

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																																																	
TITLE (4) Technical Discrepancy in Design Elevation Calculations for Service Water Intake Structure.																																																																					
EVENT DATE (5) MONTH DAY YEAR 0 2 2 9 8 4										LER NUMBER (6) YEAR SEQUENTIAL NUMBER REVISION NUMBER 8 4 - 0 0 9 - 0 0 0 3 3 0 8 4										REPORT DATE (7) MONTH DAY YEAR 0 3 3 0 8 4										OTHER FACILITIES INVOLVED (8) FACILITY NAMES DOCKET NUMBER(S) Salem Unit 2 0 5 0 0 0 3 1 1																																							
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)										20.406(e)										80.73(a)(2)(iv)										73.71(b)																													
										20.408(a)(1)(i)										80.36(e)(1)										<input checked="" type="checkbox"/> 80.73(a)(2)(v)										73.71(e)																													
										20.408(a)(1)(ii)										80.36(e)(2)										80.73(a)(2)(vi)										OTHER (Specify in Abstract below and in Text, NRC Form 306A)																													
										20.408(a)(1)(iii)										80.73(a)(2)(i)										80.73(a)(2)(vii)(A)																																							
										20.408(a)(1)(iv)										80.73(a)(2)(ii)										80.73(a)(2)(vii)(B)																																							
										20.408(a)(1)(v)										80.73(a)(2)(iii)										80.73(a)(2)(ix)																																							
LICENSEE CONTACT FOR THIS LER (12)																																																																					
NAME J. L. Rupp																				TELEPHONE NUMBER AREA CODE 6 0 9 3 3 9 - 4 3 0 9																																																	
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																																					
<table border="1"><thead><tr><th>CAUSE</th><th>SYSTEM</th><th>COMPONENT</th><th>MANUFACTURER</th><th>REPORTABLE TO NRC</th><th>CAUSE</th><th>SYSTEM</th><th>COMPONENT</th><th>MANUFACTURER</th><th>REPORTABLE TO NRC</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>																														CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC																														
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC																																																												
SUPPLEMENTAL REPORT EXPECTED (14)																				EXPECTED SUBMISSION DATE (15)																																																	
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)																				<input checked="" type="checkbox"/> NO																																																	

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

In November, 1983, observations by an NRC staff hydrologist revealed a possible technical discrepancy with the maximum water level calculations performed for the Salem Service Water Intake Structure (SWIS). The SWIS is the only portion of the plant affected by this error. Dames & Moore completed the revised calculations in December, 1983. A third party verification was completed by a Bechtel staff hydrologist on February 29, 1984. This matter was verbally reported to the NRC Resident Inspector in November 1983; however, official notification to the NRC was not done until receipt of Bechtel's confirmation of the correctness of the revised calculations. The calculations were originally based on Significant wave height instead of Maximum wave height, as required by the Corps of Engineer's Shore Protection Manual. The revised calculations indicate that minor modifications to the air intakes and exhausts on the SWIS, will have to be effected to ensure watertight integrity, in the event of a maximum calculated credible wave occurrence (postulated to occur every 1000 years). It has been determined that this design calculation error involves no undue risk to the health or safety of the public. In addition there are no safety concerns associated with the continued operation of either unit, for a short interim, until the necessary modifications can be effected.

IEZS
11

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 1	DOCKET NUMBER 05000272	LER NUMBER 84-009-00	PAGE 2 OF 4
-------------------------------------------	----------------------------------	--------------------------------	-----------------------

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are indentified in the text as [XX].

IDENTIFICATION OF OCCURRENCE:

Wave Run-up Analysis - Technical Discrepancy in Design Elevation Calculations for Service Water Intake Structure

Event Date: 02/29/84

Report Date: 03/30/84

This report was initiated by Incident Report No. 84-043

CONDITIONS PRIOR TO OCCURRENCE:

Unit 1 - Mode 5 - Rx Power 000% - Unit Load 0000 MWe

Unit 2 - Mode 1 - Rx Power 100% - Unit Load 1140 MWe

DESCRIPTION OF OCCURRENCE:

In 1973, Dames & Moore performed maximum water level calculations for the Salem Power Block, Fuel Handling Buildings, and the Service Water Intake Structure. This analysis considers the worst case 1000 year Probable Maximum Hurricane (PMH), plus concurrent flooding from wind and tidal action at the Salem Site. In November 1983, observations by an NRC staff hydrologist revealed a possible technical discrepancy with these calculations. As a result of those observations, PSE&G requested that Dames & Moore recheck the Salem flood elevation calculations.

On December 27, 1983, Salem received the revised calculations from Dames & Moore. The review indicated that the wave run-up/water tightness elevations originally calculated for the Service Water Intake Structure did contain a discrepancy; although, the original calculations for the balance of the plant (power block and fuel handling buildings) were calculated correctly. The discrepancy only exists for the Service Water Intake Structure.

PSE&G retained the services of a Bechtel staff hydrologist to act as an independent third party check of the revised calculations of Dames & Moore. This matter was verbally reported to the NRC Resident Inspector in November 1983. However, official notification to the NRC was not done until receipt of Bechtel's confirmation of the correctness of Dames & Moore's calculations. PSE&G received the Bechtel report on February 29, 1984.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 1	DOCKET NUMBER 05000272	LER NUMBER 84-009-00	PAGE 3 OF 4
------------------------------------	---------------------------	-------------------------	----------------

APPARENT CAUSE OF OCCURRENCE:

It was determined that the Salem design elevations for the Service Water Intake Structure for wave run-up/water tightness were based on "Significant" wave heights, and not "Maximum" wave heights. Significant height is the average of the highest thirty-three percent (33%) of all waves postulated for that site. Maximum height is the average of the highest one percent (1%) of all waves postulated for that site. The Corps of Engineer's Shore Protection Manual (which constitutes the industry standard for this subject and is specified in Regulatory Guide 1.59, Appendix A) requires the use of maximum wave heights for such designs; wherein, maximum wave height equals 1.67 times significant wave height.

ANALYSIS OF OCCURRENCE:

The original calculation for determining the height of the Service Water Intake Structure (SWIS) against the 1000 year maximum credible wave height of 120.4 feet has been revised; (ground level is approximately 100 feet). The new calculation determined the maximum credible wave height for the front and back of the SWIS to be 123.9 feet and 127.3 feet, respectively. Consequently, the re-calculations indicate that the air intake louvers (located in the front of the SWIS and facing the Delaware River) should be watertight to at least elevation 123.9 feet instead of the current elevation of 122.0 feet, and the air exhausts and electrical control rooms air intakes should be watertight to at least elevation 127.3 feet instead of the current elevation 126.0 feet.

The concern arises from a potential for water inleakage to the Service Water pump bay area and to the Motor Control Center through the ventilation duct openings on the top of the SWIS. Presently, at the front of the SWIS, water must reach a height of 123.8 feet in order to enter under a louver. The louvers have two ridges on them that the water must hit prior to entering the screen. Since the new calculations indicate that the maximum wave height for the front of the SWIS is 123.9 feet, it can be safely assumed that the ridges would deflect the 0.1 foot of splash. Therefore, water entry at the front of the SWIS through the louvers is highly unlikely.

At the rear of the SWIS, two places are vulnerable to inleakage. The first of which is around the exhaust fans, where the air opening begins at 126.8 feet. This dimension is 0.5 feet under the splash height of 127.3 feet. Since there is a torturous path from the predicted wave and the intake (180 degree turn around), and there is a screen on the fan, it is highly unlikely that any water would enter through the circular fan openings. The second place of concern is through the air supply duct for the Motor Control Centers. The height of the sleeve is 127.1 feet, and is protected from rain by a concrete shelter. The maximum credible wave height at the rear of the SWIS is 127.3 feet. The water (0.2 feet) must follow a twisting path, and flow through a mesh screen to enter the structure. A roof drain is also present to alleviate any water

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 1	DOCKET NUMBER 05000272	LER NUMBER 84-009-00	PAGE 4 OF 4
------------------------------------	---------------------------	-------------------------	----------------

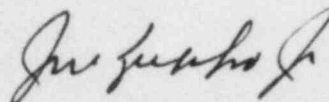
ANALYSIS OF OCCURRENCE: (cont'd)

buildup on the roof. The majority of water will flow past the sleeve and off the other side of the building. The roof is also slightly sloped to allow runoff.

Based upon the new calculations, and the evaluations performed, there are no safety concerns associated with the continued operations of either unit, for a short interim, until the necessary modifications to the SWIS can be effected. This discrepancy involves no undue risk to the health or safety of the public. Because of the discovery of an error in a design analysis, the occurrence is reportable in accordance with the Code of Federal Regulations, 10CFR 50.73(a)(2)(v).

CORRECTIVE ACTION:

Design Changes will be issued to raise the level of the SWIS air intake louvers, and to modify the air exhausts and the electrical control rooms air intakes, to ensure watertight integrity in the event of a maximum calculated credible wave occurrence. It is anticipated that these modifications should be complete by the end of July 1984.



General Manager-
Salem Operations

JLR:tns

SORC Mtg 84-038



PSEG

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

Salem Generating Station

March 30, 1984

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 84-009-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(v). This report is required within thirty (30) days of discovery.

Sincerely yours,

J. M. Zupko, Jr.
General Manager -
Salem Operations

JR:k11

CC: Distribution