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Island  
Power  
Authority

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U.S. Nuclear Regulatory Commission  
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Shoreham Decommissioning Project  
LIPA Response to NRC Request for Additional Information Related to  
Elevated Levels Found During Phase 4 Confirmatory Survey  
Shoreham Nuclear Power Station - Unit 1  
Docket No. 50-322

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Ref: (1) Telephone Conversation between S. Baggett, D. Fauver, R. Nimitz and L. Pittiglio of NRC, and F. Petschauer, C. Newson and S. Kumar of LIPA on January 9, 1995.

Ladies and Gentlemen:

This letter presents the response of the Long Island Power Authority (LIPA) to the request for additional information made by the NRC concerning certain elevated levels found during the Phase 4 Confirmatory Survey. LIPA agreed to provide a formal response and discussion during the telephone conversation referenced above.

During the confirmatory surveys performed by the Oak Ridge Institute for Science and Education (ORISE) Team for the NRC during the week of October 31, 1994, nine elevated fixed point beta-gamma measurements were noted by the ORISE team in the Dryer/Separator Storage Pool, Survey Unit RB072, and the Spent Fuel Storage Pool, Survey Unit RB068. The elevated fixed point measurements identified by the ORISE team in the Dryer/Separator Storage Pool were within the guideline values of Regulatory Guide 1.86. Based on subsequent LIPA surveys, two of the elevated measurement locations identified by the ORISE team in the Spent Fuel Storage Pool were found to be slightly above the guideline values of Regulatory Guide 1.86. In

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keeping with the principle of ALARA, all locations identified by the ORISE team were remediated by LIPA although only two locations in the Spent Fuel Storage Pool exceeded the Regulatory Guide 1.86 guidelines. An "as left" survey was performed by the ORISE team to insure that the levels were well below established guideline values. At the exit meeting on November 4, 1994, the ORISE team leader stated that the final survey of the remediated locations were acceptable and below the established guideline values.

In an effort to examine why the ORISE team was able to find the highly localized elevated readings in the Spent Fuel Storage Pool during the confirmatory survey (and LIPA was not), the numerous support and termination survey activities of these and similar survey units were reviewed by LIPA. LIPA was unable to establish the cause with any degree of certainty. LIPA concluded that it would be highly speculative to pinpoint any one activity, survey instrument, or a particular individual for the missed measurement.

The area surveyed in the Dryer/Separator Storage Pool and the Spent Fuel Storage Pool were estimated to be about 3,720,000 cm<sup>2</sup> and 6,020,000 cm<sup>2</sup> respectively. Moreover, taking into account only the affected areas of the Shoreham facility, the total area surveyed was about 320,000,000 cm<sup>2</sup>. Of this the areas of elevated levels exceeding the guideline values of Regulatory Guide 1.86 were confined to about 25 cm<sup>2</sup>, a very small fraction (0.0000001) of the total area surveyed.

Subsequent to the NRC/ORISE exit meeting on Friday, November 4, 1994, the NRC Project Inspector requested the plant staff to perform a follow-up survey of the remediated locations in the Dryer/Separator Storage Pool and the Spent Fuel Storage Pool to confirm that the elevated levels were not caused by any type of "weeping".

Pursuant to this request, a follow-up survey of the Dryer/Separator Storage Pool and the Spent Fuel Storage Pool was conducted on Wednesday, November 9, 1994, one week following the remediation. The survey included the nine remediated locations and an additional five random measurement locations in each survey unit.

The results of the follow-up survey in the Dryer/Separator Storage Pool indicated a mean value of 140 DPM/100 cm<sup>2</sup> based on 316 measurements. This was slightly lower than the mean value of 144 DPM/100 cm<sup>2</sup> found after remediation based on the same number of measurements. The additional five random measurements taken during the follow-up survey were found to be consistent with the original data collected.

The results of the follow-up survey in the Spent Fuel Storage Pool indicated a mean value of 302 DPM/100 cm<sup>2</sup> based on 430 measurements. This was equal to the mean value after remediation based on the same number of measurements. The additional five random measurements taken during the follow-up survey were also found to be consistent with the original data collected.

The above results lead to the conclusion that there is no indication of weeping in the Shoreham Dryer/Separator Storage Pool and the Spent Fuel Storage Pool.

Furthermore, the elevated levels noted by the ORISE team were extremely localized. When weeping was identified by other licensees in the past, it was typically much more widespread and uniform, and resulted in smearable contamination over large areas exposed to the same usage. The highly localized nature of the few elevated levels observed at Shoreham and the lack of any smearable contamination also tend to eliminate weeping as a possible explanation.

Enclosures 1 and 2 provide summaries of the surveys performed. These were previously transmitted to the NRC Project Inspector on November 15, 1994.

If you have any questions or need further information, please do not hesitate to contact me.

Very truly yours,



Frederick Petschauer  
Resident Manager

Enclosures: (1) Dryer/Separator Storage Pool, Survey Unit RB072  
(2) Spent Fuel Storage Pool, Survey Unit RB068

cc: R. Bernero, Director  
Office of Nuclear Materials Safety and Safeguards  
L. Bell  
C. L. Pittiglio  
T. T. Martin  
R. Nimitz  
D. Fauver

## ENCLOSURE 1

### DRYER / SEPARATOR STORAGE POOL, SURVEY UNIT RB072

The final termination survey was completed on this survey unit in mid September 1994. Based on the usage history of this survey unit it was classified as an AFFECTED survey unit. The survey design required 100% gridding, a complete scan of the structure with fixed point and smears taken in every other grid block with corresponding exposure rate measurements where accessible. The results of the 314 fixed point and smear measurements and the 294 exposure rate measurements taken, as reported in the final report, were below the guideline values established for this survey unit and are consistent with similar surveys.

During the ORISE confirmatory survey of this survey unit on November 1, 1994 four locations were found to be elevated, but below the established guideline values for fixed point measurements. Termination Survey personnel performed a before and after remediation survey of each location.

On November 2, 1994 the ORISE team resurveyed the remediated locations with acceptable results.

On November 9, 1994, as requested, Termination Survey personnel surveyed the four locations and an additional five locations within the survey unit. The results are consistent with the after remediation survey performed on November 1, 1994. The measurements from the additional five locations surveyed are also consistent with previous measurements of the area and there is no evidence of "weeping" taking place in this survey unit.

The attached data sheet documents the final survey results.

RB072 - DRYER/SEPARATOR STORAGE POOL AFTER REMEDIATION AND RESURVEY AND + 1 WEEK MEASUREMENTS

AREA	BEFORE			AFTER			+1 WEEK		
	GCPM	DPM/ 100CM2	>Lc +HTDN	GCPM	DPM/ 100CM2	>Lc +HTDN	GCPM	DPM/ 100CM2	>Lc +HTDN
F12 *	181	531		174	388		185	612	
F33	358	4143	10772	181	531		152	-61	
F43	178	469		179	490		183	571	
W09 *	669	10490	27274	244	1816	4722	228	1490	3874
F18 *							122	-673	
F32 *							162	143	
F37							130	-510	
W10							139	592	
W164							119	184	

\* - INCLUDED IN ORIGINAL DATA

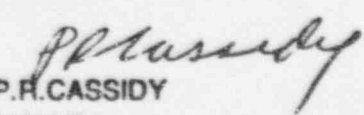
ORIGINAL DATA REPORT - MEAN OF 135 DPM/100CM2 FOR 314 MEAS.  
 WITH NEW DATA - MEAN OF 144 DPM/100CM2 FOR 316 MEAS.  
 +1 WEEK DATA - MEAN OF 140 DPM/100CM2 FOR 316 MEAS.  
 +1 WEEK DATA - MEAN OF 133 DPM/100CM2 FOR 319 MEAS. (ADDT'L MEASUREMENTS)

(BEFORE REMEDIATION - MEAN OF 258 DPM/100CM2 FOR 316 MEAS.)

NOTE - FOR THIS UNIT TO INCLUDE THE HTDN'S:

THE AVERAGE GUIDELINE VALUE IS 11100 DPM/100CM2

THE MAXIMUM INDIVIDUAL MEAS. GUIDELINE IS 33300 DPM/100CM2

  
 P.R. CASSIDY  
 11/11/94



## ENCLOSURE 2

### SPENT FUEL STORAGE POOL, SURVEY UNIT RB068

The final termination survey was completed on this survey unit in the first week of September 1994. Based on the usage history of this survey unit it was classified as an AFFECTED survey unit. The survey design required 100% gridding, a complete scan of the structure with fixed point and smears taken in every other grid block with exposure rate measurements. The results of the 428 fixed point, smear measurements and exposure rate measurements taken, as reported in the final report, were below the guideline values established for this survey unit and are consistent with similar surveys.

During the ORISE confirmatory survey of this survey unit on November 2, 1994 five locations were found to have elevated fixed point measurements. Three of these measurements were below the established guideline values. Termination Survey personnel performed a before and after remediation survey of each location.

On November 3, 1994 the ORISE team resurveyed the remediated locations with acceptable results.

On November 9, 1994, as requested, Termination Survey personnel surveyed the five locations and an additional five locations within the survey unit. The results are consistent with the after remediation survey performed on November 2, 1994. The measurements from the additional five locations surveyed are also consistent with previous measurements of the area and there is no evidence of "weeping" taking place in this survey unit.

The attached data sheet documents the final survey results.

RB068 - SPENT FUEL STORAGE POOL AFTER REMEDIATION AND RESURVEY AND + 1 WEEK MEASUREMENTS

AREA	BEFORE			AFTER			+ 1 week		
	GCPM	DPM/ 100CM2	>Lc +HTDN	GCPM	DPM/ 100CM2	>Lc +HTDN	GCPM	DPM/ 100CM2	>Lc +HTDN
F12 *	961	16980	39054	138	184		143	286	
F60 *	449	6531	15021	155	531	1221	173	898	2065
W429 *	305	3980	9154	117	143		133	469	
W430	1030	18775	43185	205	1939	4460	172	1265	2910
W432	247	2796	6431	104	-122		120	204	
F84							163	694	1596
F54							116	-265	
F24 *							123	-122	
W16							98	-245	
W242							110	0	

\* - INCLUDED IN ORIGINAL SURVEY

ORIGINAL DATA REPORT - MEAN OF 289 DPM/100CM2 FOR 428 MEAS.

WITH NEW DATA - MEAN OF 302 DPM/100CM2 FOR 430 MEAS.

+ 1 WEEK DATA - MEAN OF 302 DPM/100CM2 FOR 430 MEAS.

+ 1 WEEK DATA - MEAN OF 301 DPM/100CM2 FOR 434 MEAS. (ADDT'L MEASUREMENTS)

(BEFORE REMEDIATION - MEAN OF 551 DPM/100CM2 FOR 430 MEAS.)

NOTE - FOR THIS UNIT TO INCLUDE THE HTDN'S:

THE AVERAGE GUIDELINE VALUE IS 9400 DPM/100CM2

THE MAXIMUM INDIVIDUAL MEAS. GUIDELINE IS 28200 DPM/100CM2

*P. R. Cassidy*  
P. R. CASSIDY

11/11/94