

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

REPORT NO. 50-322/85-36  
DOCKET NO. 50-322  
LICENSE NO. NPF-36  
LICENSEE: Long Island Lighting Company  
P. O. Box 618  
Shoreham Nuclear Power Station  
Wading River, New York 11792  
FACILITY: Shoreham Nuclear Power Station  
LOCATION: Wading River, New York  
CONDUCTED: September 1 - 30, 1985

INSPECTORS:

*Jack Strosnider*  
for J. A. Berry, Senior Resident Inspector

*10/25/85*  
Date Signed

*Jack Strosnider*  
for E. L. Conner, Project Engineer, Section 1B

*10/25/85*  
Date Signed

APPROVED:

*Jack Strosnider*  
J. R. Strosnider, Chief  
Reactor Projects Section 1B, DRP

*10/25/85*  
Date Signed

SUMMARY: During the inspection period, September 1 through 30, 1985, the licensee continued testing under the 5% power license issued on July 3, 1985.

The inspectors observed plant operations conducted under the Power Ascension Test Program including reactor startup, shutdown and system testing. In addition, the inspectors reviewed licensee actions related to a level deviation on the 'B' Narrow Range Level Instrument, failure of bolts in the RHR System, and the licensee's Alcohol and Drug Abuse Program. Inspectors were also on-site prior to and during Hurricane Gloria.

The inspectors reviewed the status of previous opened items and closed three of these items. Two new items were opened as a result of this inspection. No violations were identified.

This inspection involved 65 hours by two inspectors. Additional inspection activities during this period are documented in Inspection Reports 50-322/85-35 and 50-322/85-37.

DETAILS1. Persons Contacted

H. Carter, Operating Engineer  
P. Pizzariello, Maintenance Engineer  
G. Rhoades, Lead Compliance Engineer - Impell Corporation  
J. Scalice, Operations Division Manager  
W. Steiger, Plant Manager  
D. Terry, Maintenance Division Manager  
E. Youngling, Manager - Nuclear Engineering Department

The inspectors also held discussions with other licensee and contractor personnel during the course of the inspection.

2. Plant Status

Shoreham continued plant operations and testing within the scope of the Power Ascension Test Program during this inspection period. During this testing program, the reactor was operating using the 'A' rod sequence, and rod time and friction testing of the 'A' rods was completed. The instruments associated with the 'B' reference leg during this period (see Section 6.0).

On September 9, 1985, an initiation of the Reactor Building Standby Ventilation System/Control Room Air Conditioning System occurred due to a voltage dip on the 13.8 kV offsite power system during a thunderstorm. Also on September 9 and September 18, 1985 the Control Room Air Conditioning System automatically initiated due to Low Reactor Building Differential Pressure. (See Section 8.0).

The Shoreham site was subjected to high winds and rain on September 27, 1985 due to Hurricane Gloria. The plant was shutdown at the time of the hurricane. (See Section 7.0). Following the hurricane, the plant was restarted, and low power testing continued through the end of the inspection period.

3. Status of Previous Inspection Items3.1 (Closed) Outstanding Item 50-322/85-13-01: Electrical Modifications Required Prior to Proceeding Above 5% Power Level.

In SSERs 5 and 6, modifications related to the use of breakers for the alternate AC power system (gas-turbine powered generators) were required. These modifications were reviewed in Inspection Report 85-13 and left as an outstanding item. However, when the plant was licensed, the original EDG supplied by TDI had been rebuilt, derated slightly, tested and found acceptable, and approved for use by the Commission. Therefore, the electrical modifications were not made a

license condition as they were, no longer needed. This open item may, therefore, be administratively closed.

3.2 (Closed) 50-322/82-09-04: Documentation of Local Law Enforcement Support

This open item involves safeguards information. The documentation required has been verified to exist by the inspector. A review of the documents indicated no unacceptable conditions. This item is closed.

3.3 (Closed) 50-322/84-48-01

This violation involved safeguards information. A review of LILCO's response to the Notice of Violation, and observation of activities have satisfied the inspector that this matter may be closed.

4. Review of Alcohol/Drug Program

The inspector reviewed LILCO's program to control any potential use of alcohol and/or drugs at Shoreham. Documents reviewed were:

- . Company Policy, "Guidelines for handling an employee with an Alcohol or Drug Abuse Problem"; and,
- . SP 12.030.01, Rev. 0, "Fitness for Duty", 1/8/85.

The Plant Manager is responsible to ensure site workers are fit for duty and unit supervisors are to identify personnel who appear unfit for duty. The program provides guidance (detailed questionnaire) for identification of a problem, specifies disciplinary actions (including justifications for termination), describes available company-sponsored assistance, details the method for interfacing with local law enforcement, and requires bi-annual retraining for supervisors.

The inspector requested and recieved a computer print-out of the training records for, "Qualification - Fitness For Duty". Comparison with a recent organization chart indicated that about 20 supervisors had not recieved the training. However two Watch Engineers, not on the computer list, said they had completed the training. This issue will be tracked as an open inspection item pending verification of the training records (50-322/85-36-01).

## 5. Failure of RHR Loop B Minimum Flow Valve

On September 25, 1985 while RHR loops A and B were being realigned from the suppression pool cooling mode to the LPCI standby mode, the minimum flow bypass valve for RHR loop B (MOV-45B) failed to indicate closed in the control room. Local investigation showed the bolts that held the operator to the yoke had failed, disconnecting the operator from the valve. Because the HPCI pump was undergoing hot alignment of the turbine-to-pump shaft and, therefore was out of service, an Unusual Event was declared and reactor shutdown initiated per TS 3.0.3 (two ECCSs inoperable). Plant personnel worked to repair both the RHR valve and the HPCI pump. The HPCI pump was declared operable following the appropriate surveillance tests within two hours. Reactor power reduction was stopped and testing resumed. The licensee is investigating the cause of the failed bolts on MOV-45B.

The licensee inspected all valve operators on the HPCI, RHR, and Core Spray systems. They found the following problems on the RHR system; no problem was found on the other systems.

MOV-45A (Loop A minimum flow valve) - Loose bolt on operator/yoke mounting

MOV-35A (Heat exchanger outlet) - Loose bolts on motor/yoke mounting

MOV-36A (LPCI inlet) - Loose bolts on yoke/valve mounting

MOV-40A (Suppression Pool Spray Isolation) - Loose bolts on yoke/valve mounting

MOV-41A (Suppression Pool Spray Inlet) - One bolt head failed on motor/yoke mounting

MOV-41B (Suppression Pool Spray Inlet) - Loose bolt on motor/yoke mounting

MOV-42A (Suppression Pool Test Yoke) - Loose bolts on yoke/valve mounting

The licensee replaced all bolts on any valve which had a problem.

The licensee has initiated a three phase program to resolve this issue. The first phase involved the inspection of all valves as indicated above.

The second phase involves metallurgical analysis of the bolts by the Grumman Corporation and a monthly inspection of the bolts.

The third phase involves a long term investigation into common denominators among the failed valves and a study of ways to reduce cavitation in the system which may have contributed to fatigue failure from excessive vibration.

The licensee is in the process of formalizing this program. Upon completion of this process, the inspector and region-based personnel will inspect the metallurgical data and evaluate the adequacy of the program.

Pending completion of that review, this is designated open item 50-322/85-36-02.

#### 6.0 Reactor Water Level Deviation

On September 8, 1985 at 6:45 a.m., plant operators noted an unexpected increase in the 'B' Narrow Range Level instrument in the Control Room. This increase occurred while reactor pressure was being raised to 800 psig. The licensee declared an Unusual Event, and began power reduction. The 'B' instrument returned to normal as reactor pressure was reduced to 750 psig. Pressure continued to be reduced to 400 psig for further investigation of the problem. The Unusual Event was terminated when the 'B' level instrument returned to normal. The 'B' narrow range level instrument uses a reference leg that is connected to the 'B' condensing chamber. The 'A' and 'C' narrow range level instruments use a reference leg connected to the 'A' condensing chamber. During the increase in level indicated on channel 'B', the 'A' and 'C' level instruments remained constant. Additionally, level was verified to be normal by use of the shutdown and wide range instruments. Investigation into the cause of the 'B' instrument level problems centered around the 'B' condensing chamber and its associated reference leg. Insulation was removed from the 'A' and 'B' reference legs on September 8, and temperature readings were obtained. On September 10, 1985 at 10:15 p.m., the plant was manually shutdown to cool the drywell to facilitate inspection work and to reinstall the insulation on the level instrument lines.

The reactor was restarted on September 11, 1985 so that investigation into the level deviation problem could be continued. The reactor pressure was increased, and on September 12 at 8:05 a.m. the deviation recurred. During the period September 12 to September 26, the licensee conducted Hydrostatic Tests, visual walkdowns, and dye penetrant tests of the 'B' instrumentation piping in an effort to locate and correct the level deviation. To ensure that air pockets in the instrument lines were not the problem, a high velocity flush of the instrument lines was conducted on September 16, 1985, using water from the Control Rod Drive System.

The reactor was again started on September 17. LILCO personnel, Stone & Webster Engineering personnel, and General Electric personnel commenced extensive data gathering at 50 psig increments during pressurization and heatup to determine the cause of the deviation. Data indicated that the 'B' reference leg was in fact losing level or density at a rate comparable with the rate of rise of the 'B' narrow range instrument during the deviations. This data indicated either a leak in the reference leg, or a blockage of the steam line from the reactor which maintains the condensing chamber full.

The level deviation occurred four times from September 19 to September 20 during data gathering. The cause of the deviation was narrowed down to the section of steam piping from the vessel to the condensing chamber which maintains the chamber full. During the fourth deviation, the pipe was physically moved by plant personnel while the deviation was present.



This moving of the pipe caused the 'B' narrow range level instrument to return to its normal position.

Analysis of the data and the piping that was moved indicated that a slug of water was accumulating in the steam line to the condensing chamber, thereby blocking flow from the vessel to the Condensing Chamber. The licensee installed an additional spring hanger on the line and installed additional insulation on the line. After these corrective actions, the licensee reduced and increased pressure to verify that the deviation did not reoccur. These efforts were successful and the reactor operated the remainder of the inspection period with no level deviation problems. The licensee's Nuclear Engineering Department and Plant Staff are continuing their evaluation of the need for additional corrective action(s) in this area. Pending the resolution of these studies this is designated as open item 50-322/85-36-03.

#### 7. Hurricane Gloria

On Friday, September 27, 1985, at approximately 11:00 a.m. the hurricane which had been designated 'Gloria' by the National Weather Service, hit the Long Island area.

Preparations for the hurricane were initiated by the licensee on September 25, 1985. Portions of the site were sandbagged, and loose materials were removed or secured. Shutdown of the reactor commenced on September 26, 1985 at 4:20 p.m. and the plant was in Condition 4 (Cold Shutdown) at the time the storm hit the site. The eye of the hurricane passed by about 15 miles west of Shoreham.

In accordance with their Emergency Plan Implementing Procedures, the licensee declared an Unusual Event at 10:05 a.m. on September 27, 1985 pending the imminent arrival of the hurricane. At 11:00 a.m., the Unusual Event was upgraded to an Alert. The Technical Support Center and Emergency Offsite Facility were manned. As the hurricane passed the site, sustained winds, in the 45 - 50 mph range with gusts to 70 mph, were recorded. The site sustained minor structural damage to some warehouse buildings. Reserve Station Transfer power was lost to two buses for a period of less than one hour; this loss of power in turn caused a loss of station air for a short period of time.

The Alert condition was downgraded to an Unusual Event at 3:25 p.m., and the Unusual Event was terminated at 4:45 p.m. on September 27, 1985.

#### 8. Engineered Safety Feature (ESF) Initiations

On two occasions during the inspection period, the Control Room Air Conditioning System (CRAC) automatically initiated due to low Reactor Building differential pressure. These initiations occurred on September 9 and September 19, 1985. Also on September 9, 1985, the Control Room Air Conditioning/Reactor Building Standby Ventilation System (CRAC/RBSVS) systems initiated due to an undervoltage condition.

The purpose of the Control Room Air Conditioning System is to provide temperature and humidity control and maintain a positive pressure and habitable atmosphere in the main control room during accident conditions. The system operates in either the normal or emergency mode. The emergency mode is initiated by:

- a. Reactor low water level,
- b. High Drywell Pressure,
- c. High Radiation in the reactor building refueling exhaust, or
- d. Reactor Building low differential pressure.

On both occasions of CRAC initiation, the plant was in Condition 2, with reactor power at approximately 1.5%. The events occurred while technicians were performing surveillances on the Reactor Building Standby Ventilation System filter trains. This test, SP.24.405.01, required taking a suction from the Reactor Building Normal Ventilation System exhaust fan discharge line through the filter trains. The purpose of the test was to verify proper filter flow.

During performance of the test, air is drawn into a mixing plenum, and the RBSVS system takes a suction on that plenum. It was discovered that some of the air being drawn into the plenum was also being directed to the refuel floor. This caused an increase in Reactor Building pressure which reduced the Reactor Building differential pressure. At 0.39 inches water vacuum, the CRAC system initiated.

Upon initiation of the system, the tests were stopped, fans and valves were secured, and differential pressure was restored above the initiation setpoint. The CRAC system was then secured.

To prevent re-occurrence of these events, test procedure SP 24.405.01 has been revised to require the securing of dampers prior to test initiation. This will prevent air from discharging to the refuel floor. The air will instead be drawn from the refuel floor.

The initiation of the RBSVS/CRAC on September 9, 1985 occurred when a lightning storm created a voltage dip on the 13.8 kV offsite power system. This voltage dip caused all buses fed by the 13.8 kV to experience a proportional voltage dip. This voltage dip initiated RBSVS/CRAC, and tripped the Reactor Building Normal Ventilation system. Upon determination of the cause, the RBSVS/CRAC systems were secured, and the RBSVS system was returned to service.

In the above cases, all systems operated as designed, and the plant operators carried out all required actions. There were no unacceptable conditions identified.

## 9. Site Tours

The inspectors conducted periodic tours of accessible areas in the plant, and around the site. During these tours the following specific items were evaluated:

- Fire Equipment - Operability and evidence of regular inspection of fire suppression equipment;
- Housekeeping - maintenance of required cleanliness levels;
- Equipment Preservation - Maintenance of special precautionary measures for installed equipment, as appropriate;
- QA/QC Surveillance - Verification that pertinent maintenance activities were being monitored on a sampling basis by qualified QA/QC personnel; and
- Component Tagging - Implementation of appropriate equipment tagging for safety, equipment protection, and jurisdiction.

All items observed on these tours were satisfactory.

10. Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. Unresolved items are contained in sections 4.0, 5.0 and 6.0.

11. Management Meetings

At periodic intervals during the course of this inspection, meetings were held with licensee management to discuss the scope and findings of this inspection. No written material was provided to the licensee by the inspector during this inspection.

Based on NRC Region I review of this report, and discussions with licensee representatives, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.

The inspectors also attended entrance and exit interviews for inspections conducted by region-based inspectors during the period.