



PSEG

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038

Salem Generating Station

July 29, 1993

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 93-010-00

This Licensee Event Report is being submitted pursuant to the requirements of the Code of Federal Regulations 10CFR 50.73(a)(2)(i)(B). This report is required to be issued within thirty (30) days of event discovery.

Sincerely yours,

Mark Shellock for

C. A Vondra
General Manager -
Salem Operations

MJPJ:pc

Distribution

020036

The power is in your hands.
060037

9310070122 930729
PDR ADOCK 05000311
S PDR

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Salem Generating Station - Unit 2						DOCKET NUMBER (2) 0 5 0 0 0 3 1 1 1			PAGE (3) 1 OF 0 4	
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T/S 3.0.3 Entries; More Than One Inoperable Analog Rod Position Indicator Per Bank.

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	6	93	93	000	0	0	07	29	93	Salem Unit 1	0 5 0 0 0 2 7 2
									0 5 0 0 0		

OPERATING MODE (9) 2		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																					
POWER LEVEL (10) 0 0 0	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)	20.406(c)	80.38(c)(1)	80.38(c)(2)	80.73(a)(2)(i)	80.73(a)(2)(ii)	80.73(a)(2)(iii)	80.73(a)(2)(iv)	80.73(a)(2)(v)	80.73(a)(2)(vi)	80.73(a)(2)(vii)	80.73(a)(2)(viii)(A)	80.73(a)(2)(viii)(B)	80.73(a)(2)(ix)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	
										X													

LICENSEE CONTACT FOR THIS LER (12)										TELEPHONE NUMBER	
NAME M. J. Pastva, Jr. - LER Coordinator										AREA CODE	
										6 0 9 3 3 9 - 5 1 6 5	

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	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
<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)

This LER addresses 3 Technical Specification (T/S) 3.0.3 entries due to inoperability of more than one control rod Analog Rod Position Indication (ARPI) per control rod bank. On 6/29/93, at 1200 hours, Unit 2 T/S 3.0.3 was entered for rods 1B2, 2B1, and 2B4. At 1255 hours, reactor shutdown was initiated in accordance with T/S 3.0.3. At 1345 hours, the shutdown was terminated and T/S 3.0.3 was exited after control rods 2B4 and 2B1 ARPIS were restored to specification. At 1410 hours, the T/S Action Statement was exited after rod 1B2 was restored to specification. On 6/30/93, at 0217 hours, Unit 2 T/S 3.0.3 was entered for rods 1SB2 and 1SB4. At 0259 hours, T/S 3.0.3 was exited when 1SB4 returned to specification due to thermal soak. At 0304 hours, the T/S Action Statement was exited when 1SB2 was adjusted to specification. On 7/16/90, at 2300 hours, Unit 1 T/S 3.0.3 was entered for rods 1D3, 2D1, 2D3, 2D4 and 2D5. At 2350 hours, reactor shutdown was initiated in accordance with T/S 3.0.3. On 7/17/93, at 0330 hours, the shutdown was terminated and T/S 3.0.3 was exited after rods 2D1, 2D3, 2D4, and 2D5 were restored to specification. The root cause of these events is system design. The ARPI System electronic settings experience drift due to temperature susceptibility of the system coil stacks. The signal conditioning modules of the affected rods were adjusted. System Engineering has developed an ARPI trending data base to identify problem electronic modules. The industry Rod Control User's Group has recognized an industry-wide problem with ARPI System drift. Recommendations from this group and the vendors will be used to develop appropriate action.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	93-010-00	2 of 4

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

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

IDENTIFICATION OF OCCURRENCE:

Technical Specification 3.0.3 Entries; More Than One Inoperable Analog Rod Position Indicator Per Bank

Unit 2 Event Dates: 6/29/93 and 6/30/93

Unit 1 Event Date: 7/16/93

Report Date: 7/29/93

This report was initiated by Incident Report Nos. 93-283, 93-284, and 93-311.

CONDITIONS PRIOR TO OCCURRENCE:

Unit 2 - refueling/maintenance outage completed; startup in progress; Physics testing had been completed prior to the 6/29/93 event validating control rod positions.

6/29/93: Mode 2 Reactor Power 0%

6/30/93: Mode 2 Reactor Power 2%

Unit 1 - startup in progress (following a 7/11/93 Reactor Trip)

7/16/93: Mode 2 Reactor Power 1.5%

DESCRIPTION OF OCCURRENCES:

This LER addresses two (2) Technical Specification (T/S) 3.0.3 entries on Unit 2 and one (1) T/S 3.0.3 entry on Unit 1 due to inoperability of more than one control rod Analog Rod Position Indication (ARPI) per control rod bank {AA} (see Analysis of Occurrence).

On June 29, 1993, at 1200 hours, Unit 2 T/S 3.0.3 was entered when ARPI for rods 1B2, 2B1, and 2B4 indicated greater than a ± 12 step deviation from their group demand counters. At 1255 hours, reactor shutdown was initiated in accordance with T/S 3.0.3. At 1314 hours, the Nuclear Regulator Commission (NRC) was notified of the reactor shutdown initiation, in accordance with Code of Federal Regulations 10CFR50.72(b)(1)(i)(A).

At 1345 hours, the Unit 2 shutdown was terminated and T/S 3.0.3 was exited after control rods 2B4 and 2B1 ARPIs were restored to specification. At 1410 hours, T/S 3.1.3.2.1 Action "a" was exited after the ARPI of rod 1B2 was restored to specification.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	93-010-00	3 of 4

DESCRIPTION OF OCCURRENCES: (cont'd)

On June 30, 1993, at 0217 hours, Unit 2 T/S 3.0.3 was entered when ARPI for rods 1SB2 and 1SB4 indicated greater than a ± 12 step deviation from their group demand counter. At 0259 hours, T/S 3.0.3 was exited when 1SB4 returned to specification due to thermal soak. At 0304 hours, T/S 3.1.3.2.1 Action "a" was exited when 1SB2 was adjusted to specification.

On July 16, 1993, at 2300 hours, Unit 1 T/S 3.0.3 was entered when ARPI for rods 1D3, 2D1, 2D3, 2D4 and 2D5 indicated greater than a ± 12 step deviation from their group demand counter. At 2350 hours, reactor shutdown was initiated in accordance with T/S 3.0.3. A flux map was completed verifying control rod position for the affected rods. At 0330 hours on July 17, 1993, the Unit 1 shutdown was terminated and T/S 3.0.3 was exited after the ARPI of rods 2D1, 2D3, 2D4, and 2D5 were restored to specification. The NRC was notified of the reactor shutdown initiation, at 0023 hours on July 17, 1993, in accordance with Code of Federal Regulations 10CFR50.72(b)(1)(i)(A).

APPARENT CAUSE OF OCCURRENCES:

The root cause of these events (both Units) is "Design, Manufacturing, Construction/Installation", per NUREG-1022.

ARPI system electronic settings, associated with the Westinghouse Signal Condition Module and Control Rod coil stack on both units have a history of drift due to the analog coil stacks' susceptibility to temperature changes. During each event, actual rod positions (per group demand) were verified correct, in accordance with the Reactor Engineering Manual.

ANALYSIS OF OCCURRENCES:

ARPI operability is required to determine individual control rod position. This ensures compliance with control rod alignment and insertion limits assumed in the accident analyses.

T/S 3.1.3.2.1 addresses the operability requirement of the "Reactivity Control System's" {AA} position indicating systems. The indicators are determined operable by verifying that the rod position indication system agrees within twelve (12) steps of the group demand counters. Respectively, on June 29 and June 30 (Unit 2) and July 17 (Unit 1), when more than one ARPI per bank became inoperable, T/S 3.1.3.2.1 Limiting Condition For Operation was exceeded and T/S 3.0.3 applied. With entry into T/S 3.0.3, these events are reportable to the NRC per Code of Federal Regulations 10CFR 50.73(a)(2)(i)(B).

T/S 3.0.3 states:

"When a Limiting Condition for Operation is not met except as provided in the associated ACTION requirements, within one hour

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	93-010-00	4 of 4

ANALYSIS OF OCCURRENCES: (cont'd)

action shall be initiated to place the unit in a MODE in which the specification does not apply by placing it, as applicable, in:

1. At least HOT STANDBY within the next 6 hours,
2. At least HOT SHUTDOWN within the following 6 hours, and
3. At least COLD SHUTDOWN within the subsequent 24 hours.

Where corrective measures are completed that permit operation under the ACTION requirements, the ACTION may be taken in accordance with the specified time limits as measured from the time of failure to meet the Limiting Condition of Operation. Exceptions to these requirements are stated in the individual specifications."

PRIOR SIMILAR OCCURRENCES:

These events requiring T/S 3.0.3 entry, due to ARPI control rod equipment and design concerns, have occurred previously on both Salem Units. The most recent Unit 1 event occurred on February 26, 1993 (reference LER 272/93-007-00) and the most recent Unit 2 event occurred on November 14, 1992 (reference LER 311/92-016-00).

SAFETY SIGNIFICANCE:

T/S required actions were met for these events. Also, control rod position was correct with only ARPI indication having drifted greater than ± 12 steps; therefore, these events did not affect the health or safety of the public.

CORRECTIVE ACTION:

The signal conditioning modules of the affected rods were adjusted.

System Engineering has developed an ARPI trending data base to identify problem electronic modules.

The industry Rod Control User's Group has recognized an industry-wide problem with ARPI System drift. Recommendations from this group and the vendors will be used to develop appropriate action.

Mark Sheehan

General Manager -
Salem Operations