



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 61B, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

Direct Dial Number:

December 15, 1989

FM 89-219

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

Dear Sir:

In accordance with 10CFR50.73, enclosed is Shoreham Nuclear Power Station's Licensee Event Report LER 89-008.

Sincerely yours.

Jack A. Notaro
Plant Manager

JN/RP/jp

Enclosure

cc: William T. Russell, Regional Administrator
Frank Crescenzo, Senior Resident Inspector
Institute of Nuclear Power Operations, Records Center
American Nuclear Insurers

SR.A21.0200

8912260028 891215
PDR ADOCK 05000322
S PDC

IE22
11

LICENSEE EVENT REPORT (LER)

| | | |
|---|---|-----------------------------|
| FACILITY NAME (1) Shoreham Nuclear Power Station Unit 1 | DOCKET NUMBER (2) 0 5 0 1 0 0 3 2 1 2 | PAGE (3) 1 OF 0 5 |
|---|---|-----------------------------|

TITLE (4)
Improper Installation of Solenoid Operated Valves

| 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) |
| 11 | 15 | 89 | 89 | 009 | 00 | 12 | 15 | 89 | | | 0 5 0 1 0 0 |
| | | | | | | | | | | | 0 5 0 1 0 0 |

| | | | | | | | | | | |
|------------------------------------|---|--|--|--|--|--|--|--|--|--|
| OPERATING MODE (9) * | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (101) (Check one or more of the following) (11) | | | | | | | | | |
| POWER LEVEL (10) 0 1 0 0 | <input type="checkbox"/> 20.602(b) | <input type="checkbox"/> 20.606(a) | <input type="checkbox"/> 20.726(i)(2)(iv) | <input type="checkbox"/> 73.71(b) | | | | | | |
| | <input type="checkbox"/> 20.606(a)(1)(i) | <input type="checkbox"/> 20.606(a)(1) | <input checked="" type="checkbox"/> 20.726(i)(2)(iv) | <input type="checkbox"/> 73.71(c) | | | | | | |
| | <input type="checkbox"/> 20.606(a)(1)(ii) | <input type="checkbox"/> 20.606(a)(2) | <input type="checkbox"/> 20.726(i)(2)(v) | OTHER (Specify in Abstract below and in Text, NRC Form 306A) | | | | | | |
| | <input type="checkbox"/> 20.606(a)(1)(iii) | <input type="checkbox"/> 20.726(i)(3)(i) | <input type="checkbox"/> 20.726(i)(2)(vi)(A) | | | | | | | |
| | <input type="checkbox"/> 20.606(a)(1)(iv) | <input type="checkbox"/> 20.726(i)(3)(ii) | <input type="checkbox"/> 20.726(i)(2)(vi)(B) | | | | | | | |
| | <input type="checkbox"/> 20.606(a)(1)(v) | <input type="checkbox"/> 20.726(i)(3)(iii) | <input type="checkbox"/> 20.726(i)(2)(vi)(C) | | | | | | | |

| | | | |
|--|--|---------------------------|------------------------|
| LICENSEE CONTACT FOR THIS LER (12) | | TELEPHONE NUMBER | |
| NAME David A. Smith, Operational Compliance Engineer | | AREA CODE 5 1 6 | 9 2 9 - 3 3 0 6 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
| | | | | | | | | | |
| | | | | | | | | | |

| | | | | |
|---|-------------------------------|-------|-----|------|
| SUPPLEMENTAL REPORT EXPECTED (14) | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| <input type="checkbox"/> YES (If yes, month expected submission date) | <input type="checkbox"/> NO | | | |

ABSTRACT (Limit to 1400 words. Use approximately 11" x 17" single space typewriter for final) (16)

On November 15, 1989 at 1500, the Watch Engineer was notified of a potential failure mechanism of four 3-way solenoid operated pilot valves, 1T46*SOV-035A, 035B, 037A and 037B. These SOVs are the pilot valves for the Reactor Building Standby Ventilation System (RBSV) inlet and outlet air operated isolation valves 1T46*AOV-035A, 035B, 037A and 037B. During an accident situation, a concurrent failure or malfunction of these SOVs could prevent or slow down the closing of the isolation valves and result in the potential atmospheric release of effluent gas from the Reactor Building. The SOVs were mounted horizontally rather than vertically which was justified by their Engineering Design Basis but which may have contributed to operational reliability problems. This event was determined to be reportable per 10CFR50.72 (b) (2) (iii) (C) and the NRC was notified at 1532. This Licensee Event Report is being submitted per 10CFR50.73 (a) (2) (v). The SOVs are made by Automatic Switch Co.; their catalog numbers are HV206-832-6F, L206-380-6F and L206-832-6F. Corrective actions include remounting the four SOVs vertically, conducting a field walkdown of similar SOVs to verify their proper installation, modifications, and continue to do frequent testing of the AOV's to monitor and reestablish reliability.

* Reactor Defueled

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) | | |
|---------------------------------------|-------------------|----------------|-------------------|-----------------|----------|----|-----|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
| Shoreham Nuclear Power Station Unit 1 | 0 5 0 0 0 3 2 2 | 8 9 | - 0 0 9 | - | 0 2 | OF | 0 5 |

TEXT (If more space is required, use additional NRC Form 288A's) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

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

IDENTIFICATION OF THE EVENT

Event Date: 11/15/89

Report Date: 12/15/89

CONDITIONS PRIOR TO THE EVENT

Reactor Defueled - All fuel assemblies stored in the Spent Fuel Pool

Mode Switch - Shutdown

RPV Pressure = 0 psig

RPV Temperature = 84 Degrees F

POWER LEVEL - 0%

DESCRIPTION OF THE EVENT

On November 15, 1989 at 1500, the Watch Engineer was notified of a potential failure mechanism of four 3-way solenoid operated pilot valves (SOVs) in the Reactor Building Standby Ventilation System (RBSVS) [EH]. These 4 SOVs had been mounted with their solenoids in a horizontal position rather than vertical and upright as per the manufacturer's preferred orientation. The valves had been the subject of recent investigations of Surveillance problems with their associated AOVs. This event was determined to be reportable per 10CFR50.72 (b) (2) (iii) (C). Plant management personnel were notified and the NRC was notified at 1532.

The SOVs (1T46*SOV-35A/B and 37A/B) are pilot valves for the Reactor Building inlet and outlet air operated isolation valves, 1T46*AOV-035A/B and 1T46*AOV-37A/B. The SOVs are normally energized to allow instrument air to hold open the isolation valves which permits outside air to be supplied to and exhausted from the Reactor Building. In the event of a power failure or other accident conditions, these isolation valves are designed to close automatically.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | |
|--|--|----------------|-------------------|-----------------|----------|----------|
| FACILITY NAME (1) Shoreham Nuclear Power Station Unit 1 | DOCKET NUMBER (2) 0 5 0 0 0 3 2 2 8 9 | LER NUMBER (6) | | | PAGE (3) | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | | 8 9 | 0 0 9 | 0 0 | 0 3 | OF 0 5 |

TEXT (If more space is required, use additional NRC Form 306A's) (17)

This event was discovered while investigating the root cause of the periodic failures of the Reactor Building Automatic Isolation Valves 1T46*AOV35A/B and 1T46*ACV37A/B, to meet their 10 second closure times as required by Technical Specification Table 3.6.5.2-1. It is now believed that the horizontal mounting of the SOVs may have contributed to these periodic failures.

Because a verbal report to the NRC was made per 10CFR50.72 and because of the submission of this Licensee Event Report per 10CFR50.73(a)(2)(v)(C), LILCO considers this report to fulfill any reporting requirements that may be required by 10CFR21.

CAUSE OF THE EVENT

The SOVs were installed with solenoids mounted horizontally. This is contrary to the preferred configuration which states that the SOVs should be mounted with their solenoids vertical and upright.

The fact that the SOVs were mounted in an orientation 90 degrees off of the vertical was previously approved. The air-operated isolation valves (AOVs) supplied by Fisher Controls came with ASCO SOVs premounted. When these AOVs were installed the SOVs ended up horizontal. This was noted during the Torrey-Pines Independent Review of the Shoreham Nuclear Power Station (September 30, 1982). It was also noted during the Environmental Qualification Status Report verification walkdown performed mid-1982. Because the generic qualification testing performed by ASCO for the HV206-832-6F SOVs did not meet the more stringent seismic test requirements for Shoreham, ASCO was requested to perform additional seismic qualification testing of the SOVs when mounted horizontally. The test results are documented in ASCO's Test Report No. AQR-67594, dated Jan. 8, 1985. The horizontal mounting of the SOVs was accepted based upon the following items: 1) ASCO's Test Report No. AQR-67594, 2) the architect engineer's seismic calculation which verified SOV operability when mounted horizontally, and 3) the fact that the associated air-operated isolation valves met their closure time requirements.

The mounting of the SOVs was not changed in 1988 when the four SOVs were replaced with models L206-380-6F and L206-832-6F at the end of their environmentally qualified life. The modification design process used for this work took credit for the original installation design basis; therefore the work only involved replacing SOVs with similar ones.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | |
|--|--------------------------------|----------------|-------------------|-----------------|----------|--------|
| FACILITY NAME (1) Shoreham Nuclear Power Station Unit 1 | DOCKET NUMBER (2) 050003286 | LER NUMBER (6) | | | PAGE (3) | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | | -06 | 19 | -010 | 014 | OF 015 |

TEXT (if more space is required, use additional NRC Form 366A's) (17)

The Plant had experienced reliability problems with the AOVs to which the SOVs may have contributed. Continuing investigation of these problems led to issuance of LILCO Deficiency Report 89-189. Upon dispositioning of the LDR a reportability determination was initiated for a potential mounting discrepancy with the Environmental Qualification Documentation Package. This problem was reported per 50.72(b)(2)(iii)(C).

The Nuclear Engineering Department also began reviewing the design basis of the valves. The engineering design basis review determined that the valves would fulfill their design basis safety function in their original configuration. Due to the physical construction of the SOVs, the horizontally mounted SOVs may be more susceptible to problems due to mechanical friction. The valves have been oriented in the vertical position to alleviate this concern.

ANALYSIS OF THE EVENT

The two Reactor Building Ventilation supply valves, 1F46*AOV-035A and B, and the two exhaust valves, 1F46*AOV-037A and B are arranged in series so that the SOVs for both supply or for both exhaust isolation valves would have to malfunction concurrent with an accident to allow a potential release path. But, because all SOVs were mounted in the same configuration this double isolation valve arrangement may be susceptible to the same failure mechanism.

During the period covered by this event, the reactor accumulated slightly over 2 effective full power days of operation. This was accumulated while operating under a license that limited reactor thermal power to 5% of rated.

CORRECTIVE ACTIONS

1. The SOVs were mounted in the vertical position. The Reactor Building supply and isolation valves were tested per SP 24.418.02, HVAC Reactor Building - Secondary Containment Isolation Valves Operability Test, with satisfactory results.
2. During the investigation it was noted that an Environmental Qualification Engineers approval was not always required for all safety related modifications. To address this concern Nuclear Engineering Department (NED) Procedure 3.11, Control of LILCO Engineering Change Reports for Modification of Shoreham Design Documents, has been revised to require a review of safety-related Engineering Change Reports by an Environmental Qualification Engineer. NED Procedure 3.10, Preparation, Review and Approval of L-Series E&DCRs will be revised with the same intent.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | |
|--|--|----------------|-------------------|-------------------|----------|-------|
| FACILITY NAME (1) Shoreham Nuclear Power Station Unit 1 | DOCKET NUMBER (2) 0 5 0 0 0 3 2 2 8 9 | LER NUMBER (6) | | | PAGE (3) | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | | 0 1 0 9 | 0 1 0 9 | 0 1 0 0 5 | OF | 0 5 |

TEXT IF more space is required, use additional NRC Form 300A's (17)

3. To ensure that other SOVs are mounted acceptably a field walkdown of other appropriate SOVs was completed with no other discrepancies noted.
4. The AOVs will continue to be monitored through frequent testing of the valves. This frequency is greater than required by Technical Specifications. Testing will be performed until it is established that their reliability is adequate.

ADDITIONAL INFORMATION

- a. Manufacturer and model number of failed component (s): None
- b. LER numbers of previous similar events: None