PSEG

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Nuclear Business Unit

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

LER 272/96-038-01
SALEM GENERATING STATION - UNIT 1
FACILITY OPERATING LICENSE NO. DPR-70
DOCKET NO. 50-272

Gentlemen:

This Licensee Event Report (LER) entitled "Switchgear Penetration Area Ventilation Cannot Maintain Design Temperatures" is being submitted as a Supplement to LER 96-038. This LER is submitted pursuant to the requirements of the Code of Federal Regulations 10CFR50.73(a)(2)(ii).

Sincerely,

David F. Garchow
General Manager
Salem Operations

Attachment

DVH

C Distribution
LER File 3.7

190005

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)
Switchgear Penetration Area Ventilation Cannot Maintain Design Temperatures

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 NAME	DOCKET NUMBER
12	10	96	96	-- 038 --	01	05		97	SALEM UNIT 2	05000311
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	000	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	X 50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Brian J. Thomas, LER Coordinator	609-339-2022

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 15 single-spaced typewritten lines) (16)

LER 96-038-00 detailed a concern with single failure of the Electrical Penetration Exhaust Fans. LER 96-038-01 details concerns identified during a review of LER 96-038-00. Specifically, during a review of the Switchgear & Penetration Area Ventilation (SPAV) system performance, PSE&G determined that the SPAV system may not be able to maintain the minimum design bases temperatures during cold weather. Upon receipt of an accident signal, all three of the SPAV system supply fans would start, and may cause overcooling of the area. In addition, during the review of the SPAV system, dampers that are designed to isolate the area upon CO_2 injection for fire suppression, were noted to fail close on a loss of power. Closure of the CO_2 Isolation dampers upon loss of power could cause a loss of ventilation to the switchgear room, and potentially result in the area temperatures exceeding design temperatures.

The cause of this occurrence is that the SPAV system failure modes were not properly established and evaluated during the initial plant design. The interim corrective actions are to install temporary modifications to ensure design temperatures can be maintained. The Switchgear room temperatures are being monitored to ensure that design temperatures are not exceeded. These interim corrective actions will be in place until permanent corrective actions are installed. The SPAV control logic and the CO_2 isolation damper logic will be revised to ensure that area temperatures can be maintained within design limits. This condition is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(A), any event or condition that resulted in the nuclear power plant being operated outside the design bases.

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor

Switchgear Ventilation System {VF/-}*
DC Power {EJ/-}
Low Voltage Power System {EC/-}

* Energy Industry Identification System (EIIS) codes and component function identifier codes appear as (SS/CC)

CONDITIONS PRIOR TO OCCURRENCE

At the time of identification, Salem Unit 1 was defueled and Unit 2 was in Mode 5. Post modification testing was in progress for the Switchgear Penetration Area Ventilation (SPAV) system modification.

DESCRIPTION OF OCCURRENCE

During a design review of the Switchgear Penetration Area Ventilation (SPAV) {VF/-} system performance, PSE&G determined that the potential existed for a single failure of the Electrical Penetration Exhaust Fans {VF/FAN} to place the unit in an unanalyzed condition. The two Electrical Penetration Exhaust Fans each provide 50 percent of the exhaust flow from the penetration areas. The failure of one fan could result in higher than analyzed temperatures in the Electrical Penetration area, which contains the motor control centers for the three trains of safety-related, motor-operated valves and other Technical Specification required instrumentation.

The SPAV system is currently designed to maintain year-round temperatures between 65 and 110 degrees F within the areas served, with outdoor ambient conditions of 0 degrees F winter and 95 degrees F summer, respectively. The maximum design temperature was recently increased to 110 degrees from 105 degrees F.

The potential for a single failure of the Electrical Penetration Exhaust fan to place the unit in an unanalyzed condition was previously detailed in Revision 0 to LER 96-038. Revision 1 to LER 96-038 will detail two recently identified concerns with the SPAV system: 1) overcooling and 2) overheating on a Miscellaneous Auxiliary Control (MAC) 11 panel failure for Unit 1 or a MAC 21 panel failure for Unit 2.

Overcooling

During Post Modification Testing for recently completed SPAV system modifications and review of the SPAV system performance, PSE&G determined that the SPAV system may not be able to maintain the minimum design temperatures during cold weather conditions. Upon receipt of a Safeguards Equipment Cabinet (SEC) signal (i.e., an Engineered Safety Feature start) all three of the SPAV system supply fans would start. With all three supply fans running, and cold outside air temperatures, area temperatures could drop below the design minimum temperature of 65 degrees F.

DESCRIPTION OF OCCURRENCE (cont'd)

Overheating on MAC 11/21 panel failure

During the review of the SPAV system, dampers that are designed to isolate upon CO_2 injection for fire suppression, were also noted to fail close on a loss of power. This loss of power could cause a loss of ventilation, and potentially result in area temperatures exceeding design temperatures.

Specifically, there are six CO_2 Isolation dampers in each unit that are designed to close, to control CO_2 flooding in the event of a fire. The control power for these CO_2 Isolation dampers s is supplied by the MAC 11 panel for Unit 1, and the MAC 21 panel for Unit 2. A failure of the MAC 11 panel or the MAC 21 panel would cause the CO_2 Isolation dampers for that unit to close. The closing of these CO_2 Isolation dampers would interrupt ventilation air flow and could result in the area temperatures exceeding design temperatures.

CAUSE OF OCCURRENCE

The cause of this occurrence is that the SPAV system failure modes were not properly established and evaluated during the initial plant design, and the impact of the damper closure due to loss of power was not considered. Damper closure was assessed in terms of supporting the automatic initiation of the CO_2 suppression system in response to 10 CFR 50 Appendix R concerns.

PRIOR SIMILAR OCCURRENCES

LER 272/95-008-00 reported a similar concern of exceeding 105 degrees if only one of the three Electrical Penetration Supply Fans were operable. This occurrence was caused by the failure of two of the supply fans. LER corrective actions addressed the supply fans and did not address the exhaust fans.

In the past two years there were eleven LERs that addressed design deficiencies as the cause. These LERs are 272/95-014-00, 272/95-020-00, 272/95-029-00, 272/96-001-00, 272/96-010-00, 272/96-012-00, 272/96-018-00, 272/96-019-00, 272/96-020-00, 272/96-034-00 and 272/96-037-00. Corrective actions for these LERs were specific to the particular issue. As stated in the 50.54(f) response, PSE&G has reasonable assurance that Salem stations are being operated in accordance with their design bases

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SAFETY CONSEQUENCES AND IMPLICATIONS

Overcooling

The overcooling of the Switchgear rooms would occur only with extremely low outside air temperatures, and would be a concern with the "C" 125 Vdc battery room. The "C" 125 Vdc battery room has a non-safety related heater installed. While the heater could not be relied upon to maintain temperatures above 65 degrees F, the heater would most likely prevent the room from falling below design temperature. Further, the plant is designed with sufficient redundant DC power sources to safely shutdown with the failure of the "C" 125 Vdc batteries. In addition, other equipment in the area may be adversely effected.

Overheating on MAC 11/21 Panel failure

The maximum room temperature with the CO_2 Isolation dampers closed has been preliminary determined to exceed 110 degrees. The maximum room temperature has not been determined, but some safety related equipment may be adversely impacted. The loss of the MAC 11/21 panel is indicated in the Control Room. The Control Room response includes notifying the fire protection personnel. To mitigate the elevated room temperatures, the CO_2 Isolation dampers would have to be opened, or the room doors opened.

The health and safety of the public was not affected.

CORRECTIVE ACTIONS

1. A design review of the SPAV system in response to LER 96-038-00 has been completed. This review identified the concerns addressed in this LER.

2. A 10CFR50.59 Evaluation was completed to increase the maximum design temperature to 110 degrees.

3. Administrative controls to address removal from service of an Electrical Penetration Exhaust Fan will be implemented prior to Salem Unit 2 entering Mode 4. The outside air intake dampers were modified to enable them to fully close to preclude reducing area temperatures to below acceptable design minimums.

4. A modification to the supply fan start logic, and the outside supply dampers will be implemented to ensure that the minimum design temperature is maintained. This modification is scheduled to be completed for both Units by May 31, 1997.

5. As an interim corrective action, the Switchgear room temperature is being routinely monitored to ensure that the maximum design temperature is not exceeded, and controls are in place to limit temperature increases in the area.

6. As a permanent corrective action, a modification to the CO_2 damper logic is scheduled to be completed for both Units Unit by May 31, 1997.