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December 27, 1990

U.S. Nuclear Regulatory Commission
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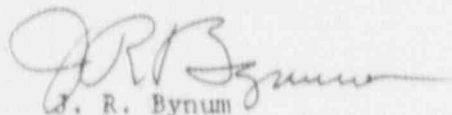
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET
NO. 50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT
(LER) 50-327/90025

The enclosed LER provides details concerning the failure to fully verify the alarm functions for the oxygen and hydrogen analyzers of the waste gas disposal system because of an inadequate procedure. This event is considered as an operation prohibited by Technical Specifications and is being reported in accordance with 10 CFR 50.73(a)(2)(i)(b).

Very truly yours,

TENNESSEE VALLEY AUTHORITY


J. R. Bynum

Enclosure

cc: See page 2

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U.S. Nuclear Regulatory Commission
December 27, 1990

cc (Enclosure):

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NRC Resident Inspector
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Mr. B. A. Wilson, Project Chief
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 1 [DOCKET NUMBER (2) | PAGE (3) |]
[05000312710004]

TITLE (4) Improper calibration - oxygen analyzer alarm setpoint of the waste gas disposal system.

EVENT DAY (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER	
11	30	90	025	0	12	27	90			05000312710004	

OPERATING MODE (9) THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following)(11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 78.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 78.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> OTHER (Specify in
<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	Abstract below and in
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Gregory S. Kniedler, Compliance Licensing Engineer	615843-7461

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

On November 30, 1990, at 0905 Eastern standard time, with Unit 1 in Mode 1 (100 percent power), and Unit 2 in Mode 1 (52 percent power), the waste gas hydrogen and oxygen analyzers were declared inoperable. Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.3.10 were entered for Units 1 and 2, and grab samples were initiated by Operations' personnel in accordance with TSs. A condition adverse to quality was initiated to identify the fact that Surveillance Instruction (SI) 243, "Channel Calibration of the Waste Gas Disposal System Oxygen and Hydrogen Analyzer," did not constitute an appropriate TS defined channel calibration. In TS, Section 3.11.2.5, LCO actions are taken based on a two percent oxygen combined with a four percent hydrogen mixture; therefore, the alarm should be set accordingly and verified in the SI. The root cause of this event was determined to be an inadequate procedure resulting from failure of personnel to perform an adequate technical review of both TS LCOs and requirements to ensure that channel calibrations were properly performed. Corrective actions include the generating and issuing of scaling and setpoint documents, revision to the affected procedure, and the issuing of a design change notice on the hydrogen and oxygen gas analyzer.

(6-89)

Expires 4/30/92

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Sequoyah Nuclear Plant Unit 1	10501013 12 17 19 10	0	2	5	0	0	0 2 OF 0 4

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

Description of Event

On November 30, 1990, at 0905 Eastern standard time (EST), with Unit 1 in Mode 1 (100 percent power, 2235 pounds per square inch gauge [psig], 578 degrees Fahrenheit [F]), and Unit 2 in Mode 1 (52 percent power, 2240 psig, 564 degrees F), the waste gas hydrogen and oxygen analyzers were declared inoperable. Units 1 and 2 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.3.10, and grab samples were initiated by Operations' personnel in accordance with TS Table 3.3-13, Action Step 43.

During performance of follow-up setpoint calculation work as a result of corrective action for a separate issue on vent header pressure affects on the hydrogen and oxygen monitors (EIIIS Code MON), it was discovered that engineering values (i.e., instrument tabulation listing, and scaling and setpoint documentation), for the oxygen alarm at two percent by volume, did not exist. It was determined that Surveillance Instruction (SI) 243, "Channel Calibration of the Waste Gas Disposal System Oxygen and Hydrogen Analyzer," did not verify an oxygen alarm setpoint at two percent by volume oxygen. TS LCO 3.11.2.5 requires action to reduce oxygen concentrations for conditions where oxygen levels are greater than two percent by volume and hydrogen levels are less than or greater than four percent by volume. Surveillance Requirement (SR) 4.11.2.5 required the oxygen and hydrogen monitors to be operable by Table 3.3-13 of Specification 3.3.3.10. TS Definition 1.4 states that a channel calibration shall encompass the entire channel including the sensor and alarm and trip functions. SI-243 performs the channel calibration at one percent and four percent by volume oxygen, and by volume hydrogen as required by TS SR 4.3.3.10, but the alarm function was not being appropriately verified.

Additional investigation revealed that during normal operations, the hydrogen levels in the waste gas system typically run at least four percent, and accordingly, the alarm stays in most of the time. This results in the hydrogen concentration masking the oxygen concentration relative to the hydrogen and oxygen alarm because both the hydrogen and oxygen sound the same alarm. Operations' personnel determine the actual gas concentration levels by observing the hydrogen and oxygen recorders and annunciators in the hot sample room on a daily basis and by each shift.

Cause of Event

The root cause of this event was determined to be an inadequate procedure resulting from failure of personnel to perform an adequate technical review of both TS LCOs and requirements to ensure that channel calibrations were performed for the hydrogen and oxygen analyzer. An appropriate procedure was written to address the channel calibration of TS 3.3.3.10 for the oxygen and hydrogen analyzer, but it did not address TS 3.11.2.5 oxygen alarm setpoint at two percent. Contributing factors to the inadequate procedure are that TS 3.3.3.10 does not specifically list the two percent by volume oxygen alarm set point, and that TS 3.3.3.10 does not refer to TS 3.11.2.5.

Analysis of Event

This event is being reported in accordance with 10 CFR 50.73(a)(2)(4)(b) as an operation prohibited by TSs.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Sequoyah Nuclear Plant Unit		1990	025	00	3	4

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

Analysis of Event (Continued)

The waste gas disposal system (EISS Code IS) consists of the hydrogen and oxygen analyzer, as described in the Updated Final Safety Analysis Report, Section 11.3. The automatic gas analyzer is provided to monitor hydrogen and oxygen concentrations in a nitrogen atmosphere. Associated alarms for the hydrogen and oxygen concentrations are to be set at TS limits to ensure that an explosive gas mixture does not exist within the waste gas disposal system.

The TS LCOs associated with the hydrogen and oxygen gas analyzers are 3.3.3.10, "Radioactive Gaseous Effluent Monitoring Instrumentation," and 4.11.2.5, "Explosive Gas Mixture." SR 4.3.3.10 requires a channel calibration at one percent and four percent by volume oxygen, balance nitrogen, and a channel calibration at one percent and four percent by volume hydrogen, balance nitrogen.

LCO 3.11.2.5 action statements are taken based on a two percent oxygen combined with a four percent hydrogen mixture, thus indicating that a channel calibration and alarm setpoint be verified for a two percent by volume oxygen. In the review of these LCOs and SRs, it was discovered that 3.3.3.10 does not refer to 3.11.2.5, while 3.11.2.5 does refer to 3.3.3.10. However, this has been corrected as a result of the implementation of the Radiological Effluent Technical Specification (RETS).

SI-243 performs the channel calibration to determine the operability of the hydrogen and oxygen analyzer measuring and alarm functions of the waste gas disposal system, for LCO 3.3.3.10. However, under LCO 3.11.2.5, explosive gas mixtures, appropriate action must be taken for an oxygen concentration of two percent. The two percent by volume of oxygen in the channel calibration has not been appropriately verified. There are no safety implications for not verifying the alarm at two percent oxygen since the gas analyzer alarm is triggered by either a hydrogen or oxygen concentration signal and operational history of the system indicates that high hydrogen concentrations initiates the alarm most of the time. In addition, Operations' has two instructions: 1-SI-OPS-000-003.D, "Daily Shift Log," and OSLA-99, "Assistant Unit Operator (AUO) Duty Locations and Responsibilities," require checking the oxygen and hydrogen level of the gas analyzer on a daily and shift basis, respectively.

The interim corrective action to lift the hydrogen concentration lead to the analyzer alarm will require operator action when the oxygen concentration is above the setpoint because the hydrogen concentration is usually above four percent. Therefore, this condition would not adversely affect the health and safety of the public.

Corrective Action

For immediate corrective action, TS LCO 3.3.3.10 was entered on November 30, 1990, at 0905 EST, and grab samples were initiated by Operations' in accordance with Table 3.3-13, Action Step 43. In addition, a review and evaluation of TS LCOs 3.3.3.10 and 3.11.2.5 for clarity were performed on December 11, 1990, with the results being that the recently issued RETS TS change ensures a cross-tie between LCOs.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Sequoyah Nuclear Plant Unit	0500032790	--	025	--	00	404

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

Corrective Action (Continued)

Long-term corrective action is to generate and issue the scaling and setpoint documents associated with the hydrogen and oxygen analyzer by January 4, 1991. This will allow the channel calibration procedure for the hydrogen and oxygen analyzer, SI-243, to be revised by January 18, 1991, to include the alarm setpoint specified in TS LCO 3.11.2.5. In addition, a temporary alteration control form (TACF) will be issued to lift the hydrogen lead to the analyzer alarm by January 15, 1991. This will ensure that greater attention is given to the oxygen concentration until the permanent design change is complete. The permanent design change will be the issuing and implementation of a design change notice (DCN) that will replace the OR gate associated with the hydrogen and oxygen concentrations to an AND gate to ensure compliance with TSs.

Additional Information

There have been 17 LERs previously written as a result of SIs not ensuring compliance with TSs--SQN-50-327/86001, 86013, 86028, 86030, 86035, 86039, 86040, 86043, 86044, 86050, 87002, 87007, 87008, 87009, 89025, SQN 50-328/86006, and 86007. The corrective actions associated with the above LERs (excluding LER SQN 50-327/89025) resulted from SQN's SI review program and should have identified this problem; but, because the oxygen alarm setpoint of two percent was inferred in the LCO 3.11.2.5 and not in the SR of either 4.3.3.10 or 4.11.2.5, it was not detected. LER SQN 50-327/89025 resulted from an evaluation of a nuclear experience review report concerning a problem another nuclear power facility encountered with respect to representative samples of diesel generator fuel oil. The LER on diesel generator fuel oil was a result of not fully incorporating American Society of Testing Material (ASTM) Standard ASTM D270-175 requirements into procedures.

Commitments

1. TVA will generate and issue scaling and setpoint documents associated with the hydrogen and oxygen analyzer. This will be completed by January 4, 1991.
2. TVA will issue a TACF to lift the hydrogen lead to the analyzer alarm. This will be completed by January 15, 1991.
3. TVA will revise SI-243 to include the oxygen alarm setpoint at two percent by volume oxygen. This will be completed by January 18, 1991.
4. TVA will issue a DCN to replace the OR gate associated with the hydrogen and oxygen concentrations with an AND gate. This will be completed by June 14, 1991.

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