U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 50-322/80-12

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 No. 1

Inspection At: Shoreham, New York

Inspection Conducted: July 21-24, 1980

Inspectors: L. Narrow 8/5/80
L. Narrow, Reactor Inspector date

date

date

Approved by: R W McGaughy 8/20/80
R. W. McGaughy, Chief, Projects Section, RC&ES Branch date

Inspection Summary: Inspection on July 21-24, 1980 (Report No. 50-322/80-12)

Areas Inspected: Special, unannounced inspection by a regional based inspector of the status of outstanding items; and of concerns which had been brought to NRC's attention with respect to bolting of structural steel and construction of the biological shield wall. The inspection involved 22 inspector hours on site by one regional based inspector.

Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

Long Island Lighting Company

*T. F. Gerecke, Engineering QA Manager
*W. Hunt, System Superintendent (Unico)
*J. M. Kelly, Field QA Manager
T. Koch, QA Engineer
J. McCarthy, Assistant Instrument Supervisor
M. H. Milligan, Project Engineer
*A. R. Muller, C Engineer
E. J. Nicholas, Section Supervisor, Field QA
*J. P. Novarro, Project Manager
*J. Rivello, Plant Manager
M. G. Smith, QA Engineer
*J. Taylor, Startup Manager
*E. W. Tesko, Mechanical Superintendent (Unico)
*A. . Wofford, Vice President

Stone and Webster Engineering (S&W)

*T. T. Arrington, Superintendent Field QC
E. Barcum, Senior QC Inspector
E. J. Hassett, Senior Construction Assistant (Unico)
H. Calabro, Senior QC Inspector
*J. W. Hassett, Senior QC Inspector
R. Perra, Chief Inspection Supervisor, FQC
A. R. Shevade, Area Superintendent (Unico)
W. C. Taylor, Assistant Superintendent, FQC
G. Wierbowski, Area Engineer (Unico)
R. Wiesel, Lead Structural Engineer (Boston)

Dravo Corporation

G. Goosney, Ironworker
D. Woods, Ironworker

General Electric Company (GE)

*R. M. Pulsifer, Resident Site Manager

*Denotes persons in attendance at exit interview.

The inspector also interviewed other licensee and contractor personnel during the inspection.

2. Plant Tour

The inspector observed work activities in progress, completed work and construction status in several areas. Work items were examined for obvious defects and for noncompliance with regulatory requirements and licensee commitments. Specific activities and completed work observed by the inspector included installation of pipe supports in the suppression chamber and dry well; installed biological shield grout hole cover plates and vent hole plugs; and structural steel framing.

No items of noncompliance were identified.

3. Review of Problems Identified to NRC

By letter dated June 30, 1980, the Region I office of NRC was informed of three areas of work which were of concern to the writer. The writer stated in the letter as well as during a later telephone discussion with representatives of Region I that he was not making any allegations of improper work but was raising some questions which were of concern to him. The areas described in the letter and during the telephone discussion are shown below.

a. Bolting of Structural Members

Concern was expressed that structural bolts were only checked for undertightness and not for overtightness and that overtightening of the bolts could result in pressurizing and weakening of the bolts.

The inspector reviewed specification and QC procedural requirements for bolting of structural steel and also interviewed ironworkers and QC inspectors to determine the controls maintained on undertightening and overtightening of structural steel bolts. From the above as well as review of selected QC records the inspector determined that formal inspections for undertightness of bolts were required and were performed. Control of overtightening was primarily dependent upon the ironworker's experience.

In addition, the inspector was informed that air for operation of the impact wrenches was provided by a central station and that the available impact wrenches with the air pressure supplied were not capable of overstressing the bolts. To verify this statement the inspector witnessed tightening and overtightening of five 7/8-inch (A-325) bolts. This type and size of bolts are used for most of the structural steel bolting on site. Two impact wrenches were used. The maximum loading on any bolt was 55 kips which is equal to the minimum specified tensile strength for this size and type of bolt. This is indicative of support for the licensee's contention that the bolts could not have been overstressed.

The inspector also noted that "AISC Specification for Structural Joints Using ASTM A325 and A490 Bolts" states, in part "Bolts installed by torquing can sustain additional direct tension loads without any apparent reduction in their ultimate strength. Because of this reserve strength, it is apparent that if the fastener does not fail while being installed, it will not fail thereafter, provided the loads to which it is subjected do not exceed those for which it has been designed."

From the above, it is concluded that the writer's statement that bolts are checked for undertightness only but not for overtightness is correct. However, the concern about weakening of the bolt by over-tightening is not valid. As pointed out in the AISC specification if this type of bolt does not fail during tightening, it will not fail in service if it is not loaded above the design load.

The inspector had no further questions concerning this item.

b. Voids in Primary Shield Wall Cubicles Around Door Openings

The letter stated that individual cubicles in the primary shield wall sounded hollow, indicating possible air pockets in the concrete within the shield wall and questioned whether this might not indicate weak spots in the containment and possible danger to area residents. During the telephone discussion the cells are identified as being located between Elevation 96 and 105 in the cubicles around door openings.

Paragraph 3.f.3.4.2 of the FSAR states, in part, "The concrete (of the primary shield wall) is considered to be structurally ineffective and... is not considered in the finite element model." The presence of voids and their repair was therefore considered only from the stand point of shielding effectiveness since structural aspects of this concrete are not safety-related.

The inspector discussed this question with representatives of the licensee and was informed that voids had been identified in some of the cubicles between door openings at the elevations indicated. These voids had been identified after removal of weep hole covers in the cubicle side walls and were recorded on N&D No. 2809 dated January 23, 1980. The N&D showed the presence of voids in Cubicles H212/1, H212/2, K212/1, K212/2, H212/6, H212/7 and H212/8. Grouting of the voids had been completed in accordance with the N&D disposition as shown by QC Inspection Report dated July 7, 1980. The inspector was informed by the licensee's representatives that the remaining cubicles adjacent to door openings had been inspected for voids as covers were removed and found to be acceptable.

It is concluded that the statement concerning voids in the shields is corroborated. However, these voids had been identified by the licensee in January, 1980 and the deficiency had been corrected.

The inspector had no further questions concerning this item.

c. Cover Plate Thickness Not As Shown on Weld data Sheet

The letter stated that a Structural Weld Data Sheet (attached to the letter) showed a plate thickness of 3/8-inch although the writer was aware that 3/16-inch plate was actually used. During the telephone discussion the writer identified these plates as the cover plates and stated that problems were encountered in welding which resulted in several changes in plate thickness finally ending up with 3/16-inch plate. He also questioned the traceability of the 3/16-inch plate.

The inspector examined E&DCR No. F26363B which was referenced on the Structural Weld Data Sheet attached to the letter to NRC. This E&DCR changed the plate thickness to 3/16-inch. During discussions with the licensee's representatives the inspector was informed that during final documentation review by QC plate thickness on the Weld Data Sheet would be corrected. Identification of the E&DCR on the data sheet required that the work be performed in accordance with the E&DCR. This was done, as evidenced by use of the correct plate thickness rather than the original thickness shown on the data sheet.

The inspector also questioned traceability of the plate used for the cover plates and plugs and to seal vent holes installed for use during grouting. He was furnished the following documents:

- Stores Requisition No. 920512 for 3/16-inch thick 8 x 4 foot Category I plate, TCN (Traceability Control Number) BB-172 which had been issued to Dravo April 8, 1980.

- Material Requisition and Control Card (MR) No. 015635 TCN BB-172 for 83 approximately 6-inch diameter 3/16-inch plates for cover plates to repair shield wall grout holes.

- MR No. 014738 TCN BA-696 for 3/8-inch plate to be punched for 150 3/4-inch slugs for shield wall grout hole repairs.

From the above, it is concluded that the 3/16-inch plate was the correct material in accordance with the E&DCR shown on the Weld Data Sheet; that the 3/8-inch plate shown was the original plate thickness which had been revised in accordance with approved procedures by the E&DCR; and that the 3/16-inch material used was traceable in accordance with QC Procedure QC-8.1, "Material Control."

The inspector had no further questions concerning this item.

4. Concrete in Primary Shield Wall

During review of Item 3.b above, voids in Primary Shield Wall Cubicles Around Door Openings, the inspector asked whether the licensee had considered the possibility of voids in primary shield wall cubicles other than those adjacent to door openings. The licensee's representative stated that this question had been discussed and had been evaluated by Engineering.

During a later discussion with Engineering, the inspector was informed that the cubicles adjacent to the doors were smaller and had only one opening in the top plate. The other cubicles had two or three openings thus permitting concrete to be pumped in through one of the openings and use of a vibrator through the other. For this reason and based on placing concrete in a plastic mock-up of the wall prior to concreting, they were confident that voids would not be found in the remaining cubicles. However, since concrete placement was stopped 4-6 inches below the top plate of the cubicle, the effectiveness of the vibrator in this shallow space appears questionable. In view of the large number of voids identified in the cubicles examined a more thorough investigation of this question appears necessary.

This item is considered to be unresolved pending a more positive determination concerning the possibility that voids may exist in the remaining Primary Shield Wall Cubicles (80-12-01).

5. Review of Nonroutine Events Reported by the Licensee

By letter dated December 11, 1978 the licensee had reported as a significant deficiency in accordance with 10 CFR 50.55(e), failure of ITT North Electric power supplies due to contamination of capacitors during shipment. These power supplies had been provided to the site by Bailey Controls for ten Category I installations.

The power supplies have been returned to Bailey Controls and replacement units supplied to the site and installed. The inspector reviewed the following documents:

- E&DCR P-3180 providing for power supplies to be replaced
- Returned Material Report 79-1028 for return of ten power packs
- Preinstallation verification of returned power supplies dated July 30, 1979
- Final installation acceptance dated November 30, 1979

The inspector had no further questions concerning this item.

6. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (78-08-01): Undercut in structural steel welds. This item was reviewed during inspections 79-10 and 80-05. Section 3.8.4.6 of the FSAR has been revised by Revision 18, June, 1980 to state that welding performed under AWS Codes will be inspected to a maximum undercut of 1/32-inch unless cyclic fatigue is considered a design parameter in which case notation of specific inspection criteria will be provided on approved fabrication and erection drawings.

The inspector had no further question concerning this item.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, or items of noncompliance. An unresolved item identified during the inspection discussed in Paragraph 4.

8. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 24, 1980. In addition, the NRC Resident Inspector, Mr. J. C. Higgins attended the meeting. The inspector summarized the scope and findings of the inspection.