use of portable radios have been placed in the vicinity of the accumulator rooms.

To ensure SQN personnel are aware of the requirements associated with portable radio use, TVA has issued a bulletin stating that all SQN radio users must comply with the SQ036 program. In addition to the bulletin, further restrictions with regard to the use of portable radios in the SQN power block have been promulgated by SQN management. That is, portable radios that were being used in the power block by SQN personnel (other than those personnel in departments required to permanently maintain radios, e.g., Operations and Nuclear Security) were required to be returned to the materials and procurement (M&P) section. SQN personnel that have a need to use portable radios in the power block are now required to check them out from M&P and sign a form stating that they are familiar with the SQ036 program. In addition, those personnel in departments that are specifically required to maintain radios inside the power block were briefed on the requirements of SQ036.

To ensure that SQ036 adequately addresses equipment that may have been installed during the extended SQN outage, TVA will review the documentation associated with engineering change notices (ECNs) that resulted in the installation of new electronic equipment. Equipment that is identified as being susceptible to radio transmission interference will be included in the next revision of SQ036, and signs prohibiting the use of radios will be posted in the immediate vicinity of this equipment. This review will be complete by November 30, 1988, and if necessary, a revision to SQ036 will be complete by December 29, 1988.

To reduce the potential for radio frequency interference, TVA is investigating the feasibility of reducing the maximum power level of the SQN radios currently in use. SQ036 presently limits the power level of portable radios to less than 6 watts. TVA will complete this feasibility study by August 31, 1988.

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

ADDITIONAL INFORMATION

There have been no previously reported reactor trip signals caused by radio transmissions.

COMMITMENTS

1. TVA will review documentation associated with ECNs that resulted in the installation of new electronic equipment that may be susceptible to radio transmission interference. If necessary, SQ036 will be revised, and additional signs prohibiting the use of portable radios will be posted. This review will be complete by November 30, 1988, and if necessary, the revision to SQ036 will be complete by December 29, 1988.
2. TVA will investigate the feasibility of reducing the maximum power level of SQN radios by August 31, 1988.

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

July 29, 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-50-327/88018 REVISION 1

The enclosed licensee event report is being revised to update the corrective action TVA has taken to prevent the recurrence of reactor trip signals generated from radio transmission interference. This event was originally reported in accordance with 10 CFR 50.73, paragraph a.2.iv, on April 11, 1988.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
S. J. Smith  
Plant Manager

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