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) Incorrect Source Strength Evaluation Date In A Radiation Monitor Calibration Procedure Resulted In A Technical Specification Noncompliance

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)
									Sequoyah, Unit 2	0 5 0 0 0 3 2 7
0 7 1 4	8 8	8 8	—	0 2 7	— 0 0	0 8	0 4	8 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)	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)	XX 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
	AREA CODE
B. E. Kilgore, Plant Operations Review Staff	6 1 5 — 8 7 0 - 7 0 8 7

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)

On July 14, 1988, during a review of radiation monitor (RM) surveillance instructions (SIs), it was discovered that an incorrect source strength evaluation date existed in SI-83, "Channel Calibration for Radiation Monitoring System." At the time of the discovery, unit 1 was in mode 5 and unit 2 in mode 1. Upon review of SI-83 it was determined that the common fuel storage pool RMs, 0-RM-90-102 and 0-RM-90-103, were affected by the incorrect evaluation date. The incorrect evaluation date resulted in 0-RM-90-103 being declared inoperable on July 14, 1988 until it could be verified that the RM was within presently acceptable technical specification (TS) setpoint limits for a high radiation trip. During the investigation of this event it was discovered that RM 0-RM-90-103 was out of calibration for a 3 month period from August 6, 1987 to October 23, 1987. The immediate cause for the out of TS tolerance condition for 0-RM-90-103 (August to October of 1987) is attributed to an incorrect source strength evaluation date in SI-83. The root cause of this event is considered to be an inadequate checklist in Appendix F of SI-1, "Surveillance Program." Appendix F of SI-1 provides a checklist to ensure that technical and administrative concerns are addressed during the SI revision review process. Upon review of the Appendix F checklist, it was discovered that a verification did not exist to ensure that RMs source strength evaluation dates are correct.

For immediate corrective action on July 14, 1988, 0-RM-90-103 was verified to be within the present allowable TS setpoint limits by a performance of SI-83 with the correct source strength evaluation date. 0-RM-90-102 was also verified to be within the allowable TS setpoint limits. For long-term corrective action, a revision will be made to SI-83 by August 22, 1988, to include the correct source strength evaluation date. A revision will be made to the SI-1, Appendix F checklist by November 1, 1988 to provide a verification to ensure that RMs source strength evaluation dates are correct.

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

DESCRIPTION OF EVENT

On July 14, 1988, during a review of radiation monitor (RM) surveillance instructions (SIs), it was discovered that an incorrect source strength evaluation date existed in SI-83, "Channel Calibration for Radiation Monitoring System." At the time of the discovery, unit 1 was in mode 5 and unit 2 in mode 1. Upon review of SI-83 which contained the incorrect evaluation date it was determined that the common fuel storage pool (EIIS Code DA) RMs, 0-RM-90-102 and 0-RM-90-103, (EIIS Code IL) were affected by the incorrect evaluation date. The incorrect source strength evaluation date in SI-83 resulted in 0-RM-90-103 being declared inoperable on July 14, 1988 until it could be verified that the RM was within presently acceptable technical specification (TS) setpoint limits for a high radiation trip. During the investigation of this event it was discovered that RM 0-RM-90-103 was out of calibration for a 3 month period from August 6, 1987 to October 23, 1987. It was found that RM 0-RM-90-103 was within compliance tolerance from October 23, 1987 to July 14, 1988 since a Technical Specification change allowed the acceptable TS limit for a high radiation trip from the fuel storage pool RMs to be raised from less than or equal to 15 millirem/hour (mrem/hour) to less than or equal to 200 mrem/hour.

The common fuel storage pool RMs monitor the air space above the fuel storage pool area, a high radiation signal generated from either of these monitors initiates an Auxiliary Building isolation (ABI) and a Auxiliary Building gas treatment system (ABGTS) start. Performance of SI-83 provides an electronic calibration test and operability verification for the RMs and associated alarms by applying a known isotope (cesium (CS)-137 for 0-RM-90-102 and 0-RM-90-103) to the RMs detector and verifying proper output voltage levels.

During a review of SI-83 it was discovered that the source strength evaluation date for the RT-10 CS-137 calibration source used in this procedure was incorrect. A damaged RL-10 calibration source was replaced by the new RT-10 calibration source in June of 1987. The evaluation date for the RT-10 source is used in SI-83, step 5.5.8.2, to calculate the acceptance criteria for desired output voltage levels from the radiation analyzer (RP-1) module when the CS-137 source is applied to the detector during calibration. The source strength evaluation date gives an origin date from which elapsed time can be totaled and the amount of half life decay experienced by the source quantified. This provides compensation for a reduction in source strength over a period of time. When the desired output voltage levels are calculated, the compensation factor provides accurate acceptance criteria to ensure compliance with TS setpoint limits for a high radiation trip.

On June 20, 1987, SI-83 was revised to provide the necessary changes required when the damaged RL-10 calibration source was replaced with a RT-10 calibration source. During this revision, the source strength evaluation date was not changed.

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

The incorrect evaluation date of August 3, 1974 remained in SI-83 upon completion of the revision. Upon discovery of the incorrect evaluation date on July 14, 1988 and subsequent consultation with the vendor (Sornento Electronic), a correct evaluation date of March 11, 1983, was verified. On August 6, 1987, SI-83 was performed on 0-RM-90-103 using the incorrect source strength evaluation date. This resulted in the setpoint for low and high desired output voltage levels to be left at a nonconservative value during this calibration. The acceptance criteria for desired output voltage level correlates with the TS setpoint limit for a high radiation trip (a 15 mrem/hour setpoint was in effect in August 1987). The "as left" value for the August 6, 1987 calibration left the desired output voltage levels out of acceptable tolerance such that it would have required a radiation level of 17 mrem/hour before the RM would have performed its designed function to initiate an Auxiliary Building isolation (ABI) and an Auxiliary Building gas treatment system (ABGTS) start. Both performances of SI-83 for 0-RM-90-102 (July 28, 1987) and 0-RM-90-103 (August 6, 1987) were found to be affected by the incorrect source strength evaluation date; however, only 0-RM-90-103 would have exceeded its TS setpoint limit (15 mrem/hour at this time) due to a high radiation condition. The out of TS tolerance for 0-RM-90-103 occurred for a period from August 6, 1987 to October 23, 1987. A TS change was issued to SQNP by the NRC October 23, 1987 which allowed the high radiation setpoint limit to be raised from less than or equal to 15 mrem/hour to less than or equal to 200 mrem/hour (Reference TS Change No. 65). This TS change allowed sufficient margin for the "as left" desired voltage levels, measured during the August 6, 1987 calibration of 0-RM-90-103, to comply with acceptable TS setpoint limits. Thus, it is considered that the monitor was in compliance at this time. TS Change No. 65 was requested by TVA because of frequent spurious ABIs resulting from the conservatively low 15 mrem/hour setpoint and the susceptibility of the RMs to spurious spiking at this sensitive level.

Upon discovery of the incorrect source strength evaluation date, Instrument Maintenance personnel notified Operations personnel, and 0-RM-90-103 was declared inoperable until it could be verified that the RM was within presently acceptable TS limits. 0-RM-90-103 was declared operable and the LCO exited on July 14, 1988 at 2325 EDT. It was also determined that 0-RM-90-102 was within present and past acceptable TS limits. Upon notification, Operations took appropriate action by entering the applicable TS Limiting Conditions for Operations and complying with their associated actions.

CAUSE OF EVENT

The immediate cause for the out of TS tolerance (August to October of 1987) for 0-RM-90-103 is attributed to an incorrect source strength evaluation date listed in SI-83 for the RMs calibration source. On June 20, 1987, SI-83 was revised to provide the necessary changes required when the damaged RL-10 calibration source was replaced with a RT-10 calibration source. During this revision, the source strength evaluation date was not changed. The incorrect evaluation date of August 3, 1974 remained in SI-83 upon completion of the revision.

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

Upon discovery of the incorrect evaluation date on July 14, 1988 and subsequent consultation with the vendor (Sornento Electronic), a correct evaluation date of March 11, 1983, was verified. On August 6, 1987, SI-83 was performed on 0-RM-90-103 using the incorrect source strength evaluation date. This resulted in the setpoint for low and high desired output voltage levels to be left at a nonconservative value during this calibration. The root cause of this event is considered to be an inadequate checklist in Appendix F of SI-1, "Surveillance Program." Appendix F of SI-1 provides a checklist to ensure that technical and administrative concerns are addressed during the SI revision review process. Upon review of the Appendix F checklist, it was discovered that a verification did not exist to ensure that RMS calibration sources source strength evaluation dates are correct.

ANALYSIS OF EVENT

This event is reported as an operation prohibited by plant TSs in accordance with 10 CFR 50.73, paragraph a.2.i.B. When SI-83 was performed for 0-RM-90-103 (August 6, 1987), the allowable TS setpoint limit for a high radiation level was 15 mrem/hour. This would have been exceeded by only 2 mrem/hour if an actual high radiation condition had occured. This increase is considered negligible since a TS change issued by the NRC allowed the setpoint limit to be increased to 200 mrem/hour (Reference TS Change No. 65). TVA applied for TS change no. 65 (October 22, 1985) and the offsite dose consequences of a design basis fuel handling accident were reanalyzed to jusitfy the higher setpoint. The analysis demonstrated that a change in the monitor setpoint of 10 mrem/hour corresponds to a change in the unfiltered offsite thyroid dose of .5 rem. This leads to a possible setpoint of 6000 mrem/hour without violating the criteria of 10 CFR 100. The American Nuclear Society 51.1 guidelines reduce the 10 CFR 100 values by a factor of 10 which would still allow a setpoint of 600 mrem/hour. A setpoint of 200 mrem/hour on RM-90-102 and -103 will provide the required fuel handling accident mitigation features actuation while keeping a 5800 mrem/hour margin for error. Since 0-RM-90-102 was operable and within the acceptable 15 mrem/hour TS setpoint, TVA is confident that the RM would have performed its designed function to initiate an ABI isolation and ABGTS start should an actual high radiation condition have occurred during the August 6, 1987 to October 23, 1987 period, such that the 10 CFR 100 limits would not have been exceeded.

CORRECTIVE ACTION

For immediate corrective action, 0-RM-90-103 was verified to be within the presently allowable TS setpoint limit by a July 14, 1988 performance of SI-83 with the correct source strength evaluation date used in acceptance criteria calculations. 0-RM-90-102 was also verified to be within both past and present allowable TS setpoint limits. For long-term corrective action, a revision will be made to SI-83 by August 22, 1988, to include the correct source strength evaluation date for the presently used calibration source.

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

A revision will be made to the SI-1, Appendix F checklist by November 1, 1988 to provide a verification to ensure that RMs source strength evaluation dates are correct. Surveillance Instruction which use the RT-10 calibration source were verified to have the correct source strength evaluation date.

ADDITIONAL INFORMATION

There have been 24 previously reported Licensee Event Reports as the result of an inadequate surveillance instruction. Reference LERS SQRO-50-327/86011, 86013, 86028, 86030, 86035, 86040, 86042, 86044, 86050, 87002, 87004, 87006, 87007, 87008, 87014, 87017, 87018, 87022, 87023, 87024, 87031. SQRO-50-328/88006, 86007, 87002.

COMMITMENT

1. Revise SI-83 to include correct source strength evaluation dates by August 22, 1988.

2. Revise SI-1 by November 1, 1988 to provide a verification to ensure that RMs source strength evaluation dates are correct.

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TENNESSEE VALLEY AUTHORITY

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

August 4, 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-50-327/88027

The enclosed licensee event report provides details concerning an incorrect source strength evaluation date in a radiation monitor calibration procedure which resulted in a technical specification noncompliance. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.i.B.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

Jerry Patrick

S. A. Smith
Plant Manager

Enclosure
cc (Enclosure):

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