



PSEG

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Nuclear Business Unit

July 21, 1995

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

Attn: Document Control Desk

SALEM GENERATING STATION
LICENSE NO. DPR-71
DOCKET NO. 50-272
UNIT NO. 1

LICENSEE EVENT REPORT NO. 95-011-00

This Licensee Event Report is being submitted pursuant to
the requirements of Code of Federal Regulation 10CFR50.73(a)
(2) (ii) (B).

Sincerely,

Clay C. Warren
General Manager
Salem Operations

SORC Mtg. 95-080
MJPJ:vs

C Distribution
LER File

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S PDR

The power is in your hands.

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1) Salem Generating Station - Unit 1	DOCKET NUMBER (2) 05000 272	PAGE (3) 1 OF 7
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TITLE (4) Design basis concern: Inconsistency between WCAP-11634 analysis used for postulated steam line breaks outside containment and the updated final safety analysis report.

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	22	88	95	-- 11	-- 00	07	21	95	Salem Unit 2	05000 311
										05000

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) 20.402(b) 20.405(a)(1)(i) 20.405(a)(1)(ii) 20.405(a)(1)(iii) 20.405(a)(1)(iv) 20.405(a)(1)(v) 20.405(c) 50.36(c)(1) 50.36(c)(2) 50.73(a)(2)(i) 50.73(a)(2)(ii) 50.73(a)(2)(iii)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0%		50.73(a)(2)(v)	73.71(c)
		50.73(a)(2)(vii)	OTHER
		50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
		50.73(a)(2)(viii)(B)	
		50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)
 NAME M. J. Pastva, Jr. LER Coordinator TELEPHONE NUMBER (include Area Code) 609 339-5165

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
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		NO		04	30	96

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 6/22/95, it was determined that beginning 2/22/88 (Unit 1) and 11/26/88 (Unit 2), a discrepancy has existed between the Updated Final Safety Analysis Report (UFSAR) Sections 3.6.5.2 and 15.4 and WCAP-11634, for main steam piping break postulations and single failure assumptions which involved a condition outside the design basis of the plant. The WCAP, which was derived from Branch Technical Position (BTP) MEB 3-1, Revision 1, and was implemented at Salem Units 1 and 2 as part of the design change to eliminate the Boron Injection Tanks (BIT), uses less conservative assumptions than the UFSAR. The cause of the discrepancy is attributed to inadequate design review. The 10CFR50.59 evaluations for BIT elimination refer to the WCAP, but the associated UFSAR change notice did not revise the UFSAR Sections to reflect the WCAP's assumptions/results. The reason for the delay in recognizing this condition is being evaluated in accordance with our corrective action program. Appropriate action will be taken for the discrepancy between the main steam penetration area piping analysis and the UFSAR assumptions prior to restart of Salem Units 1 or 2., The corrective action program has been changed, to more consistently evaluate design basis with increased focus on reportability and operability. It is anticipated that by 4/30/96, a supplement to this report will be submitted to provide the reason(s) for the delay in recognizing this condition and any additional corrective actions.

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Plant and System Identification:

Westinghouse - Pressurized Water Reactor

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

Identification of Occurrence:

Design Basis Concern (Both Units): Inconsistency Between WCAP-11634 Analysis Used For Postulated Steam Line Breaks Outside Containment And The Updated Final Safety Analysis Report

Event Date: February 22, 1988 (Unit 1)
 November 26, 1988 (Unit 2)

Discovery Date: June 22, 1995

Report Date: July 21, 1995

This report was initiated by Incident Report No. 95-944

Conditions Prior to Occurrence:

Mode 5 Reactor Power -0-% Unit Load -0-MWe

Description of Occurrence:

On June 22, 1995, it was determined that beginning February 22, 1988 (Unit 1) and November 26, 1988 (Unit 2), a discrepancy has existed between the Updated Final Safety Analysis Report (UFSAR) and the steam line break analysis for the containment penetration area which involved a condition outside the design basis of the plant. This discrepancy was identified in accordance with PSE&G's Engineering Discrepancy Control process in February, 1994 and was assigned a long term priority as a documentation discrepancy. In addition, following identification of this discrepancy functional responsibility for disposition of the this concern changed numerous times. It was subsequently re-evaluated during an internal review of outstanding engineering discrepancies to identify potential safety and compliance issues.

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Description of Occurrence: (cont'd)

The subject discrepancy exists between UFSAR Sections 3.6.5.2 and 15.4 and WCAP-11634, for main steam piping break postulations and single failure assumptions. The WCAP, which was derived from Branch Technical Position (BTP) MEB 3-1, Revision 1, and was implemented at Salem Units 1 and 2 as part of the design change to eliminate the Boron Injection Tanks (BIT), uses less conservative assumptions than the UFSAR. The NRC was notified of this occurrence in accordance with 10CFR50.72(b)(2)(i).

Analysis of Occurrence:

The design basis analysis of concern is the steam line break outside containment, which establishes the temperature and pressure transients for evaluating the environmental qualification of equipment in the penetration area structure.

Salem UFSAR Section 3.6.5.2 describes the High Energy Line Break (HELB) criteria applicable to the Main Steam piping outside containment and identifies the postulated break sizes and locations, which include longitudinal and circumferential breaks just upstream of the Main Steam Isolation Valves (MSIVs). The UFSAR describes the blowdown following a large MSLB as consisting of saturated steam followed by two-phase flow. The UFSAR also states that safety related equipment in the penetration areas is environmentally qualified for operation, and that the reactor may be brought to a safe shutdown condition following any postulated MSLB with the most limiting single failure.

NRC Information Notice (IN) 84-90 identified nonconservatisms in the Westinghouse analysis methodology for Main Steam Line Breaks (MSLB). Superheated steam could result in a more severe environmental condition following the MSLB.

As part of their review of a License Change Request (LCR) for Boron Injection Tank (BIT) elimination, the NRC questioned how the effect of superheated steam, coupled with BIT elimination, would effect Salem's MSLB analyses. By

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Analysis of Occurrence (cont'd)

letter dated July 31, 1986, PSE&G responded that inside containment breaks were addressed by WCAP-8822, Supplement 2, which was sent to the NRC. Outside containment breaks (i.e., penetration area) were being evaluated by Westinghouse. The initial assessment described in PSE&G's July 31, 1986 letter was that the affected safety functions (steamline isolation, reactor trip and SI) would be accomplished before the 1.5 minutes required for the steam generator tubes to become uncovered. At PSE&G's request, NRC approved the BIT elimination LCR (Tech Spec Amendments 78/52, April 7, 1987) prior to completion of the re-evaluation of penetration area MSLB. The NRC's Safety Evaluation Report (SER) for the amendments required the evaluation to be completed prior to BIT removal, but did not request a copy of the completed evaluation.

WCAP-11634 (October 20, 1987) summarizes an evaluation performed by Westinghouse relative to the effects of superheated steam on the MSLB analyses. Because the main run of piping in the penetration was classified as break exclusion piping, the largest break assumed in the WCAP was a 1.0 ft² longitudinal break, and no single failure was assumed. WCAP-11634 was used as the basis for the penetration area temperature profile for Environmental Qualification upon implementation of the design change for the BIT removal, during the Unit 1, 7th refueling (subsequent criticality on February 22, 1988) and during the Unit 2, 4th refueling (subsequent criticality on November 26, 1988). The 10CFR50.59 evaluation associated with the BIT design change package referred to the WCAP, but did not address the difference in assumptions between the WCAP and the UFSAR.

The WCAP used Salem-specific mass and energy releases based on the following key assumptions:

- o The break size was limited to 1.0 ft² because main runs of steam piping in the penetration area pipe were considered to be break exclusion piping.
- o Because postulated breaks larger than the branch lines (.35 ft²) were considered break exclusion piping breaks, no single failure was assumed for the larger breaks.

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Analysis of Occurrence: (cont'd)

The WCAP referred to PSE&G and Westinghouse correspondence as the basis for the relaxation in assumptions. The change was not supported by demonstration of full conformance with the BTP. The primary justification is the overdesign of the main runs of piping which maintains stress levels extremely low.

In order to resolve the discrepancy and reconcile the assumptions in WCAP-11634 with the UFSAR, the main steam piping was reviewed against Branch Technical Position (BTP) MEB 3-1, "Postulated Rupture Locations in Fluid System Piping Inside and Outside Containment," which allows relaxation of pipe break postulations in containment penetration areas if design and inspection criteria are met. The piping at Salem Generating Station does not fully conform to the BTP criteria.

Apparent Cause of Occurrence

The cause of the original discrepancy is attributed to inadequate design review. The 10CFR50.59 evaluations for BIT elimination refer to the WCAP, but the associated UFSAR change notice did not revise the UFSAR Sections 3.6 or 15.4 to reflect the WCAP's assumptions and results.

The reason for the delay in recognizing this condition is being evaluated in accordance with our corrective action program.

Prior Similar Occurrence

Review of Salem documentation found no prior similar occurrence

Safety Significance:

This occurrence is reportable as an LER, pursuant to 10CFR50.73(a)(2)(ii)(B), because the WCAP-11634 analysis assumptions are less conservative than those in the UFSAR, and are not consistent with NRC acceptance criteria.

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Safety Significance: (cont'd)

The design of the Salem Main Steam piping is such that stresses at terminal ends are reduced. Therefore, as described in UFSAR Section 3.6.5.2, breaks are not postulated at terminal ends. The only location for longitudinal and circumferential breaks of Main Steam piping in the penetration area is just upstream of the MSIV. This location is selected based on relative stress level (although the stress is well below the code allowable).

The initial review of the design of the main steam piping from the containment wall to the MSIVs, which includes the circumferential break location identified in the UFSAR, shows that the piping meets the intent of the break exclusion criteria of BTP 3-1. For this reason, PSE&G believes that this circumferential break analyzed in the UFSAR is not credible and that the 1 ft² break is appropriate.

With respect to the inservice inspections specified in BTP 3-1, Volumetric inservice inspection of Main Steam piping welds have not been examined on a 100% basis during our ten (10) year inspection intervals. However, they are presently performed in accordance with ASME Section XI (1983 through Summer 1983 Addenda) and Code Case N-408.

The fabrication and inspection of welds were performed to Nuclear Class 1 requirements, even though the piping is classified as Nuclear Class 2. 100% of the welds were shop and field inspected via 100% Radiographic Test, Magnetic Particle Test, or Penetrant Test, and 100% Hydrostatic Test, in accordance with piping specifications and ANSI B31.7, 1969 code requirements. The above provides assurance of adequacy of welds in the applicable main steam piping in the penetration area.

Based on the overall conservatism in the design of the piping, we believe it is reasonable to limit the postulated break size to one square foot, and assume no concurrent random single failure for an assumed rupture of the main run of piping in the penetration area. Because these assumptions have been analyzed with acceptable results, we conclude that this discrepancy involved minimal impact on public health and safety.

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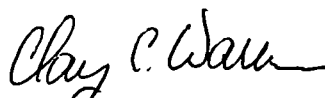
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Corrective Action

Appropriate action will be taken to resolve the discrepancy between the main steam penetration area piping analysis and the UFSAR assumptions prior to restart of Salem Units 1 or 2.

Changes have been made to the corrective action program, which will provide more consistent evaluation of design basis discrepancies, with increased focus on reportability and operability.

It is anticipated that by April 30, 1996, a supplement to this report will be submitted to provide results of ongoing efforts to determine the reason for the inadequate design review, delay in recognizing this condition, and any additional corrective actions.



Clay C. Warren
General Manager
Salem Operations

MJPJ:vs
REF: SORC Mtg. 95-080