U.S. NUCLEAR REGULATORY COMMISSION

REGION I

REPORT NO. 50-322/84-39

DOCKET NO. 50-322

LICENSE NO. CPPR-95

LICENSEE: Long Island Lighting Company
P. O. Box 618
Shoreham Nuclear Power Station
Wading River, New York 11792

INSPECTION AT: Shoreham, New York

INSPECTION CONDUCTED: October 1 - October 31, 1984

INSPECTORS: C Petrone — 11-8-84
C. Petrone, Resident Inspector — date signed

P W Eselgroth — 11-8-84
P. W. Eselgroth, Senior Resident Inspector — date signed

APPROVED BY: Gene Kelly for — 11-19-84
J. Strosnider, Reactor Projects Sect. 1C — date signed

SUMMARY: The inspectors reviewed five previous inspection findings and were able to close one. Three new unresolved items were identified. Emergency diesel generator testing, storage of safety related equipment, service water system corrosion problems, low pressure coolant injection system motor generator set field inspection, scram pilot solenoid valve materials and administration of security guard examination were reviewed. No violations were identified.

This report involved 120 hours of inspection by resident inspectors.

DETAILS

1.0 Persons Contacted

H. Carter, Operating Engineer (L)
C. Cole, Colt Diesel Building Construction Manager (L)
R. Gutmann, Maintenance Engineer (L)
J. Kelly, Field QA Manager (L)
A. Muller, QC Division Manager (L)
J. Notaro, Modification/Outage Division Manager (L)
J. Leonard, Vice President - Nuclear (L)
R. Purcell, Startup Manager (L)
R. Rheen, Security Supervisor (L)
J. Scalice, Operating Division Manager (L)
J. Smith, Manager Nuclear Operations Support Division (L)
W. Steiger, Plant Manager (L)
D. Terry, Maintenance Division Manager (L)
J. Wynne, Lead Compliance Engineer (L)

L - Long Island Lighting Company

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

2.0 Status of Previous Inspection Items

2.1 (closed) Unresolved Item (84-19-03): Protected Area Barrier.

During a previous inspection, it was noted that portions of the protected area barrier had been moved to facilitate construction activities. During this inspection, the inspector verified that the protected area barrier had been re-established in accordance with the approved physical security plan . This item is resolved.

2.2 (open) Unresolved Item (84-32-01): High Pressure Coolant Injection System (HPCI) Spurious Isolation.

This item was identified during a previous inspection. Since then, the licensee has provided the following additional information: On August 16, 1984 HPCI outboard steam warmup valve (1E41*MOV-048) spuriously closed during the Integrated Electrical Test (PT307.002-3) which stopped the opening of HPCI motor operated valve IE41*MOV-042, which was intended to initiate a LOCA signal. This condition occurred twice. Both times, it happened approximately eight seconds into the test, which immediately followed emergency AC bus re-energization. The source of the spurious isolation signal was found to be the Riley Temperature Monitors located in the B21 - Steam Leak Detection System. These modules randomly provide a momentary (less than .25 seconds) trip signal upon re-energization. This trip signal may be of sufficient duration to cause an isolation of the monitored system (i.e., RCIC or HPCI).

The licensee plans to correct this problem by replacing the existing 0-150 minute timers (145C3043P012) E51-M602A,B and E51-M603A,B with 0-5 minute timers (145C3043P005) as per the recommendations contained in Field Deviation Disposition Request FDDR-K51-2295. This modification, which must be complete prior to exceeding 5% power, will be reviewed by the inspector when the replacement is complete. This item remains open pending final review.

2.3 (open) Unresolved Item 84-32-02: Plant Modification Administrative Control.

During the previous inspection period the administrative controls implemented by the licensee for plant modifications were reviewed. The purpose of this inspection was to determine whether the plant modification administative controls contained in the station operating manual provide clear definition of the administrative steps necessary for plant modifications including all required approvals. The following Station Procedures were reviewed:

SP12.010.01 - Interim Station Modification Program
SP12.010.02 - Station Modification Activities
SP12.013.01 - Maintenance Work Requests

This review focused, in particular, on those steps required for returning a modified system to service. The inspector found, as previously documented, that the above procedures do not clearly define what approval signatures the Watch Engineer should check for prior to returning a modified system to service. Plant management agreed with the NRC inspector's observation and informed the inspector that steps were being initiated to correct the lack of procedural clarity in this area.

Approximately a month after these procedure inadequacies were identified, the inspector found that the necessary procedure changes for clarification of this area still were not issued. The inspector contacted plant management and inquired about the delay in issuance of the procedure revisions. The inspector was informed that management's objective was to have had them issued before a month had elapsed.

2.4 (open) Unresolved Item 84-32-03: Equipment Failure History Analysis.

As stated in Inspection Report 84-32, a review was conducted by the inspector in September 1984 of the equipment history area to ascertain how the licensee tracks equipment failures. The purpose of this inspection was to determine to what extent the licensee maintains an equipment failure trend analysis program for assessing and highlighting significant failure rate trends related to such causes as poor design and/or materials or poor maintenance practices.

The inspector found that no system or method, manual or computerized, was in use at that time for performing equipment failure rate trend analysis for Shoreham plant equipment. Several large file cabinets of Maintenance Work Requests (MWR) are on file by component number; however, this information was not being analyzed for significant failure rate trends.

During this past month, the inspector was provided with a copy of a memorandum by the Maintenance Division Manager entitled "Implementation of Equipment History Program, Including Plant Trending Data and Analysis". This program establishes implementation dates for various milestones of an equipment history trending and analysis system and, in particular, identifies a December 1, 1984 implementation date for the trend analysis capability for Safety-Related equipment. The progress of this program was subsequently reviewed with the Maintenance Engineer and found to be on schedule. This item will remain open pending completion of implementation of this program for Safety-Related equipment.

2.5 (open) Unresolved Item (84-18-01): Radwaste Building Flooding.

A previous inspection report documented that on May 9, 1984 and on May 21, 1984 The floor of the Radwaste Building Floor Drain Filter Room became flooded by an estimated 7,000 gallons of uncontaminated water in the first instance and about 3,500 gallons in the second instance due to unrelated system malfunctions. These spillages, which would be expected to contain varying levels of contamination during normal plant operations, resulted in about two inches of water level on the floor on May 9 and about one inch of water on May 21.

On May 9 water was spilled from the regenerative evaporator portion of the liquid radwaste system at approximately 9 a.m. when a flexible rubber piping joint ruptured in the 12 inch discharge side of the regenerative evaporator pump. The rupture hole size was estimated to be 3/4 inch in diameter. On May 21, 1984, failure of two automatically operated valves in the Radwaste Building High and Low Conductivity Drain Systems caused an overflow of uncontaminated water from the Floor Drain Sump onto the Floor Drain Filter Room floor to a level of about 1 inch (approximately 3,500 gallons). The particular automatic valves found to have not operated properly were (1) a solenoid operated vent valve, SOV-342, in the High Conductivity Drain System and (2) an air operated process valve, AOV-289B, in the Low Conductivity Drain System.

The licensee's stated corrective action program included a determination of the automatic valve failure causes, the flexible joint failure cause and necessary actions to preclude such failures in other similar type joints in the plant.

Upon inspection of SOV-342, it was found that a piece of wood, approximately one inch by one-quarter inch round, had become lodged in the valve seat. The piece of wood was removed, associated lines flushed and the valve returned to service.

Air operated valve AOV-289B was found to be operating improperly due to air leakage past a filter blowdown valve which was causing AOV-289B to receive a false signal to open. The blowdown valve packing set nut was adjusted and the problem resolved.

An inspection by the licensee of the ruptured flexible rubber joint, in the regenerative evaporator portion of the liquid radwaste system, revealed that the joint had been improperly installed. Specifically, the joint (1G11-EXJ-046),

as documented in Engineering and Design Coordination Report L-586 (dated June 5, 1984) was over stretched by approximately 0.70 inches, and the control rods for this joint were installed improperly with nuts on the inside face of the joint flange faces. This installation was contrary to the requirements of E&DCR F25796A issued September 24, 1980.

During this inspection period, the NRC inspector reviewed the status of the licensee's corrective action program for this item and found that the review of other plant flexible joints for similar problems was not completed.

2.6 Suppression Pool Corrosion

This item was originally identified during a previous inspection (82-15-04). On September 27, the resident inspectors and the Chief of Section 1C of the Region I Division of Project and Resident Programs inspected components in the suppression pool to ascertain the extent of the previously reported corrosion. General corrosion of those uncoated components in the suppression pool was observed. The corroded components included safety relief valve discharge piping supports, structural bracing, and smaller items such as u-bolts supporting conduit. Photographs were taken to document the degree of corrosion. This issue was addressed in a LILCo report to the residnet inspectors dated October 10, 1984. The report presented analyses evaluating the integrity of the safety relief valve discharge piping supports. This report and the photographs taken by the resident inspectors were reviewed by the Region I technical staff. It was concluded, based on this review, that there are no safety concerns precluding operation through the first refueling outage. However, this issue will not be considered resolved until a more comprehensive evaluation is performed and a program is developed ensuring that the problem is defined, monitored, and corrected in a timely manner.

3.0 Emergency Diesel Generator Additional Testing

Discussions between the licensee and NRR determined the need for additional testing of the TDI new design crankshaft for fatigue qualification. The licensee selected EDG-103 for additional testing of the new crankshaft, up to the 10^7 fatigue cycle (740 hour) level, at full load conditions. EDG-103 had previously accumulated 220 hours of full load testing, and the licensee recommended engine testing at 10 p.m. on October 8, 1984. Based on a review of test program electrical load measured valves, the licensee elected to perform this test at a power level of 330 ± 100 KW.

The inspector observed the subject test program during numerous visits to the TDI engine room #103 and the main control room where the EDG output is metered. The inspector verified performance of the test at the prescribed power level, the use of proper procedures and data taking, and toured the engine area for abnormal conditions. All aspects of the testing were observed to be satisfactory during these inspection tours.

On October 17, 1984, at approximately 1:45 p.m., the licensee observed a leak on the 1½ inch lube oil supply line to the turbocharger of EDG-103. The leakage was observed at a circumferential crack 1 inch in length adjacent to a weld in the area where this 1½ inch line joins the main lube oil supply header. The leak, which was on the order of a tablespoon a minute, was wrapped with rags by the operator, and the engine was shut down. At this point, the engine had accumulated 429 hours of full load testing on the new design crankshaft. Shutdown for repair of the leak was combined with a planned shutdown for routine maintenance which had been scheduled for the following day.

Repair of the lube oil line leak involved replacement of a section of the 1½ inch piping and use of a "socket" weld connection to the supply header, instead of a "stab-in" weld connection. The licensee also determined that one of the pipehangers added to this section of piping by the licensee had caused additional pipe stresses which contributed to the failure. The licensee is reviewing what actions should be taken for EDG-101 and EDG-102 to preclude similar problems on these engines.

Following repair of the turbocharger lube oil supply line and routine engine servicing, EDG-103 recommenced full load testing at 10:30 p.m. on October 19, 1984.

The final resolution of corrective actions for all three TDE diesel engine turbocharger lube oil supply lines is unresolved item 84-39-01. This item must be completed prior to exceeding 5% reactor power.

4.0 Emergency Diesel Generator No. 102

On August 21, 1984 during troubleshooting of the HPCI Leak Detection System, EDG-102 failed to auto start during a Bus 102 undervoltage with a simulated LOCA signal. The EDG had auto-started correctly during the first test run but failed to auto start for the second test attempt. Review by the licensee determined that at the end of the first test, when the Control Room Operator paralleled with the grid, he failed to pick up sufficient load on the EDG. The EDG may have momentarily motorized which energized the Reverse Power Relay which tripped the 86B Lockout relay. Since no control room panel alarms or computer alarms were received, the operator was unaware of the trip when he attempted to restart the EDG for the second test. Preliminary review by the inspector indicates that if a similar trip occurred during plant operation, the EDG would be in a condition where it would not auto start and this condition would not be annunciated. As a result of this event, the inspector requested that the licensee take the following action:

- Review and determine if any EDG could be in a tripped condition and this condition go undetected by routine breaker alignment checks.

- Determine if the annunciator logic or the process computer alarm typer should be modified to warn the operator of this degraded condition.

- Review operating procedures and alarm response procedures to determine if revisions are necessary to warn operators of this possible condition.

- Investigate if it is necessary to re-perform surveillance tests following any paralleling to the grid. This should be an auto start test.

This is unresolved item 84-39-02 which must be resolved prior to exceeding 5% power.

5.0 Scram Pilot Solenoid Valve Review

As a result of a problem experienced at another reactor plant with the operation of Automatic Switch Co. (ASCO) solenoid valves, a review was conducted by the inspector at Shoreham. The particular valves (Part No. T-ASCO HV-176-816-1, GE Part No. 9220138) had failed to scram four rods on demand and caused eleven other rods to hesitate during routine quarterly control rod scram time testing. The defective component was determined to be a polyurethane disc-holder subassembly which develops an adhesive quality at elevated temperatures (above 160^{o}F), causing it to adhere to the seat of the scram pilot valve vent port.

The inspector reviewed a Shoreham master listing of safety-related solenoid operated valves and other plant information provided by plant management in response to an NRC request that similar ASCO valve applications at Shoreham be reviewed for this problem. From the documentation provided by Shoreham it was not possible to determine if the pilot scram valve disc holder sub-assemblies utilize polyurethane or some other material. The possibility that polyurethane parts exist in other safety-related solenoid valves is being investigated. The resolution of the possible existence of polyurethane in safety-related solenoid valves in general and the pilot scram valves in particular, is unresolved item 84-39-03.

6.0 Service Water Strainer Corrosion

The licensee has experienced leaks in the Service Water System Pump Strainers due to salt water corrosion. Two of the four strainer shells were removed for examination and repair. Apparently, the leaks developed due to corrosion in areas where the internal epoxy protective coating had failed which allowed salt water to contact the carbon steel strainer casing. The cause of the corrosion is still under investigation by the licensee.

Strainer Removal and Repair: The inspector reviewed the licensees administrative controls for the tagout and removal from service of the A and C Service Water Pump strainers. This included Repair Replacement Instructions RR 84-41, Rev. 0; Maintenance Work Request 84-5490, LILCO Deficiency Report LDR-2497. These instructions incorporated the requirements of ASME Section XI and included: appropriate inspection verification signoff requirements; detailed welding specifications; non-destructive examination requirements; and post-repair hydrostatic testing requirements. The inspector observed portions of the weld repair activities on the "A" and "C" service water strainers and verified that:

- Welding was performed in accordance with the approved procedures;
- The correct weld rod was used;
- All required work instructions were at the work site; and,
- The welders were trained and qualified to perform these repairs.

No discrepancies were identified; the inspector will continue to monitor these repair activities.

Previous Corrosion Problem: Corrosion of the P-41 Service Water System Pump internals had been previously identified as a problem (CDR-82-00-07) caused by galvanic corrosion due to dissimilar metals. In light of these previous problems, the licensee should determine if any other components in the Service Water System are subject to accelerated corrosion caused by failure of the epoxy coating, dissimilar metals, or other mechanisms. This item is Construction Deficiency Report CDR 84-00-02 and must be addressed prior to initial criticality.

7.0 Storage of Safety Related Equipment

The inspector reviewed the licensee's controls for the storage of Safety-Related Equipment for the Colt Emergency Diesel Generator Building construction activities. These controls are contained in design specification SH1-159A which implements the requirements of ANSI 45.2.2, Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants.

The inspector toured storage areas of the plant including the Level B area of the Stone and Webster warehouse, the Level B warehouse near the gas turbine, and the Level D laydown area South of the Stone and Webster warehouse. These areas were examined to determine if:

- Housekeeping was adequate;
- Appropriate environmental controls were established for each level of storage (B and D);
- Items were placed on pallets or shoring;
- Adequate precautions existed to prevent unauthorized access and vandalism;
- Items were adequately marked;
- Hazardous chemicals, paints, solvents were segregated; and
- Covers, caps, plugs, or other closures were intact.

The condition of the storage areas were generally acceptable. The inspector noted several missing dust caps on pieces of stored pipe, but these caps were subsequently replaced. The inspector had no additional concerns.

8.0 LPCI Motor Generator Set Field Inspection

As a result of a problem experienced at another reactor plant with Louis Allis alternating current motor generator (MG) sets, the licensee arranged for a vendor representative to make a field inspection at Shoreham of the four Low Pressure Coolant Injection (LPCI) system Louis Allis MG sets for loose diode rings. The NRC inspector observed the field inspection of one of the units and verified the use of proper plant administrative control procedures and that the diode ring on the unit being inspected had been properly installed. The NRC inspector also subsequently reviewed the completed maintenance work requests which documented the field inspection results and verified that the diode ring on all four units was found to be tight and the lock tab in place. (MWRs 84-6089, 6090, 6091 and 6092).

9.0 Security Qualification Examination

On October 3, 1984 one supervisory contract guard resigned after being confronted by management with information indicating that he used unauthorized notes on a portion of a security qualification examination. This was reported in Preliminary Notification PNS-I-84-20. The licensee took prompt corrective action which included:

- Rewriting and restructuring of all written security tests;
- Retesting all security personnel using the new tests; and
- Improving the security precautions to prevent unauthorized access to the written exams.

The inspectors had no further questions.

10.0 Colt Diesel Generator Building

Construction of the Colt Diesel Generator Building is proceeding on schedule and is currently 80% complete. Construction continues on a two shift per day, six days per week basis. The structural concrete is essentially complete, all electrical power and control cables have been pulled and wire termination is underway. All of the electrical panels and motor control centers are in place. Most of the mechanical piping installation is complete and hydrostatic testing of this piping is underway. Run in of the three diesel generators is expected to begin the last week of December 1984.

11.0 Site Tours

The resident inspectors conducted periodic tours of accessible areas in the plant, in the new Colt Diesel Generator Building and around the site in general. During these tours the following specific items were evaluated:

- Fire Equipment - Operability and Evidence of periodic inspection of fire suppression equipment;
- Housekeeping - Maintenance of required cleanliness levels;
- Equipment Preservation - Maintenance of special precautionary measures for installed equipment, as applicable;
- QA/QC surveillance - Pertinent construction activities were being surveilled on a sampling basis by qualified QA/QC personnel;

- Security - Adequate construction security;

- Welding - Observations to determine that proper procedures were in use by qualified welders.

- Component Tagging - Implementation of appropriate equipment tagging for safety, equipment protection, and jurisdiction.

During a routine tour of the Radwaste Building, after normal working hours, the inspector toured the 37 foot level where a modification was being made to the fuel pool cooling piping. The inspector noted in one location that an open ended section of pipe adjacent to valve G-41-04V-0085B was left without a cleanliness cover, contrary to the requirements of SP12.023.02. The inspector informed QA who in turn contacted the appropriate plant personnel to have the pipe end capped with a cleanliness cover. QA then issued deficiency report LDR #2531.

All other items observed during general site tours were found to be satisfactory.

12.0 Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. Unresolved items are contained in paragraphs 2 through 6.

13.0 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.

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

14.0 Plant Visit by Commissioner James K. Asselstine

Commissioner Asselstine, accompanied by his Technical Assistant John Austin, visited the Shoreham Site on October 1, 1984. He met with the Resident Inspectors and discussed the status of the NRC Inspection Program. He then met with the licensee's management personnel including J. Leonard, Vice President - Nuclear and W. Steiger, Plant Manager to discuss the plant staff organization and status of plant completion. He performed a tour of the facility which included the Reactor Building, the Drywell, the Refueling Floor, the Turbine Building, and the new Colt Emergency Diesel Generator Building. Representatives from Suffolk County and the Shoreham Opponents Coalition also attended the meeting and accompanied the Commissioner on the plant tour.