



**PSEG**

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

**Salem Generating Station**

February 16, 1994

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 94-002-00

This Licensee Event Report is being submitted pursuant to the requirements of Code of Federal Regulation 10CFR50.73(a)(2)(i)(B). Issuance of this report is required within thirty (30) days of event discovery.

Sincerely yours,

  
J. J. Hagan  
General Manager -  
Salem Operations

MJPJ:pc

Distribution

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9402230294 940216  
PDR ADCK 05000272  
S PDR

The power is in your hands.

  
1/1

**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 (MNNB 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)<br>Salem Generating Station - Unit 1 | DOCKET NUMBER (2)<br>05000 272 | PAGE (3)<br>1 OF 05 |
|--|--------------------------------|---------------------|

TITLE (4)  
Manual RPS Actuation Due To Less Than Required Operable Control Rod Demand Pos. Indicators

| 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          |
| 01             | 21  | 94   | 94             | 002               | 00              | 02                | 16  | 94   | FACILITY NAME                 | DOCKET NUMBER<br>05000 |
|                |     |      |                |                   |                 |                   |     |      | FACILITY NAME                 | DOCKET NUMBER<br>05000 |

|                         |   |   |                      |  |
|-------------------------|---|---|----------------------|--|
| OPERATING MODE (9)<br>3 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) |   |                      |  |
| POWER LEVEL (10)<br>000 | 20.402(b)   | 20.405(c)   | 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  |
|                         | 20.405(a)(1)(iii)   | 50.73(a)(2)(i)                                      | 50.73(a)(2)(viii)(A) | (Specify in Abstract below and in Text, NRC Form 366A) |
|                         | 20.405(a)(1)(iv)  | <input checked="" type="checkbox"/> 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<br>M. J. Pastva, Jr. - LER Coordinator | TELEPHONE NUMBER (include Area Code)<br>(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 |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| B     | AA     | ZI        | S120         | Y                   |       |        |           |              |                     |

|  |                                     |    |                               |       |     |      |
|--|-------------------------------------|----|-------------------------------|-------|-----|------|
| SUPPLEMENTAL REPORT EXPECTED (14)                  |                                     |    | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| YES<br>(If yes, complete EXPECTED SUBMISSION DATE) | <input checked="" type="checkbox"/> | NO |                               |       |     |      |

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

On 1/21/94, at 1017 hours, the Reactor was manually tripped, (reactor trip system breakers opened) in accordance with Technical Specifications. During rod drop testing, the step counter readings of the Control Rod Shutdown Bank B group demand position indicators for Groups 1 and 2 did not agree: Group 1 demand indicated 188 steps for rod SB1 while Group 2 indicated 174 steps for rod SB2. Testing was stopped, position was verified at 188 steps, and the Group 2 indicator was declared inoperable. The cause of this event is improper assembly, by the supplier, of the indicator step counter liquid crystal display (LCD) module to the counter back plane. The counter was replaced with a spare, which was satisfactorily tested and placed into service. The indicator supplier, Science Application International Corporation (SAIC), has been requested to provide the results of full inline inspection and failure analyses of the failed counter. The Unit 2 design change package for installing these counters will be revised to provide for visual verification/testing to confirm that the indicator LCD module is properly installed. The PSE&G vendor manual will be revised to ensure proper operation of SAIC GRID counters prior to installation or replacement. This event will be reviewed by Operations personnel and by the Training Department for incorporation into the Operations lesson plan.

**REQUIRED NUMBER OF DIGITS/CHARACTERS  
FOR EACH BLOCK**

| <b>BLOCK NUMBER</b> | <b>NUMBER OF DIGITS/CHARACTERS</b>  | <b>TITLE</b>                 |
|---------------------|---|------------------------------|
| 1                   | UP TO 46  | FACILITY NAME                |
| 2                   | 8 TOTAL<br>3 IN ADDITION TO 05000   | DOCKET NUMBER                |
| 3                   | VARIES  | PAGE NUMBER                  |
| 4                   | UP TO 76  | TITLE                        |
| 5                   | 6 TOTAL<br>2 PER BLOCK  | EVENT DATE                   |
| 6                   | 7 TOTAL<br>2 FOR YEAR<br>3 FOR SEQUENTIAL NUMBER<br>2 FOR REVISION NUMBER             | LER NUMBER                   |
| 7                   | 6 TOTAL<br>2 PER BLOCK  | REPORT DATE                  |
| 8                   | UP TO 18 -- FACILITY NAME<br><br>8 TOTAL -- DOCKET NUMBER<br>3 IN ADDITION TO 05000   | OTHER FACILITIES INVOLVED    |
| 9                   | 1   | OPERATING MODE               |
| 10                  | 3   | POWER LEVEL                  |
| 11                  | 1.<br>CHECK BOX THAT APPLIES  | REQUIREMENTS OF 10 CFR       |
| 12                  | UP TO 50 FOR NAME<br>14 FOR TELEPHONE   | LICENSEE CONTACT             |
| 13                  | CAUSE VARIES<br>2 FOR SYSTEM<br>4 FOR COMPONENT<br>4 FOR MANUFACTURER<br>NPRDS VARIES | EACH COMPONENT FAILURE       |
| 14                  | 1<br>CHECK BOX THAT APPLIES   | SUPPLEMENTAL REPORT EXPECTED |
| 15                  | 6 TOTAL<br>2 PER BLOCK  | EXPECTED SUBMISSION DATE     |

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

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

IDENTIFICATION OF OCCURRENCE:

Manual Reactor Protection System Actuation Due To Less Than Required Operable Control Rod Group Demand Position Indicators

Event Date: 1/21/94

Report Date: 2/16/94

This report was initiated by Incident Report Nos. 94-025 and 94-026 .

CONDITIONS PRIOR TO OCCURRENCE:

11th Refueling Outage in progress with the Unit in Mode 3.

Control rod drop time testing of Shutdown Bank B, was in progress in accordance with procedure S1.IC-ST.RCS-0001(Q), "ROD DROP TIME MEASUREMENT - HOT FULL FLOW".

DESCRIPTION OF OCCURRENCE:

On January 12, 1994, at 1017 hours, the Reactor was manually tripped, (reactor trip system breakers opened) in accordance with Technical Specification (TS) 3.1.3.2.2. During rod drop testing, the step counter readings of the Control Rod Shutdown Bank B group demand position indicators {AA} for rod Groups 1 and 2 did not agree: Group 1 demand indicated 188 steps for rod SB1 while Group 2 indicated 174 steps for rod SB2. Testing was stopped and position shown by the plant P250 computer {ID} was verified to be 188 steps. The Group 2 demand position indicator was declared inoperable. The NRC was notified of the manual actuation of the Reactor Protection System (RPS) {JC}, at 1835 hours, in accordance with the requirements of 10CFR50.72(b)(2)(ii).

ANALYSIS OF OCCURRENCE:

Operability of the control rod position demand indicators ensures compliance with control rod alignment and insertion limits. The indicators are determined operable by verifying that the rod position indication system agrees within twelve (12) steps of the group demand counters for a range of positions. This permits the Operator to verify that the control rods in the bank are either fully withdrawn or

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ANALYSIS OF OCCURRENCE: (cont'd)

fully inserted and satisfies accident analysis assumptions concerning their position.

During control rod drop time testing of Shutdown Bank B, the Group 1 position demand indicator (step counter) showed 188 steps while the step counter for Group 2 showed 174 steps. Testing was stopped and position of the groups, as shown by the P-250 plant process computer, was verified to be 188 steps. The Group 2 step counter was then declared inoperable and in accordance with TS, the Reactor was manually tripped (reactor trip system breakers opened). The Rod Control System was functioning correctly; however, the demand position indicator counter liquid crystal display (LCD) display did not change when the counter audible clicker operated. The subject indicator counter is one of the 14 Science Application International Corporation (SAIC) Group Rod Indicator Displays (GRID) installed, in accordance with a design change package (DCP), during the recent 1R11 Unit refueling/maintenance outage.

Bench testing the indicator demand counter, SAIC GRID serial number (S/N) 881993-20, determined the failure resulted from improper assembly of the counter LCD display module, "SUPER SUB-CUB", supplied by Red Lion Controls. Inspection revealed the LCD display module elastomeric strip was not making proper contact with the counter back plane (PC Board). This resulted from the LCD display module locking pin not properly penetrating the PC Board. Consequently, the PC board under the strip was exposed to ambient conditions and the pad area developed oxidation. This restricted electrical current flow to the LCD display module, which resulted in the erroneous LCD indications.

The failed counter was replaced with a spare, which was inspected and tested to ensure proper assembly of the LCD module to the counter PC Board, and returned to service. Non-reportable SAIC GRID counter failures, (i.e. not requiring RPS actuation) occurred on December 29, 1993, and following the event reported in this LER, on January 21, 1994. Following these failures, spare GRID counters were also installed and satisfactorily tested. These non-reportable failures are also attributed to improper assembly of the LCD display module elastomeric strip to the associated PC Board. Additional testing on installed Unit 1 SAIC counters did not reveal any additional problems, with exception of the second non-reportable failure on January 21, 1994. On February 11, 1994, SAIC made 10CFR21 notification in response to these failures and other SAIC GRID failures, which are not applicable to PSE&G.

SAIC has been requested to provide the results of full inline

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ANALYSIS OF OCCURRENCE: (cont'd)

inspection and failure analyses of the failed GRID counters described in this report. The Unit 2 DCP for installing these counters will be revised to provide for visual verification and testing in order to confirm that the indicator LCD module is properly installed. The PSE&G vendor manual will be revised to ensure proper operation of SAIC GRID counters prior to installation or replacement.

APPARENT CAUSE OF OCCURRENCE:

The cause of this event is "Design, Manufacturing, Construction/Installation", as classified in Appendix B of NUREG-1022. This occurred due to improper assembly of the step counter LCD display module to the counter PC Board.

PREVIOUS OCCURRENCES:

A review of documentation did not reveal a previous occurrence.

SAFETY SIGNIFICANCE:

This event did not affect the health and safety of the public and is reportable to the NRC pursuant to Code of Federal Regulations 10CFR 50.73(a)(2)(iv). During this event, control rod position was correct and the TS required action was met. In accordance with procedure S1.IC-ST.RCS-0001(Q), Reactor Engineering verifies the reactor will remain sub-critical with  $K_{eff} \leq 0.95$ , when any Shutdown or Control Rod Bank is fully withdrawn from the core under hot plant conditions. As such, this event did not affect plant safety.

CORRECTIVE ACTION:

The failed counter (reported by this LER) was replaced with a spare, which was satisfactorily tested and placed into service.

SAIC has been requested to provide the results of full inline inspection and failure analyses of the failed GRID counters described in this report.

The Unit 2 design change package for installing these counters will be revised to provide for visual verification and testing in order to confirm that the indicator LCD module is properly installed.

The PSE&G vendor manual will be revised to ensure proper operation of SAIC GRID counters prior to installation or replacement.

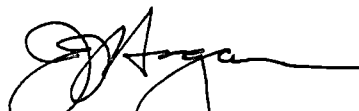
This event will be reviewed by Operations personnel and by the

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CORRECTIVE ACTION: (cont'd)

Training Department for incorporation into the Operations lesson plan.

  
General Manager -  
Salem Operations

MJPJ:pc

SORC Mtg. 94-016