U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-322/81-22

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, Unit 1

Inspection at: Shoreham, New York

Inspection conducted: November 23 - December 31, 1981

Inspectors: J. C. Higgins, Senior Resident Inspector — 1/6/82 date signed

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Approved by: R. M. Gallo, Chief, Reactor Projects Section 1A projects Branch #1, DRPI — 1/14/82 date signed

Inspection Summary:

Inspections on: November 23 - December 31, 1981 (Inspection Report No. 50-322/81-22)
Areas Inspected: Routine onsite regular and backshift inspections by the resident inspector (92 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 design change control, maintenance review, and followup on previous inspection findings.

Results: Of the six areas inspected no violations were identified in five areas and one in the sixth area (failure to follow procedures governing design change control, paragraph 5.c).

DETAILS

1. Persons Contacted

D. Durand, Lead Startup Engineer (L)
T. Gerecke, Quality Assurance Manager (L)
J. Kelly, Field QA Manager (L)
W. Matejek, Lead Advisory Engineer (S&W)
M. Milligan, Project Engineer (L)
J. Morin, Senior Licensing Engineer (L)
A. Mueller, Acting QOA Engineer (L)
R. Perra, Asst. Supt. FQC (S&W)
J. Riley, Lead Startup Engineer (GE)
J. Rivello, Plant Manager (L)
J. Smith, Manager, Special Projects (L)
W. Taylor, Asst. Supt. FQC (S&W)
D. Terry, Assistant Startup Manager (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, quality assurance and construction personnel.

2. Previous Inspection Item Update

a. (closed) Unresolved Item No. (322/81-01-03): Automatic Damper Operation: Revision 23 to the FSAR, dated October 1981, changes the system description in paragraph 9.4.4.2 so that it agrees with the actual in plant arrangement of the Turbine Building Ventilation System. This item is closed.

b. (closed) Inspector Follow Item No. (322/81-12-13): Review of Repair/Rework Requests for LDR applicability: Revision 2 to QAI-10.4-01 which was issued on 11/30/81 specifies that each Repair/Rework Request must be reviewed by Operational Quality Assurance to determine if the deficient condition warrants a LILCO Deficiency Report (LDR). This item is closed.

c. (closed) Unresolved Item (322/81-12-08): Electrical Wiring Checkout: This item has been escalated to a violation, as described in paragraph 5.c of this report. The unresolved item is therefore closed and all followup will be under the violation, number (322/81-22-03).

d. (open) Unresolved Item (322/81-12-07): Submerged Electrical Cables: Safety-related electrical cables in Electrical Manhole No. 2 by the screen-well were originally noted to be underwater in July. On July 27, 1981 E&DCR F-35998 was written to install covers/plugs over the manholes. This was not done and on November 27, 1981 the inspector noted that the cables were again underwater. The licensee had the manholes pumped dry and covers installed by December 4, 1981. The inspector questioned the effect of continued submergence in brackish water on the cables. This item remains open.

3. Plant Tour

a. 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 and review of fire insurance inspection reports.

-- Housekeeping: Minimal accumulations of debris and maintenance of required cleanness levels of systems under or following testing.

-- Equipment Preservation: 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 site construction security.

-- Weld Rod Control: Observations to determine weld rod was being controlled in accordance with site procedures.

With the exception of the below item no discrepancies were identified.

b. Document Control

During a plant tour, the inspector noted several wiring drawings affixed to the inside of control room panels. These drawings were not in use but were not the latest revision and were not marked "VOID" or uncontrolled. The inspector questioned this situation. The licensee's representative stated that personnel are responsible for ensuring drawings being used are the latest and had them removed to prevent any inadvertent use. A LILCO Deficiency Report (LDR #0570) was written by Operational Quality Assurance (OQA) to obtain corrective and preventive action. The inspector also reviewed the last four OQA surveillances and the last two OQA Audits of drawing and document control and noted that the area was being addressed by the licensee. The inspector had no further questions at this time.

4. NRC Bulletins and Circulars

a. Documents Closed

Bulletin 80-19: This Bulletin, titled "Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by Combustion Engineering", and Rev. 1 to the Bulletin describe repeated failures of the subject relays manufactured by the C. P. Clare Co. The licensee has reviewed his facility and determined, as requested by the Bulletin, that such relays are not used in the reactor protection system at Shoreham. These relays have been added to the Licensee's Deficient Items List to prevent procurement in the future. During tours of the plant, the inspector reviewed documents and observed the components used in various reactor protection system panels on a random basis and noted that none of the subject relays were used. This Bulletin is closed.

Bulletin 80-20: Bulletin 80-20, "Failure of Westinghouse Type W-2 Spring Return to Neutral Control Switches", described a malfunction of the subject switch. The licensee's review of the facility revealed that none of these switches are used at Shoreham in any Class 1E application. The switches have been added to the licensee's Deficient Items List to prevent procurement in the future without corrective action. The inspector independently reviewed selected plant documents to determine if these switches had been purchased or used and also toured the facility to observe equipment control switches actually in place. None of the subject switches were identified. This Bulletin is closed.

Bulletin 81-02: This Bulletin, titled "Failure of Gate Type Valves to Close Against Differential Pressure", along with Supplement No. 1 to the Bulletin describe certain Westinghouse and Borg-Warner motor operated gate valves which would not shut against the required design differential pressure. The licensee reviewed his facility and determined that none of the subject valves were used at Shoreham. The valves were added to the Deficient Items List to preclude procurement in the future. The inspector reviewed various documents onsite and during plant tours observed, on a random basis, the motor operated gate valves installed in the plant. None of the subject valves were identified. The inspector also reviewed valve specifications SH1-288V, "Motor Operated Carbon Steel Valves 2½ in. and Larger" from the Velan Corp. and noted that the specification required that the motor operators of all valves be able to open and close the valves against full differential pressure at specified rates of travel. This Bulletin is closed.

b. Documents Remaining Open

Circular 81-01: This Circular, titled "Design Problems Involving Indicating Pushbutton Switches Manufactured by Honeywell Incorporated" describes two problems that manifest themselves during relamping, namely: (1) a short circuit may be induced; and (2) the circuit controlled by the switch may inadvertently be actuated. The Circular specifically addresses Series 2 indicating pushbutton switches by the Micro Switch Division of Honeywell Incorporated, but states that the deficiencies cited may be common to other

indicating pushbutton switches and that holders of construction permits should scrutinize the design of other pushbutton switches in their facility for susceptibility to the above problems. The licensee's review revealed that none of the Series 2 switches were used at Shoreham but the review did not address similar switches. The inspector toured the facility and noted several types of indicating pushbutton switches used in the control room which appeared to be susceptible to the above problems during relamping. Some of the locations where these switches were noted are: the rod select matrix, main turbine electro-hydraulic control panel, reactor feed pump turbine control, rod sequence control system, and neutron monitoring system. This Circular remains open.

5. Design Change Control

a. Documents Reviewed

The inspector reviewed the following documents pertaining to design change control:

- 10 CFR 50 Appendix B;
- FSAR sections 14 and 17;
- Operational Quality Assurance Manual;
- Engineering Quality Assurance Manual;
- ANSI N45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants;
- Startup Manual;
- FQC Procedure QC5.2;
- CSI 2.16, E&DCR Implementation Verification Program;
- Startup Instruction No. 2, Electrical Checkout Instructions;
- Selected Engineering & Design Coordination Reports (E&DCRs); and
- Selected Drawings and weekly drawing summary sheets.

b. Discussion

The inspector reviewed the above documents to determine the completeness and effectiveness of design change control methods, particularly during the time period when systems are under the jurisdiction of the Startup Group. Design changes are generally approved via an Engineering & Design Coordination Report (E&DCR), although sometimes a change to an electrical system may be approved via a simple drawing revision. When a system is under construction's jurisdiction all E&DCRs are posted against the controlling

document (e.g. the drawing) and then at time of system turnover or release to Startup the system is verified to be constructed in accordance with all the latest documents including any E&DCRs. After turnover to Startup, all E&DCRs and drawing revisions are distributed to Startup by Engineering. The Startup Test Engineer then has the responsibility to review the design change. If work must be done in the field to effect the change, the Test Engineer must write a Repair/Rework Request to implement the E&DCR. He must also ensure that any design changes are properly incorporated into the Test Program. With the exception of the below items the inspector identified no discrepancies in the program.

c. Electrical Wiring Checkout

The licensee performs electrical wiring checks as part of the Startup Test Program per Startup Instruction No. 2 "Electrical Checkout Instructions" and Procedure CG.000.007, "Low Voltage Control Circuits". The instruction also details the evaluations and required documentation when drawings are revised due to design changes to circuits that have already had their wiring checkout completed. The inspector reviewed the implementation of this program and noted that the requirements had not, in all cases, been followed. This constitutes a violation, as described below and is designated Item No. (322/81-22-02).

10 CFR 50, Appendix B, Criterion III requires that design interfaces among organizations be controlled by the establishment of procedures and that design changes be subject to design control measures commensurate with those applied to the original design.

10 CFR 50, Appendix B, Criterion V; Shoreham FSAR, Section 17.2.5; and the LILCO Operational Quality Assurance Manual, Section 5.3.1 require that activities affecting quality be accomplished in accordance with documented instructions, procedures, and drawings.

1. Startup Instruction No. 2, Rev. 1, "Electrical Checkout Instructions", page 2, requires that the wire checking and functional testing of electrical circuits be documented by "yellow-lined" elementary diagrams or drawings called "Yellow-Lined Masters".

   Contrary to that requirement, on December 14, 1981 there was no Yellow-Lined Master in the Startup Resource Center Yellow-Lined Master File for drawings ESK-11R4204 or ESK-6T2301.

2. Startup Instruction No. 2, page 2 and 3, requires that prior to the Preoperational Test the Test Engineer review changes made to his system by Engineering and Design Coordination Reports(E&DCRs) and by drawing revisions. The latest drawing and the Yellow-Lined Master drawing then must be stamped, dated, and initialed to indicate whether additional testing is required or whether the design changes do not affect the tests performed.

Contrary to that requirement, on December 14, 1981 there was no stamping or other documentation on the below listed drawings in the Startup Resource Center Yellow-Lined Master File to indicate that the latest revisions had been reviewed by the Test Engineer prior to the Preoperational Test: ESK-5R2303, ESK-5R2304, ESK-6P2108, and ESK-6P2111.

3. Startup Instruction No. 2, page 3, requires that all superseded drawings be retained in the Yellow-Lined Master File.

   Contrary to that requirement, as of December 14, 1981 numerous superseded drawings were not retained in the Startup Resources Center Yellow-Lined Master File, including:

   ESK-11R4204, original and Rev. 1
   ESK-6T2301, Rev. 2
   ESK-6G1133, Rev. 5
   ESK-6P2111, Rev. 3

4. Field Quality Control Procedure QC5.2, Rev. C, Change 3, paragraph 4.3.4.3 requires that superseded documents, which are retained, be marked "VOID".

   Contrary to that requirement, numerous superseded drawings retained in the Startup Resource Center Yellow-Lined Master File were not marked "VOID", including:

   ESK-11R4201, Rev. 3
   ESK-11R4202, Rev. 2
   ESK-5R4301, Rev. 11, 11A, 12, and 13
   ESK-6R4308, Rev. 3
   ESK-5R2304, Rev. 6, 6A, 6B, and 6C
   ESK-6G1104, Rev. 3
   ESK-6G1114, Rev. 2

d. Additional Program Comments

In addition to the above violation, the inspector noted that the design change documents (E&DCRs and drawing updates) were not distributed in a controlled manner to the Startup Test Engineers,who are responsible for implementing the design changes and for incorporating the changes into the test program. The inspector also noted that procedures in place do not fully detail methods to assure and document that each design change, issued after Startup has jurisdiction of a system, is both incorporated into the plant and into the test program. Particular areas noted to be not adequately covered were: documentation of actions for an E&DCR issued when a drawing change does not result; documentation of action for E&DCRs and drawing changes for other than electrical drawings; actions to be taken and resulting documentations when changes occur after the Preoperational Test has been released for performance.

Some examples from the Startup Resource Center files are listed below to illustrate the above concerns.

- Drawings ESK-6C4101 and ESK-6C4101A: The Yellow-Lined Master drawing shows three series "49-" contacts, but E&DCR F-32001 changes the circuit to have only one contact. The documents are unclear as to which arrangement was checked out. Also terminal point 3A was Yellow-Lined, while the components originally connected to 3A have been reconnected to 1A.

- Drawing ESK-6C4101: The Yellow-Lined Master indicates that contact No. 11 comes from tank no. 4, while three affecting E&DCRs indicate it is from tank no. 3.

- Drawing ESK-11R4201: The Yellow-Lined Master was completed on Rev. 3 on 4/26/79. The Preoperational Test (PT) was completed in 1980. On 8/20/81 E&DCR F-36378A was issued and on 10/1/81 Rev. 4 was issued. As of 12/14/81 Startup still had jurisdiction of the system, had submitted a package to the Plant Staff for turnover of the system, yet there was no documentation in the Yellow-Lined Master to show that the E&DCR and Rev. 4 had been reviewed to determine if retesting was required.

- Drawing ESK-6G1114: Rev. 3 was the Yellow-Lined Master. Rev. 4 was issued after PT release and there was no documentation to indicate review for required retesting.

This item is unresolved and is designated as unresolved item no. (322/81-22-03).

6. Control Rod Drive (CRD) System

a. Discussion

The inspector reviewed the below documents:

- PT.106.001, "Control Rod Drive System" Preoperational Test;

- Piping and Instrumentation Drawings FM-27A, B, and C;

- FSAR sections 4.23 and 14.1.3.7.18;

- NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking";

- Letter from NRC to LILCO dated 3/11/80;

- Letter from GE to NRC dated 11/27/79; and

- Selected Checkout and Initial Operation (C&IO) tests.

The inspector also toured various portions of the CRD system both in company with licensee representatives and alone. Based on the document review and system tours, the inspector compared the installed system and system test procedure to regulatory requirements and licensee commitments. The inspector also reviewed C&IO test results to determine if appropriate acceptance criteria had been met.

The inspector witnessed portions of PT.106.001, which were performed in the main control room and the reactor building including: CRD venting, CRD movement, and CRD scram time testing. During the test the inspector noted that:

- the test procedure was approved and released for performance by the JTG;

- test procedure was in use by personnel performing the test;

- test equipment was calibrated within required time periods;

- test personnel were suitably qualified;

- quality assurance participation was as required;

- data was logged per the procedure; and

- test acceptance criteria were met for portions observed.

At the conclusion of this inspection the licensee testing and the NRC review were still ongoing. To date no discrepancies were identified with the exception of the below item.

b. CRD System Modification

NUREG-0619 discusses the problem of CRD system return line nozzle cracking. Part of the solution to this problem was to cap the nozzle and reroute the return flow. The Shoreham FSAR, section 4.2.3.2.2.3 does not reflect this modification.

One concern with the revised design, as discussed in the two letters listed in paragraph 6.a above, is the ability to provide maximum makeup flow to the reactor vessel from the CRD system in the event of an accident. The modifications were considered acceptable to the NRC if a plant specific minimum flow could be demonstrated. For Shoreham the minimum flow required is 135 gpm. This will be demonstrated during preoperational testing using temporary instrumentation. The control room flow indicator, which would be used by operators under actual accident situations, is off instrument C11-F001 and is only a 0-100 gpm gage. The inspector stated that this instrument did not appear to meet the above concerns. These two items dealing with the CRD system modification are unresolved and are designated item no. (322/81-22-01).

7. Maintenance

The licensee performs maintenance on systems under Startup's jurisdiction using the Repair/Rework Request (RRR). The inspector reviewed the portions of the Startup Manual describing the use of the RRR and reviewed the 45 RRRs which have been written for the Standby Liquid Control System (C41). Selected RRRs were discussed with the system Test Engineer and the S&W Lead Advisory Engineer. For RRRs #C41-25 and 26, issued to overhaul the Standby Liquid Control Pumps, the inspector noted that the pump vendor manual had been used vice the permanent plant maintenance procedure. The licensee's representative stated that permanent plant maintenance procedures should be used where possible, and if written and approved, to check out the maintenance procedures. The Test Engineer reviewed the Maintenance Procedure and wrote a memo to the Plant Staff, dated 12/10/81, giving a recommended change to the procedure based on knowledge gained during the pump overhaul.

The inspector had no further questions as this time.

8. Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. Unresolved items are contained in Paragraphs 5.c and 6 of this report.

9. Management Meetings

At periodic intervals during the course of this inspection, meetings were held with plant management to discuss the scope and findings of this inspection.

The resident inspector also attended the entrance and exit interviews for an inspection conducted by a region-based inspector during the month.