NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Sequoyah, Unit 1	0 5 0 0 0 3 2 7	1 OF 0 5

TITLE (4) Calibration of Auxiliary Building Vent Radiation Monitor Resulted In An Auxiliary Building Isolation Due To Procedure 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)
0 9	0 3	8 8	8 8	— 0 3 2	— 0 0	0 9	2 9	8 8	Sequoyah Unit 2	0 5 0 0 0 3 2 8
										0 5 0 0 0

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	20.402(b)	20.405(c)	XX 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
J. L. Long, Plant Operations Review Staff	AREA CODE 6 1 5 — 8 7 0 - 7 2 5 4

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

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

At 1338 EDT, on September 3, 1988, with unit 1 in mode 5 (cold shutdown and unit 2 at 90 percent power, an auxiliary building isolation (ABI) occurred. Before this event, at 0304 EDT, Instrument Maintenance technicians (IMs) were performing Surveillance Instruction (SI)-83, "Channel Calibration For Radiation Monitoring System" for the "C" channel of the auxiliary building vent radiation monitor 0-RM-90-101. SI-83 required Handswitch 0-HS-90-136A3 to be placed in the "101C" position to prevent the output of the C channel from causing an ABI during calibration. At 1154 EDT, Chemistry personnel placed the auxiliary sampling equipment in service to satisfy technical specifications for an inoperable radiation monitor. After the IMs completed the calibration of the radiation monitor, SI-83 required that the charcoal filters be reinstalled. Technical Instruction (TI)-16 "Sampling Methods" which is used to accomplish installation of the charcoal filter, instructed Operations personnel that changing the filter could result in an ABI, and recommended that the "B" channel of 0-RM-90-101 be blocked while changing filters. As a result, the "C" channel was unblocked to allow the "B" channel to be blocked. The next section of SI-83 was for verification of the radiation indicator and the radiation recorder by step increasing the trip reference voltage of the radiation monitor. At 1338 EDT, during the verification, the trip setpoint of the radiation monitor was exceeded, and with handswitch 0-HS-90-136A3 set to block the "B" channel, the actuation of the "C" channel was permitted to cause an ABI. The root cause of this event was that the steps necessary to be completed to continue performance of SI-83 after installing the charcoal filters did not take into the account the actions required by TI-16. To prevent recurrence of this event, SI-83 will be revised to include a step to remove the control fuses when performing calibrations of 0-RM-90-101.

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

DESCRIPTION OF EVENT

At 1338 EDT, on September 3, 1988, with unit 1 in mode 5 (0 percent power, 300 psig, and 130 degrees F) and unit 2 in mode 1 (90 percent power, 2235 psig, and 573 degrees F), an auxiliary building isolation (ABI) (EIIS code VF) occurred.

Before this event, Instrument Maintenance technicians (IMs) were performing Surveillance Instruction (SI)-83, "Channel Calibration For Radiation Monitoring System." SI-83 contains the instructions necessary to calibrate the following radiation monitors (EIIS code IL): 1) O-RM-90-101 Auxiliary Building Ventilation, 2) O-RM-90-102 Fuel Pool Radiation Monitor (A train), 3) O-RM-90-103 Fuel Pool Radiation Monitor (B train), 4) 1-RM-90-106 Containment Building LowerOCompartment Air Monitor, 5) 1-RM-90-112 Containment Building Upper Compartment Air Monitor, 6) O-RM-90-125 Main Control Room Intake Monitor (A train), 7) O-RM-90-126 Main Control Room Control Intake Monitor (B train), 8) 1-RM-90-130 Containment Purge Air Exhaust Monitor (A train), and 9) 1-RM-90-131 Containment Purge Air Exhaust Monitor (B train). The IMs were calibrating the "C" channel of O-RM-90-101, which is used to monitor the effluent releases for radioactive iodine exhausted from the Auxiliary Building. At 0804 EDT on September 3, 1988, channels A, B, and C of O-RM-90-101 were declared inoperable as the entire monitor was removed from service for the calibration. Additionally, Handswitch O-HS-90-136A3 was placed in the "101C" position to prevent the output of the C channel from causing an ABI. As a result of these actions, Technical Specification Limiting Condition for Operation 3.3.3.10 action b was entered which requires, in part, that auxiliary sampling equipment be placed in service and that samples be continuously collected within four hours of declaring the radiation monitor inoperable.

At 1154 EDT, on September 3, 1988, Chemistry personnel completed connections for the auxiliary sampling equipment and placed it in service in accordance with SI-407.2 "Radioactive Gaseous Waste Effluent, Particulate, and Iodine Release Rates From Shield and Auxiliary Building Vents (Weekly/Conditional)" and thereby, complied with technical specification actions.

After the IMs completed the calibration of the "C" channel of radiation monitor O-RM-90-101, SI-83 step 5.3.13.25 required that, 1) the charcoal filters be reinstalled, 2) the charcoal filter housing to be closed and secured, 3) the inlet and outlet sample monitor isolation valves be opened, 4) the sample monitor pump be started, and 5) that the flow alarms be reset locally. When installing auxiliary sampling equipment, the charcoal filter from the radiation monitor is relocated to the auxiliary sampler. Similarly, when removing the auxiliary sampler from service the charcoal filter is transferred back to the radiation monitor. SI-407.2 refers to Technical Instruction (TI)-16 "Sampling Methods" to accomplish installation and removal of the auxiliary sampling equipment. TI-16 notifies Operations personnel that changing the charcoal filter may cause a monitor spike, which could result in an ABI, and recommends that the "B" channel of O-RM-90-101 be blocked while changing filters. As a result, the "C" channel was unblocked to allow the "B" channel to be blocked. After successfully completing step 5.3.13.25, the IMs continued with the performance of the SI.

The next section of SI-83 contained instructions for verification of the radiation indicator and the radiation recorder associated with the "C" channel of 0-RM-90-101. The procedure required the IMs to step increase the trip reference voltage of the radiation monitor to ensure that the radiation indicator and radiation recorder displayed the appropriate corresponding counts per minute. At 1338 EDT, on September 9, 1988, during the verification of the radiation indicator and radiation recorder, the trip setpoint of the "C" channel of the radiation monitor was exceeded, and with handswitch 0-HS-90-136A3 set to block the "B" channel, the actuation of the "C" channel was permitted to cause an ABI.

Operations personnel immediately responded to the annunciator for the radiation monitor and recovered from the ABI in accordance with Systems Operating Instruction (SOI)-30.50, "Recovery From Auxiliary Building Isolation" by resetting the ABI actuation signal, opening ventilation dampers, starting auxiliary building general supply and exhaust fans, starting fuel handling exhaust fans, and placing auxiliary building gas treatment system in standby. Recovery from the ABI was completed at 1408 EDT, on September 3, 1988. All of the above equipment functioned as designed.

The auxiliary building houses equipment for both units 1 and 2 and its ventilation system is therefore considered common to both units.

CAUSE OF EVENT

As previously described, the immediate cause of the ABI was exceeding the radiation monitor trip setpoint during the verification of the radiation indicator and radiation recorder with the "C" channel unblocked. As a result, the simulated high radiation signal caused the radiation monitor to actuate and completed the circuitry necessary for an ABI.

The root cause of this event was that the steps necessary to be completed to continue performance of SI-83 after installing the charcoal filters did not take into the account the actions required by TI-16. Specifically, the action for installing the charcoal filter, starting the pump, and resetting the alarms had been completed as required by SI-83. However, TI-16 contained steps to block the "B" channel, and it also contained steps to unblock the "B" channel upon completion of the TI. As a result, the action to unblock the "B" channel, and subsequently block the "C" channel was not required by SI-83 before continuing with the procedure. Hence, the successive steps of SI-83 simulated a high radiation signal to an unblocked channel of the radiation monitor and caused an ABI.

A contributing cause to this event is the design of the control circuitry. The handswitch used to block 0-RM-90-101 is incapable of blocking more than one channel at a time. The importance of this is heightened by the fact that when SI-83 was performed that all three channels were removed from service, but only one of the channels could be blocked. Therefore, two inoperable channels were always unblocked and could potentially produce an ABI.

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A second contributing cause to this event was that it was required that there be interface between two procedures and two groups of technicians (chemistry and IMs) while working with a complex system. This fact increased the likelihood that a problem would occur.

ANALYSIS OF EVENT

An ABI is an engineered safety features (ESF) actuation and is reportable pursuant to the criteria established in 10 CFR 50.73 a.2.iv.

An ABI can be automatically initiated by, either 1) high temperature in the auxiliary building air intake, 2) high radiation in the spent fuel pool area, 3) phase A containment isolation signal, or 4) high radiation in the Auxiliary Building vent. During this event a high radiation signal was simulated on the radiation monitor for the Auxiliary Building vent and an ABI was generated. Subsequent to the ABI signal, all equipment functioned as designed as the general supply and exhaust fans shut off, the fuel handling area fans shut off, the appropriate dampers operated, and both trains of Auxiliary Building gas treatment system started. Since no high radiation levels actually existed, then this unplanned challenge of an ESF posed no safety consequence.

CORRECTIVE ACTION

Immediate corrective action taken by Operations personnel subsequent to the ABI was to perform SOI-30.5D for restoration of the ventilation system. Subsequent to determining the immediate cause, the handswitch was placed in the correct position to inhibit an ABI and the remaining portion of that section of SI-83 was completed without further incident.

To prevent recurrence of this event, SI-83 will be revised to include a step to remove the control fuses associated with the trip output of 0-RM-90-101 when performing calibrations of that radiation monitor. Removing the control fuses will, in essence, provide a block on all three channels of 0-RM-90-101, thereby, preventing a channel that has been removed from service from causing an ABI. Also, removing the fuses will make the position of the handswitch irrelevant while the SI is being performed. Therefore, placing the handswitch in the position to block the "B" channel as required by TI-16 will have no affect on the SI. A step will also be included when the SI is completed, to reinstall the fuses before returning the radiation monitor to service. This revision to SI-83 will be completed by October 7, 1988.

Other TVA procedures such as SI-82 "Functional Tests For The Radiation Monitoring System", SI-302 "Vacuum Switch and Controller Performance Check for Radiation Monitoring Gas Sample Flows", and TI-16 were reviewed to determine if a similar revision was necessary.

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However, because of recent modifications to the radiation monitor control circuits, removal of the fuses was not considered necessary for performance of these procedures. TVA is evaluating alternate methods such as making system design changes to accomplish the same net results as pulling the fuses. This evaluation will be completed by November 15, 1988.

ADDITIONAL INFORMATION

There have been four previous occurrences of ABIs caused by 0-RM-90-101: SQRO-50-327/88003, 86061, 86053, and 85031. However, none of the previous occurrences had a similar root cause.

COMMITMENTS

1. Revise SI-83 to include steps to remove and reinstall control fuses when performing calibration on 0-RM-90-101 by October 7, 1988.

2. TVA will evaluate alternate methods such as making system design changes to accomplish the same net result as pulling fuses. The evaluation will be completed by November 15, 1988.

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TENNESSEE VALLEY AUTHORITY
Sequoyah Nuclear Plant
Post Office Box 2000
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September 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-50-327/88032 REVISION 0

The enclosed licensee event report provides details concerning an inadvertent Auxiliary Building isolation which occurred during the performance of a procedure for the calibration of a radiation monitor. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.iv.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

S. J. Smith
Plant Manager

Enclosure
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