U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-322/84-49

Docket No. 50-322

License No. NPF-19 Priority -- Category C

Licensee: Long Island Lighting Company

P.O. Box 618

Wading River, New York 11792

Facility Name: Shoreham Nuclear Power Station

Inspection At: Shoreham, New York

Inspection Conducted: December 21, 1984 - January 10, 1985

Inspectors: N. Blumberg, Lead Reactor Engineer — 2/26/85 date

N. Blumberg for C. Petrone, Lead Reactor Engineer — 2/26/85 date

S. Kucharski, Reactor Engineer — 2/26/85 date

Approved by: L. Bettenhausen, Chief, Test Programs Section, EPB — 3/1/85 date

Inspection Summary: Inspection on December 22, 1984 - January 11, 1985 (Report No. 50-322/84-49).

Areas Inspected: Routine, announced inspection of initial fuel load activities, measuring and test equipment, independent inspector measurements and QA/QC interfaces. The inspection involved 165 hours onsite by three region based inspectors.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Licensee, Consultants and Contractors

*J. Alexander, Reactor Engineer
*D. Bouchie, Lead Startup Test Director and Analysis (STD&A) Engineer (General Electric (GE))
*J. Brand, Licensing Engineer (Stone and Webster (S&W))
*W. Burnett, Compliance Engineer (Impell Consultant)
A. Lepore, Lead Engineer Startup Test Quality Control (QC) (S&W)
S. Petty, QC Supervisor
*G. Rhoads, Compliance Engineer (Impell Consultant)
*C. Rowe, Quality Assurance (QA) Supervisor
J. Scalice, Manager-Operations
W. Steiger, Plant Manager
*D. Terry, Manager-Maintenance
J. Wynne, Compliance Engineer

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P. Eselgroth, Senior Resident Inspector

The inspector also interviewed other licensee personnel including watch engineers, watch supervisors, reactor operators, GE test personnel, instrument and control (I&C) technician, and maintenance personnel.

*Denotes those present at the exit interview.

2. Initial Fuel Load Operations

2.1 Fuel Load and Control Rod Test Witnessing

Initial fuel load activities commenced at approximately 2030 hours on December 21, 1984. The first fuel bundle was placed in the reactor core at approximately 2200 hours on December 21. NRC inspectors were continously onsite for the first eight shifts. Subsequent inspections were performed periodically on various shifts on a selected sampling basis while fuel loading or control rod testing was in progress. The licensee secured fuel load activities for holidays from 0800 hours December 24, 1984 to 0800 hours December 26, 1984 and 0800 hours December 31, 1984 to 0800 hours January 2, 1985. Fuel load activities and associated control rod testing, which were performed concurrently, were observed by the inspectors from the Control Room, refueling floor, refuel bridge, and control rod drive hydraulic control units (HCU's).

In addition, the inspectors performed general plant tours. The Senior Resident Inspector also participated in the inspection of fuel load activities, details of which are included in Inspection Report No. 50-322/84-50.

Fuel load activities were reviewed for the following:

-- Test procedures and fuel handling procedures were being complied with.

-- Required licensed personnel were present in the Control Room and on the refuel bridge during actual fuel movement.

-- Communications were established between the refuel bridge and the Control Room.

-- Core status was maintained current at both the Control Room and refuel floor.

-- Source range instruments were operating properly.

The following test procedures were being performed by the licensee:

-- STP-3, Fuel Loading

-- STP-4, SRM Performance and Control Rod Sequencing

-- STP-5, Control Rod Drive

The following activities were observed:

-- Movement of new fuel from the spent fuel pool to the reactor vessel.

-- Movement of neutron monitoring fuel load chambers (FLC's) and change over from FLC neutron monitor to installed source range instrumentation.

-- Operation of the refueling bridge.

-- Control rod insert and withdrawal, functional scram time, and friction tests.

-- Preliminary shutdown margin test with 144 fuel bundles installed.

-- Overall test control from the Control Room.

-- Performance of inverse multiplication plots.

-- Adequacy of shift turnovers.

-- Operability testing of Reactor Building Secondary Containment isolation valves.

2.2 Test Observations

2.2.1 STP-3 requires that a preliminary shutdown margin test be performed after 144 fuel bundles (12x12 array) have been loaded into the core. The temporary fuel load chambers (FLC's) were relocated adjacent to the core. This caused very high count rates to occur on all FLC's connected to source range monitor channels with the highest at 500 counts. Because of rod withdrawals during this test, count rates can more than double. On pulling the eighth and final rod to notch 16, a high count rod block was received, preventing any further rod withdrawal. The test had to be stopped and all rods inserted. The fuel load chambers were slightly relocated to reduce count rates and the test successfully completed on January 5, 1985.

The inspector witnessed the performance of both tests and independently verified SRM count rates, 1/M plots, and plant temperature below 71.6° F. This plant temperature permitted the pulling of eight rather than nine rods for verification of shutdown margin.

2.2.2 On December 28, 1984, fuel bundle LJH 661 was bumped during insertion into the core. The bundle was removed from the core and replaced into the spent fuel pool until it could be inspected for possible damage. A bundle of equal enrichment (LJH 770) was substituted in its place. Bundle LJH 661 was dechanneled so that the protective channel could be removed from the water and inspected independently.

One of the GE test engineers on shift was also a qualified quality control inspector for fuel inspections. On January 3, 1985 the fuel channel was removed from the fuel pool and raised above the water level for inspection. Other than minor scratches, no damage was observed on the fuel channel The fuel channel was accepted for reuse and rechanneled to the fuel bundle to be inserted into the core at a later date in place of bundle LJH 770. The NRC inspector also performed a visual inspection of the fuel channel and independently determined that there was no observable damage to the fuel bundle channel.

2.2.3 On January 9, 1985 the monthly operability test of Reactor Building Ventilation (RBVIS) valves was performed. Valve AOV-35B shut in approximately 25 - 30 seconds rather than the required 10 seconds. The three other RBV valves (AOV-35A, 37A and 37B) had shut in 5 - 6 seconds. The slow shutting time of AOV-35B caused this valve to be considered

inoperable, affecting the ability to properly establish secondary containment. Until AOV-35B was repaired, all fuel movements and rod testing were stopped. Repairs consisted of cleaning and lubricating the valve seat and lubrication of the actuator. The inspector witnessed the tag out of valve operators and some of the repairs to the valve internals. It took several attempts at repair and operation of the valve for the valve to meet technical specification requirements. Approximately 24 hours later, valve AOV-35B was stroked twice and closed in approximately 9.5 seconds. All other valves were stroked and their shutting times were within 5-6 seconds. The inspector witnessed the surveillance test and independently confirmed the closing times.

2.3 Findings

2.3.1 During fuel loading activities on December 27, 1984, the inspector reviewed the licensee's controls to prevent loose objects from falling into the open reactor vessel or spent fuel pool. The area surrounding the refueling cavity had been roped off and signs posted requiring that coveralls be worn, that jewelry be removed and loose items be attached by lanyard to the user or a stationary object. However, the inspector observed the following:

-- coveralls in use had missing sleeves;

-- two persons were wearing watches;

-- A clipboard was in use which was not attached by a lanyard; and,

-- One set of binoculars were in use without using the neck strap.

The inspector also observed that although personnel who wore eye glasses were securing them with tape, eye glass retainer straps were not available. Approximately one half of the nuts used to secure the hand rails surrounding the refueling cavity were missing or loose. As the railings are only several feet from the refueling cavity, these nuts could come loose and fall into the open cavity.

The inspector discussed these observations with the Plant

Manager and Reactor Engineer. As a result of this discussion, the following actions were taken:

-- A plant memorandum was issued to all managers and supervisors concerning station housekeeping requirements.

-- All shifts were briefed on proper dress and loose item control.

-- Eye glass straps and new supplies (untorn) of coveralls were made available at the access control point.

-- New signs containing more explicit instructions were posted at the access control point.

-- The security procedures were changed to eliminate the need to carry an extra badge into the refuel floor.

-- All missing nuts on the handrails were replaced and loose nuts were tightened.

-- Health physics technicians at the access control point were assigned the additional responsibility to assure housekeeping procedures were adhered to prior to personnel entering the refuel area.

-- Personnel on the refuel bridge were instructed to get time checks from the Control Room for making entries into the fuel movement log located on the refuel bridge rather than using their personal watches.

During subsequent inspections, the inspector noted that, in general, the corrective actions had been effectively implemented. One additional instance was observed on January 5, 1985 in which two sets of binoculars were taken on to the refuel bridge without being logged in. The Watch Engineer was informed and immediate corrective action was taken. No other instances were observed.

2.3.2 Performance of STP-5, Step 8.1.2.1, rod friction tests requires recording of reactor pressure using the plant computer reading. On reviewing preliminary test data, the inspector observed, that in some instances this pressure was recorded as "0" psig and others as "24" psig. The inspector questioned this and was later informed that the "24" psig was the computer point which read actual pressure (head of water) and the "0" was used because of depressurized open vessel

plant conditions without reference to the computer point. A GE Test Director stated that this preliminary data would be consistent and that all data would reflect the computer point reading.

2.3.3 Prior to issuance of an operating license, NRC:RI inspectors determined that fire detector systems in the Reactor Building deviated from licensee commitments made in a licensee Fire Hazard Analysis Report, dated June, 1982. In response to this deviation, a licensee letter dated December 7, 1984 stated, in part, that as an interim compensatory measure hourly fire patrols of the Reactor Building would be instituted as specified in the Technical Specifications. In addition, a permanent fire watch (a plant security guard) was posted on the refuel floor.

STP-3 required the complete removal of all personnel and the locking of the refuel floor during performance of the preliminary shutdown margin test. This was done during the first test performed of January 4, 1985.

Subsequent to the test, the licensee realized that securing the fire watch deviated from compensatory measures commitment made in its December 7, 1984 letter to the NRC. This was reported to Senior Resident Inspector when discovered by the licensee.

STP-3 was revised to allow a fire watch to enter the refuel floor and observe for fires. The fire watch would remain out of line of sight of core and away from the reactor vessel cavity. Except for the fire watch and a health physics technician, no other personnel were allowed on the refuel floor during shutdown margin testing.

The inspector informed the licensee that further resolution for the need to maintain a fire watch on the refuel floor would have to be made concerning open vessel criticality. The Licensee concurred with inspector's comments and stated that this was under evaluation. Subsequent to the inspection, on January 16, 1985, the inspector was informed by the licensee that reactor vessel internals and head were to be installed for initial criticality. With refuel floor shielding installed, fire watches for the refuel floor should be able to be maintained in a routine manner.

3. Measuring and Test Equipment

A Honeywell Visicorder was used for measurement of rod friction tests and, in one instance, a rod scram time test. The inspector reviewed the Calibration procedure 46.050.30, "Calibration of Honeywell Viscorder, Revision 4, December 19, 1983" and calibration data for calibration performed on December 18, 1984. No violations or discrepancies were observed.

4. Independent Inspector Measurement, Calculations and Verifications

During this inspection, the inspectors performed the following independent measurements, calculations and verifications. Except, where specific single verifications are identified, all verifications identified below were accomplished several times on a sampling basis:

-- Independent calculations were made of source range neutron monitoring data to confirm license calculations for inverse multiplication (1/M) plots.

-- Source range instrumentation readings were independently verified for 1/M plots and the preliminary shutdown margin testing.

-- Control rod withdrawal and insertion times were independently measured during control rod functional tests.

-- Control rod accumulation precharge pressures, charging header pressures were independently verified during performance of control rod scram time tests.

-- Control rod scram times were verified using the process computer. In one instance, for rod 30-39, because of computer malfunction, scram times were measured using a Visicorder. Visicorder readings were independently measured by the inspector for proper scram times.

-- Visicorder readings for determining accumulator differential pres sure during control rod friction testing were independently measured.

-- Ambient temperature readings at the control rod accumulators were verified using a licensee test instrument. These temperatures are used for accumulator pressure corrections.

-- Insertion of correct binary codes for bypassing the Rod Sequence Control System (RSCS) for three rods were independently verified during the 144 fuel bundle shutdown margin test (see paragraph 2.2.1)

-- During inspection of fuel bundle channel LJH661 for damage by GE representative, the channel was independently visually verified and determined to have no observable damage based on this visual inspection.

-- Reactor Building Ventilation Valves AOV-35A, 35B, 37A and 37B closure times were independently measured during performance of 24.418.02, "HVAC Reactor Building Secondary Containment Isolation Valves Operability Test" (see paragraph 2.2.3).

Findings:

In each case detailed above, the inspector confirmed licensee results and observed no discrepancies.

5. QA/QC Interfaces

The inspector observed that quality control (QC) inspectors have been providing twenty four hour shift coverage during fuel loading and control rod testing evaluations. Two QC inspectors are assigned to each backshift with one assigned specifically to fuel load activities and the other to cover other work and provide fuel load support when required. The inspector discussed QC surveillance duties with QC inspectors on shift. While there are no specific QC hold points, QC inspectors are reviewing 100 percent of selected STP data and selected procedural steps. The inspector also reviewed QC surveillance reports and determined that QC surveillances are being documented in accordance with QC procedures.

In May of 1984, the licensee prepared QAI-10.5-01, "Operational Quality Assurance Surveillance Program for Startup Testing." This procedure requires that special preplanned OQA surveillance activities be prepared, and that QC surveillances be documented on these surveillance plans. The inspector observed that surveillance plans were prepared for STP's 1, 2 and 3 and that some rough hand-written pre-plans had been established for STP's 4 and 5, while actual surveillances were being documented on generic QC surveillance forms rather than the surveillance preplans.

Discussions with licensee representatives indicates that QAL-10.5-01 is not completely working as intended. The licensee representatives stated the surveillance program would be reviewed for weaknesses prior to commencement of full scale testing. The inspector noted that although full implementation of QAF-10.5-01 was weak in the area of pre-planning, actual QC field coverage was adequate.

6. Management Meetings

Licensee management was informed of the scope and purpose of the inspection at an entrance interview conducted on December 21, 1984. The findings of the inspection were periodically discussed with licensee representatives during the course of the inspection. An exit interview was conducted on January 10, 1985 (see paragraph 1 for attendees) at which time the findings of the inspection were presented. At no time during this inspection was written material provided to the licensee by the inspectors.