

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

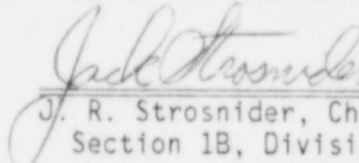
REPORT NO. 50-322/86-10
DOCKET NO. 50-322
LICENSE NO. NPF-36
LICENSEE: Long Island Lighting Company
P. O. Box 618
Shoreham Nuclear Power Station
Wading River, New York 11792

INSPECTION AT: Wading River, New York

INSPECTION CONDUCTED: April 16-May 31, 1986

INSPECTORS: John A. Berry, Senior Resident Inspector
Clay C. Warren, Resident Inspector

APPROVED:


J. R. Strosnider, Chief, Reactors Projects
Section 1B, Division of Reactor Projects

6/24/86
Date Signed

SUMMARY: During the period covered by Inspection Report 86-10, April 16, 1986 through May 31, 1986, 290 hours of direct inspection were performed by the Senior Resident Inspector, Resident Inspector and one region-based inspector.

No unacceptable conditions were identified during the inspections described in this report.

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1. Status of Previous Inspection Items

1.1 Closed 86-08-03: Inadequate Local Leak Rate Testing of BWR Vacuum Relief System Valves (IE Notice 86-16)

Shoreham has a different Containment design than the plants in the subject information notice (i.e. no Torus or Torus to Secondary vacuum breaker systems). However, SNPS has had similar problems with simulating the Integrated Test direction in Local Tests. The most similar case at SNPS to those in the Information Notice are the Containment Purge and Vent lines-T46. The test frequency for valves in these lines has been increased per the present Technical Specifications for reverse testing of these valves. They are also tested in the Integrated test direction per the Appendix J schedule as recommended in the Information Notice using a blank flange inside Containment. This adequately addresses possible leakage paths for these valves. Another possible concern are flanged connections at valves in the Appendix J test program. These are addressed by a special maintenance bolting procedure SP35.121.02 to assure proper flange tightness.

This item is closed.

1.2 Closed 86-08-05: Failure of Automatic Sprinkler System Valves to Operate

Licensee review of the facility fire suppression systems showed that no ASCO valves of the same type listed in IE Notice 86-17 are installed at Shoreham.

This item is closed.

1.3 Closed 84-29-01: Bahnson Air Handling Units

I&E Information Notice 85-30 was provided to inform licensees of potentially significant discrepancies in record keeping and material defects identified on heating, ventilation, and air conditioning (HVAC) equipment manufactured by the Bahnson Company (a division of Flakt, Inc.) of Winston-Salem, North Carolina. Millstone 3 and Shearon Harris have found discrepancies in record keeping and material defects. It was found that factory NDE liquid penetrant inspections were incomplete and undocumented. Millstone 3 units had low-strength carbon steel fasteners substituted for the required ASTM-A449 fan motor anchor bolts and self-tapping stainless steel screws for the required ASTM-A193-GRB8 cooling coil mounting bolts. Shearon Harris units had welds with cracks, lack of fusion, and undercut exceeding 1/64 inch. There were also missing welds and welds not made in accordance with the design drawings.

As a result of these findings, Board Notification 84-006 (2/9/84) was made by NRR for the Shoreham Nuclear Power Station.

The Shoreham Station uses four safety-related air conditioning units (ACUs) supplied by Bahnsen (shipping date 9/75-5/76). These units (S&W Mark Nos. 1X61*ACU-007A&B) supply cooling air to the control room and relay room, respectively.

Upon issuance of the Board Notification and IE Information Notice, the licensee initiated an inspection of all accessible areas of each ACU's internal/external structures. These inspections resulted in the following LILCO Deficiency Report (LDRs):

<u>LDR No.</u>	<u>Date</u>	<u>Equipment Mark No.</u>	<u>Service</u>
2167	03/07/84	1X61*ACU-007A&B	Control Room (CB E1. 63')
2168	03/07/84	1X41*ACU-014A&B	Relay Room (CB E1. 44')
2470	08/06/84	1X41*ACU-014B	Relay Room (CB E1. 44')
2471	08/06/84	1X41*ACU-014A	Relay Room (CB E1. 44')
2472	08/06/84	1X61*ACU-007A	Control Room (CB E1. 63')
2473	08/06/84	1X61*ACU-007B	Control Room (CB E1. 63')
2537	11/05/84	1X61*ACU-007A	Control Room (CB E1. 63')

Typical nonconformances identified in the above LDRs were: weld splatter, discontinuity, undercut, excessive convexity and lack of fusion on structural members; cooling coil/air filter support braces missing; various weld detail discrepancies with design drawings; lower-strength bolting substitutions made on the inlet bell and its support attachments. While these inspections were limited to external welds and internal welds which were readily accessible, the engineering disposition would address the adequacy of the remaining welds without further inspections required.

In a follow-up to the licensee's corrective actions on the Bahnsen's HVAC equipment deficiencies, NRC Inspections 50-322/84-50 and 85-02 were conducted by the Resident Inspector. Unresolved Item 84-29-01 was identified to permit NRC review of the seismic structural calculations prepared by Corporate Consulting, Ltd. (CCL) for Bahnsen/Flakt to address the LDR-specific deficiencies for both the welds inspected "as-built" as well as the inaccessible, "hidden", welds.

Unresolved item 84-29-01 was updated in NRC Inspection Report 50-322/85-02. The inspector reviewed the LDR's and expressed a concern over the engineering disposition. The concern related to the fact that because of the relatively small number of welds inspected, and the high number of deficiencies found, that either 1) the remaining welds should be inspected or 2) satisfactory justification should be provided for why further inspection is not necessary. The item remained unresolved pending NRC review of the licensee's final engineering dispositions and seismic calculations.

The licensee reviewed the disposition of the LDR's and concluded that upon satisfactory completion of the LDR reworks, the structural integrity of Shoreham's Bahnson ACUs will not be compromised in performing its intended safety function under design basis loads. That conclusion was based upon additional calculations performed in response to the inspectors concerns expressed in NRC Inspection Report 85-02, as well as previous calculations.

The seismic calculations were performed assuming that the "hidden" welds did not exist. The calculations showed that with this assumption the ACUs would still perform their intended safety function. Non-conforming bolting material was replaced under LDR rework. Based on the inspectors review of the seismic calculations, and the LDR rework, this item is closed.

1.4 Closed 84-29-06: Generic Letter 83-28, Salem ATWS Event

NRR review of Licensee Actions in response to Generic Letter 83-28 acknowledges that the facilities response to the NRC's concerns were adequate. A letter dated April 9, 1986 from Walter R. Butler, BWR Project No. 4 Directorate, Director Division of BWR Licensing to John D. Leonard, Vice President Nuclear Operations, LILCO, documents this satisfactory Licensee response.

This item is closed.

2. Review of Facility Operations

2.1 Plant Status Summary

During the period covered by inspection report 86-10 the facility remained in a shutdown condition while the licensee plugged condenser tube leaks (See Section 9.0) and performed 18 month surveillance activities.

2.2 Operational Safety Verification

The inspector toured the control room daily to verify proper shift manning, use of and adherence to approved procedures, and compliance with Technical Specification Limiting Conditions for Operation. Control panel instrumentation and recorder traces were observed and the status of annunciators was reviewed. Nuclear instrumentation and reactor protection system status were examined. Radiation monitoring instrumentation, including in-plant Area Radiation monitors and effluent monitors were verified to be within allowable limits, and observed for indications of trends. Electrical distribution panels were examined for verification of proper lineups of backup and emergency electrical power sources as required by the Technical Specification.

The inspector reviewed Watch Engineer and Nuclear Station Operator logs for adequacy of review by oncoming watchstanders, and for proper entries. A periodic review of Night Orders, Maintenance Work Requests, Technical Specification LCO Log, and other control room logs and records were made. Shift turnovers were observed on a periodic basis.

The inspector also observed and reviewed the adequacy of access controls to the Main Control Room, and verified that no loitering by unauthorized personnel in the Control Room Area was permitted. The inspector observed the conduct of Shift personnel to ensure adherence to Shoreham Procedures 21.001.01, "Shift Operations" and 21.004.01, "Main Control Room - Conduct for Personnel".

The inspector noted that on-shift personnel conducted themselves in a dedicated and professional manner, and that watchstanding personnel were fully aware of plant status and ongoing activities.

No unacceptable conditions were identified.

2.3 Plant and Site Tours

The inspector conducted periodic tours of accessible areas of plant and site throughout the inspection period. These included: the Turbine and Reactor Buildings, the Rad Waste Building, the Control Building, the Screenwell Structure, the Fire Pump House, the Security Building, and the Colt Diesel Generator Building.

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 activities were being surveilled on a sampling basis by qualified QA/QC personnel;
- Component Tagging - Implementation of appropriate equipment tagging for safety, equipment protection, and jurisdiction;
- Personnel adherence to Radiological Controlled Area rules, including proper Personnel frisking upon RCA exit;
- Access control to the Protected Area, including search activities, escorting and badging, and vehicle access control;

- Integrity of the Protected Area boundary.

No unacceptable conditions were identified.

2.4 Administrative Matters

2.4.1 Review of Operations Committee (ROC)

Several Review of Operations Committee Meetings were attended by the inspector during the inspection period. During these meetings, the inspector verified the required Technical Specification composition and quorum for the committee. The inspector also verified that appropriate reviews of safety evaluations and issues were presented.

No unacceptable conditions were identified.

2.4.2 Plant Organizational Changes

During this inspection period, the following organizational changes occurred:

- . Mr. Jeffrey L. Smith was appointed as Corporate Director of Training, responsible for both nuclear and fossil training.
- . Mr. Brian McCaffrey was appointed Manager, Nuclear Operations Support Department, replacing Mr. Smith.
- . Mr. Chuck Daverio was appointed Assistant to the Vice President-Nuclear Operations, replacing Mr. McCaffrey.
- . Mr. Doug Crocker was appointed Section Head, Offsite Emergency Preparedness Section, replacing Mr. W. Renz, who resigned.
- . Mr. Gary Krieger was appointed Section Head, Onsite Emergency Preparedness Section, replacing Mr. Crocker.
- . Mr. Dennis Spencer, Section Head, Drill Scenario and Development Section, Emergency Preparedness Division, resigned.
- . Mr. Mark Potkin was appointed as Modification Engineer, Outage and Modifications Division, replacing Mr. R. Gutman who was previously promoted to the position of Manager, Nuclear Contracts & Material Control Division.

3. Licensee Reports

3.1 In Office Review of Licensee Event Reports

The inspector reviewed Licensee Event Reports (LERs) submitted to the NRC to verify that details were clearly reported, including accuracy of the cause description and adequacy of corrective action. The inspector determined whether further information was required from the licensee, whether generic implications were involved, and whether the event warranted onsite follow-up. The following LERs were reviewed:

- 86-17 Source Leak Test not performed on a sealed source prior to being put in use.
- 86-18 Unmonitored discharge of non-radioactive water (less than minimum detectable activity) from the condensate storage tank sump.

No unacceptable conditions were noted.

4. Monthly Surveillance and Maintenance Observation

4.1 Surveillance Activities

The inspector observed the performance of various surveillance tests to verify that; the surveillance procedure conformed to technical specification requirements, administrative approvals and tagging requirements were reviewed and approved prior to test initiation, testing was accomplished by qualified personnel, current approved procedures were used, test instrumentation was currently calibrated, limiting conditions for operation were met, test data was accurately and completely recorded, removal and restoration of affected components was properly accomplished, and tests were completed within the required Technical Specification frequency.

In the area of surveillance testing, the facility conducted an extensive program to complete a large number of 18 month tests that would have come due during the next three months. This licensee effort was conducted to ensure that no shutdowns would be necessary to perform surveillances once the low power testing program is resumed.

The bulk of the 18 month surveillances were performed on the Emergency Diesel Generators including operating emergency diesel lockout feature test, operating emergency diesel load reject test from both rated and partial load, operating emergency diesel loss of offsite power test, operating emergency diesel loss of offsite power test with emergency core cooling system actuation and operating emergency diesel generator 24 hour full load run.

In addition to 18 month diesel generator testing, the licensee also conducted 18 month manual and automatic initiation tests of both loops of the Core Spray, Low Pressure Coolant Injection Mode of the Residual Heat Removal System and Reactor Building Service Water Pumps.

The inspectors monitored the performance of the following surveillance items to ensure procedural compliance, system performance, procedural adequacy and Technical Specification satisfaction:

- 24.307.01 Electrical Power Systems/AC Sources-Operating Emergency Diesel Generator Load Test
- 24.307.02 Electrical Power Systems/AC Sources-Operating Emergency Diesel Generator Test Mode Override Verification
- 24.307.03 Electrical Power Systems/AC Sources-Operating Emergency Diesel Generator Load Reject Test
- 24.203.04 Electrical Power Systems/AC Sources-Operating Emergency Diesel Generator Loss of Offsite Power with Emergency Core Cooling System Actuation
- 24.307.02 Electrical Power Systems/AC Sources-Operating Emergency Diesel Generator 24 Hour Run Test
- 24.203.04 Plant Systems/Reactor Building Service Water Automatic Pump Start Operability Test
- 24.203.04 Plant Systems/Reactor Building Service Water Automatic Valve Accident Signal Operability Test

No unacceptable conditions were identified.

4.2 Maintenance Activities

The inspector observed the conduct of various maintenance activities throughout the inspection period. During this observation, the inspector verified that; maintenance activities were conducted within the requirements of the plant's administrative procedures and technical specifications, proper radiological controls were implemented and observed, proper safety precautions were observed, and that activities which have the potential to impact plant operations are properly coordinated with the control room.

During the inspection period the following maintenance activities were observed:

- Main condenser tube leak repairs,
- Repair to plant exhaust ventilation radiation monitor,

- Electro-hydraulic control system pump removal, installation and system flushing, and
- M-50 system chiller condenser tube cleaning

No unacceptable conditions were noted.

5. Review and Followup of I&E Notices, Bulletins and Generic Letters

5.1 I&E Notices

The inspector reviewed notices issued by the Office of Inspection and Enforcement during the inspection period. Review was to determine; if the subject of the notice was applicable to the Shoreham Nuclear Power Station, and if followup of the licensee's action was required by the inspector.

The following IE Information Notices were received during the period covered by Inspection Report 86-10:

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| IE Notice No. 86-23: | Excessive Skin Exposure Due to Contamination with Hot Particles. |
| IE Notice No. 86-24: | Respirator Users Notice: Increased Inspection Frequency for Certain Self-contained Breathing Apparatus Air Cylinders. |
| IE Notice No. 86-25: | Traceability and Material Control of Material and Equipment, Particularly Fasteners. |
| IE Notice No. 86-26: | Potential Problems In Generators Manufactured by Electrical Products Incorporated. |
| IE Notice No. 86-27: | Access Control at Nuclear Facilities. |
| IE Notice No. 86-29: | Effects of Changing Valve Motor-Operated Switch Settings. |
| IE Notice No. 86-30: | Design Limitation of Gaseous Effluent Monitoring Systems. |
| IE Notice No. 86-31: | Unauthorized Transfer and Loss of Control of Industrial Nuclear Gauges. |
| IE Notice No. 86-32: | Request for Collection of Licensee Radioactivity Measurements Attributed to the Chernobyl Nuclear Plant Accident. |

- IE Notice No. 86-34: Improper Assembly, Material Selection and Test of Valves and Their Actuators.
- IE Notice No. 86-35: Fire in Compressible Material at Dresden Unit 3.
- IE Notice No. 86-36: Change in NRC Practice Regarding Issuance of Confirming Letters to Principal Contractors.
- IE Notice No. 86-37: Degradation of Station Batteries.
- IE Notice No. 86-38: Deficient Operator Actions Following Dual Function Valve Failures.
- IE Notice No. 86-39: Failures of RHR Pump Motors and Pump Internals.

IE Notices 86-26, 86-31, 86-36 and 86-39 are not applicable to Shoreham. Shoreham was the subject of IE Notice 86-34 and has satisfactorily completed action to resolve the problems identified in the notice. Licensee response to all remaining notices will be reviewed as part of future routine resident inspections.

6. Survey of Licensee's Response to Selected Safety Issues

The inspectors reviewed the licensee's response to selected safety issues in response to Temporary Instruction 2515/77. Licensee response to recommendations on reliability of high-pressure coolant injection/reactor core isolation cooling systems and on biological fouling of cooling water heat exchangers were reviewed. The licensee has adequately addressed the recommended actions. The inspector had no further questions.

7. Annual Review of Licensee Radiological Environmental Monitoring Program

The inspector reviewed the licensee's Radiological Environmental Monitoring Program annual report for 1985. This report summarizes the results of the sampling and analyses of environmental media to determine the radiological impact of station operations. These environmental media include air, water, vegetation, and aquatic plants and animals. In addition, direct radiation is monitored by placement of thermoluminescent dosimeters at various locations around the station.

As a result of this review, the inspector determined that the licensee has generally complied with its environmental Technical Specification requirements for sampling frequencies, types of measurements, analytical sensitivities, and reporting schedules. Exceptions to the sampling and analysis program were adequately explained, e.g., low air sample volume analyzed due to sample pump power failure. The report included summaries of the laboratory quality assurance program and of the land use survey.

The analyses of environmental samples indicated that doses to humans from radionuclides of station origin were negligible.

8. Licensee Response to CAL 86-05 Dated March 21, 1986

In response to CAL 86-05 the licensee issued a 30-day letter dated April 18, 1986 outlining actions taken to correct deficiencies identified in Special Inspection 50-322/86-03. This letter (SNRC-1249) provides information requested by Item 4 in CAL 86-05 and is outlined below.

8.1 Vice President Nuclear Operations/Plant Manager Activities

Meetings were held between the Vice President Nuclear Operations, Plant Manager and Local 1049 IBEW Representatives to emphasize the importance the licensee places on the concept of personal accountability and responsibility.

The Vice President Nuclear Operations and Plant Manager held a meeting with facility foreman and line supervisors to encourage open communication on matters effecting quality of safety. A meeting emphasizing the same matters was also held with plant section heads.

The licensee has taken a more aggressive attitude in the personnel recruitment area in an attempt to reduce the number of contractor personnel filling supervisory positions. Results of this effort are not yet conclusive but a positive trend appears to be developing. This is evidenced by the licensee's recruiting and hiring qualified personnel to fill three supervisory positions within the Radiochemistry Department. In addition to filling these supervisory positions the licensee has been able to successfully recruit five technicians to fill vacant positions.

Plant Manager directives have been issued in an effort to increasing management attention and responsiveness to quality assurance audit findings, improving administrative control over personnel training and qualification programs, establishing a personnel resources report that will enable the plant manager and Vice President Nuclear Operations to be better appraised of vacancies and personnel transfers, and improving observations of work being performed in the plant by division managers and section heads.

8.2 Quality Assurance Actions

In the Quality Assurance area, an action plan has been developed instituting programmatic changes, audit actions and quality assurance training improvements designed to remedy the problems identified by Inspection 86-03 of the radiochemistry area.

Programmatic changes have been made within the Quality Assurance process to ensure a timely resolution of quality concerns. At the direction of the Quality Assurance Manager changes were instituted

to increase the distribution of QA Audit Reports to all department managers regardless of the audit area, in an attempt to increase interdepartmental attention. Format changes in the Quarterly Trend Analysis Report, Quarterly Audit Finding Summary and Quality Assurance Open Item List have been made to increase the usefulness of these reports. These changes should assist management in keeping abreast of outstanding Quality Assurance Open Items, timeliness of response, response acceptability and potential for adverse trend.

The licensee contracted an independent assessment of the facility Quality Assurance Program. The audit assessment report was presented to the Nuclear Review Board on April 18, 1986.

In the audit area, two audit related actions have taken place in response to Special Inspection 86-03. A Quality Assurance audit of the Health Physics Section was performed and findings have been discussed with the lead auditor, the Health Physics Engineer and the Radiological Controls Division Manager. The results of this audit report can be found in Inspection Report 86-07. In addition to the above audit the QA Division Manager moved up scheduled Nuclear Review Board Training Audit and QA Training Audits to April from their originally scheduled dates. The Training and Qualification audit was conducted by a twelve man audit team that expended over 1,000 man hours in audit preparation and conduct. The audit indicated proper qualification of personnel with no problems similar to the qualification deficiencies identified in the radiochemistry area (See Inspection Report 86-03 for further details). However, the audit report did result in 35 audit findings and 19 observations spanning all areas from program/procedure development through record keeping. As a result of these findings the audit report recommended further management attention be applied in the training and qualification area to assure timely resolution of these audit findings and observations.

Actions have been or will be taken in the QA training area to enhance the activities of Quality Assurance personnel conducting audits. QA auditors will receive or have already completed training in Health Physics, Radiochemistry, Operations and Radwaste operations. This training should enable the Quality Assurance auditors to improve their technique in these areas.

8.3 Training Actions

The Vice President Nuclear Operations ordered an immediate update of all qualification and training records in response to findings in Special Inspection 86-03. As part of this effort all qualification file folders have been updated and a qualification matrix performed. In the future these files will be updated on a monthly basis until software changes can be made to allow training records to be placed in a computer data base at which time updating will be maintained continually.

This inspector has no further questions.

9. Condenser Tube Leaks

During late April the licensee noted a gradual increase in condensate system conductivity and chloride concentration, indicative of condenser seawater inleakage. Further investigation using installed conductivity elements indicated inleakage in three of four condenser quadrants with only the 'B' quadrant showing no indication of leakage.

The facility opened the waterboxes that indicated leakage and performed soap tests on the tubesheets. Soap bubble testing indicated that the 'A' quadrant had 10 leaks, the 'C' quadrant had 28 leaks and the 'D' quadrant had 22 leaks. The leaks were found to be at the tube/tubesheet interface and all leaking tubes were characterized by a small bulge or bubble on the inner tube surface. The bulges appeared uniform in size and shape being approximately one-eighth inch high, one-third inch wide and three-quarter inch long.

A complete mapping of all tubes indicated approximately two hundred tubes had the same bulge formation and all were subsequently plugged to stop known leaks and preclude any further leaks from bulged tubes.

In an attempt to identify the cause of the bulging a tube was cut to determine if a chemical reaction was occurring between the titanium tubes and the munz metal (admiralty brass) tube sheet. There was no evidence of corrosion at the tube/tubesheet interface and this mechanism has been eliminated. One additional tube was removed, with the bulge intact, and shipped to an independent metallurgical laboratory in hopes of determining the mechanism by which the bulges are formed. The results of that analysis are not yet available.

The condenser is currently in service and no additional tube leakage is evident.

10. 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.

Based on NRC Region I review of this report, and discussions with licensee representatives, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.

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