NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Salem Generating Station - Unit 2	0 5 0 0 0 3 1 1	1 OF 0 3

TITLE (4)

Reactor Trip From 100% Due to Turbine Generator Failure

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)
										0 5 0 0 0
1 0	0 4	8 4	8 4	— 0 2 4	— 0 0	1 1	0 2	8 4		0 5 0 0 0

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)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
J. L. Rupp	6 0 9 — 3 3 9 — 4 3 0 9

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	
X	T B	T G	W 1 2 0	Y							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 2	0 1	8 5

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

At 0915 hours, October 4, 1984, during routine power operation, Unit 2 Turbine Generator tripped on generator differential relay protection. By design, the turbine trip caused a reactor trip. The Reactor Protection System functioned as designed. The turbine trip and reactor trip occurred as required to prevent additional generator damage, and to minimize the primary plant transient. This occurrence involved no undue risk to the health or safety of the public. However, due to the automatic actuation of the Reactor Protection System, the event is reportable in accordance with the Code of Federal Regulations, 10CFR 50.73(a)(2)(iv). Initial investigation revealed that the generator trip was caused by a phase-to-ground fault on stator coils B-40 and B-41. Some stator coils, at both the generator and turbine end, were discovered to be loose. In addition, a high potential test indicated additional distress in the Phase C winding. It has been decided to replace the generator, manufactured by Westinghouse, with one of a General Electric design. Although the generator is being replaced, investigations are continuing to assess the full extent of damage, and to determine the root cause of the failure.

IE 22

NRC Form 366
(9-83)

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

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

IDENTIFICATION OF OCCURRENCE:

Reactor Protection System [JC] - Reactor Trip From 100% - Turbine Generator Failure

Event Date: 10/04/84

Report Date: 11/02/84

This report was initiated by Incident Report No. 84-157

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 - Rx Power 100 % - Unit Load 1160 MWe

DESCRIPTION OF OCCURRENCE:

At 0915 hours, October 4, 1984, during routine power operation, Unit 2 Turbine Generator [TB] tripped on generator differential relay protection [EL]. By design, the turbine trip caused a reactor trip.

APPARENT CAUSE OF OCCURRENCE:

Initial investigation revealed that the generator trip was caused by a phase-to-ground fault. The ground fault occurred on stator coils B-40 and B-41, located on the turbine end of the generator. Some stator coils, at both the generator and turbine end, were discovered to be loose. The full extent of damage and the cause of the generator failure is still under investigation.

ANALYSIS OF OCCURRENCE:

The primary function of the reactor trip (on turbine trip) is to prevent steam generator safety valve actuation, due to the steam generator pressure increase in the event that the turbine should trip during power operation. A turbine trip is sensed by two (2) out of three (3) signals from low autostop oil pressure or all turbine steam stop valves off open position signals. A turbine trip causes a direct reactor trip above approximately ten percent (10%) reactor power (P-7 interlock circuitry), and results in a controlled short term release of steam to the turbine condenser. This steam release removes sensible heat from the Reactor Coolant System [AB] and thereby avoids steam generator safety valve actuation.

ANALYSIS OF OCCURRENCE: (cont'd)

This reactor trip is anticipatory, and is included as part of good engineering practice and prudent design. No credit is taken in any of the safety analyses for this trip. Reactor protection, during power operation, is provided by the Power Range Detectors for rapid transients, and by the Overtemperature and Overpower Delta Temperature for slower developing transients. The Reactor Protection System [JC] functioned as designed. The turbine trip and the reactor trip occurred as required to prevent additional generator damage, and to minimize the primary plant transient. This occurrence involved no undue risk to the health or safety of the public. Because of the automatic actuation of the Reactor Protection System, the event is reportable in accordance with the Code of Federal Regulations, 10CFR 50.73(a)(2)(iv).

CORRECTIVE ACTION:

A high potential test was performed on the generator. Results of the test indicate additional distress in the Phase C windings. The failure of this generator appears to be very similar to the failure experienced with Unit 1 generator. The circumstances surrounding the Unit 1 generator failure are documented in Unit 1 LER 84-005-00.

It has been decided to replace the Unit 2 generator, manufactured by Westinghouse, with one of a General Electric design. Although the generator is being replaced, investigations are continuing to assess the full extent of damage, and to determine the root cause of the failure. A supplemental report will be issued upon completion of the investigation.

General Manager-
Salem Operations

JLR:tns

SORC Mtg 84-146

PSE&G

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

Salem Generating Station

November 2, 1984

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

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-75
DOCKET NO. 50-311
UNIT NO. 2
LICENSEE EVENT REPORT 84-024-00

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

Sincerely yours,

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

JR:kll

CC: Distribution

IE22
1/1