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-OL-4
	)	(Low Power)
(Shoreham Nuclear Power Station, Unit 1)	)	
	)	

TESTIMONY OF
ANTHONY NOZZOLILLO
ON BEHALF OF LONG ISLAND LIGHTING COMPANY

Q.1. Please state your name and business address.

A. Anthony Nozzolillo, 250 Old Country Road, Mineola, New York.

Q.2. By whom are you employed?

A. Long Island Lighting Company (LILCO).

Q.3. How long have you been employed by LILCO and what positions have you held?

A. I have been employed by LILCO since 1972. From 1972 through 1983, I was assigned to the Company's Planning Department, served as Manager of the System Planning Division, and have specialized in performing economic analyses of alternative engineering and financial

options incident to various aspects of LILCO's operations. I have taught qualified LILCO employees the graduate level course in Engineering Studies of Economy. This is a course taken by engineers dealing with how to evaluate various engineering options from an economic standpoint including, among others, such factors as rate of return, depreciation, federal income taxes, operation and maintenance expenses, insurance and property taxes which are an integral part of the total revenue requirement calculation. In 1983 I became a division manager in the Electrical Engineering Department. In November 1983, I accepted a temporary assignment to the Legal Department to work with the Company's legal staff in the current rate case proceeding. My responsibilities in that respect were to coordinate the development of testimony and preparation of other aspects of the rate case. In April 1984, I was appointed Manager of the Financial Analysis and Planning Department.

Q.4. What are your responsibilities as Manager of the Financial Analysis and Planning Department?

A. To develop and maintain financial modelling systems. In this capacity, I am also involved in the analysis of various system development plans for economic impact on both the Company and its consumers. I also play an active role in the development and analysis of financial options for planning purposes.

Q.5. Will you please describe your educational background?

A. I graduated summa cum laude from the Polytechnic Institute of Brooklyn in 1972 with a B.S. degree in Electrical Engineering. In 1978, I received an M.B.A. degree from C.W. Post Center of Long Island University. In addition, I attended the Company's graduate institute course in Engineering Studies of Economy and have attended various seminars dealing with advanced engineering economics.

Q.6. Have you previously testified concerning economic matters?

A. Yes, I have. I testified in New York State Public Service Commission cases 27374 and 27375 on the economic and financial impact of the inclusion of Construction Work in Progress (CWIP) in LILCO's rate base. In case

28553, I presented the Company's financial statistics and quality indicators which would result from $281,000,000 of permanent rate relief becoming effective on October 1, 1984. I have also testified regarding the economics of coal conversion for LILCO's Port Jefferson Units #3 and #4 before the Department of Environmental Conservation.

Q.7. What is the purpose of your testimony in this proceeding?

A. My testimony will present the economic benefits to LILCO's customers, in terms of present worth of revenue requirements, resulting from a three-month earlier commercial operating date for the Shoreham Nuclear Power Station which may be achieved if the exemption permitting low power testing is granted as requested.

Q.8. What do you mean by present worth of revenue requirements?

A. It is appropriate to look at benefits in terms of LILCO's revenue requirements because rates are normally set on that basis. In discussing revenue requirements over a period of time, it is necessary to discuss them

in terms of present worth which allows a direct comparison of revenue requirements over different periods of time. I have simply looked at the present worth sum of those revenue requirements over a period of years during which LILCO's operation will be affected by the generation of power at Shoreham.

Q.9. In performing your analysis of potential economic benefit, what commercial operating dates for the Shoreham plant did you consider?

A. According to the Company's scheduling estimates, July 1, 1985 is the earliest date that commercial operation could commence if all required permits are granted in a timely fashion. The alternate in-service date I considered is October 1, 1985, which represents a three-month slip from July 1985. For purposes of analyzing any potential economic benefit, I have analyzed two synchronization dates for the July in-service date. Obviously, the dates lack certainty. Nevertheless, my analysis using either of these dates gives a good indication of the magnitude of the potential economic benefit if low power testing can be conducted early and allow the plant to reach commercial operation sooner.

If the dates were changed, the range of the potential benefit might change, but in my opinion there would still be a benefit if the plant achieves commercial operation 3 months earlier as a result of this exemption.

Q.10. What are the economic benefits for a July 1, 1985 rather than an October 1, 1985 in-service date?

A. In terms of present worth of revenue requirements, these benefits are in the range of $8-45 million.

Q.11. How did you calculate this range of benefits?

A. To quantify this benefit, I used two computer programs which LILCO routinely uses in its financial forecasts. To establish an estimate of the total annual revenue requirements for the scenarios outlined above, I used LILCO's Strategic Financial Planning model (SFP). The SFP model is a computer based long-range financial tool for combination electric and gas utilities. This computer model makes financial and revenue forecasts for a utility based on a set of assumptions and/or projections concerning energy demand, capital expenditures, operating costs, and financial and regulatory policies. This model is used by LILCO in its own internal long

range planning and has been used by the Public Service Commission and the State Energy Office. For example, the State Energy Office has used it in matters related to the State Energy Master Plan and for analyzing the Nine Mile Point 2 investment. I utilized LILCO's Planning Production Cost Evaluation Program to estimate total production fuel costs. This program simulates the dispatch of generation (and interchange power availability) to meet the system load. Again, the Planning Production Cost Evaluation Program is routinely used in normal business operation by LILCO. Moreover, the model was reviewed and adopted by the Technical Committee in PSC Case 28252 under the title "Shoreham Nuclear Generating Station Ratemaking Principles." The results of this program were an input to the SFP model.

Q.12. What are the basic assumptions that you used in performing your analysis?

A. The basic assumptions are contained in a 13-page document entitled "Basic Premises and Assumptions" which was prepared under my direction and supervision and is Attachment 1 to this testimony. I have reviewed and am

familiar with all of the assumptions. Each is based on information routinely generated by LILCO or on my professional judgment, where such information is not available.

Q.13. Mr. Nozzolillo, you have stated that the benefits for an earlier in-service date are in the range of $8-45 million in terms of present worth of revenue requirements. What are the significant elements that constitute this economic benefit?

A. There are several elements. The earlier Shoreham operates, the sooner consumers start realizing the benefits resulting from the displacement of fossil fuel. Also, the sooner the plant goes commercial, the lower the ultimate cost of the facility. A lower total investment translates into lower annual revenue requirements for return on net investment, depreciation, associated federal income taxes and gross revenue taxes, all of which comprise the revenue requirements on the basis of which rates are set. This is a benefit that will continue over the life of the facility.

All of these factors are reflected in my analysis.

Q.14. Mr. Nozzolillo, why is there such a broad range in the benefits which you have established?

A. The upper range of $45 million results from the tax depreciation associated with synchronization of the plant into our system if the synchronization were to occur in 1984. The $8 million figure assumes a 1985 synchronization date. Another factor that affects the benefits is the timing as to when LILCO can utilize the investment tax credit carried forward as a credit on LILCO's tax returns. After 1984, this amount is well in excess of $200 million. The sooner the Company is able to utilize this credit for federal income tax purposes, the more beneficial it is for its consumers due to the time value of money.

Q.15. Please summarize your testimony.

A. If, as a result of obtaining the requested exemption, Shoreham reaches commercial operation three months sooner than it would otherwise, LILCO's customers will see a benefit of $8 to $45 million dollars in terms of present worth of revenue requirements. Therefore, from the standpoint of economics, expediting the commercial operation of Shoreham is in the public interest.

BASIC PREMISES AND ASSUMPTIONS

The following is a description of the Premises and Assumptions which are common to all three of the following cases unless otherwise noted:

- Case I: Shoreham I/S* 7/85; synchronized 12/84
- Case II: Shoreham I/S 7/85; synchronized 1/85
- Case III: Shoreham I/S 10/85; synchronized 3/85

1. Study Period

   - 1984 through the year 2000

2. Load Forecast

   The following tabulates the energy and peak load demand forecast that was used in the analysis.

   FORECAST

Year	Summer Peak (MW)	Requirements** (GWH)	Sales (GWH)
1984	3210	14539	13315
1985	3270	14876	13566
1986	3315	15097	13753
1987	3360	15333	13954
1988	3360	15372	13990
1989	3390	15474	14083
1990	3445	15788	14370
1991	3505	16122	14675
1992	3585	16542	15059

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* In service.

** Sales plus losses and Company use.

Year	Summer Peak (MW)	Requirements (GWH)	Sales (GWH)
1993	3670	17038	15512
1994	3760	17543	15974
1995	3855	18056	16443
1996	3940	18556	16909
1997	4035	19084	17382
1998	4125	19612	17865
1999	4220	20143	18350
2000	4315	20678	18839

3. Inflation Rates

Year	Value
1984	5.0%
1985	5.7%
1986	5.8%
1987	5.7%
1988 - Balance of Study	6.0%

4. Austerity Program

Both the total corporate capital budget and the total electric operation and maintenance (O & M) budget reflect austerity measures for the calendar year 1984. Beginning with 1985, both budgets begin a transition towards a normal level. The transition is smooth rather than a step function. Depending on the items being addressed, this transition could take up to two years. Thus, by 1987, we should be back to a normal level.

5. Construction Budget

This budget is developed consistent with No. 4 above. Following is a description of the major components:

° Shoreham

Book Cost

7/85 C.O. date - $4.07 billion
10/85 C.O. date - $4.22 billion

These costs were established consistent with the Company's proposal in its current rate case filing regarding the Financial Stability Adjustment (FSA) revenues.

- Capital estimates for post-commercial expenditures (including capital modifications and retrofits).

Shoreham - Post-Commercial Capital Costs

Year	$X Million
1985	22.8 for 7/85 I/S and 11.4 for 10/85 I/S
1986	44.6
1987	48.2
1988	46.4
1989	21.7
1990	26.1
1991	27.1
1992	25.9
1993	31.1
1994	32.9
1995	30.8
1996	37.0
1997	39.2
1998	36.7

Year	$X Million
1999	44.1
2000	46.7

- For the purposes of this presentation, a 30 year book life was assumed for Shoreham starting from the beginning of commercial operation.

° Nine Mile Point #2

For the year 1984, it was assumed that LILCO will continue to cover all interest expenses incurred by the trust but will make no further contributions towards direct construction expenditures. Starting in 1985, LILCO will satisfy its obligations in full, including the amounts not covered in 1984.

For the purpose of this analysis, a January 1, 1987 in-service date was assumed.

° New 345 kV Interconnection

- It is assumed that LILCO builds and owns the next interconnection and associated internal transmission reinforcements. The in-service date is 1/1/91. The capital requirements are as follows:

Year	$X Million
1985	1
1986	2
1987	8
1988	45
1989	56
1990	62

° Coal Conversion

- No coal conversions are assumed.

° Future Generation Additions

- Coal generating units will be added based upon need. Need is defined as a reserve deficiency after the reallocation of NYPA hydropower. New units will be added for a reserve deficiency of 200 MW or more.

- The capital requirements for future coal units, based on the UE&C Report (January 1983-Jamesport Study), for the dates 1998 and 2000, are as follows:

Future Coal Units Capital Requirements (Excluding AFC)
($ Millions)

C.O. Date Size Unit Type	1/98 400 MW Type 1	1/2000 400 MW Type 2
Year		
1985	-	-
1986	-	-
1987	-	-
1988	1	-
1989	1	-
1990	8	-
1991	12	1
1992	30	1
1993	138	2
1994	281	25
1995	293	76
1996	336	88
1997	238	232
1998		391
1999		238

Other in-service dates were adjusted by inflation.

° Transmission Requirements for Future Coal Units

The following are the capital requirements for transmission system reinforcements to accommodate the future coal units.

Future Transmission Capital Requirements (Excluding AFC)
($ Millions)

First Coal Unit C.O. Date	1/98
Year	
1987	-
1988	-
1989	-
1990	-
1991	2
1992	4
1993	23
1994	59
1995	77
1996	100
1997	52

° Bokum, New Haven, Jamesport

- The following assumptions were incorporated for these projects:

	New Haven	Jamesport	Bokum
Date of Amortization	1/85	1/87	1/88
Period of Amortization	10 yrs.	10 yrs.	10 yrs.
Method	St. Line	St. Line	St. Line
Full Recovery Return on + Return of	Yes	Yes	Yes

° "Other Capital"

- This item represents the balance of the total capital budget for the electric and gas systems adjusted in accordance with the austerity program outlined in No. 4 above. Common plant is allocated 83% to the electric system and 17% to the gas system. Capital requirements for this item assumed in this study are as follows:

Other Capital
($X Millions)

Year	1983	1984	1985	1986	1987	1988	1989	1990
Electric System	59	47	62	77	95	101	107	113
Gas System	18	15	15	15	16	17	18	19
Total	77	62	77	92	111	118	125	132

After 1990, capital expenditures were escalated at 6% per year, using 1990 as the base.

° Capital To Extend Service Life of Existing Plants

- The following capital expenditures were added to approximate the cost of improvements to extend the service lives of LILCO's existing fossil steam plants from 35 to 45 years (the assumed retirement dates for this study).

Extension of Service Life Capital Requirements
($X Millions)

	1986	1988	1990	1992	1994	1996	1999
Total	5	5	5	17	28	32	26

6. Total Electric O & M Budget (excluding fuel)

° The starting point for the annual O & M expenses was LILCO's current rate case filing. Budget figures for the years 1984-89, inclusive, were developed consistent with No. 4 (Austerity Program) above. Future projections are based on the extrapolation of this data.

Electric System O&M Budget
(Excluding Fuel & Nuclear)
($ X Million)

Year	1983	1984	1985	1986	1987	1988	1989
Total	205	163	190	230	260	275	295

From 1990 on, escalate at 6% per year using the 1989 figure as the base.

° Shoreham Operating Costs

Shoreham O&M
($ X Million)

Year	
1985	32.2 for 7/85 I/S and 16.1 for 10/85 I/S
1986	68.0
1987	82.6
1988	85.6
1989	80.8
1990	96.2
1991	102.0
1992	96.2
1993	114.6
1994	121.5
1995	114.5
1996	136.5
1997	144.7
1998	136.4
1999	162.5
2000	172.2

° Future Coal Units

- O&M expenses for future coal units were also added to the above. The O&M assumed for a 400 MW, Type 1 coal unit installed in 1998 is $68 million, and for a 400 MW, Type 2 coal unit installed in 2000 is $38 million (both in current year dollars).

7. Gas System O&M Budget

° The following gas system O&M budget was developed in accordance with the austerity measures outlined above in No. 4:

Gas System O&M Budget
($ X Millions)

Year	1983	1984	1985	1986	1987	1988	1989
Total	57	48	50	55	60	64	67

From 1990 on, expenditures were escalated at 6% per year using the 1989 figure as the base.

8. Property Taxes

° Existing System

- The property taxes assumed for the existing electric and gas systems are as follows:

Property Taxes - Existing System (Non-Nuclear)
($ X Millions)

Year	1984	1985	1986	1987	1988	1989
Electric	129	139	150	162	175	189
Gas	23	25	27	29	31	34
Total	152	164	177	191	206	223

From 1990 on, property taxes were escalated at 6% per year using 1989 figure as the base.

° Shoreham

The Shoreham property taxes assumed are as follows:

Shoreham Property Taxes (1985 C.O.)
($ X Million)

1985	1986	1987	1988	1989	1990	1991	1992	1993-2000
5 per month	67	73	81	89	97	107	118	Escalate at 6%

NOTE: Property taxes prior to commercial operation are capitalized.

° Other Property Taxes

- Additional property taxes assumed for the next interconnection and the future coal units are as follows:

Other Property Taxes
($ X Million)

Interconnection	20 (1991$ - Escalate at 6%)
Future 400 MW Coal Units	
Type 1 - C.O. 1/98	57 (1998$ - Escalate at 6%)
Type 2 - C.O. 1/2000	48 (2000$ - Escalate at 6%)

9. Fuel Costs

° Oil

- The basis for the fuel oil costs used in this study is the Fuels Purchasing official forecast for 1984-1988, dated 9/12/83 which was reconfirmed on April 3, 1984. It is assumed that special limitations will not be renewed. A premium is applied to the cost of low sulphur fuels in 1985 to reflect the loss of bargaining power as a result of the elimination of special limitations. Beyond 1988, fuel oil is assumed to escalate at 2% real.

FUEL OIL COSTS

Plant	% S	Cost Units	1984	1985	1986	1987	1988
Npt. 1-3	2.8	$/MBTU	4.36	-	-	-	-
		$/Bbl.	27.65				
	1.0	$/MBTU	-	5.31	5.42	5.52	5.77
		$/Bbl.		32.80	33.45	34.10	35.65
Pt. Jeff 3-4	2.8	$/MBTU	4.42	-	-	-	-
		$/Bbl.	28.05				
Pt. Jeff 1-4	1.0	$/MBTU	-	5.38	5.48	5.59	5.84
		$/Bbl.	-	33.20	33.85	34.50	36.05
Glenwood 4-5	0.37	$/MBTU	5.31	5.56	5.67	5.77	6.04
E.F.B. 1-2	1.5	$/Bbl.	32.58	34.08	34.75	35.40	37.03
Npt. 4	0.7	$/MBTU	5.08	5.35	5.46	5.56	5.82
		$/Bbl.	31.38	33.03	33.70	34.35	35.93
F. Rockaway 4	0.3	$/MBTU	5.35	5.57	5.68	5.79	6.06
		$/Bbl.	32.78	34.18	34.85	35.50	37.13
Gas Turbines	# 2	$/MBTU	6.52	6.70	6.88	6.88	7.25
		$/Bbl.	37.80	39.06	39.90	39.90	42.00

° Coal

- Coal cost estimates used in this study are based upon forecasts provided by Fuels Purchasing in 11/82 for delivery to Long Island updated for

current inflation estimates. Beyond 1988, coal is assumed to escalate at 1% real.

Coal Costs

Year	1984	1985	1986	1987	1988	1989-2000
$/MBTU	2.32	2.44	2.58	2.76	2.88	Escalate at 7%

° Nuclear Fuel

- Nuclear fuel costs are based on the latest Company estimates. These estimates, which were for a January 1, 1985 in-service date, were adjusted to reflect the assumed 1985 in-service date. The nuclear fuel costs include principal, interest and spent fuel disposal costs. The spent fuel disposal costs are based on a U.S. Department of Energy Contract that requires a fee of 1 mil/kwh of nuclear generation (gross) to be collected.

  These estimates were developed for the years 1985-1988; thereafter the total cost was escalated on a $/MBTU basis at an escalation rate of 6% per year.

Nuclear Fuel Costs - Shoreham I/S 1985

Year	1985	1986	1987	1988	1989-2000
$/MBTU	.789	.857	.917	.961	Escalate at 6%

10. Other Production Assumptions

LILCO's in-house production costing model was used to determine total LILCO annual fuel costs for the study period. Total annual production fuel costs are consistent with the assumptions stated herein. In addition to those factors already noted above, the following are also taken into account in the determination of total fuel costs:

° All LILCO-owned generating units cost

° NYPP economy transactions

° The addition of 100 MW of refuse-fired or other unconventional generation sources by 1990.

° NYPA hydro reallocated to LILCO on a gradual schedule reaching 123 MW by 1995 in accordance with a schedule proposed by the Energy Association as follows:

NYPA Hydro Reallocated To LILCO

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995-2000
MW	34	34	39	44	49	87	90	98	106	114	123

° Firm Capacity Purchase

For those years when there is an installed reserve deficiency, it is assumed that firm capacity can be purchased to satisfy reserve requirements. Firm capacity is priced at the cost of an intermediate load fossil steam unit built in the early 1970's such as those included under the existing capacity exchange agreement with NUSCO.

° Total Production Fuel Costs

Table 4 provides the total annual production fuel cost for the two assumed Shoreham in-service dates.

Production Fuel Costs
($ X Million)

Shoreham C.O.	7/1/85	10/1/85
Year		
1985	676	726
1986	583	583
1987	611	615
1988	633	636
1989	616	616
1990	732	734
1991	741	741
1992	739	739
1993	881	881
1994	988	988
1995	1108	1108
1996	1243	1243
1997	1399	1399
1998	1415	1415
1999	1588	1588
2000	1619	1619

11. Return, Interest and AFC Rates

The following reflects the assumptions used in this study:

Year	Return on Equity (%) Comm.	Pref.	Interest Rate (%) LTD	STD	Trust Interest Rate (%)
1984	16.0	-	-	11.0	11.0
1985	16.0	-	-	13.5	13.5
1986	15.0	13.0	13.0	12.0	12.0
1987	14.0	12.0	12.0	11.0	11.0
1988-2000	14.0	12.0	12.0	11.0	11.0

NOTES:

A "-" indicates that the program was precluded from issuing this type of security in the year indicated.

The AFC rate utilized in a given year is based on the prior year weighed average cost of capital.

12. Other Assumptions

- The discount rate for purposes of present worthing is 13.0%.

- The amount of rate relief granted was assumed to be equal to the revenues required. No regulatory lag was assumed. That is, the SFP model was executed in the "bottom up" mode assuming conventional rate treatment.