

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-322/82-30

Docket No. 50-322

License No. CPPR-95 Priority -- Category B

Licensee: Long Island Lighting Company

175 East Old Country Road

Hicksville, New York 11801

Facility Name: Shoreham Nuclear Power Station

Inspection At: Shoreham, New York

Inspection Conducted: October 14, - November 29, 1982

Inspectors: J. C. Higgins for 12/21/82  
J. C. Higgins, Senior Resident Inspector date

J. H. Hannes for 12/21/82  
J. H. Hannes, Resident Inspector date

Approved by: R. M. Gallo 12/21/82  
R. M. Gallo, Chief, Reactor Projects date  
Section 1A, Projects Branch #1, DPRP

Inspection Summary: Inspection on October 14 - November 29, 1982 (Inspection Report No. 50-322/82-30)

Areas Inspected: Routine onsite regular, backshift, and weekend inspections by the Resident Inspectors (214 inspection hours) of work activities, preoperational testing and plant staff activities including: tours of the facility, test witnessing, review of NRC Bulletins and Circulars, review of drawings, test procedure and test results review, review of pipe break analysis, review of temporary wall and floor seal installation, review of motor operated valve wiring and followup on previous inspection items.

Results: Of the nine areas inspected, no violations were identified in eight areas and one violation was identified in the ninth area (failure to properly implement instructions for systems affecting safety, paragraph 6).

## DETAILS

### 1. Persons Contacted

T. Arrington, Superintendent FQC (S&W)  
M. Giannattasio, Asst. Construction Superintendent (L)  
R. Gutman, Maintenance Engineer (L)  
J. Kelly, Field QA Manager (L)  
W. Matejek, Lead Advisory Engineer (S&W)  
J. McCarthy, Section Supervisor - FQA (L)  
A. Muller, OQA Engineer (L)  
W. Museler, Manager, Construction and Engineering (L)  
K. Nicholas, Lead Startup Engineer (GE)  
T. Paulantonio, Lead Startup Engineer (S&W)  
R. Perra, Assistant Superintendent FQC (S&W)  
J. Ricardo, Lead Startup Engineer (S&W)  
J. Riley, Operational Manager (GE)  
J. Rivello, Plant Manager (L)  
C. Seaman, Senior Asst. Project Engineer (L)  
J. Smith, Manager, Special Projects (L)  
E. Youngling, Startup Manager (L)

GE - General Electric

L - Long Island Lighting Company

S&W- Stone and Webster

The inspector also held discussions with other licensee and contractor personnel during the course of the inspection including management, clerical, maintenance, operations, engineering, testing, health physics, security, quality assurance, and construction personnel.

### 2. Previous Inspection Item Update

#### 2.1 Items Closed

2.1.1 (Closed) Unresolved Item No. (322/80-04-04): This item was previously reviewed in inspection 82-23. The licensee subsequently approved Rev. 1 to CG.000.037, "In Place Testing of HEPA Filter and Charcoal Adsorber Stage". Rev. 1 corrects the reference in Enclosure 1, Table 1; adds the proper equation to Enclosure 6; and adds step 7.5.11 to require that air flow be continued until the residual gas effluent is less than 0.01 ppm. This item is closed.

2.1.2 (Closed) Unresolved Item No. (322/80-04-07): CRAC System Instrumentation: This item addressed three discrepancies in instrumentation for the Control Room Air Conditioning (CRAC) System. First, the licensee added a "times one hundred" multiplier for FT-002. Second, the licensee labeled the outside air intakes "East" and "West" on the Control Room Panel. Third, the adequacy of indication for flow rates was

addressed in the Shoreham Safety Evaluation Report (SER) as Open Item No. 42. This third item was resolved in SER Supplement 1, page 6-17, by the addition of control room flow recorders to measure outside air supply flow rate. The inspector observed the installation in the control room of the above three modifications. This item is closed.

- 2.1.3 (Closed) Unresolved Item No. (322/81-01-05): Turbine Building Design Basis Temperature: The licensee has approved Startup Test Procedure (STP-813), Rev. 2, dated October 25, 1982, to verify that the Turbine Building Ventilation System maintains temperatures within their design values. The test is performed at startup test condition 6, which is 95 to 100% power. This item is closed.
- 2.1.4 (Closed) Unresolved Item No. (322/81-02-04): Excess Flow Check Valves (EFVs) near Iron Supports: The licensee has completed a review of the EFVs located within three inches of iron supports and determined that this would cause a gradual deterioration of the magnets. All EFVs operate satisfactorily now, as demonstrated by AT.690.001, "Excess Flow Check Valve Display System". If the magnet were to fail in use, a particular combination of alarms and indications would enable the operator to determine the problem. Guidance for this situation has been included in Alarm Response Procedure, ARP-0381, "Excess Flow Check Valve Closed". This item is closed.
- 2.1.5 (Closed) Unresolved Item No. (322/81-04-07): Alarm Response Procedures (ARPs): The Assistant Startup Manager now reviews and initials ARPs issued as Blue dotted ARPs under the Startup Interim Operating Instruction Program to ensure that all "Later's" and missing values have been addressed. The licensee has also revised his standard format for system turnover to the Plant Operating Staff to include reviewed and marked-up copies of ARPs. The inspector reviewed recent system turnover packages and noted that they included comments on appropriate ARPs. The inspector also reviewed the Startup Blue-dotted ARPs and noted that all "Later's" were filled in. This item is closed.
- 2.1.6 (Closed) Unresolved Item No. (322/82-12-03): Carbon Dioxide (CO<sub>2</sub>) Fire Protection Preoperational Test (PT): The inspector reviewed PT.501.001-1 and noted that Rev. 1 included measurements for CO<sub>2</sub> and oxygen concentrations in the control room and in other rooms when CO<sub>2</sub> was discharged into adjacent areas. Rev. 1 also incorporates checks to determine if areas meet the requirements of Article 2523 of NFPA Standard No. 12, which calls for 30% CO<sub>2</sub> concentration in two minutes for deep seated fire hazard areas. This item is closed.

- 2.1.7 (Closed) Unresolved Item No. (322/81-12-01): Incorrect CO<sub>2</sub> system Valve and Pipe arrangement: The licensee has approved Engineering & Design Coordination Report (E&DCR) No. F-43138, dated September 29, 1982, which modifies FB-44A to show the correct arrangement. The inspector compared E&DCR F-43138 to the installed piping and valves in the field and noted that this corrected the previous errors. This item is closed.
- 2.1.8 (Closed) Unresolved Item No. (322/82-17--01): Type B Leak Rate Test of hydrogen and oxygen analyzers: The licensee has approved PT.654.002, Rev. 3, which contains appropriate Type B leak rate tests of the hydrogen and oxygen analyzers. The leakage measured for the analyzers is added into the total Type B and C leakage, before comparison with the acceptance criterion. The inspector reviewed the test procedure and conducted tours of the analyzers and lines in question. This item is closed.
- 2.1.9 (Closed) Violation No. (322/82-15-02): Test Performance: The inspector noted that PT.654.007 had not been followed as written. The licensee recalled the procedure, revised it, reapproved it, and reperformed the entire test. The inspector reviewed the completed and approved test results and had no additional questions on them. The licensee also reinstructed those involved in test performance and discussed the issue at a general Startup Meeting. The inspector discussed this item with personnel involved with the exception of the test engineer, who is no longer employed at the site. This item is closed.
- 2.1.10 (Closed) Item in paragraph 4.2.4.1 of report 82-04: RBCLCW Labeling: The licensee has put new labels on the control room panel for the Reactor Building Closed Loop Cooling Water (RBCLCW) System, which address the concerns of this item. The inspector observed the new labels in the control room. This item is closed.

## 2.2 Items Remaining Open

- 2.2.1 (Open) Item No. (322/82-04-10): Carbon Steel Bolting on Copper-Nickel Pipe: The inspector reviewed the following documents relating to installation and inspection of the copper-nickel piping:
- QAP 10.16, Rev. 2, "Bolted Joint Inspection".
  - Selected Engineering & Design Coordination Reports (E&DCRs) including F-25229A and F-35497, F-35497A.
  - Courter and Company Control Book for tracking bolted joint installations and inspections.

- Selected document packages for completed bolted joint inspections.

The E&DCRs issued specified that installations prior to August, 1981 were acceptable without electrical insulating kits, but that new installations would require the insulation kits. The inspector questioned the engineering basis used for this criterion. The licensee stated that it was based on engineering judgement and then further agreed that a materials analysis would be performed on corroded bolts to determine if the corrosion mechanism was general or galvanic. Also, during system tours the inspector noted several new carbon steel fasteners installed without electrical insulation. The licensee issued a Nonconformance and Disposition Report (N&D No. 5329) to address these cases. This item remains open.

### 3. Plant Tour

#### 3.1 Discussion

The inspector conducted periodic tours of accessible areas in the plant during normal and backshift hours. During these tours, the following specific items were evaluated:

- Hot Work - Adequacy of fire prevention/protection measures used;
- Fire Equipment - Operability and evidence of periodic inspection of fire suppression equipment;
- Housekeeping - Maintenance of required cleanliness levels of systems under or following testing;
- Equipment Preservations - Maintenance of special precautionary measures for installed equipment, as applicable;
- QA/QC surveillance - Pertinent construction and startup activities were being surveilled on a sampling basis by qualified QA/QC personnel;
- Security - Adequate security for site construction and new fuel storage activities;
- Weld Rod Control - Observations to determine weld rod was being controlled per site procedures;
- Component Tagging - Implementation of appropriate equipment tagging for safety, equipment protection, and jurisdiction; and
- System Review - Inspection of the heat trace system power supplies associated with selected safety related systems for verification of electrical redundancy.

With the exception of the below items, no discrepancies were identified.

### 3.2 Condensate Demineralizer Supports

During a plant tour, the inspector observed that the lateral discharge lines inside the condensate demineralizers are restrained with plastic tie-wraps. This means of restraint was discussed with the licensee. The licensee is presently consulting with the condensate demineralizer vendor to determine if this method of restraint is acceptable from a design and operability aspect. This item is unresolved and is designated as item no. (322/82-30-02).

### 3.3 Ground Cable

Inspection of control room panels revealed that a ground cable for the isolated ground system in panel 1D11-PNL-059 (Radiation Monitoring Panel) had not been fully installed, (although the system was accepted by Startup.) Due to a design modification, this system was subsequently removed by repair/rework No. 1D11-054. The same ground cable in panel (PNL)-059 was not fully removed. Discussions involving these discrepancies were pursued with the licensee. A supplement to repair/rework No. 1D11-154 was issued to complete the removal of the ground isolation system.

## 4. NRC Bulletins and Circulars

### 4.1 Circulars Closed

#### 4.1.1 Circular 78-13:

This Circular, "Inoperability of Service Water Pumps", described a situation where the Service Water Pumps lost suction due to intake area ice buildup. This Circular was partially addressed in Inspection Report (IR) 82-15. Since that time, the licensee has revised procedure SP.29.019.01 "Loss of Service Water" to address the four concerns identified in IR 82-15. This Circular is closed.

#### 4.1.2 Circular 80-01:

This Circular, "Induction Disc Protection Relays" describes a potential problem resulting in higher than normal relay pick-up values due to the migration of a lubricant within the relays. The licensee conducted a review and determined the relay types addressed in the Circular were utilized at Shoreham. Corrective actions were initiated in accordance with a General Electric Service Advice Letter. These relays have been added to the Licensee's Deficient Items List to prevent procurement in the future. The inspector discussed the corrective actions with the licensee and reviewed both the Repair/Rework authorization and the relay re-calibration test data. Initial



review of the Deficient Items List by the inspector revealed that not all the affected relays were addressed. The Deficient Items List has since been corrected. This Circular is closed.

4.1.3 Circular 80-12:

This Circular titled, "Valve Failure Resulting From Valve-to-Actuator Key Disengagement" describes an instance where a Pratt Butterfly valve using a Bettis actuator became inoperable when the shaft-to-actuator key fell out of place. This Circular was previously reviewed in report 82-15. The licensee has investigated similar type valve/actuators at Shoreham and concluded that such valves are manufactured with a female key-way that doesn't extend to the top of the shaft, thereby alleviating valve inoperability. The inspector reviewed vendor manuals to verify proper key way assemblies and during plant tours observed the referenced valves on a random basis for proper installation and orientation. This Circular is closed.

4.1.4 Circular 81-02:

This Circular, "Performance of NRC-Licensed Individuals While on Duty", was previously reviewed in Inspection Report 82-05. At that time the licensee had incorporated the Circular concerns except that no clear definition was provided of the operator "at the controls" or in the control room. The licensee has since issued Rev. 4 to SP.21.004.01, "Main Control Room - Conduct of Personnel" to define these items, Discussions with the Operations Engineer indicated that:

1. The current procedure calls for a licensed operator at the controls whenever Technical Specifications requires one in the control room, and
2. The licensee is considering modifying the procedure such that a licensed operator would be required in the control room but not at the controls during cold shutdown. Either alternative meets regulatory requirements and guidance. This Circular is closed.

4.1.5 Circular 81-11:

This Circular, "Inadequate Decay Heat Removal During Shutdown" describes incidents during which there was inadequate decay heat removal capability due to systems being secured. The Circular indicated certain administrative controls that should be provided to ensure adequate decay heat removal capability. The licensee reviewed the Circular, his procedures and draft Technical Specifications and determined that the concerns were addressed. The inspector noted that the current draft of the

Shoreham Technical Specifications contained Limiting Conditions for Operation (LCOs) and Surveillance Requirements to address the concerns of the Circular. This Circular is closed.

#### 4.2 Bulletins and Circulars Remaining Open

##### 4.2.1 Circular 81-13:

This Circular, "Torque Switch Electrical Bypass Circuit For Safeguard Service Valve Motors," describes valve malfunction resulting from electrical bypass circuits around the valve-open torque switch on Limitorque valve operators not being installed as designed. A review conducted by the licensee confirmed that four remaining valves required the torque switch bypass jumper. Appropriate modifications to these valves have been performed. The inspector reviewed applicable electrical schematics and performed onsite surveillance of selected valves to verify the torque switch jumper installations. Relative to the Circular concerns, the following were noted:

- Administrative controls are not available to ensure the required torque switches are bypassed for future plant modifications.
- The licensee's review included only gate and globe valves. No justification was available as to why other types of valves were not modified.

As a result of the above, the licensee has agreed to:

- modify a Station Procedure for initial checkout and operation of motor operated valves.
- provide justification why only gate and globe valves were considered in the review and modification process.

This Circular remains open.

##### 4.2.2 Bulletin 79-18:

The Bulletin, "Audibility Problems Encountered on Evacuation of Personnel from High-Noise Areas", describes problems encountered by personnel hearing evacuation alarms in various high-noise plant areas. The licensee proposed various courses of action, including: use of emergency planning accountability methods and performance of Bulletin tests after fuel load. NRC inspector and Region I review found that the proposed actions did not fully address the Bulletin concerns. The inspector stated that all areas which had sufficient high-noise and could be practically reviewed before fuel load should have their reviews, tests and corrective actions complete before fuel



load. The final surveys and tests needing equipment which would only be operated after fuel load could be postponed until that time. This Bulletin remains open.

## 5. Test Witnessing

The inspector reviewed procedures CG-000.014-5 and 6 and witnessed portions of the test for Reactor Core Isolation Cooling (RCIC) and Turbine Building Service Water Motor Operated Valves. During the performance of the tests, the inspector observed that:

- test personnel were suitably qualified;
- data was logged per the procedures;
- test procedures were in use by personnel performing the tests.

The following discrepancy was identified.

The Initial Checkout and Operation (C&IO) of RCIC valve E51\*MOV-045 was being performed utilizing procedure CG-000.014-5 instead of the current effective procedure CG-000.014-6. In addition, revision 5 was also used for testing P41-MOV-111A instead of the latest revision 6. This occurred, in part, due to Startup Form 7.9 authorizing the performance of CG-000.014-5 for E51\*MOV-045 and the available C&IO Control Copy #146 for P41-MOV-111A testing not being updated with revision 6. The inspector discussed this with the Startup Manager who took the following actions. All Controlled Copies of C&IO procedures were checked to verify that the current revisions were held. Personnel involved were counseled on using correct revisions of procedures and data sheets. In this instance it was noted that the use of revision 5 versus 6 had no effect on the tasks performed. The inspector had no further questions at this time.

## 6. Motor Operated Valve (MOV) Wiring

### 6.1 Quality of Wiring Installation

10 CFR 50, Appendix B, Criterion V, the Shoreham FSAR, Section 17, and the Quality Assurance Manual, require activities affecting quality be accomplished in accordance with appropriate instructions. A surveillance of motor operated valves was conducted by the inspector. Two instances, as follows, were identified that lacked adherence to required instructions:

1. Contrary to Electrical Specification No. SH1-159, the terminal lug bend for torque switch jumpering at the limit switch terminals was greater than the required sixty degrees for valve E51\*MOV-045. In addition, the insulation on one electrical lead was deteriorated with exposed wiring.

2. Engineering and Design Coordination Report No. 9732-E, issued to allow jumpering the open torque switch at the limit switch contacts, required a minimum of two threads protrusion of the terminal stud above the nut. The torque switch jumpering for valve E11\*MOV-36A did not have a minimum of two thread protrusion.

Discussions with the licensee has resulted in follow-up of these items by issuance of two LILCO Deficiency Reports.

These items constitute a violation of 10 CFR 50, Appendix B, Criterion V, the FSAR Section 17, and the Quality Assurance Manual and are designated as Violation No. (322/82-30-01).

#### 6.2 Location of Wiring

Current NRC and licensee requirements necessitate that motor operated valves important to safety have the open-torque switches bypassed to ensure maximum operability. Engineering and Design Coordination Report No. F-9732-E was issued to allow jumpering torque switches at the limit switch terminals if the open-torque switch contacts were not accessible. NRC inspection of valve E11\*MOV-36A disclosed that the open-torque switch contacts were accessible, but the torque switch was jumpered at the limit switch terminals. This item is unresolved and is designated as item no. (322/82-30-05).

#### 7. Quality Assurance for Seismic Components

The Shoreham FSAR in paragraphs 3.2.1, 3B-1.29, and 7.1.1.2.4 and Figure 7.1.1-2 commits to Regulatory Guide 1.29 (R.G. 1.29) on "Seismic Design Classification". R.G. 1.29 paragraph C.2 states that, those portions of structures, systems, or components whose continued function is not required but whose failure could reduce the functioning of safety-related features should be designed and constructed seismically. At Shoreham, these type items are designated Quality Assurance, Category II (QA Cat. II), Seismic Cat. I items. Shoreham has designed these items seismically. R.G. 1.29 paragraph C.4 then states that the pertinent quality assurance requirements of Appendix B to 10 CFR Part 50 should be applied to the safety requirements of those portions of structures, systems, and components covered under paragraph C.2.

The licensee has not formally defined which requirements of Appendix B are pertinent and, for example, has not inspected or audited these QA Cat. II, Seismic Cat. I items with quality control or quality assurance personnel. These items have been inspected under the construction inspection program. This item is unresolved and is designated Item No. (322/82-30-03).

## 8. Temporary Seals

During plant tours, the inspector noted that a soft temporary seal material had been placed in various wall and floor penetrations, holes, cracks, etc. The inspector determined that this was in place in order to permit the final Carbon Dioxide (CO<sub>2</sub>) Fire Suppression System Preoperational Tests to take place before the final seals were installed. The inspector questioned what controls were in place to ensure that all penetrations, holes, cracks, etc., which were temporarily sealed would receive a final seal, equal to or better than the temporary seal. The licensee was not able to answer the question during the inspection period. This item is unresolved and is designated Item No. (322/82-30-04).

## 9. Pipe Break Analyses

FSAR paragraphs 3.6 and 3.6B and Appendix 3.C describe the analyses and protection for pipe breaks in the plant. These analyses assume that flooding from the pipe breaks in the Reactor Building can be isolated before water depth at Elevation 8' (the lowest level in the Reactor Building) reaches 22 inches above the floor. This height is assumed to be the first level where safety related equipment is flooded. The following measurements by the inspector on Elevation 8' showed safety-related equipment below the 22 inch mark:

- High Pressure Coolant Injection (HPCI) loop level  
Pump Motor - 16 inches
- Reactor Core Isolation Cooling (RCIC) loop level  
Pump Motor - 16 inches
- HPCI vacuum pump motor - 10 inches
- HPCI condensate pump motor - 15 inches

The inspector noted that there were currently outstanding information requests to the licensee from the Office of Nuclear Reactor Regulation (NRR) on internal flooding and requested that the licensee address these equipment heights in their response to these items. The licensee's representative stated that they would be addressed. This item is unresolved and is designated item no. (322/82-30-06).

## 10. Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. Unresolved items are contained in paragraphs 3.2, 6.2, 7, 8, and 9 of this report.

## 11. Management Meetings

On November 22, 1982 a publicly noticed meeting was held between the following representatives of the licensee and the NRC:

NRC-Region I

J. Allan, Deputy Regional Administrator  
S. Ebnetter, Chief, Engineering Programs Branch  
R. Gallo, Chief, Reactor Projects Section 1A  
P. Hannes, Resident Inspector  
J. Higgins, Sr. Resident Inspector  
T. Martin, Director, DETP  
L. Narrow, Reactor Inspector  
R. Starostecki, Director, DPRP

NRC-NRR

R. Gilbert, Project Manager  
A. Schwencer, Chief, Licensing Branch 2  
E. Weinkam, Project Manager

LILCO

W. Museler, Manager, Engineering and Construction  
M. Pollock, Vice President, Nuclear  
E. Youngling, Startup Manager

At the meeting the following topics were discussed: Various as-built verification programs in progress or recently completed at Shoreham including the Torrey Pines Technology Independent Inspection Results, the Shoreham Plant Configuration Review Program, the stress reconciliation program for piping and pipe support, and the electrical raceway program; recent pipe support inadequacies at other sites and why they do not apply to Shoreham; Preoperational Test performance relative to fuel load; Regulatory Guide 1.29; previous Region I inspection issues transferred to the Office of Nuclear Reactor Regulation (NRR) for resolution; the findings of the preoperational Health Physics inspection (322/82-33); and plans for the Operational Quality Assurance Inspection (322/82-34).

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 inspector also attended the entrance and exit interviews for region-based inspections conducted during the inspection period.