U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-322/85-01

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: January 14-29, 1985

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

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

Approved by: L. H. Bettenhausen, Chief Test Programs Section, EPB — 3/13/85 date

Inspection Summary: Inspection on January 14-29, 1985 (Report No. 50-322/85-01)

Areas Inspected: Routine, unannounced inspection of initial fuel load activities, core verification, surveillance testing, core component installation, instrument calibrations, and QA/QC interfaces. The inspection involved 108 hours on-site by two region based inspectors.

Results: No violations were identified.

DETAILS

1. Licensee, Consultants and Contractors

J. Alexander, Reactor Engineer

*J. Brand, Licensing Engineer

*W. Burnett, Compliance Engineer (Impell Consultant)

*E. Dean, Operating Engineer (Acting)

*R. Grunseich, Supervisor Nuclear Licensing

*L. Lewin, Instrument and Control (I&C) Engineer

A. Muller, Manager, Quality Control Division

*G. Rhoads, Compliance Engineer (Impell Consultant)

*C. Rowe, Quality Assurance (QA) Supervisor

J. Scalice, Manager, Operations Division

*D. Terry, Manager, Maintenance Division

*J. Wynne, Compliance Engineer

USNRC

P. Eselgroth, Senior Resident Inspector

The inspector also interviewed other licensee personnel including watch engineers, watch supervisors, reactor operators, General Electric test engineers, licensee staff engineers, I & C technicians, and maintenance personnel.

*Denotes those present at the exit interview.

Initial Fuel Load Witnessing

The inspector monitored the fuel load activities on a sampling basis at various times during the day and evening. Fuel load activities were observed at the control room, refueling floor and refueling bridge. Fuel load activities which commenced on December 21, 1984 were completed on January 19, 1985 with the insertion of the final fuel bundle at 1919 hours.

Fuel load activities were reviewed for the following:

-- Required licensed personnel were present on the control room and on the refuel bridge during 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 bridge.

-- Surveillance test procedures and fuel handling procedures were being followed.

-- Instruments were operating properly.

-- Selected Technical Specifications were being complied with.

The following activities were observed:

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

-- Operation of the refueling bridge

-- Control rod insert and withdraw check

-- Scram timing checks

-- Overall test control from the control room

-- Personnel access to refueling floor

-- Shift turnover

-- Performance of STP-3, "Fuel Load" and STP-5, "Control Rod Drive"

No deficiencies or violations were observed.

3. Core Verification

Subsequent to fuel load, Procedures STP-3, "Fuel Load", and SP 58.005.02, "Core Verification", require that a final verification of the core be performed to ensure that all fuel bundles were in the proper location; were properly oriented; and that there was fuel cell to fuel cell symmetry. Although the core was verified and double checked during fuel load by documentation on fuel transfer sheets; the final verification noted above was performed. This verification consisted of a one by one verification of each fuel bundle and a final videotape of the core; a review of the fuel transfer sheets to ensure that they accurately reflected the

core; and a check that the fuel bundle status boards in the Control Room and Refuel Floor accurately reflect the core. In addition, using a 90° angle TV camera, verification was made that all fuel bundles were at the same height.

The inspector observed portions of the core verification using the TV camera and verified that the method used provided an accurate determination of location, orientation and height of each fuel bundle. During the TV verification, a licensee QC inspector was present on the refuel bridge performing a 100 percent independent verification.

Subsequent to the TV verification, the video tapes of the core were reviewed in their entirety by the Reactor Engineer, a GE engineer, and a QC inspector. The NRC inspector witnessed approximately 30 percent of the videotape viewing of the core verification.

Due to an idiosyncrasy of the video tape machine, four peripheral bundles were found not to have been videotaped. The licensee retaped those bundles the next day. The inspector reviewed the videotape of the four bundles and determined that they were verified as properly installed.

No deficiencies or violations were observed.

4. Surveillance Test Witnessing

4.1 Test Performance

The inspector witnessed the following surveillance tests to assess the adequacy of the test and overall performance by licensee personnel:

-- SP 24.602.01, "IRM Functional Test"

-- SP 24.601.01, "SRM Functional Test"

During performance of the above tests, the following areas were verified:

-- The latest procedure revision was being used.

-- Prerequisites and initial conditions were met.

-- Test equipment was in calibration.

-- Procedures were correctly followed.

-- All data was properly taken and analyzed.

-- Test results were acceptable.

4.2 Test Results Review

The inspector reviewed following surveillance test results for completeness and to ensure results were within specification and in conformance with the Technical Specifications:

-- SP 22.008.01, Operational Surveillances

- Appendix 12.7, "Rod Position Indicator Check"
- Appendix 12.8; "Weekly Surveillance Readings and Checks"
- Appendix 12.9, "Daily and Shift Surveillance, Condition 4 and 5"
- Appendix 12.15, "Refueling Operation Periodic Surveillance Check List"

Data was reviewed for tests performed on January 13-14, 1985.

-- SP 24.601.01, "SRM Functional Test Data Sheet"

Data was reviewed for test performed on January 18, 1985

-- SP 24.602.01, "IRM Functional Test Data Sheet"

Data was reviewed for tests performed on January 11 and 18, 1985.

4.3 Findings

Performance of the Intermediate Range Monitor (IRM) functional tests requires readings of the IRM's at the local (back) panel and concurrently at the Control (front) panel. During observation of the test, the inspector alternated between both panels and noted that during the check of the downscale alarm for IRM "H", the back panel meter was reading correctly at 5/125 on the black scale while the front panel strip chart recorder was reading 25/125. The test procedure did not require the front panel operator to look a the IRM recorder. The inspector informed the operator of the discrepancy. MWR No. 850293 was submitted to repair the strip recorder.

Subsequent to this test, the inspector conducted discussions with licensee representatives concerning this discrepancy. The licensee agreed to revise procedures 24.601.01, "IRM Functional Test"; 24.602.01, "SRM Functional Test"; and 24.604.01, "APRM Functional Test" to ensure that front panel recorders are reading correctly during the performance of the functional tests. During a subsequent NRC Inspection (50-322/85-09), the inspector verified that these procedures were properly revised. In addition, the inspectors witnessed

performance of SP 24.601.01 and 24.602.01 and observed that the front panel recorders were reading properly.

5. Core Component Installation

During a review of surveillance tests, the licensee determined that the Reactor Core instrumentation reverse flow check valves required performance of an 18 month surveillance test prior to startup of the reactor. In order to perform this surveillance test, the reactor vessel internals and head needed to be reinstalled. Hence, the initial criticality to a maximum of .001 percent power which had originally been intended to be accomplished with an open reactor vessel, will be accomplished instead with the reactor vessel and primary containment heads installed.

The inspector reviewed the following procedures which concerned installation of major reactor vessel components, the reactor vessel had, the containment head, and refuel floor shielding:

-- SP 35.705.32, Moisture Separator Installation, Revision 0, February 3, 1983

-- SP 35.705.34, Steam Dryer Installation, Revision 0, February 8, 1983

-- SP 35.705.35, Reactor Vessel Head Studs Installation, Revision 0, February 3, 1983

-- SP 35.705.36, Reactor Vessel Head Installation, Revision 0, February 8, 1983

-- SP 35.705.37, Reactor Vessel Head Tensioning, Revision 0, May 20, 1983

-- SP 35.705.38, Reactor Vessel Head Insulation Installation, Revision 2, June 3, 1983

-- SP 35.705.39, Drywell Head Installation, Revision 1, December 13, 1982

-- SP 35.705.40, Installation of Refueling Canal Shield Plugs, Revision 0, December 6, 1982

-- SP 35.705.41, Installation of Dryer Separator Storage Pool Shield Plugs, Revision 0, December 6, 1982

-- SP 35.705.42, Installation of Refueling Cavity Shield Plugs, Revision 0, December 9, 1982

The inspector witnessed installation of the refuel canal shield blocks, the moisture separator, the steam dryer, and the reactor vessel head. During attempted installation of the top refuel canal shield block, this

block would not fully insert. The problem appeared to be alignment which may require a change in the rigging. The block was removed to be installed at a later date.

During installation of the moisture separator, the inspector observed that the alignment and mating of separator appeared to be proper. A quality control inspector was present during the installing, tightening, torquing and locking of the 36 moisture separator head bolts. The NRC inspector inspector independently witnessed that each of the 36 head bolts which connect the separator to the reactor vessel were tightened into the engaged position, torqued to at least 50 Ft-lbs by use of a breaker torque wrench, and that each nut was properly locked by a spring loaded retainer ring. The inspector observed that procedures were in use for all evolutions and that maintenance work packages were maintained at the work location.

Prior to installation of the reactor vessel head, the inspector observed the installation of the reactor vessel "O" rings. The inspector observed that the "O" ring seating surfaces were clean, and that the "O" rings were properly fastened into place. After the "O" rings were installed, the installation received 100 percent inspection by a QC inspector. The inspector also verified, on a sampling basis, reactor vessel head stud tensioning after the head installation.

No violations or deficiencies were observed.

6. GETARS and Plant Instrument Calibration

As noted previously in NRC Inspection Report 322/82-42, GETARS (Startup Transient Monitoring System) is a computer data acquisition and reduction system which monitors hundreds of plant parameters. Since this system will be used for obtaining official test data during the startup test program, it must be calibrated to ensure accuracy of the data collected. On a sampling basis, the inspector reviewed calibrations of several GETAR's data points and determined that calibrations had been adequately performed. Some calibrations performed during 1983 had been reaccomplished in 1984. A GE representative stated that GETAR's data points would be calibrated or calibration checked at least once per year. Calibrations for some GETAR's data points had not yet been accomplished, but the inspector verified that a maintenance work request had been submitted to calibrate these data points. No deficiencies were observed in the calibrations of GETAR's data points.

The inspector selected the following GETARS data points to determine if the instrument loops providing data to GETARS had also been calibrated:

-- Narrow Range Reactor Pressure

-- Wide Range Reactor Pressure

-- Narrow Range Reactor Level

-- Wide Range Reactor Level

-- Selected Reactor Water Cleanup Systems Process Temperatures

-- "A" Recirculation Loop Temperature

-- "B" Recirculation Loop Temperature

-- Recirculation Loop RTD's

All of the above instruments were included in the plant instrument preventive maintenance program and were calibrated on a regular basis. A licensee representative stated that the above instruments were calibrated approximately once every 18 months. The inspector reviewed the most recent calibration data for each instrument loop listed above and found no discrepancies. All calibrations reviewed had been performed within the last 18 months. The inspector noted that each calibration was on the SAWS (Scheduled Activity Work Sheet) system, a computer scheduling system to ensure that surveillance testing and preventive maintenance activities are accomplished at proper frequencies.

No deficiencies or violations were identified.

7. Independent Inspector Measurements, Calculations and Verification

During this inspection, the NRC inspectors performed the following independent measurements, calculations and verifications. Except where single items or 100 percent verification is specified, all verifications identified below were accomplished on a sampling basis:

-- Independent verifications of fuel bundle locations and fuel bundle heights were made from the refuel bridge during TV verification of the core. Further independent verification was made during subsequent replay of the videotape made during the core verification.

-- Independent observations of the IRM and SRM meters and recorders were made during performance of the IRM and SRM functional tests.

-- Independent verification that all 36 moisture separator head bolts were properly turned, tightened, torqued, and locked in place.

-- Independent observation of reactor vessel head stud tensioning and stud elongation measurements.

-- Independent verification of proper reactor vessel head and flange temperature during stud tensioning.

-- Independent verification of proper installation of reactor vessel head "O" rings.

A deficiency was noted as detailed in paragraph 4.3. No violations or deviations were identified.

8. QA/QC Interfaces

The inspector observed extensive QC coverage during fuel loading, core verification and core components installation. A Quality Control inspector performed an independent 100 percent verification of core bundle locations during the videotaping of the core; and the verification that all fuel bundle bail handles were at the same heights. During the independent review of the core verification video tape, a QC inspector was present for an additional 100 percent verification.

Quality Control inspectors witnessed portions of major core component installations. They performed a 100 percent verification of the torquing of steam separator head bolt nuts and final certification of proper installation of reactor head "O" rings. On a sampling basis, QC inspectors witnessed stud tensioning measurements.

The inspector determined, based on the above observations, that QC coverage was adequate.

9. Management Meetings

Licensee management was informed of the scope and purpose of the inspection at an entrance interview conducted on January 14, 1985. The findings of the inspection were periodically discussed with licensee representatives during the course of the inspection. An exit interview was conducted on January 29, 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.