NRC FORM 366
(7-77)

LICENSEE EVENT REPORT

CONTROL BLOCK: [| | | | | |] (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1	N J S G S 2 (2)	LICENSEE CODE	0 0 - 0 0 0 0 0 - 0 0 (3)	LICENSE NUMBER	4 1 1 1 1 (4)	LICENSE TYPE	(5) CAT

CON'T

0 1	REPORT SOURCE	L (6)	0 5 0 0 0 3 1 1 (7)	DOCKET NUMBER	0 7 2 5 8 3 (8)	EVENT DATE	0 8 0 3 8 3 (9)	REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 On July 25, 1983, during a routine startup following refueling, flux map results

0 3 indicated that the Technical Specification limits for the Enthalpy Hot Channel Factor

0 4 would be exceeded during low power operation with control rods near the insertion limits.

0 5 The plant was not operated in a manner of concern and immediate measures were taken to

0 6 insure compliance with the Technical Specifications. The event involved a condition

0 7 which could possibly have resulted in operation less conservative than assumed in the

0 8 accident analyses per Technical Specification 6.9.1.8h.

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP SUBCODE	VALVE SUBCODE
0 9	R C (11)	B (12)	A (13)	F U E L X X (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 3	—	0 3 5	/	0 1	T	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
G (18)	X (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	N (24)	W (25)	W 1 2 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The possible problem had been revealed by a PSE&G reload safety evaluation model.

1 1 Further investigation confirmed the model predictions. In addition to revision of the

1 2 control rod insertion limits, a License Change Request will be submitted to eliminate

1 3 the problem.

1 4

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	C (28)	0 0 2 (29)	NA	C (31)	Special Testing

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	NA

8308150277 830803
PDR ADOCK 05000311
S PDR

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	NA	

NAME OF PREPARER R. Frahm PHONE (609) 935-6000 Ext. 4309

IE22

PSEG

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

Salem Generating Station

August 4, 1983

Dr. Thomas E. Murley
Regional Administrator
USNRC
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Dr. Murley:

LICENSE NO. DPR-75
DOCKET NO. 50-311
REPORTABLE OCCURRENCE 83-035/01T

Pursuant to the requirements of Salem Generating Station Unit No. 2, Technical Specifications, Section 6.9.1.8h, we are submitting Licensee Event Report for Reportable Occurrence 83-035/01T. This report is required within fourteen (14) days of the occurrence.

Sincerely yours,

J. M. Zupko

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

RF:kll 967

CC: Distribution

IE22

Report Number: 83-035/01T

Report Date: 08-03-83

Occurrence Date: 07-25-83

Facility: Salem Generating Station Unit 2
Public Service Electric & Gas Company
Hancock's Bridge, New Jersey 08038

IDENTIFICATION OF OCCURRENCE:

Power Distribution Limits - Enthalpy Hot Channel Factor - Potentially Out of Specification.

This report was initiated by Incident Report 83-123.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 2 - Rx Power 2 % - Unit Load 0 MWe.

DESCRIPTION OF OCCURRENCE:

On July 25, 1983, during a routine startup following refueling, flux map results indicated that the Technical Specification limits for Enthalpy Hot Channel Factor ($F\Delta H$) would be exceeded during low power operation with control rods near the insertion limits. The flux map was conducted below insertion limits in Mode 2, to verify this result as predicted by the PSE&G Nuclear Fuel Analysis Group. ($F\Delta H$ limits do not apply in Mode 2). Only Salem Unit 2, Fuel Cycle 2, is affected.

Prompt notification of the NRC was performed on July 25, with written confirmation transmitted the next day. Immediate measures were taken to establish more conservative control rod insertion limits and insure compliance with the Technical Specifications during operation at power.

APPARENT CAUSE OF OCCURRENCE:

The Salem Unit 2, Cycle 2 core design and Reload Safety Evaluation (RSE) was performed by Westinghouse Nuclear Fuel Division (NFD). PSE&G performed an independent RSE to verify the NFD analysis. Preliminary results from the PSE&G RSE indicated that the quantity $F\Delta H$ would violate the Technical Specifications at low power, rodded conditions. This apparent discrepancy was initially discussed informally with NFD in December 1982.

In March, 1983, PSE&G concluded analytical investigations which demonstrated that the discrepancy could be attributed to differences between two-dimensional (2D) core physics modeling (used by NFD) and the PSE&G three-dimensional (3D) modeling. The 3D model predicted higher assembly power levels on the core periphery, particularly along diagonal lines of symmetry. This difference was relatively small for full power but increased for low power, rodded conditions at BOC. The 3D model predicted a violation of $F\Delta H$ Technical Specification limits at the Zero Power Insertion Limit (ZPIL).

APPARENT CAUSE OF OCCURRENCE: (cont'd)

This potential for violation was identified to the NRC in a letter desribing the results of the Revised Cycle 2 Reload Analysis, May 16, 1983. In this letter, PSE&G desribed plans to preclude violation by making special low power, rodded flux map measurements and determining appropriate administrative rod insertion limits prior to entering Mode 1. A commitment was made to submit an appropriate request for a license change should administrative limits be required. As noted, startup measurements at zero power demonstrated the PSE&G 3D model predictions to be correct. Subsequent flux maps at 50% power confirmed the zero power measurements.

ANALYSIS OF OCCURRENCE:

The limits on the nuclear enthalpy hot channel factor $F_{\Delta H}$ ensure that the minimum value of the DNBR during steady state operation, normal operational transients, and anticipated transients is limited to 1.30.

Based on the results of the rodded flux map measurements made in Mode 2, the currently approved rod insertion limit would not be sufficient to maintain the quantity $F_{\Delta H}$ within the current limits. The reactor was not operated in a manner of concern, however, and as noted, measures were immediately implemented to preclude such operation. It should also be noted that, although the $F_{\Delta H}$ limits would be exceeded near the current zero power rod insertion limits, a large margin to minimum DNBR would be maintained. The event therefore involved no undue risk to the health or safety of the public.

Due to the presence of a condition which could have possibly resulted in operation in a manner less conservative than assumed in the transient or accident analyses, the event is reportable in accordance with Technical Specification 6.9.1.8h.

CORRECTIVE ACTION:

As noted, immediate action was taken to revise control rod insertion limits and insure compliance with the Technical Specifications. Based on the results of the startup test measurements, the ZPIL for Bank D was administratively changed from 2 to 47 steps. These measures, combined with existing Technical Specification requirements and procedural controls, ensured safe operation of the unit. Accordingly, the startup of Salem Unit 2 was continued. A License Change Request is now being prepared for submittal to the NRC.

FAILURE DATA:

Not Applicable

Prepared By R. Frahm

J. M. Zupko
General Manager -
Salem Operations

SORC Meeting No. 83-105