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Robert A. Fenech
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December 7, 1992

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2 - DOCKET NOS. 50-327 AND 50-328 - FACILITY OPERATING LICENSES DPR-77 AND DPR-79 - LICENSEE EVENT REPORT (LER) 50-327/92019

The enclosed LER provides details concerning radiation monitor setpoints being calculated in a nonconservative manner. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as an operation prohibited by technical specifications.

Sincerely,

Robert A. Fenech

Robert A. Fenech

Enclosure
cc: See page 2

110055

IE07

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NRC Form 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

Approved OMB No. 3150-0104
Expires 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Sequoyah Nuclear Plant, Unit 1

DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 | PAGE (3) 1 OF 0 6

TITLE (4) Technical Specification Radiation Monitor Setpoints Nonconservative

EVENT DAY (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 8
1 1	0 6	9 2	9 2	0 1 9	0 0	1 2	0 7	9 2		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)					
POWER LEVEL (10)	1 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)
K. E. Meade, Compliance Licensing	6 1 5 8 4 3 - 7 7 6 6

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) X NO				

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

On November 6, 1992, it was discovered that certain technical specification (TS) radiation monitors (RMs) could have had their setpoints calculated in a nonconservative manner. The subject RM setpoints do not account for the system design that has the gas sample chamber upstream of the sample pump, thus, creating a vacuum. This pressure difference requires a correction factor to be applied in order to calculate the setpoint. Applying the correction factor for the maximum vacuum to several TS RMs indicates that the actual RM setpoints could have been greater than the TS allowable setpoints specified in TS 3.3.3.1. Since the action of TS 3.3.3.1 was not applied, it is concluded that SQN operated in a condition prohibited by plant TSs. Upon discovery, plant personnel recorded vacuum readings at the RMs to ensure that they remained within their TS allowable setpoints. The instrument malfunction alarms were then recalibrated on the subject RMs to ensure TS compliance.

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

I. PLANT CONDITIONS

Units 1 and 2 were operating at approximately 100 percent rated thermal power.

II. DESCRIPTION OF EVENTS

A. Event

On November 6, 1992, it was discovered that certain technical specification (TS) and non-TS radiation monitors (RM) (EIIS Code IL) could have had their setpoints calculated in a nonconservative manner. The subject RM setpoints do not account for the system design that has the gas sample chamber upstream of the sample pump, thus, creating a vacuum in the chamber. This pressure difference requires a correction factor to be applied in order to calculate the correct setpoint for the RMs. The RM design could allow as much as 13 inches of mercury vacuum before initiating an instrument malfunction alarm in the main control room (MCR). Applying the correction factor for this vacuum to the setpoints for the containment purge RMs, the upper and lower containment RMs and the MCR RMs indicated that the actual RM setpoints could have been greater than the TS allowable setpoints of TS 3.3.3.1. Since the action of TS 3.3.3.1 was not applied for the subject timeframes, it is concluded that SQN was operating in a condition prohibited by TSs. It should be noted that this correction factor is only applicable to the total gas RMs. Particulate RMs were originally calibrated by the vendor using a solid source and, thus, do not require correction for vacuum.

B. Inoperable Structures, Components, or Systems That Contributed to the Event

None.

C. Dates and Approximate Times of Major Occurrences

1974 — General Atomic issued the primary calibration document indicating that the detectors associated with the subject RMs were calibrated at standard temperature and pressure. The SQN design operates with the detectors under a vacuum.

1979 — General Atomic sent a revision to the primary calibration document of the vendor manual to TVA Engineering Design in Knoxville. This revision contained corrected sensitivity numbers to calibrate the RMs. This information was not sent to site personnel, who were responsible for performing RM setpoint calculations.

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1980 SQN began power operation with the MCR RMs set at 350 counts per minute (cpm). The TS allowable setpoint was 400 cpm. Correcting these setpoints for maximum gas chamber vacuum indicates that the control room isolation setpoint for the MCR RMs could have been 529 cpm. The containment and purge RMs were set at 10 percent of their TS limit. The containment and purge RMs would still have been within TS allowable values.

1982 Inspection and Enforcement Notice 82-49 was issued requesting licensees to evaluate their RM designs to ensure that the proper correction is being applied for pressure changes. TVA believed that the subject notice was in reference to pressure effects on flow measurements. Thus, TVA did not consider the potential effect of vacuum on the RMs.

1990 The setpoints for the containment and purge RMs were raised to 70 percent of their TS allowable setpoints because of high background activity in containment. Correcting the RM setpoints for maximum vacuum indicates that a containment vent isolation could have occurred at 143 percent of the TS allowable setpoints.

1990 A problem evaluation report was generated indicating that the wrong sensitivities were being used when calculating RM setpoints. Without correcting for vacuum, this resulted in RM setpoints being set at approximately 95 percent of their TS allowable setpoint.

1990 A revision to Technical Instruction (TI) 18, "Radiation Monitoring," and Surveillance Instruction (SI) 0-SI-CEM-030-410.2, "Containment Upper and Lower Compartment Purge Sampling," to incorporate the proper RM sensitivities, further raised the containment and purge RM setpoints to 75 percent of the TS limit. Applying a more conservative interpretation of the vendor calibration data concluded that when the setpoint is corrected for chamber pressure, the RMs could have been set at 113 percent of their TS allowable values. This revision also reduced the setpoints of the MCR RMs to 253 cpm. Correcting for vacuum, the actual control room isolation setpoint could have been 382 cpm, which is within TS limits.

1992 On November 6, a problem evaluation report was generated indicating that a correction factor for vacuum had not been applied to the above referenced RMs. This could result in nonconservative setpoints for TS RMs.

1992 On November 6, the Technical Support System engineer for the RMs calculated the maximum vacuum at which the subject RMs would remain within the TS allowable setpoint to be 10 inches of mercury vacuum. At that time, a program was initiated to recalibrate the instrument malfunction alarms for the subject RMs from 13 to 10 inches of mercury vacuum. Presently, all the RMs in question have had their alarms recalibrated.

D. Other Systems or Secondary Functions Affected

The following non-TS RMs were also affected.

Condenser Vacuum Exhaust RMs
Auxiliary Building Ventilation RM
Service Building Ventilation RM
MCR RMs

E. Method of Discovery

During a review of RM system design, the SQN Chemistry supervisor discovered this problem.

F. Operator Action

Not applicable - no operator action was required.

G. Safety System Response

Not applicable - no safety system response was required.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this event was the failure to take into account the correction factor required for system vacuum.

B. Root Cause

The apparent root cause of this event was the failure of TVA personnel to understand that, since the vendor calibration information was performed at standard temperature and pressure, and SQN's RM system was operated under vacuum, compensation for the vacuum is required in order to obtain the correct RM setpoints.

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

IV. ANALYSIS OF EVENT

The design purpose of the MCR RM setpoints is to initiate a control room isolation. The design purpose of the containment and purge RM setpoints is to initiate a containment vent isolation. The subject RM setpoints would have initiated the design-intended functions; however, the isolations could have occurred at setpoints greater than the TS allowable values.

An evaluation was performed of the Updated Final Safety Analysis Report, Chapter 15 events using the maximum possible isolation setpoints. The evaluation analyzed the impact of a large-break loss of coolant accident (LOCA), a small-break LOCA, a fuel-handling accident inside containment, and reactor coolant system leakage during containment purging activities with the subject RM setpoints at their highest possible calculated values. These conditions constitute the most limiting events for this analysis.

The evaluation concluded that, due to the low reactor coolant gross activity and the data available from the containment and purge RMs, there is a high degree of confidence that, while the plant has been in operation, the actual RM readings would not have been greater than the TS allowable values for the subject RMs. The evaluation further concludes that, for the events analyzed, the present SQN safety analysis bounds this event. Therefore, there was no risk to the health and safety of the public as a result of this event.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Upon discovery, Instrument Maintenance personnel recorded vacuum readings from the subject RMs every four hours to ensure readings of less than 10 inches of mercury vacuum. These readings continued until each affected RM had its instrument malfunction alarm recalibrated to 9 inches (plus or minus 1 inch) of mercury vacuum.

B. Corrective Actions to Prevent Recurrence

TI-18 and SI-0-SI-CEM-030-410.2 will be revised to address the method of accounting for gas detector chamber vacuum.

SQN presently has administrative controls in affect that will ensure that vendor information is reviewed for applicability by the appropriate organizations.

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

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A review of previous, similar reportable events identified no previous similar events.

VII. COMMITMENTS

TI-18 and 0-SI-CEM-030-410.2 will be revised to address the method of accounting for gas detector chamber vacuum by December 31, 1992.