

TENNESSEE VALLEY AUTHORITY

6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

June 7, 1990

U.S. Nuclear Regulatory Commission
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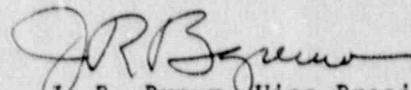
Gentlemen:

TENNESSEE VALLEY AUTHORITY -- SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT (LER)
50-327/90008

The enclosed LER provides details of events wherein two control room isolations occurred as a result of spurious spikes caused from loose terminations on a relay socket for Radiation Monitor O-RM-90-126. These events are being reported as engineered safety feature actuations in accordance with 10 CFR 50.73(a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY



J. R. Bynum, Vice President
Nuclear Power Production

Enclosure

cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20546, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1 DOCKET NUMBER (2) 05000327 PAGE 1 OF 4

TITLE (4) Two control room isolations occurred as a result of spurious spikes caused from loose terminations on a relay socket.

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)		
05	14	90	90	008	00	06	07	90	Sequoyah, Unit 2	05000328		
										05000		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 50 CFR 5. (Check one or more of the following) (11)

OPERATING MODE (9) 6	20.402(b)	20.406(c)	<input checked="" type="checkbox"/> 60.72(a)(3)(iv)	73.71(b)
POWER LEVEL (10) 000	20.406(a)(1)(i)	60.36(a)(1)	<input type="checkbox"/> 60.72(a)(2)(i)	73.71(c)
	20.406(a)(1)(ii)	60.36(a)(2)	<input type="checkbox"/> 60.73(a)(3)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)
	20.406(a)(1)(iii)	60.73(a)(2)(i)	<input type="checkbox"/> 60.73(a)(3)(viii)(A)	
	20.406(a)(1)(iv)	60.73(a)(2)(ii)	<input type="checkbox"/> 60.73(a)(2)(v)(B)	
	20.406(a)(1)(v)	60.73(a)(2)(iii)	<input type="checkbox"/> 60.73(a)(2)(i)(c)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: Sydney W. Spencer, Compliance Licensing Engineer TELEPHONE NUMBER: 6115 843 - 75410

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)

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

EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

At 0900 EDT, on May 14, 1990, and at 2016 EDT, on May 21, 1990, with Unit 1 in Mode 5 and Unit 2 at 100 percent power, inadvertent control room isolations (CRIs) occurred. Radiological Control personnel immediately surveyed the area and determined that no abnormal activity levels existed in the area. Operations personnel reset the CRIs after each respective isolation. Both of the CRIs resulted from high radiation spikes on Radiation Monitor (RM) 0-RM-90-126. The initial CRI appeared to be caused from welding or an unknown radio frequency source. After the second CRI, subsequent investigation revealed the root cause to be loose terminations on a relay socket that had been replaced during the outage. The loose terminations generated noise resulting in a CRI when disturbed by personnel who were working near the loose terminations. Intermediate corrective actions consisted of properly terminating the loose connections on the relay socket and review of the strip charts of the other RMs that had relay sockets replaced to ensure no indications of excessive noise that would be indicative of improper terminations. As long-term corrective action, SQN has implemented a comprehensive program to reduce personnel errors.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 9 0	LER NUMBER (6)			PAGE (3)	
		VE-R	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 305A's) (17)

Description of Event

At 0900 Eastern daylight time (EDT) on May 14, 1990, with Unit 1 in Mode 5 (0 percent power, 300 pounds per square inch gauge [psig], and 170 degrees Fahrenheit [F]), and Unit 2 in Mode 1 (100 percent power, 2,235 psig and 578 degrees F), a control room isolation (CRI) occurred as a result of a spurious spike on a control room intake radiation monitor (RM). At 2016 EDT on May 21, 1990, with Unit 1 in Mode 5 (0 percent power, 300 psig, and 170 degrees F), and Unit 2 in Mode 1 (100 percent power, 2,235 psig, and 578 degrees F), a second CRI occurred as a result of a spurious spike on a control room intake RM. In both cases, Operations immediately entered Limiting Condition for Operation (LCO) 3.7.7 and dispatched Radiological Control personnel to ascertain if an actual high radiation condition existed. The CRIs were both initiated from RM (EIS Code IL) 0-RM-90-126, which samples the main control room air intake. This RM supplies an input signal to the Train B of the control room emergency ventilation system (CREVE) (EIS Code VI). In both events, Radiological Control surveys revealed that an actual high radiation condition did not exist, the CRIs were reset in accordance with System Operation Instruction (SOI) 30.1B, "Isolation of the Control Room Heating Air Conditioning, and Ventilation System," and LCO 3.7.7 was exited at 0955 EDT on May 14 and 2045 EDT on May 21, 1990, respectively.

Investigation of the first event consisted of the following: (1) The instrument mechanics checked the power supplies for proper voltage output and noise, (2) the shift operations supervisor (SOS) interviewed Electrical Modifications personnel working in the area to determine if the work being performed could have caused the CRI, and (3) the SOS interviewed the shift operations personnel to determine if any switching or motor starts were being performed during this time. The system engineer and the factory representative for the RM manufacturer (Sorrento) were in the area at the time of the event and saw the spike trace. The system engineer and the factory representative both reviewed the trace, and both considered the trace to be representative of welding noise. Based on the above and the results of the radiological surveys, it was concluded that the initial CRI was caused from welding or an unknown radio frequency source. Accordingly, the RM was returned to service.

Following the second event, a more indepth investigation into peripheral activities was conducted. It was determined that a relay socket for the RM had been recently replaced; the RM was declared operational on May 12, 1990, after the performance of the postmodification test (PMT). The PMT did not indicate problems existed in the system. The PMT was written to perform response time testing of the newly-installed relay; a review of the strip charts was not required because no changes were made to the strip chart circuit. Review of the strip chart for RM-90-126 following the second event back to May 12, 1990, indicated numerous instances where spikes occurred. It is believed that while personnel were working in the panels near the loose terminations, these loose terminations would cause spikes on 0-RM-90-126, similar to those caused by welding or a radio frequency signal.

Cause of Event

The root cause of the first event is attributed to personnel error in that during the wiring termination for the relay socket, the individuals failed to tighten the terminations properly. The root cause of the second event is attributed to a lack of depth during the review of the first CRI. The individuals involved in the review of the

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TEXT CONTINUATION

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FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 9 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 386A's) (17)

Cause of Event (Continued)

first CRI looked at the activities occurring during the incident, reviewed the RM strip chart and, from past experience, concluded that welding caused the event and failed to further investigate the event.

Analysis of Event

These events are being reported in accordance with 10 CFR 50.73(a)(2)(iv), as unplanned actuations of an engineered safety feature.

The main control room habitability system, is described in Section 6.4 of the SQN Updated Final Safety Analysis Report (UFSAR). The control building air-cleanup system and the heating, ventilation, and air-conditioning system are described in Section 9.4.1 of the UFSAR. Additionally, the main control room air intake RMs are described in Section 11.4.2.2.5 of the UFSAR. The CREVS is designed to provide a safe environment for personnel controlling plant operations during normal operations and during accidents. There are two 100-percent redundant equipment trains for CREVS--Train A and Train B. The function of the subject RM is to detect high radiation levels in the main control room air intake and, upon detecting high radiation levels, to initiate a CRI, and subsequent CREVS start to protect the main control room environment from contamination. In each of these events, the RM performed its design function to initiate isolation of the main control room and CREVS actuation. Associated equipment performed its intended function as designed. The loose wiring caused the RM to operate in the conservative direction, i.e., to initiate the protective function. Because there was no actual radiation increase involved with these events, there was no adverse effect on the health and safety of the public or plant personnel.

Corrective Action

Immediate corrective actions for each event consisted of having Radiological Control personnel perform surveys to ensure actual high radiation conditions did not exist and recovering from the CRIs in accordance with SOI-30.1B.

After it was determined that loose terminations were the cause of the spikes, the loose terminations were properly terminated. The strip charts of other RMs that had the relay sockets replaced were reviewed to ensure that other instruments were not reading erratically. In addition, functional tests have been performed on the Unit 1 and Unit 2 upper and lower containment RMs and the A and B trains of the control room intake RMs to ensure these RMs are functioning properly. It is believed that these loose terminations were an isolated incident. Personnel performing the incident investigation have been cautioned to fully examine all possible causes, i.e, not always believe the seemingly most obvious conclusion. Management emphasis is continuing to be placed on reducing personnel errors as described in LER 50-328/90008.

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

Additional Information

There have been 20 previously reported occurrences of CRIs at SQN since 1980. Of these 20 occurrences, none are attributed to loose terminations.

Commitments

None.

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