

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station - Unit 1						DOCKET NUMBER (2) 0 5 0 0 0 2 7 2			PAGE (3) 1 OF 0 4		
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TITLE (4)
Waste Gas System O2 Conc. > 2% for > 48 Hours (T. S. 3.11.2.5) Due To System Design

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)
12	27	88	88	019	01	11	30	88			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)	50.38(a)(1)	50.73(a)(2)(v)	73.71(c)							
	20.405(a)(1)(ii)	50.38(a)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)							
	20.405(a)(1)(iii)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)								
	20.405(a)(1)(iv)	50.73(a)(2)(iii)	50.73(a)(2)(viii)(B)								
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)									

LICENSEE CONTACT FOR THIS LER (12)

NAME M. J. Pollack - LER Coordinator						TELEPHONE NUMBER					
						AREA CODE					
						6 0 9		3 3 9 - 4 0 2 2			

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)

Oxygen concentration within the Waste Gas Holdup System was greater than 2% for more than 48 hours contrary to the requirements of Technical Specification Action 3.11.2.5.a. On 12/25/87, chemistry sampling of No. 14 Waste Gas Decay Tank (WGDT) indicated an oxygen concentration of 4.4%. Additionally, No. 13 WGDT indicated an oxygen concentration of 4.3% at 2110 hours the same day. Oxygen concentration within No. 14 WGDT and No. 13 WGDT were not reduced to less than 2% until 12/27/87 and 12/28/87, respectively. Oxygen concentration of greater than 2% within the Waste Gas Holdup System (WGHS) is an anticipated concern at the conclusion of a refueling outage. Normally oxygen can be diluted/purged from the system within 48 hours, however, due to the apparently larger quantity of oxygen from outage activities, it could not be reduced within 48 hours. The root cause of this event has been attributed to design. Oxygen will accumulate in the RCS during the course of a refueling outage. The VCT is used to degas the RCS via the Waste Gas System. Subsequently, high oxygen concentration gases, in the VCT, were transmitted to the WGHS per the current accepted procedure. The WGHS oxygen concentration was reduced via dilution and discharge techniques. To minimize the probability of recurrence of this event, the applicable Operations Department procedure, involving the purge of the VCT, has been revised to include an option to vent the VCT to the Plant Vent via the Aux. Bldg. Vent. System when the VCT contains high oxygen concentration and low activity level.

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as {xx}

IDENTIFICATION OF OCCURRENCE:

Waste Gas System Oxygen Concentration Greater Than 2% For More Than 48 Hours Contrary to Technical Specification 3.11.2.5

Event Date: 12/27/87

Report Date: 11/30/88

This report was initiated by Incident Report No. 87-505.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 5 Reactor Power 0% - Unit Load 0 MWe

DESCRIPTION OF OCCURRENCE:

Oxygen concentration within the Waste Gas Holdup System {WE} was greater than 2% for more than 48 hours contrary to the requirements of Technical Specification Action 3.11.2.5.a.

On December 25, 1987 at 0940 hours, chemistry sampling of No. 14 Waste Gas Decay Tank (WGDT) indicated an oxygen concentration of 4.4%. Technical Specification Action 3.11.2.5.b was entered. At 1615 hours, the same day, sampling indicated an oxygen concentration of 3.7%. Additionally, No. 13 WGDT indicated an oxygen concentration of 4.3% at 2110 hours the same day. Oxygen concentration within No. 14 WGDT and No. 13 WGDT was not reduced to less than 2% until 2125 hours on December 27, 1987 and 0855 hours on December 28, 1987, respectively.

Technical Specification 3.11.2.5. states:

"The concentration of oxygen in the waste gas holdup system shall be limited to less than or equal to 2% by volume.

APPLICABILITY: At all times.

ACTION:

- a. With the concentration of oxygen in the waste gas holdup system greater than 2% by volume but less than or equal 4% by volume, reduce the oxygen concentration to the above limits within 48 hours.
- b. With the concentration of oxygen in the waste gas holdup system greater than 4% by volume, immediately

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DESCRIPTION OF OCCURRENCE: (cont'd)

suspend all additions of waste gases to the system and reduce the concentration of oxygen to less than or equal to 2% by volume without delay."

Efforts to reduce the level were immediately implemented upon identification of the high oxygen concentration within the WGDT's. These methods included:

1. fill and vent operation of the CVCS Holdup Tanks;
2. discharge of the Waste Gas Holdup Tanks, at pressure greater than 60 psi, via the plant vent (by procedure);
3. dilution of Waste Gas Holdup Tanks (if the tank pressure is less than 60 psi) with gas from other WGDTs if the oxygen concentration in those tanks is < 2% by volume;
4. and nitrogen purge of the Waste Gas Holdup tanks and CVCS Holdup Tanks.

APPARENT CAUSE OF OCCURRENCE:

The root cause of this event has been attributed to system design. Gases in the VCT with high oxygen concentration were purged to the Waste Gas System as per the procedures in effect at that time.

Investigation has revealed that the source of the oxygen was the Volume Control Tank (VCT). Records indicate that the VCT had accumulated oxygen concentration levels as high as 13.8% as of December 21, 1987. As per procedure, the tank gases were purged to the Waste Gas System resulting in the VCT oxygen concentration level decrease to 2.9% as of December 26, 1987 and 1.8% as of December 27, 1987.

The source of the VCT oxygen has been attributed to routine refueling/maintenance outage activities. The CV-141 valve was removed to facilitate the installation of the No. 13 Positive Displacement Charging Pump pulsation dampener. This work provided a direct flowpath of ambient air into the VCT.

ANALYSIS OF OCCURRENCE:

Oxygen concentration of greater than 2% within the Waste Gas Holdup System is an anticipated concern at the conclusion of a refueling outage. Oxygen enters the Waste Gas Holdup System via the VCT as a result of post outage degassing of the RCS. During the course of an outage, oxygen will enter the RCS via related work involving reactor vessel head removal, Reactor Coolant System valve maintenance, Chemical and Volume Control System associated maintenance, ... etc.

If the oxygen concentration in the Waste Gas Holdup System exceeds

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ANALYSIS OF OCCURRENCE: (cont'd)

2%, it can normally be purged/diluted from the system within the 48 hour Technical Specification time limit. However, due to the apparently larger than normal quantity of oxygen from the recent refueling outage activities, the level could not be reduced within the Technical Specification Action Statement 48 hour time frame. Therefore, since Technical Specification Action Statement 3.11.2.5.a was not complied with this event is reportable in accordance with Nuclear Regulatory Commission 10CFR 50.73(a)(2)(i)(B).

A review of historical post outage Waste Gas Holdup System sampling records, when Technical Specification 3.7.11 was in effect, has shown oxygen levels within the Waste Gas Holdup System to have exceeded 2% by volume. Normally, the oxygen level could be reduced to less than 2% within 48 hours. However, on April 25, 1986, oxygen concentrations exceeded 2% by volume within the Waste Gas Holdup System and were not reduced within 48 hours (reference LER 272/86-009-00). The problem then was attributed to inadequate procedures.

The concern for oxygen within the Waste Gas Holdup System is due to the presence of hydrogen gas within the system. In sufficient quantities, hydrogen in the presence of oxygen can be explosive. The Technical Specification level of not greater than 2% oxygen is conservatively low, ensuring that this explosive hazard is not present. Monitoring of the oxygen concentration in accordance with Technical Specifications ensures that if the oxygen concentration does increase above the 2% limitation expeditious corrective action can be taken to lower the level back below 2%. As discussed above, this action was taken, therefore, this event did not affect the health or safety of the public.

CORRECTIVE ACTION:

As discussed in the Description of Occurrence section, the oxygen concentration was lowered to below the 2% limit.

Operations procedure II-3.3.10, "Establishing A Hydrogen Atmosphere In The Volume Control Tank", has been revised to include an option to vent the VCT to the Plant Vent via the Auxiliary Building Ventilation System (ABVS) {VF}. The vent path is upstream of the ABVS filtration. The ABVS vent path could be used when the VCT contains high levels of oxygen and relatively low activity levels and may only be used prior to establishing a hydrogen atmosphere (i.e., during fill and vent of the RCS). The procedure ensures the release of the VCT gases to the Plant Vent is monitored and documented in accordance with Technical Specifications for plant discharges.



General Manager -
Salem Operations



Public Service Electric and Gas Company P.O. Box E Hancocks Bridge, New Jersey 08038

Salem Generating Station

November 30, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-70
DOCKET NO. 50-272
UNIT NO. 1
LICENSEE EVENT REPORT 87-019-01; SUPPLEMENT

This Supplemental Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(c). The Apparent Cause of Occurrence and Corrective Action Sections have been updated based upon the results of additional investigation. Additionally, discussion associated with high oxygen in the Reactor Coolant Drain Tank (RCDT) was removed from the LER since the RCDT is not directly associated with the Waste Gas System.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "L. K. Miller".

L. K. Miller
General Manager -
Salem Operations

MJP:pc

Distribution

The Energy People