UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322 (O.L.)
(Shoreham Nuclear Power Station, Unit 1)	)	

PREPARED DIRECT TESTIMONY OF
GREGORY C. MINOR
ON BEHALF OF SUFFOLK COUNTY

REGARDING

SUFFOLK COUNTY CONTENTION 28(a)(iii)

AND

SOC CONTENTION 7.A(3)

IODINE MONITORING

MAY 4, 1982

DS03
S
1/1

Summary Outline of Suffolk County Testimony
on SC 28(a)(iii) and SOC 7.A(3)

This testimony addresses the issue of LILCO's ability to monitor the continuous release of iodine resulting from an accident at Shoreham. In the absence of adequate devices to continuously monitor the release, LILCO plans to use sampling and analysis techniques. LILCO's original location for collecting the samples was deficient but it has since committed to collect samples at a more acceptable location. The issue that remains unresolved is the overall accuracy with which the complete system can measure the radioactive iodine and particulate released in an accident. LILCO provides no analysis or projected accuracy of release measurement, and the NRC has not reviewed the Shoreham design to determine the acceptability of LILCO's accuracy in assessing the release quantities. Without these reviews, there can be no assurance that the system meets the requirements of GDC 13 and 64 and the original intent of Item II.F.1(2) in NUREG 0737.

Exhibit

1. LILCO March 18, 1982 letter documenting the location of the Station Vent Iodine Sampler.

PREPARED DIRECT TESTIMONY OF
GREGORY C. MINOR
ON BEHALF OF SUFFOLK COUNTY REGARDING
SUFFOLK COUNTY CONTENTION 28(a)(iii) AND
SOC CONTENTION 7.A(3) --
IODINE MONITORING

I. INTRODUCTION

This testimony was prepared by Gregory C. Minor. A statement of my qualifications and experience has been separately provided to the Board. The testimony addresses the subject of monitoring iodine in the plant vents following an accident. These requirements are included in NUREG-0737 requirements under Item II.F.1(2) which states in part:[1/]

> II.F.1, ATTACHMENT 2 SAMPLING AND ANALYSIS OF EFFLUENTS
>
> Position
> Because iodine gaseous effluent monitors for the accident condition are not considered to be practical at this time, capability for effluent monitoring of radioiodines for the accident condition shall be provided with sampling conducted by absorption on charcoal or other media, following by onsite laboratory analysis
>
> Clarification
> (1) Licensees shall provide continuous sampling of plant gaseous effluent for postaccident releases of radioactive iodines and particulates to meet the requirements of the enclosed Table II.F.1-2. Licensees shall also provide onsite laboratory capabilities to analyze or measure these samples. These requirements should not be construed to prohibit design and development of radioiodine and particulate monitors to provide online sampling and analysis for the accident condition. If gross gamma radiation measurement techniques are used, then provisions shall be made to minimize noble gas interference.

[1/] NUREG-0737, p. II.F.1-7.

LILCO's original plan in response to Item II.F.1(2) had several flaws which could have precluded its obtaining an accurate quantitative assessment of the iodine released from the plant vent following an accident. Those flaws are identified in Suffolk County Contention 28(a)(iii) and SOC 7.A(3), which are essentially identical,[2/] as follows:

> Suffolk County contends that the NRC Staff has not adequately assessed and LILCO has not adequately resolved, both singularly and cumulatively, the generic unresolved issues applicable to a BWR of the Shoreham design. As a result, the Staff has not required the Shoreham structures, systems, and components to be backfit to current regulatory practices as required by 10 CFR 50.55(a), 50.57, and 50.109, with regard to the following:
>
> (a) LILCO has failed to resolve adequately certain generic safety items identified as a result of the TMI-2 accident and contained in NUREG-0737, "Clarification of TMI Action Plan Requirements" (1980).
>
> (iii) The monitoring of iodine releases in the TMI-2 accident was both untimely and complicated by the iodine sampling and measuring techniques used. The equipment needed for continuous on-line iodine gaseous effluent monitoring is not presently available at Shoreham. NUREG-0737, Item II.B.1 allows the alternative of vent release sampling, provided it is powered by vital bus power and is accessible during an accident. The Shoreham design does not satisfy either of these alternatives. LILCO proposes instead to measure two other streams, those from the turbine building and rad-waste building, while assuming the reactor building ventilation contribution is zero. These two sampling instruments are not powered by vital bus power. Thus, LILCO's iodine measurement system cannot account for leakage, incomplete isolation, or system

---

[2/] The wording of Suffol. County Contention 28(a)(iii) is used.

misoperation and thus may not be capable of accurately assessing the quantity of iodine released in the station vent. The design is, therefore, not in compliance with 10 CFR Part 50, Appendix A, Criteria 13 and 64.

LILCO has apparently corrected one of the deficiencies by locating a monitor (RE-126) for the main station vent in a location which it judges to be accessible.[3] However, this action leaves unanswered the question of how accurately the LILCO system can assess the quantity of iodine released.

II. DISCUSSION OF ISSUES

The system proposed by LILCO will sample the plant vent and the Reactor Building Standby Ventilation system at a location in the turbine building.[4] This sample station will collect the iodine and particulate on filter material, which will then be taken to the counting room to be analyzed and measured. LILCO describes this process as follows:

> "The normal station vent exhaust monitor (RE-042) is not powered from a vital instrument bus, however, it is powered from a dependable backup power supply to normal ac. Due to its location in the secondary containment, it may be inaccessible during an accident. This would preclude obtaining the radioiodine and particulate sample media from the monitor for analysis. . . .
>
> The addition of the high range station ventilation exhaust monitor (RE-126) assures continuous sampling of radioiodine and particulates during accident conditions. Continuous sampling is achieved with isokinetic sampling during normal

---

[3] LILCO Response to SOC's March 1, 1982 Interrogatories, 3/17/82, p. 10.

[4] See Exhibit 1 for the location of Panel 1D11*PNL-126

operation and accident conditions. Provisions have been made to comply with ANSI N13.1-1969 to the maximum extent practical to assure representative sampling. The sampling collector will initiate an alarm in the control room when it reaches a concentration of 10^2 μ Ci/cc and 30 min. collection time. At this time the microcomputer associated with RE-126 transfers the flow to the next particulate and iodine assembly, isolates the alarmed assembly, and indicates to the operator the need to replace the collector assembly and transfer it to the laboratory for analysis.

The sampling media is paper with more than 90 percent collection efficiency for 0.3 micron particles and a charcoal cartridge with more than 90 percent collection efficiency for methyl iodide.

The radioiodine and particulate sampling media is analyzed in the counting room at Shoreham. Charcoal cartridges are purged with nitrogen or air to remove entrapped noble gases. A separate counting station is provided which serves as a backup for the counting facility in the radiochemistry laboratory. At least one of these locations will remain a low-contamination, low-background area for all postulated accident conditions. The above meets the requirements of Table II.F.1-2."[5/]

Unfortunately, this statement provides little or no information concerning, or detailed analysis of the accuracy of the resulting iodine or particulate release quantities. In fact, there is an opportunity for errors to be introduced at each step of the process. Possible sources of inaccuracies include the following:

(1) non-uniformity of distribution in the plant vent;

(2) sampling inaccuracy of the isokinetic probe;

(3) sample losses due to plate-out in the sample tubing;

(4) variations in filter efficiency;

[5/] FSAR pp. II.F.1-6 and -7, Rev. 25, February 1982.

(5) delay time to transport the material to the counting room;

(6) time elapsed until sample is actually counted;

(7) counting inaccuracies;

(8) variations due to the time required for sample accumulation on filters;

(9) variation of releases as a function of time; and

(10) weather conditions which may affect the releases.

Without an analysis of the accuracies (or inaccuracies) involved in each of the above factors, there can be little confidence that the final readings for iodine and particulate releases are quantitatively accurate. Therefore, LILCO has failed to demonstrate that it has adequately addressed the concerns which originated NUREG 0737, Item II.F.1(2).

Furthermore, both LILCO and the NRC place a high reliance on ANSI Standard 13.1-1969 for the techniques employed in sampling and measuring.[6/] However, the extent to which LILCO has complied with that standard cannot be determined since LILCO states only that "(p)rovisions have been made to comply with ANSI 13.1-1969 to the maximum extent practical to assure representative samples."[7/] Details of LILCO's non-compliance as well as an analysis of the impact of such non-compliance on release assessment accuracy have not been included in the FSAR. Even if LILCO did fully comply with ANSI 13.1-1969, in the absence of a defined standard for the overall release measurement accuracy, and without a Shoreham-specific analysis of release measurement accuracy, there is no evidence that

---

[6/] LILCO refers to ANSI 13.1-1969 on FSAR pages II.F.1-5 and -6. The NRC stated their reliance on ANSI 13.1-1969, during informal discovery meetings on 4/24/82, and in NUREG-0737, Item II.F.1.

[7/] Ibid 5, page II.F.1-6 (emphasis added).

the Shoreham system provides adequate accuracy to meet the concerns expressed in NUREG 0737, Item II.F.1(2).

III. CONCLUSION

LILCO has made some significant improvements in the post-accident iodine and particulate release monitoring equipment. However, it has failed to provide an assessment of how well the derived quantities of released radioactivities will represent the actual values released. Without such an assessment, it is not possible to be sure the requirements of GDC 13 and 64 have been met, nor has LILCO demonstrated that it complies with the intent of NUREG 0737, Item II.F.1(2).

EXHIBIT 1

LILCO LONG ISLAND LIGHTING

LONG ISLAND LIGHTING COMPANY

175 EAST OLD COUNTRY ROAD · HICKSVILLE, NEW YORK 11801

Direct Dial Number

82-12

March 18, 1982

Mr. Gregory Minor
MHB Technical Associates
1723 Hamilton Avenue
Suite K
San Jose, CA 95125

Dear Greg:

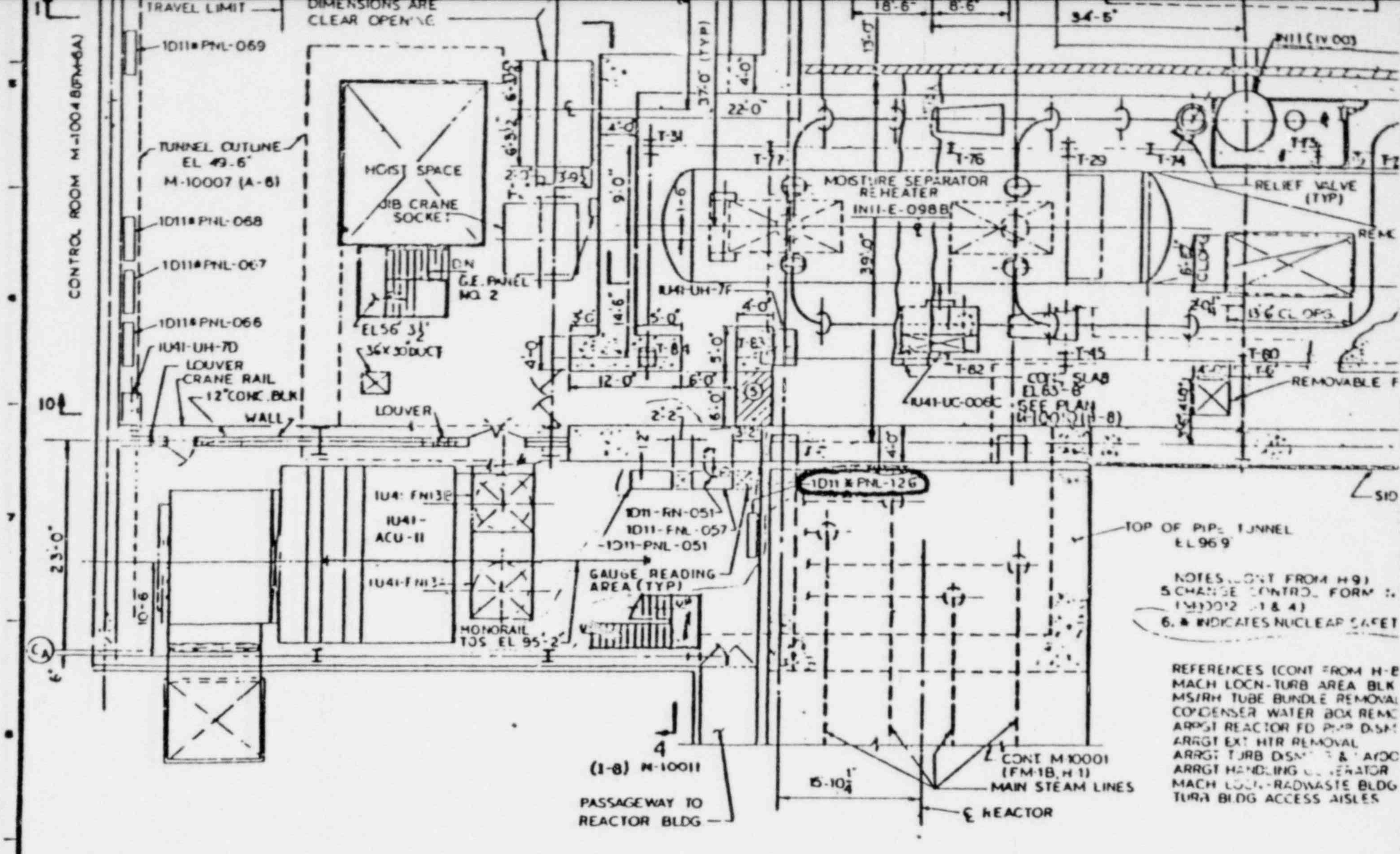
As I agreed, I have enclosed a copy of the latest revision of the S & W drawing, showing the revised location of the Station Vent Iodine Sampler (Panel 1D11 * PNL - 126).

Very truly yours,

B. R. McCaffrey for
Regulatory Supervisor

JL/tp

Enclosure



(Revised 1/6/82)

S+W Dwg. No. 11600.02-FM-2A-9

SEE RECORD OF DRAWING CHANGES BCM 2A-6	SEE RECORD OF DRAWING CHANGES 11600.02 BCM 2A-5	REVISED STAIRS & PLATFORMS, ADDED VENT DUCTS & COLUMN ...	GENERAL REVISION
DESCRIPTION	DESCRIPTION	DESCRIPTION	DESCRIPTION

SEE RECORD OF DRAWING CHGS. 11600.02-BCM-2A-7	9	DESCRIPTION
SEE RECORD OF DRAWING CHANGES 11600.02-BCM-2A-8	8	INCORP. ECN F 1480