

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-322/84-13

Docket No. 50-322

License No. CPPR-95 Priority -- Category B

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: April 10-13 and April 30-May 2, 1984

Inspectors: Rosemary T. Hogan for June 14, 1984
J. C. Jang, Radiation Specialist date

Rosemary T. Hogan June 14, 1984
R. T. Hogan, Radiation Specialist date

J. J. Kottan 6-14-84
J. J. Kottan, Radiation Laboratory Specialist date

Approved by: W. J. Pasciak 6/15/84
W. J. Pasciak, Chief, Effluents Radiation Protection Section, Radiological Protection Branch date

Inspection Summary:

Inspection on April 10-13 and April 30-May 2, 1984 (Report Number 50-322/84-13)

Areas Inspected: Routine, unannounced preoperational inspection of the licensee's chemistry program including the following areas: licensee action on previous inspection findings, organization, training, procedures, laboratory QC program, capability test results, and effluent radiation monitors. The inspection involved 84 inspector-hours onsite by three regionally based inspectors.

Results: Of the seven areas inspected, no violations were identified.

DETAILS

1. Individuals Contacted

LILCO

- (1)(2) L. Calone, Chief Technical Engineer
- (1) G. Gixonda, Compliance Engineer
- (1) G. Gogates, Compliance Engineer
- P. Kwaschyn, Radwaste Supervisor
- (1) N. Morcos, Radiochemistry Support Supervisor
- R. Petricek, Radiochemistry Supervisor
- (1)(2) J. Schmitt, Radiochemistry Engineer
- (1)(2) W. Steiger, Operation Manager
- (1) J. Wynne, Lead Engineer-Compliance
- (2) R. Waterman, Assistant Compliance Engineer
- (2) T. Rose, Quality Assurance Engineer

Contractors

- B. Embrey
- J. Jones, Radiation Measurement Service, Inc.
- W. Wattson, Radiation Measurement Service, Inc.
- A. Dobrzeniecki, Stone and Webster Engineering Company

NRC

- (1)(2) C. Petrone, Resident Inspector
- (1) R. Hogan, Radiation Specialist
- (1) J. Jang, Radiation Specialist
- (2) J. Kottan, Radiation Laboratory Specialist

Note: (1) denotes those present at the exit meeting on April 13, 1984
(2) denotes those present at the exit meeting on May 2, 1984

2. Licensee Action on Previous Inspection Findings

(Closed) Follow-up Item (82-33-01): Chemistry Technician Training and Passing Grade for the Qualification Examination. The inspector reviewed Procedure SP 71.006.01, "Radiochemistry Technician Selection, Training, and Qualification Program", dated April 6, 1984. The inspector determined that the licensee's actions are acceptable.

(Closed) Follow-up Item (82-33-03): Program for in-plant chemistry sampling and analysis. The inspector reviewed the licensee's procedures for sampling and analysis as well as the licensee's Chemistry Activity Schedule and noted that the licensee has in place a program for in-plant sampling and analysis.

(Closed) Follow-up Item (82-33-04): Chemistry QA Program. The inspector reviewed procedure SP 71.018.01, General Laboratory Operation. This procedure includes both radiological and nonradiological chemistry QA including such items as control charts, spiked samples, interlaboratory comparisons, and routine analysis of standards.

(Closed) Follow-up Item (83-30-03): Chemistry Staffing, Qualifications, and Training of New Organization in Chemistry. The inspector reviewed Procedure SP 12.002.01, "Organization and Administration", dated January 25, 1982, and Procedure SP 12.003.01, "Personnel Qualifications and Responsibilities", dated March 29, 1984, which included staffing, qualifications, and administrative controls for chemistry section. The inspector determined that the licensee's actions are acceptable.

(Closed) Follow-up Item (83-30-08): Inplant chemistry program. This item is closed (see above item 82-33-03).

(Closed) Follow-up Item (83-30-01): Effluent monitor testing and calibration. The inspector reviewed the licensee's procedures for calibration and testing of effluent radiation monitors, and also the results of the most recent effluent monitor tests and calibrations. The tests and calibrations were performed in accordance with the required procedures.

(Closed) Follow-up Item (82-33-06): Calibration of liquid effluent flow control system. The inspector reviewed the calibration data of the liquid radioactive flow control system and noted that the individual system components and the entire system were calibrated as required.

3. Organization

The inspector reviewed the licensee's radiochemistry organization. The radiochemistry organization consists of three subsections; radiochemistry, radwaste, and radiochemistry support. Each subsection Engineer reports to the Radiochemistry Engineer who in turn reports to the Chief Radiological Control Engineer. The Chief Radiological Control Engineer reports to the Operation Manager. The radiochemistry organization performs chemistry, radiochemistry, and part of the radwaste operations including transportation activities.

At the present time the radiochemistry organization consists of one Radiochemistry Engineer, three Engineers, one Foreman (one vacant), ten technicians (three vacant), eleven contractor consultants, and seven contractor technicians.

4. Training

The licensee's training program for chemistry personnel was reviewed. The chemistry technician training program is detailed in Procedure SP 71.006.01, Radiochemistry Technician Selection, Training, and Qualification Program. The program requires that technicians pass selection examinations and procedure qualifications. The inspector had no further questions in this area at this time.

5. Procedures

The inspector reviewed the licensee's procedures for implementation of the chemistry program. The licensee has procedures for sampling, instrument calibration and operation, analyses, radiation monitor calibration and effluent release control. In addition the licensee has obtained copies of vendor laboratory procedures used for effluent analyses and has found these procedures to be technically acceptable. The licensee has all necessary procedures for fuel loading.

6. Laboratory Quality Control Program

The licensee's laboratory QC program is detailed in Procedure SP 71.018.01, General Laboratory Operation. Procedure SP 71.018.01 addresses procedure requirements; personnel qualification; housekeeping, equipment and reagents; performance records; laboratory surveillance; technician control; instrument control; chemical control; and corrective action. The procedure contains acceptance criteria and corrective actions. The inspector noted that control charts had already been implemented for the gas flow proportional counter and the liquid scintillation counter. The complete implementation of Procedure SP 71.018.01 will be reviewed during subsequent inspections.

7. Capability Test Results

Test samples were submitted to the licensee in order to evaluate the licensee's capability to measure radioactivity in effluents. The test samples were prepared by the NRC reference laboratory, DOE Radiological and Environmental Sciences Laboratory (RESL), and duplicated types of samples and nuclides that the licensee would encounter during operation. The test samples were analyzed by the licensee using the licensee's normal methods and equipment.

The results of the test sample measurements comparison indicated that all of the measurements were in agreement under the criteria used for inter-comparing results. (See Attachment 1) The inter-comparison results data is listed in Table 1. The inspector had no further questions in this area.

8. Effluent Radiation Monitors

The inspector reviewed the licensee's procedures for the calibration of effluent radiation monitors and the associated data for the most recent calibrations. The inspector noted that the effluent radiation monitors were calibrated in accordance with the licensee's procedures. While reviewing the data for the liquid effluent radiation monitor, the inspector noted that the licensee had set the lower level discriminator at a value corresponding to 95 KeV. The inspector stated that any dissolved or entrained Xe-133 (81 KeV gamma energy) which may be present in the liquid radioactive waste would not be detected by the licensee's radiation monitor. The licensee responded that a sample of each batch of liquid radwaste would be analyzed on a gamma spectrometer prior to release, and the flow of the release would be controlled by a flow control device during release. The licensee further stated that the discriminator was set at 95 KeV because of electronic noise in the system. The inspector stated that the licensee should be able to detect Xe-133 in liquid effluent releases and therefore, the discriminator should be set sufficiently below 95 KeV to detect Xe-133.

In a subsequent telephone call to the licensee on May 25, 1984, the inspector stated that the lower level discriminator setting should be adjusted so that the monitor could detect Xe-133. This change should be made prior to initial criticality. This item will be reviewed during a subsequent inspection after fuel load (84-13-01).

9. Exit Interview

The inspector met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on April 13, 1984 and May 2, 1984. The inspector summarized the purpose, scope, and findings of the inspection.

TABLE 1

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>MRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>RESULTS IN MICROCURIES PER MILLILITER</u>				
RESL Liquid	H-3	(9.35±0.28)E-5	(7.8±0.8)E-5	Agreement
Standard	Sr-89	(3.27±0.33)E-4	(2.4±1.1)E-4	Agreement
	Sr-90	(5.18±0.15)E-5	(6.15±0.31)E-5	Agreement
	Cs-137	(5.04±0.10)E-6	(5.69±0.26)E-6	Agreement
	Co-60	(6.58±0.13)E-6	(7.23±0.34)E-6	Agreement
	Ce-144	(5.90±0.18)E-6	(6.86±1.57)E-6	Agreement
	Fe-55	(2.88±0.10)E-6	(2.34±0.12)E-4	Agreement
<u>RESULTS IN TOTAL MICROCURIES</u>				
Particulate	Ce-144	(3.46±0.02)E-2	(3.88±0.03)E-2	Agreement
Filter	Cs-137	(1.50±0.02)E-2	(1.77±0.01)E-2	Agreement
2-22-84	Mn-54	(1.47±0.02)E-2	(1.75±0.01)E-2	Agreement
	Co-60	(2.68±0.02)E-2	(3.15±0.02)E-2	Agreement

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>RESULTS IN TOTAL MICROCURIES</u>				
Charcoal	Cd-109	(3.42±0.05)E-2	(3.33±0.05)E-2	Agreement
Cartridge	Co-57	(9.80±0.12)E-4	(9.5±0.3)E-4	Agreement
5-10-83	Ce-139	(5.18±0.10)E-4	(5.8±0.6)E-4	Agreement
	Sn-113	(1.48±0.03)E-3	(1.4±0.2)E-3	Agreement
	Cs-137	(9.74±0.05)E-3	(9.41±0.06)E-3	Agreement
	Co-60	(9.84±0.05)E-3	(9.88±0.08)E-3	Agreement
	Y-88	(2.40±0.04)E-3	(2.1±0.3)E-3	Agreement
Charcoal	Ba-133	(6.22±0.30)E-2	(5.92±0.07)E-2	Agreement

Cartridge
1-15-82

RESULTS IN GAMMAS PER SECOND

	<u>ENERGY</u>			
Particulate	186 keV	82.0±0.5	98.7±?	Agreement
Filter	242 keV	176.0±1.0	194±?	Agreement
	295 keV	440±2	489±?	Agreement
	352 keV	846±4	933±?	Agreement
	609 keV	1065±5	1130±?	Agreement
	1120 keV	352±2	397±?	Agreement
	1238 keV	140.0±0.7	155±?	Agreement
	1765 keV	363±2	426±?	Agreement

Attachment 1Criteria for Comparing Analytical Measurements

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

<u>Resolution</u>	<u>Agreement</u>
<3	0.4 - 2.5
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
>200	0.85 - 1.18