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# **An Evaluation of the Long Island Lighting Company's Economic Analysis of the Impact of the Potential Abandonment of the Shoreham Nuclear Power Plant**

**Coopers  
& Lybrand**

State University of New York

Stony Brook

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April 8, 1983

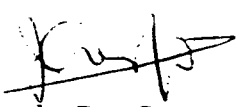
Mr. Walter Oberstebrink  
President  
Action Committee for Long Island  
425 Broad Hollow Road  
Melville, New York 11747

Dear Mr. Oberstebrink:

It is with a great sense of commitment and responsibility that we at Coopers & Lybrand accepted the assignment to perform an evaluation of LILCO's economic analysis of the impact of the potential abandonment of the Shoreham Nuclear Power Plant. We have conducted this review and reached our conclusions and recommendations based on our extensive knowledge and experience in the utility industry. It is this knowledge and experience of the electric utility industry that made possible a totally independent review of LILCO's assumptions and methodologies. I trust that you will find the recommendations and conclusions of this report useful in guiding you and other members of the Action Committee for Long Island at this very critical time.

We are appreciative of the assistance and cooperation that we received from you and your associates and hope we have been able to shed some light onto this very complex issue.

Very truly yours,



Joseph R. Crespo

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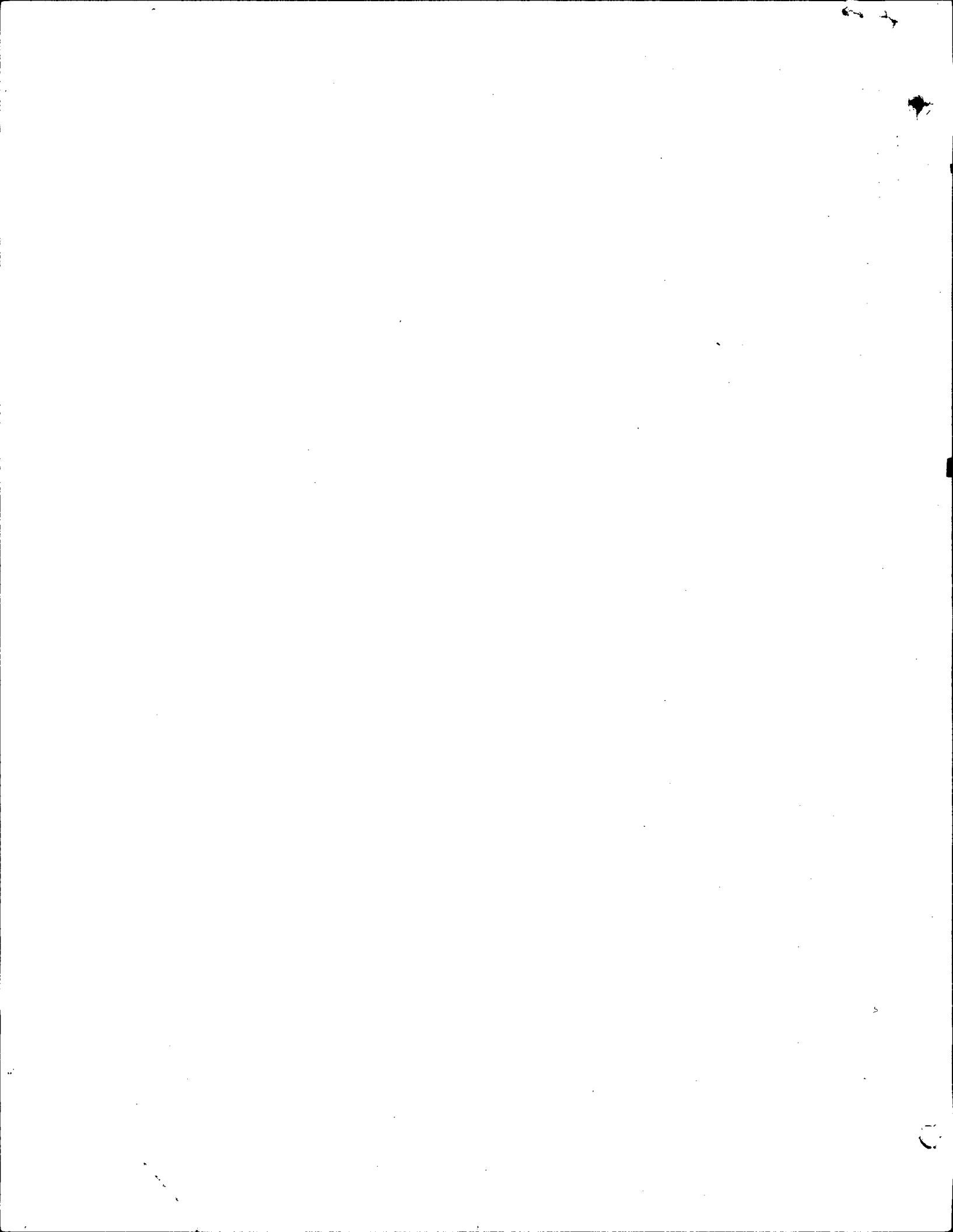
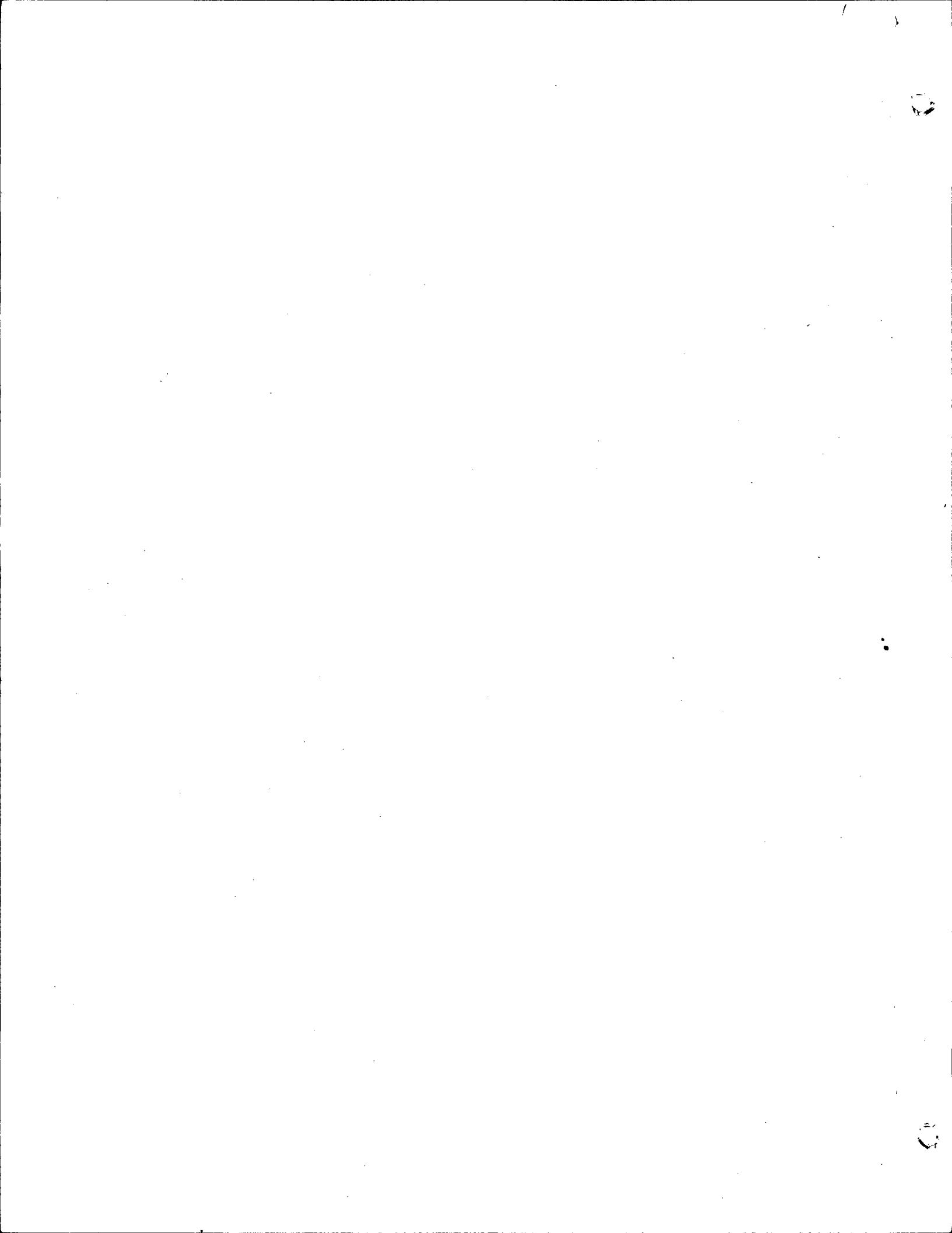


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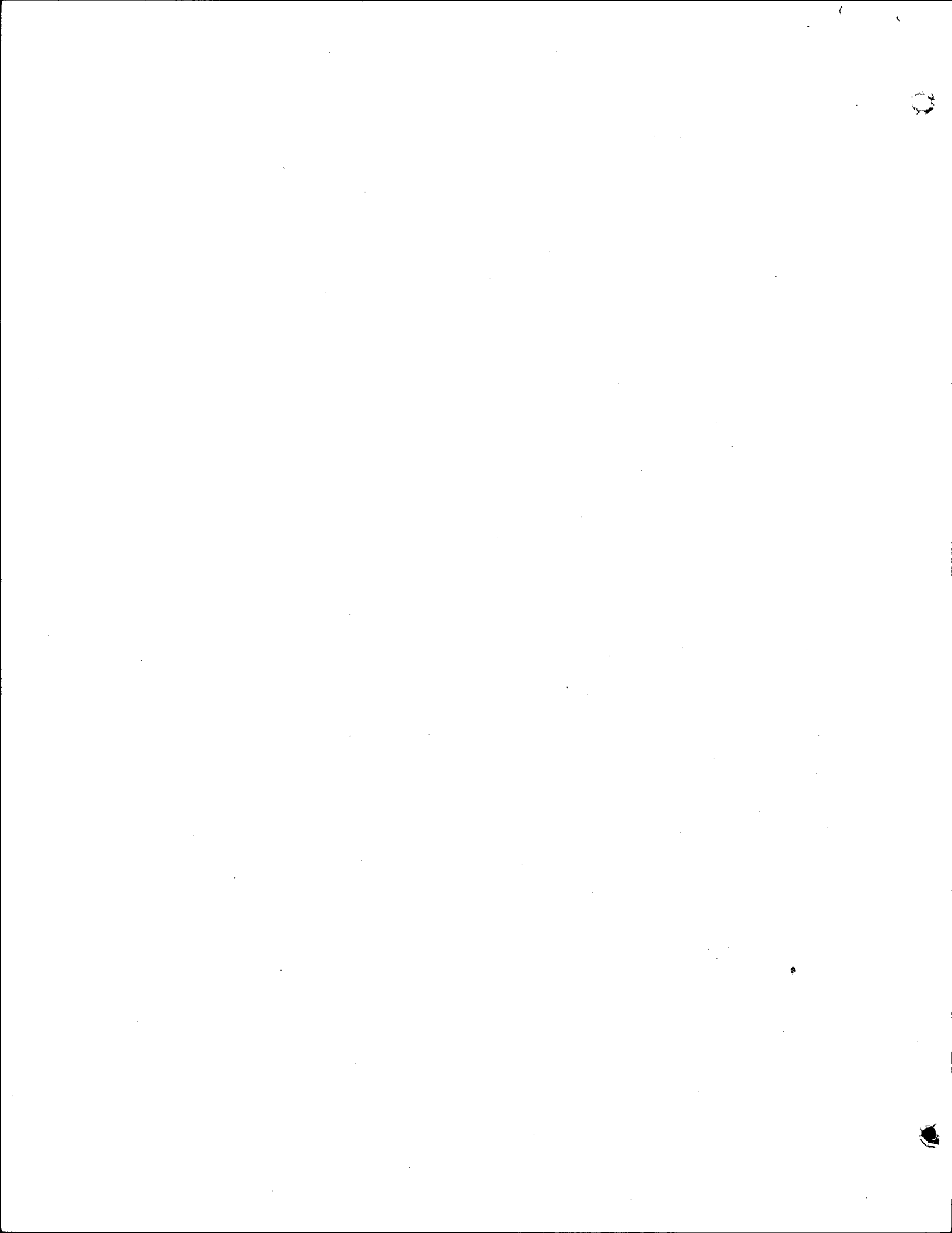


## I. Executive Summary

The potential abandonment of the Shoreham Nuclear Power Plant will have serious financial consequences on LILCO, its customers and the tax payers of the Wading River-Shoreham School District, the Town of Brookhaven and Suffolk County. As outlined in the conclusions section of this report, the impact on the residential rate payers will range from \$848 to \$1,109 over the first ten years depending on the scenario to be considered as most likely to occur. Also over the first ten years, the total taxes that would be displaced as a result of the Shoreham abandonment will be \$684.5 million. Consequently, the tax impact on the Wading River-Shoreham School District will be \$265.6 million, the Town of Brookhaven will be \$144.8 million and Suffolk County will be \$274.1 million.

In addition to the immediate direct impact that the Shoreham abandonment would have on LILCO and the residents of Long Island, it is our feeling that severe consequences resulting from the lack of fuel diversity, poor reliability and less adequate power supply will also reverberate for years to come throughout the infrastructure and economy of Long Island.

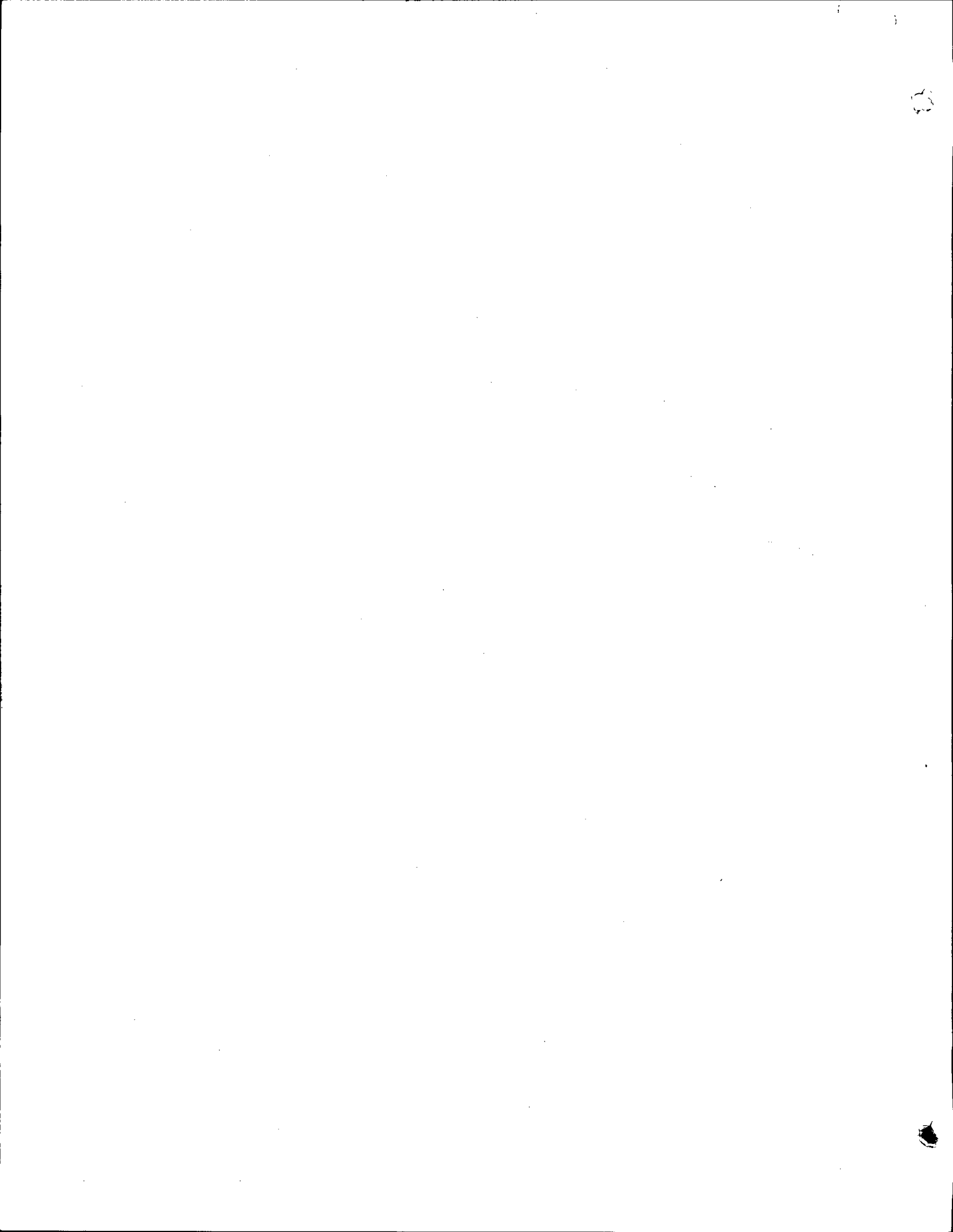
One of our major concerns is the grave danger, impacting LILCO's study in its entirety, of utilizing fairly modest growth rates in their forecast. In our critique of LILCO's report we discuss at length our reasons for feeling that potentially LILCO's forecast of peaks and energy might be unduly low. While it is entirely likely that LILCO may not experience again the high rates of growth which were characteristic of the 1960's and early 1970's, it is also just as





likely to expect that growth will not continue at LILCO's very low projected rates.

We urge you to consider that LILCO and Long Island are at a critical point in their existence. Without doubt this situation will require compromise and tough decisions but most of all it mandates the vision and commitment of the leaders of Long Island.



## II. Introduction

Coopers & Lybrand (C&L) was retained by the Action Committee for Long Island to perform a review of the Economic Analysis Study performed by Long Island Lighting Company (LILCO) measuring the impact of the potential abandonment of the Shoreham Nuclear Power Plant.

C&L's approach has been shaped by the very technical nature of LILCO's study. Since the results of this type of study depend upon assumptions as to load levels, equipment timing, cost of capital, inflation rates, taxes, reserve requirements and many others, we first turned our attention to an evaluation and critique of LILCO's assumptions. Subsequently we reviewed all of LILCO's computations and voluminous computer runs using the same thoroughness and painstaking attention to detail for which our Firm is well known. All of LILCO's analytical work which forms the basis for their conclusions has been reviewed for substance and accuracy.

Recognizing that LILCO's staff has been very involved with the Shoreham project since its inception, we have relied on our own staff of recognized and experienced experts in the utility field to arrive at a set of prudent planning criteria which are so essential for a study of this nature. This approach provided both a fresh outlook for the required evaluation and insured our independence in reviewing LILCO's work. As a result of our critique of LILCO's work, we have set up a base case of our own and subjected that case to a series of sensitivity analyses.

While we concur with LILCO that the use of the anticipated forty year life of a nuclear power plant is the proper time

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frame for a study of this nature, we cannot help but feel that LILCO did not focus sufficient attention on the possible negative short run consequences of abandonment. Therefore, in our evaluation of the Company's study we have placed greater emphasis on the analysis of the first ten years of the planning scenario, i.e., 1984 through 1993.

The Company's study measures forthrightly and directly its perception of the consequences of abandonment on LILCO's ability to supply the electricity needs of its consumers. Those perceived consequences are expressed in terms of the costs required to replace Shoreham's capacity and a decline in system reliability. Indirectly it measures the impact on system-wide electricity prices and local real estate taxes in Suffolk County, the Town of Brookhaven and the Wading River-Shoreham School District.

However, the real economic impact goes well beyond these issues. The lack of an adequate and reliable power supply will also affect jobs, unemployment, retention and attraction of commerce and industry, the tax base and the entire infrastructure of Long Island.

We have not subjected the financial information and the assumptions included in this report to any auditing procedures and, consequently, we express no opinion on the financial data, the assumptions, or the projected outcome. To the extent that assumed events do not occur, the outcome may vary materially from that projected. Consequently, the conclusions reached should be re-evaluated, based on any changes in circumstances occurring after the date of the report.



### III. Recommendations

A thorough and analytical review of LILCO's study coupled with the results of our own comparisons and sensitivity analyses, has led to the following observations and recommendations.

1. C&L's review of LILCO's study has measured the impact of the Shoreham abandonment on LILCO's customers, real estate taxes in the Wading River-Shoreham School District, Town of Brookhaven and Suffolk County, as well as the consequences on LILCO as a Corporation. Our study falls short of truly measuring the total impact on employment, jobs and the viability of Long Island as a desirable place to live and attract commerce and industry. Therefore, we recommend that these areas be further studied in order to more fully evaluate the consequences of a Shoreham abandonment.
2. While we realize that the issues surrounding nuclear power are complex and at times emotional, it is our recommendation that aggressive steps be taken to inform the residents of Long Island regarding the potential financial consequences of currently contemplated actions with regard to the abandonment of the Shoreham plant. While it is at times difficult to comprehend financial consequences that extend over long periods of time, such as forty years, our report has addressed these issues over a shorter time frame, i.e., 1984-1993. Even over this shorter period of years, the impact is of great consequence.

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3. We can not envision any type of abandonment scenario which would not result in potential penalties to Long Island's rate payers and tax payers. It is our understanding that other interested parties may have reached the conclusion that abandonment could take place without such penalties. If this is the case, we strongly recommend an expeditious and definitive review of these conclusions.
4. We recommend that LILCO adopt Coopers & Lybrand's "base case" for their own planning purposes and desist from using potential additions of renewable resources generation and assuming the timely availability of Nine Mile Point #2 as part of their planning criteria.
5. Finally, we recommend that LILCO strongly consider an upward revision of their forecast to reflect the potential impact of economic recovery and emergence of electric energy intensive technologies.

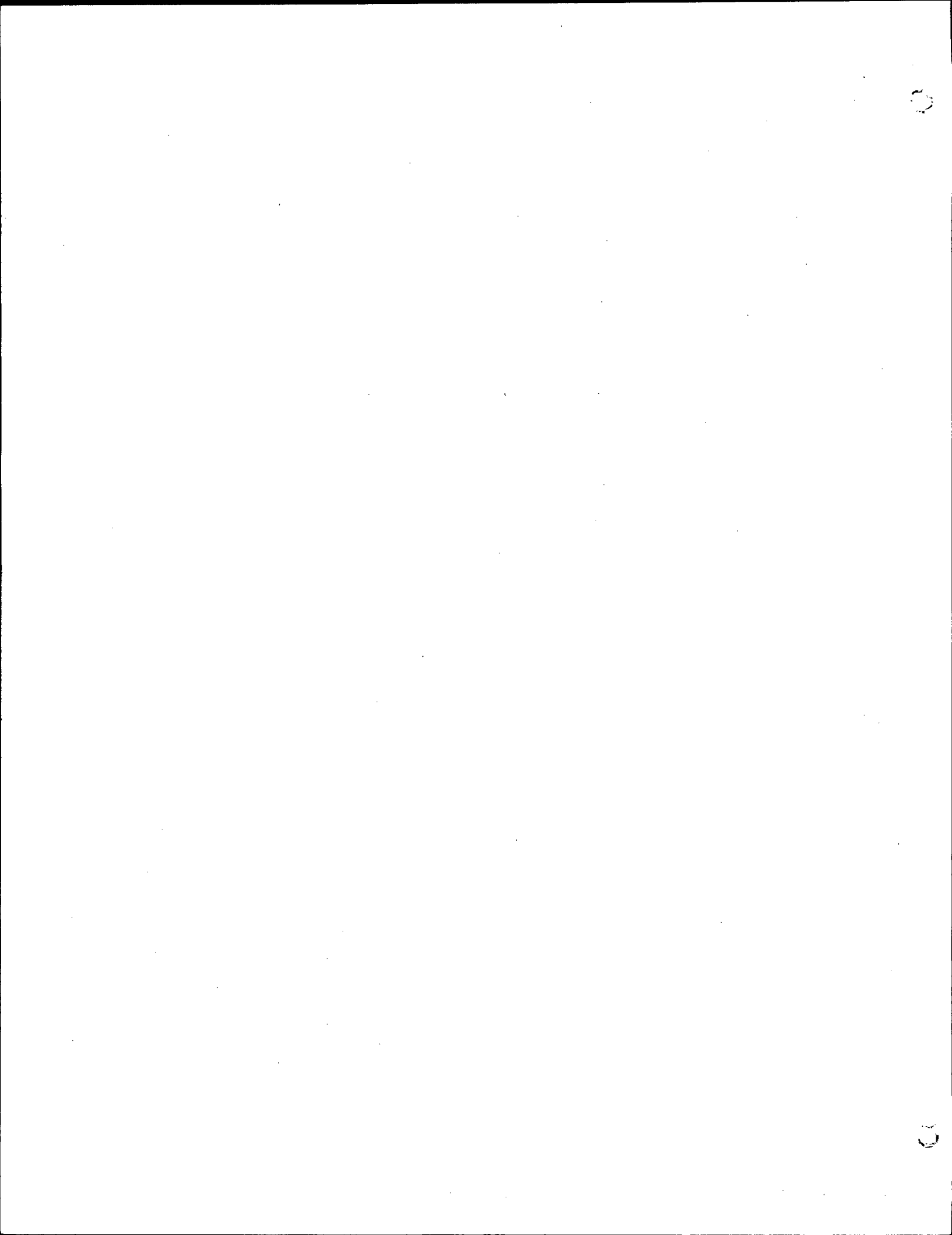
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#### IV. Conclusions

A thorough and analytical review of LILCO's study coupled with the results of our own comparisons and sensitivity analyses, has led to the following conclusions:

1. LILCO's base study confirmed by our independent review places the overall penalty to LILCO's rate payers of abandoning Shoreham at the \$25.1 billion level over a forty year period.
2. Coopers & Lybrand's base case reflecting the same growth rate used by LILCO but with further assumptions regarding capacity additions, confirms that the penalty for abandonment would be approximately \$23.6 billion.
3. Coopers & Lybrand's review of LILCO's assumptions with regard to load growth points to the potential negative consequences of understating the growth rate. There is strong evidence to indicate that LILCO's growth projections might be too low.
4. Slightly more realistic load growth projections and assumptions would result in capacity deficiencies of 802 MW by 1993 and a penalty over forty years in excess of \$30.8 billion to LILCO's rate payers.
5. Over the first ten years, i.e., 1984-1993, of the Shoreham abandonment scenario, the real estate taxes in the Wading River-Shoreham School District would go up by \$265.6 million, in the Town of Brookhaven by \$144.8 million, and in Suffolk County by \$274.1 million. It is unlikely that the School District would survive under



these circumstances. Therefore, if it is assumed that the School District taxes are absorbed by the residents of the Town of Brookhaven, a preliminary approximation shows that the increase per household over the ten year period would be \$3,104.45 for Town taxes and an additional \$617.13 for County taxes or a total of \$3,721.58.

6. The potential operating consequences of abandoning Shoreham under the C&L base case results in reserve requirements deficiencies of 4 MW in 1984 growing to 343 MW by 1993.
7. Under the C&L scenario of 2½% growth per year the reserve requirements deficiencies grow from 4 MW in 1984 to 802 MW by 1993.
8. In addition to the increase in rates that LILCO's customers would pay as a result of Shoreham coming on line, the average LILCO residential rate payer would be penalized \$856 over the 1984-1993 period, if Shoreham is abandoned under the assumptions of LILCO's base case.
9. Under the assumptions of the C&L base case the average LILCO customer would be penalized \$848 for the 1984-1993 period if Shoreham is abandoned.
10. Under C&L's higher growth scenario the average LILCO residential customer would be penalized \$1,109 for the 1984-1993 period if Shoreham is abandoned.
11. LILCO's fuel diversity will be practically nonexistent if Shoreham is abandoned, making the Company even more susceptible to fluctuations in oil prices.



12. LILCO's overall system reliability will suffer significantly in the abandonment scenario and would expose Long Island residents to potential brown outs and unavailability of reliable firm sources of power for future commercial and industrial development.
  
13. The reaction of the financial community to the reality of abandoning a \$3.2 billion investment while difficult to quantify, will undoubtedly be very negative and will result in severe consequences to LILCO's financial integrity. LILCO's ability to undertake further construction or major maintenance projects would be severely affected.

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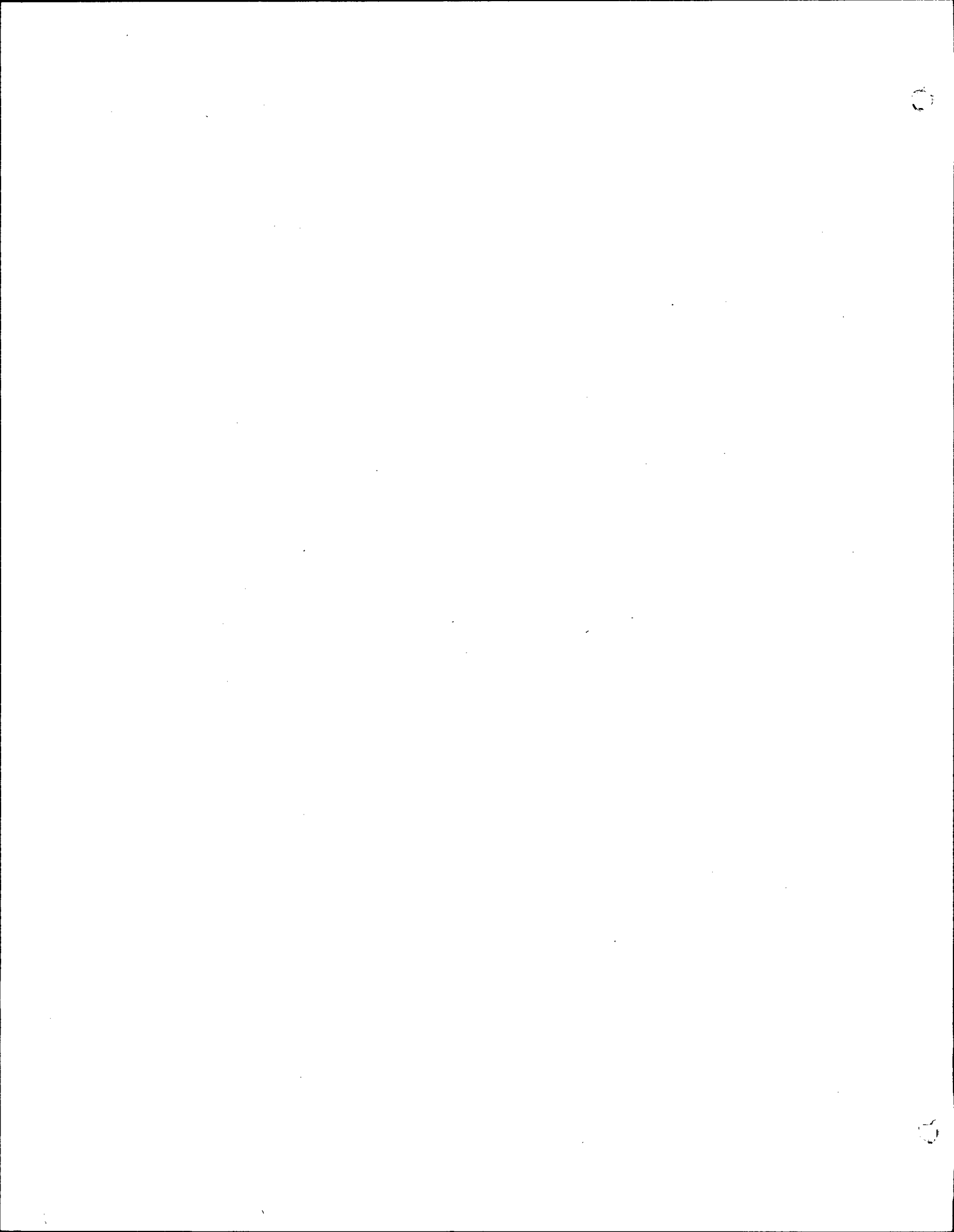
## V. LILCO's Report

The LILCO report primarily addresses the costs of the future electric supply of Long Island under two scenarios. One scenario assumes that the Shoreham Nuclear Power Plant (Shoreham) commences commercial operation on January 1, 1984 as currently planned. The other scenario assumes that Shoreham will never become operational and proposes an alternative expansion plan aimed at meeting the same load forecast with something approximating the same degree of reliability (i.e., the same as with Shoreham operating). The approach used by LILCO is one that is commonly used in studies of engineering economics for the comparison of alternative plans. A choice between two alternatives is made on the basis of either the present value of expenditures over the study period or the sum of the expenditures. In either case this type of study may be considered to look at the long-run costs.

In addition to increasing the cost of electricity to its consumers, the LILCO study finds that the abandonment of Shoreham will have several other major consequences. These are:

### 1. Poor Fuel Supply Reliability

The Company is the only major electric utility in the contiguous 48 states that relies exclusively on foreign oil for its boilers' fuel supply. It is thus totally at the mercy of the OPEC nations with regard to both the cost and stability of its fuel supplies. Should Shoreham come on line as planned this situation would, to a large extent, be remedied. On the other hand, should Shoreham be abandoned this situation would persist



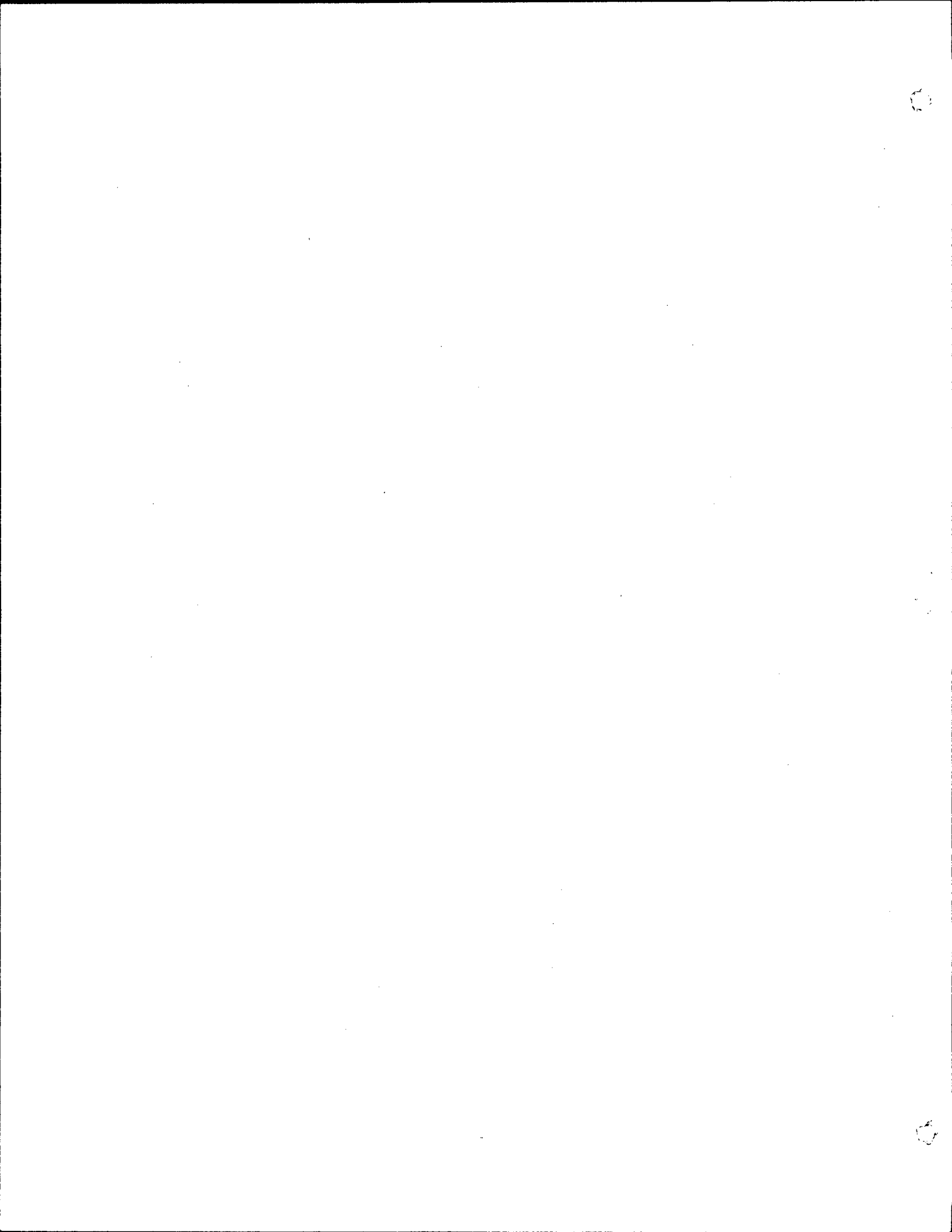
until well into the future. While some relief can be obtained by converting existing oil burning plants to coal firing there is an additional cost penalty for so doing.

2. Lessened Power Supply Reliability

The attempt, in the event of Shoreham's abandonment, to replicate the degree of power supply reliability provided by Shoreham although theoretically possible, may in reality prove to be illusory. This is so because the abandonment of Shoreham will increase LILCO's reliance on sources outside of Long Island in order to meet its reserve requirements. On paper, the New York Power Pool (NYPP) appears to have adequate resources to assist LILCO under emergency conditions. However, the Company has limited access to those resources. This is so because of severe transmission constraints and other power transfer limitations existing in the southeast area of the NYPP. LILCO's ability to import power from upstate New York is limited to one tie to the north across Long Island Sound. Even the proposed second tie across the Sound (in 1990) does not, in practice, provide reliability equal to that which Shoreham would provide. Again, we are dealing with constraints that cannot be remedied by LILCO alone. Transmission limitations in the southern tier of the New England system makes an increase in capacity of the existing tie between Northport and Connecticut have but limited value.

3. Reduced Distribution System Reliability

The study finds that under the abandonment scenario LILCO's financial condition will be badly weakened. As



a result, discretionary spending on various programs involving maintenance and upgrading of the distribution system will have to be dropped. These programs are the most visible efforts of the Company to provide reliable service. They are also the ones with the greatest short term impact. An outstanding example of such programs is the systematic, periodic trimming of trees adjacent to LILCO's overhead electric lines. When trees are properly trimmed there is a large measurable decrease in service outages during storms. When trees have not been regularly trimmed the severity and frequency of service outages can be shown to increase greatly.

LILCO during the course of their study, of necessity, had to make certain assumptions dealing not only with engineering economics but also with regulatory treatment.

In the area of regulatory treatment it was taken as a matter of faith that the viability of the Company as a business enterprise would be guaranteed by regulatory authorities. The specific assumptions in this regard are:

1. The New York Public Service Commission (PSC) will authorize LILCO to amortize the sunk costs of the abandoned Shoreham Nuclear Unit. Amortization will take place over a suitable period and interest will be recovered on the un-amortized portion.
2. The PSC will authorize rate relief adequate to enable LILCO to both finance the cost of the facilities required in the alternative plan and to finance the dismantling

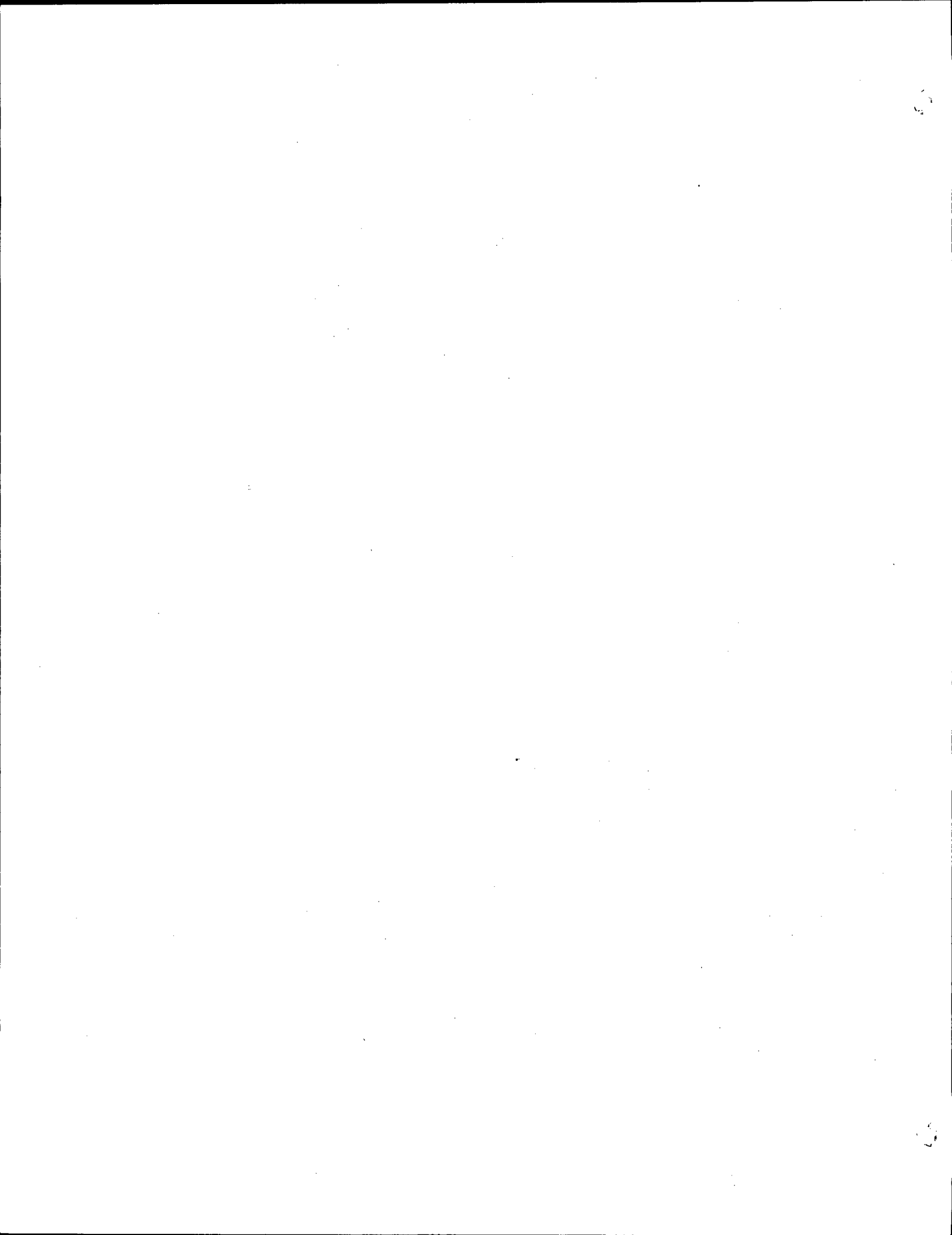


and/or removal of those portions of Shoreham already constructed.

3. The PSC will continue to enforce the provisions of the Fuel Adjustment Clause currently contained in LILCO's electric tariffs. This means that all fuel costs will continue to be recovered from consumers.

LILCO's major assumptions in the realm of engineering economics are as follows:

1. The load forecast submitted to the NYPP in March of 1983 which assumes an annual growth rate of 1.7% per year was used.
2. Startup date of Shoreham is January 1984 in the base case with Shoreham in service.
3. Shoreham is operated at 5% output during 1984 and is not abandoned until January 1985 in the Shoreham abandonment scenario.
4. Nine Mile Point #2 comes on line in 1987.
5. 100 MW of miscellaneous cogeneration and refuse fueled power become available by 1990.
6. Conversion of Port Jefferson and E. F. Barrett oil fired units to coal commencing in 1987 under the abandonment scenario.
7. Major new interconnection is built to the north in 1990.





8. 400 MW coal units on line in 1994 and 1996 in abandonment scenario (1994 is the earliest year that any new unit can be put in service).
9. Coal units added after 1999 in both scenarios.
10. No penalty in the cost of money after abandonment.
11. A 6% overall inflation rate.
12. Real price of oil drops through 1987 and escalates after that at a "real" rate of 2% per year.
13. Coal and uranium prices escalate at a "real" rate of 1% per year after 1987.
14. Write-off Bokum Uranium Mine investment over five years.
15. Abandon New Haven and Jamesport investment and write-off over five years.
16. LILCO absorbs a 10% increment of the Shoreham taxes which are displaced under the abandonment case.
17. Compromise Rate Moderation Plan in effect.

LILCO used these and other assumptions to compare the revenue requirements of what might be considered two different companies, i.e., LILCO with and without Shoreham. The revenue requirements were derived through the use of two computer models. The first, a production costing model, simulates the operation of LILCO's electric generating units. It

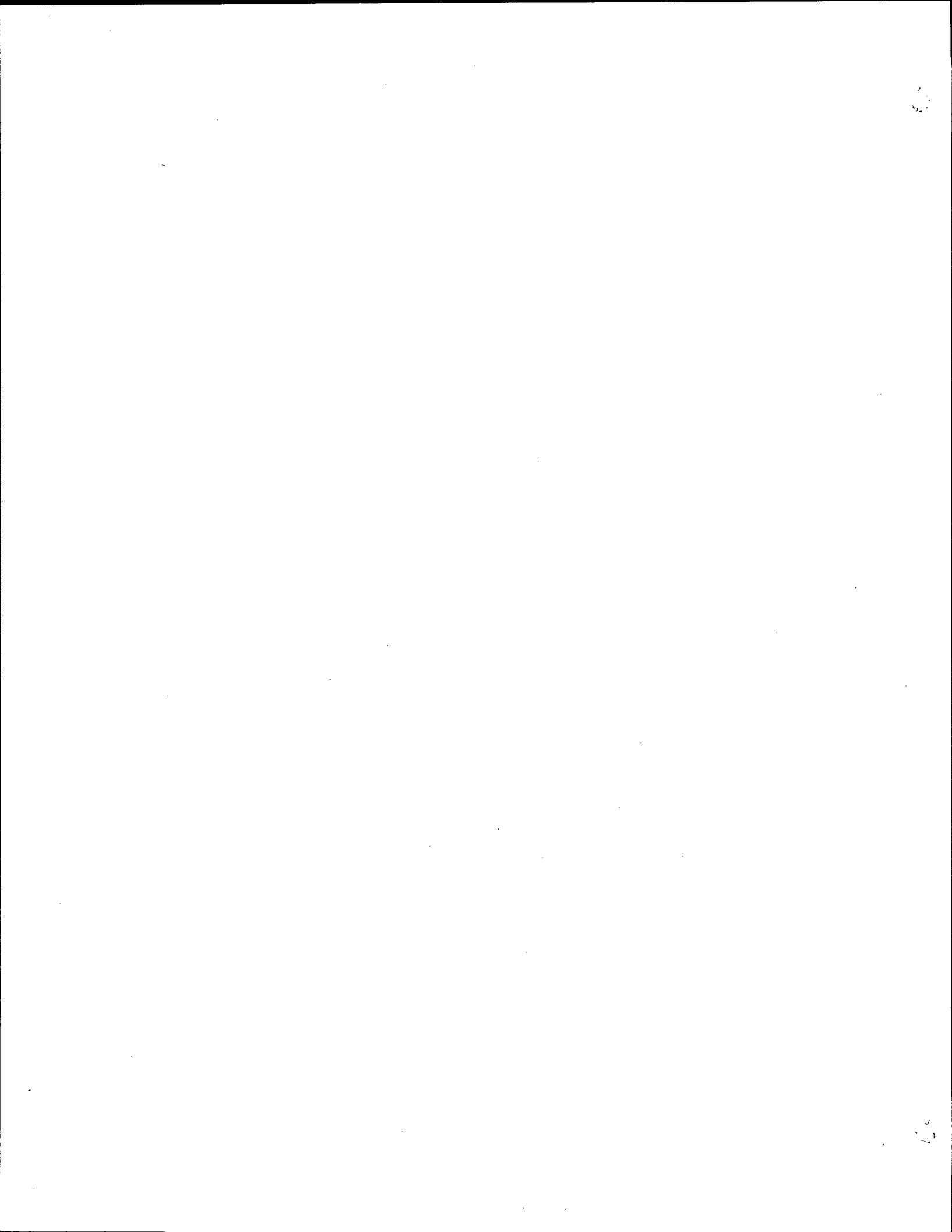


dispatches the units in economic sequence in order to achieve the lowest possible fuel costs consistent with reliability requirements. An important consideration in the use of this model is the ability to estimate potential economic interchange with the NYPP. Also taken into account are maintenance and random forced outages. The model dispatches the system annually from 1983 through 2017. Results for the remainder of the 40 year study period are obtained by extrapolation.

The results of the economic dispatch are entered into a Regulatory Analysis Model (RAM) which is a revenue and financial model of the entire Company used in long-range studies. Real results are available through 2009 and the later year additional revenue requirements are obtained by extrapolation. Assumptions as to future cost of capital, cost of generating units, construction timing and the like are entered into the model and a stream of annual revenue requirements is generated.

A third model, a loss of load probability program (LOLP) is used to calculate system reliability (i.e., what are the expectations that all load cannot be served).

LILCO's results show that abandonment of Shoreham, under the assumptions shown earlier, will require a total of some \$25.1 billion more of revenues over the forty year study life than would be required if Shoreham goes in service as planned. In the first ten years a cumulative total of some \$1.8 billion more will be required.



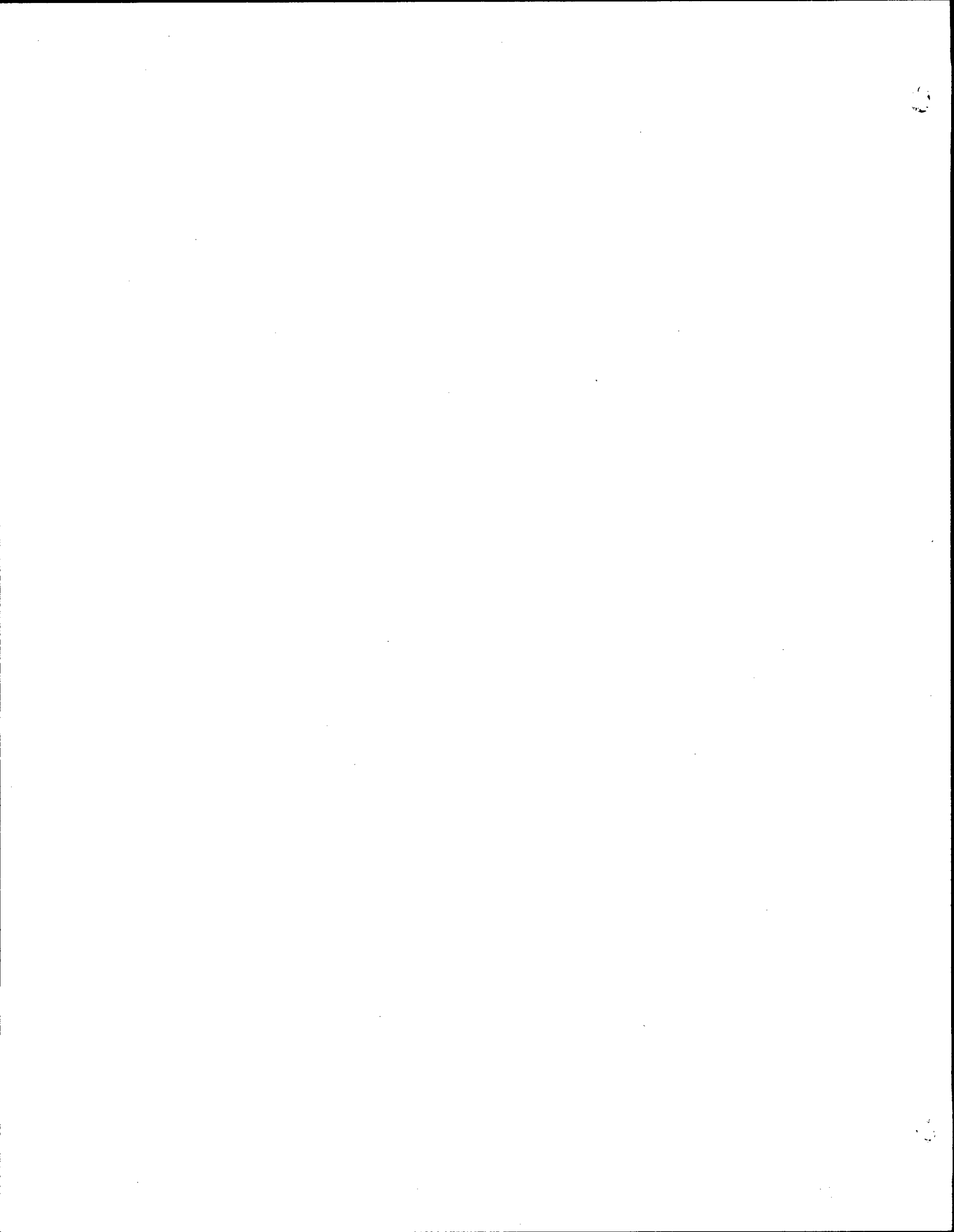
## VI. Critique of LILCO's Report

In our approach to this critique of LILCO's report, we have not been content to merely perform a review of all of the analytical work performed by LILCO in support of its study. The essence of the Company's analytical approach is the output of their planning process. Since the output of that process is largely dependent upon a series of assumptions, we have started with an examination of those assumptions having critical effects upon LILCO's results.

Particular attention has been paid to the impact that potentially questionable assumptions could have during the first ten years, i.e., 1984 through 1993. We were concerned that since Shoreham has become so firmly ingrained in LILCO's plans for the 1980's that the assumptions made in the short run, as to how Shoreham's capacity would be replaced during those early stages would turn out to be either too conservative or too optimistic.

We are also very concerned with LILCO's forecast of system peak loads and energy requirements over the next forty (40) years. A small increase in that forecast could greatly affect the Company's capacity needs under the Shoreham abandonment case.

In that which follows, we will set forth those assumptions to which we take exception along with an explanation of the reasons for our concerns.



## A. Production Capacity Assumptions

### 1. Unconventional Sources

In LILCO's base case study under the abandonment scenario it has been assumed that 100 MW of such capacity will come on line by 1990. These sources could include wind, solar, refuse and cogeneration.

We take strong exception to LILCO's use of this assumption for planning purposes -- under any circumstances. Our exception has its basis in the lack of any firm commitment from anyone to supply LILCO, on a date certain, with power from such sources. The timing, financing and construction of these facilities is controlled by the entrepreneur offering the capacity (not by LILCO) and since no one has come forth it certainly does not seem advisable to include this assumption in the short run period. Additionally the economics of any of these unconventional sources of power is constantly changing; and, to the extent that the cost of conventional utility fuels decrease these sources become less attractive to potential investors. Included in the assumed 100 MW of unconventional capacity are 32 MW from the now idle Hempstead Refuse Recovery Plant. Given the current concerns regarding this facility, the status of that capacity is shaky indeed.

Therefore, given all the uncertainties surrounding the addition of these 100 MW of capacity we conclude that LILCO is ill advised to assume that they will be on line by 1990.





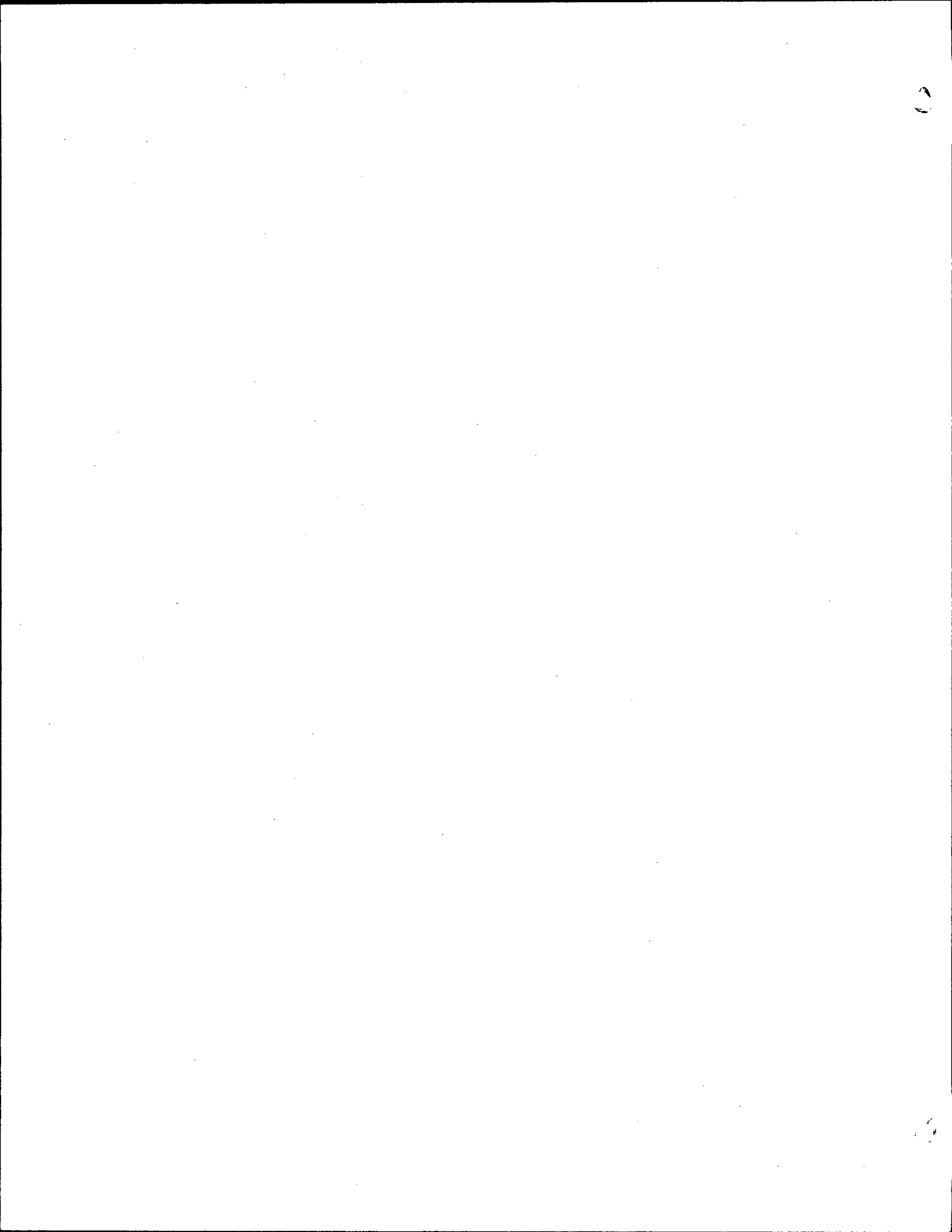
## 2. Conventional Sources

### a. Nine Mile Point #2

LILCO has purchased an 18% participation in Nine Mile Point #2 being constructed in upstate New York. This 18% participation is equivalent to 194 MW of capacity and is scheduled to go on line early in 1987 in time for that annual summer peak. Since that unit is still four years away from its scheduled completion and based on the experience of the utility industry of being generally unable to complete all the design, construction, safety and licensing requirements for a nuclear power plant on schedule, we think it unwise for LILCO to assume that Nine Mile Point #2 will come on line as expected in early 1987. We strongly feel that for planning purposes a less optimistic criteria should be utilized and that the unit will be expected to slip at least one year.

### b. Oil to Coal Conversions

We concur with and endorse LILCO's position that under the abandonment scenario the Port Jefferson and Barrett units should be converted from oil to coal at the earliest possible date in order to give LILCO and its customers a minimum semblance of fuel diversity. We would, however, question on a preliminary basis LILCO's ability to achieve those conversions sequentially commencing in 1987. While we do not question the practicality of achieving those conversions in the manner outlined by LILCO from a design or construction standpoint, we are concerned about the potential emergence of

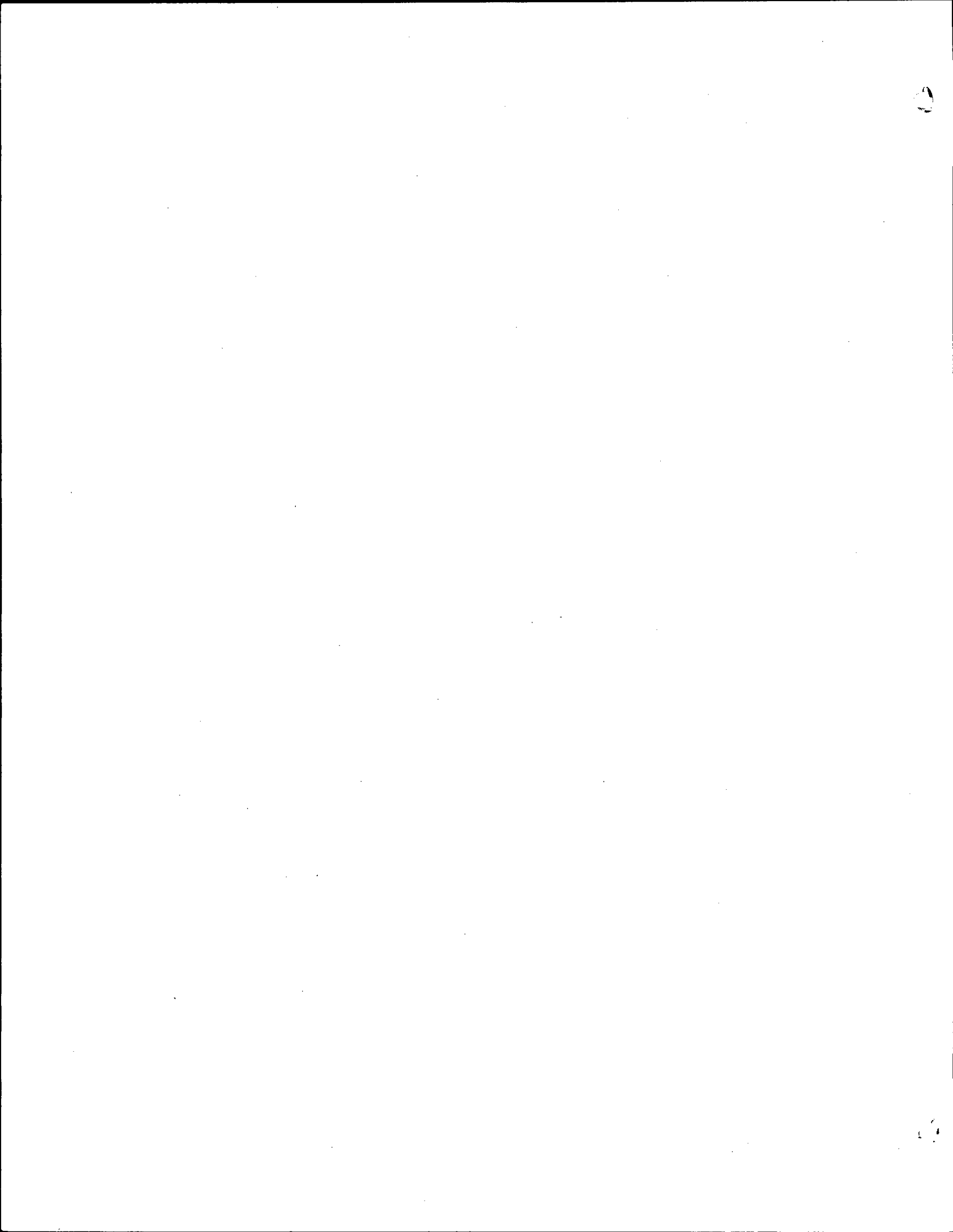


other problems in the system during that period which would require the diversion of human and financial resources to the detriment of those conversions. While we are not suggesting or recommending a different course of action, we felt it necessary to highlight the great importance of these conversion projects and impress on LILCO's management their absolute priority.

- c. One of LILCO's base assumptions is that a new major interconnection will be built to the north in 1990. While this interconnection more than likely would be built whether Shoreham is abandoned or not, it becomes more critical and almost absolutely essential under the abandonment scenario. Since the construction of such a tie-line requires several permits and licensing requirements, an early decision would be required in order for this tie-line to be completed on schedule. While we take no exception with LILCO's assumption for the need for this interconnection, we do seriously question their ability to raise the money for this construction were Shoreham to be abandoned because LILCO would find itself in a weakened financial position.

#### B. Load Forecast

One of the most critical assumptions that LILCO was required to make in its study is the rate of growth in system peak loads and system energy requirements over the next 40 years. The forecast utilized in the study reflects a basic growth rate of 1.7 percent per year.



We believe that the use of this forecast for planning purposes in the base case study under the abandonment scenario could place LILCO in a very precarious position during the late 1980's and early 1990's were Shoreham actually abandoned.

LILCO and many other utilities have been unduly impressed by the lack of growth over the last few years. This lack of growth is attributable to the recession and the difficult economic environment that has existed nationwide. We believe strongly, that there is an inherent danger in assuming or taking for granted that the slow rate of growth will persist once economic recovery occurs. In addition to facing a more salubrious economic climate, commerce and industry also will have a more varied menu of undertakings from which to choose. There are strong indications that the entire nation, Long Island included, is on the verge of a real technological revolution in such areas as: telecommunications, mini computers and highly energy intensive sophisticated industrial processes such as laser welding, robotics, iron ore pelletizing, etc. }

For the following reasons, specific to LILCO, we believe it would have been appropriate for the Company to have used a forecast based on a somewhat higher growth rate.

1. While it is true that the proportion of residential customers to total customers on the LILCO system is very large, it is not true that the majority of the Company's energy sales are made to residential consumers. Over 50 percent of LILCO's energy sales are made to commercial and industrial customers.

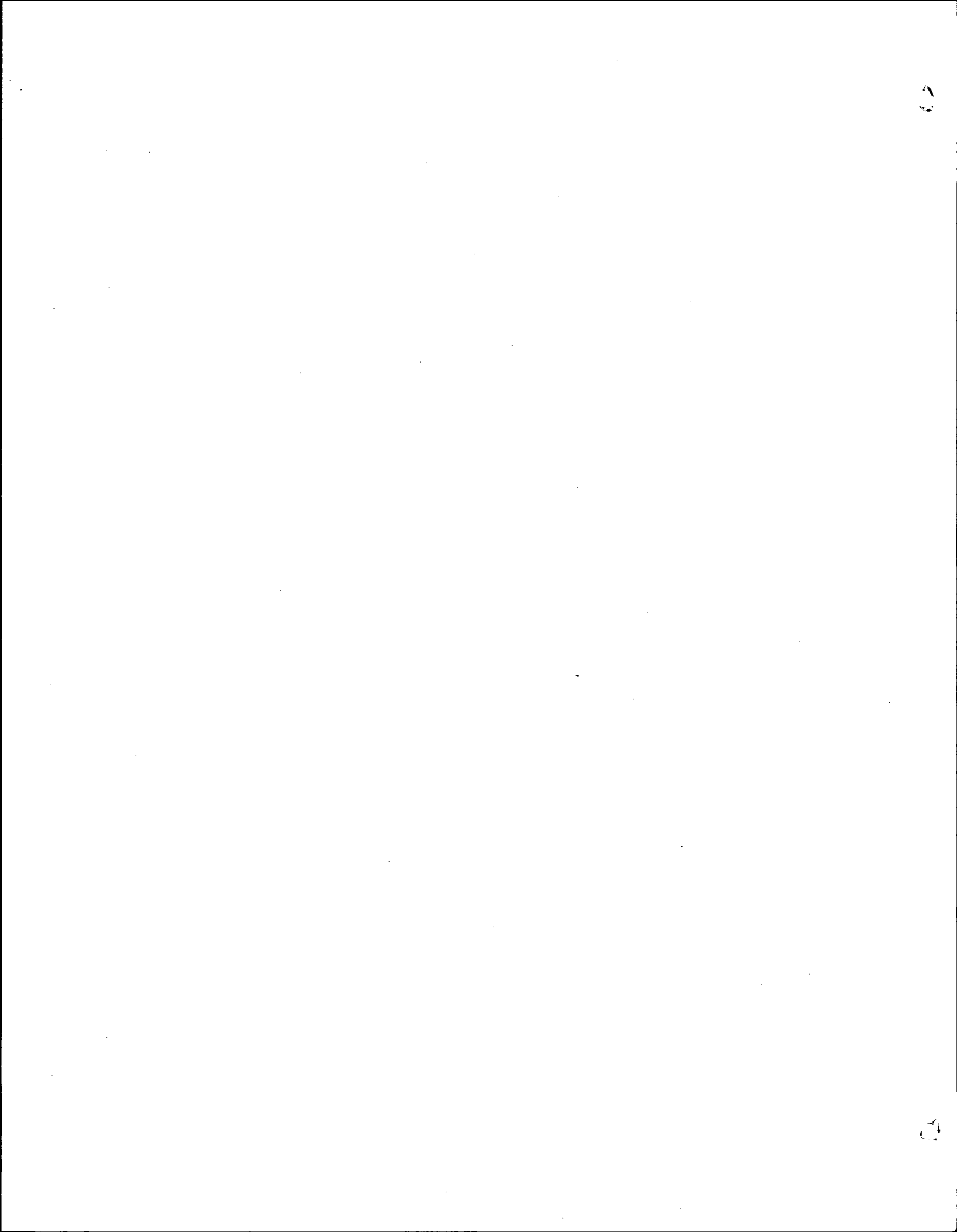


Since there are many highly sophisticated companies in the LILCO service area, it is difficult to believe that none of them will be taking part in the technological revolution to which we have referred.

2. The existing large number of households on Long Island also creates a unique set of circumstances for LILCO that perhaps have not been totally reflected in its forecasts. The most current census information available for the Nassau-Suffolk Standard Metropolitan Statistical Area (SMSA) indicates that slightly over 40% of the Nassau-Suffolk population is under age 24. Since the population of the Nassau-Suffolk SMSA is estimated to be approximately 2,600,000 people this means that there are slightly over 1,000,000 inhabitants under age 24. The potential for future household formation on Long Island is very great and could be quite explosive with the greatest impact coming during the early 1990's. Even a modest household formation ratio of say 10% to 15% could result in approximately 100,000 new net residential households being formed in LILCO's service area by the end of the century.

Further credence is added to this possibility by observing that the New York State Department of Health Vital Statistics for births and deaths in Nassau and Suffolk County show "a natural increase" over the last ten years with births outnumbering deaths on the average 10,500 per year.

3. Another aspect of the Nassau-Suffolk SMSA which concerns us with regard to LILCO's forecast is that



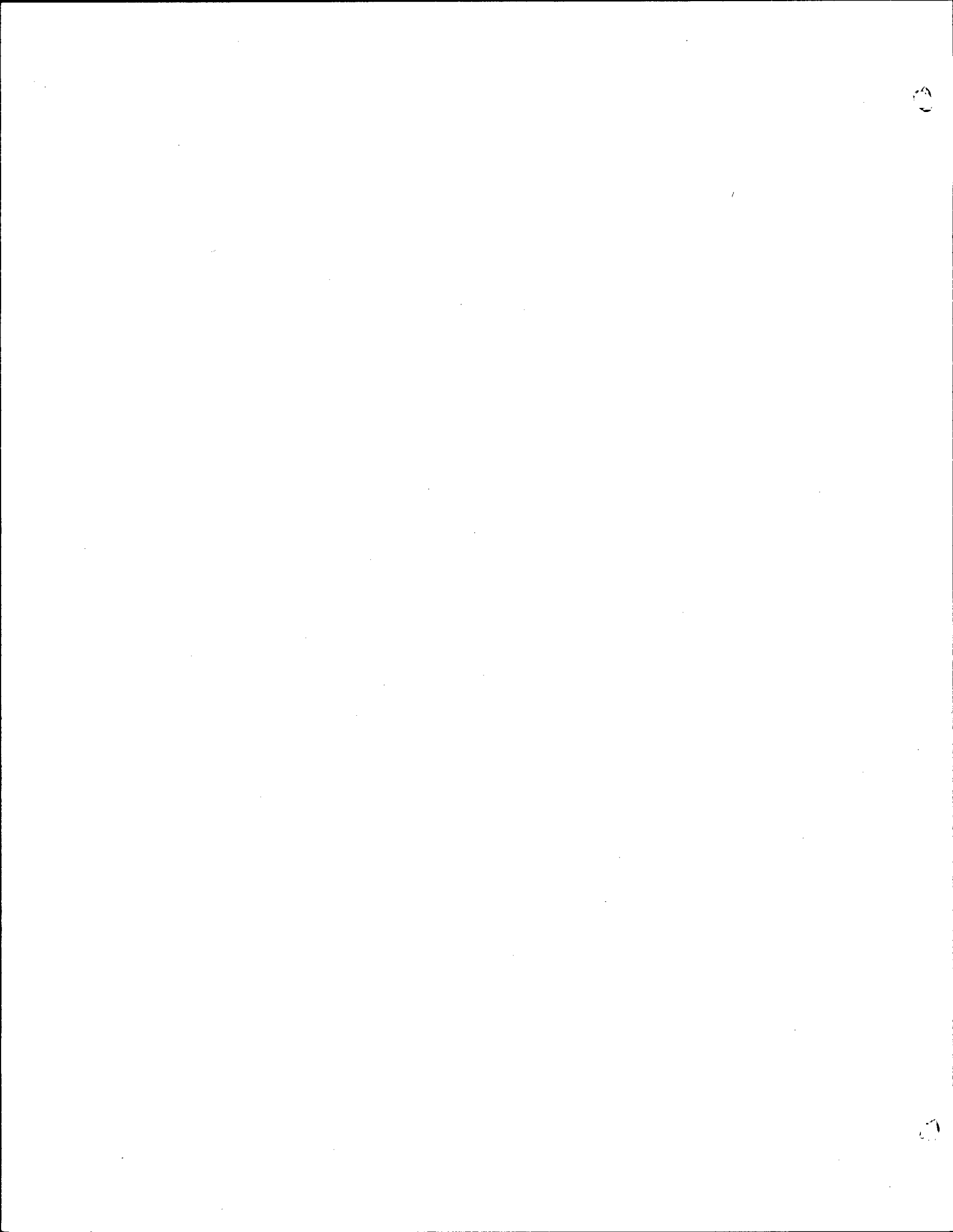


according to the most recent 1980 census data, the median household income for the Nassau-Suffolk SMSA is \$23,547 which is the second highest in the nation for SMSA's with a population of 1,000,000 people or more. With this high median income the potential for accelerated energy growth despite conservation could be quite substantial under a more favorable economic climate.

4. In addition there are some extremely visible national trends that will undoubtedly impact Long Island which further adds to our concern regarding LILCO's forecast. Current trends in population growth and the continued tendency for women to enter the marketplace will result in an increase in the available workforce in excess of 33% between now and roughly the end of the century. This is the highest increase that this country has experienced since World War II. Even with a modest attempt to maintain current living standards, large increases in energy and electricity use should result in order to support this greatly expanding workforce.

#### C. Global Costing Assumptions

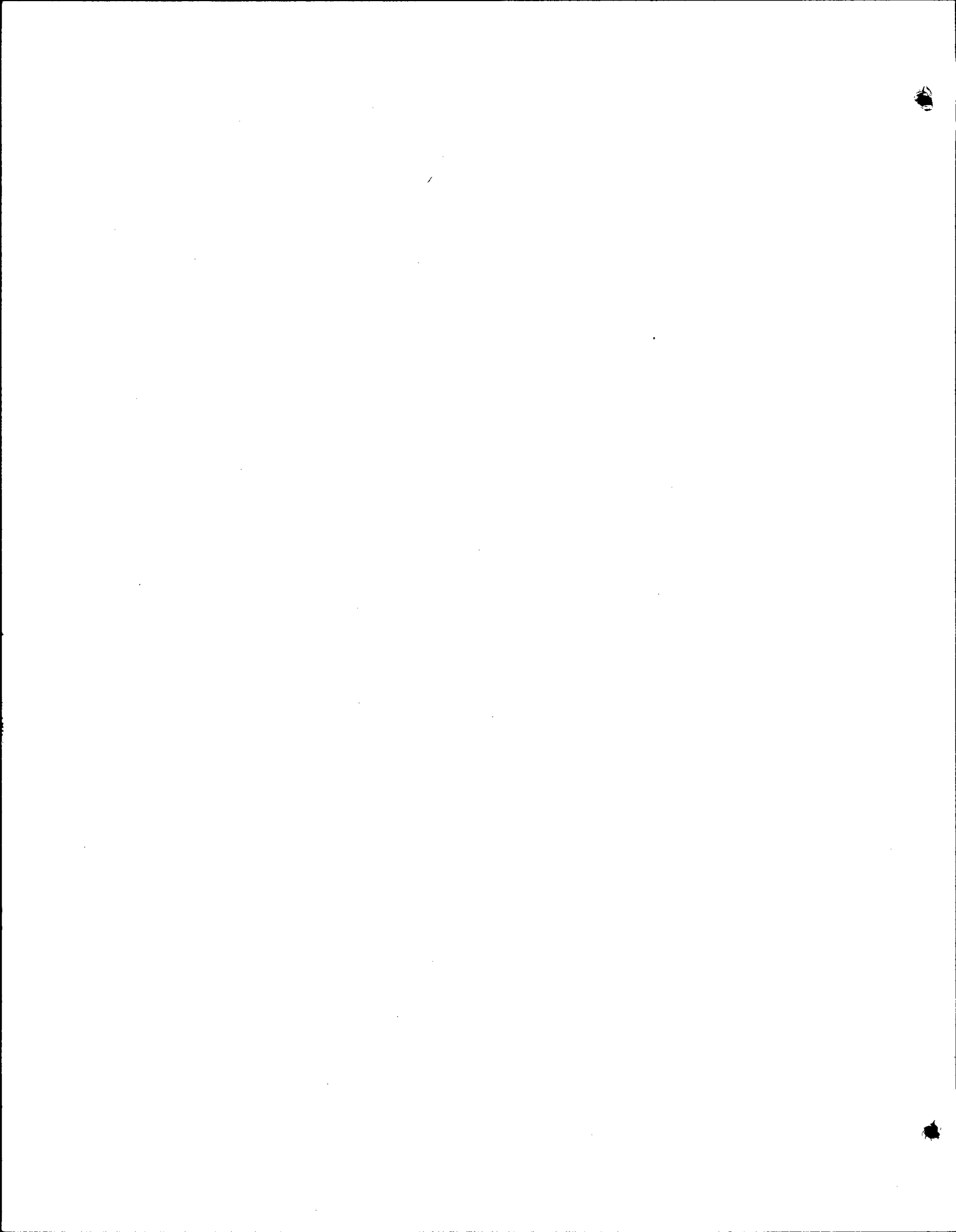
1. LILCO's use of an overall 6% inflation rate falls within the range of current predictions by Data Resources Inc. (DRI), a leading and respected economic firm. Nevertheless, since different rates of inflation would also have a significant impact on the overall validity of LILCO's results we believe that analyses should be made of the effects of both lower and higher rates of inflation.



2. While we agree with LILCO's assumption that oil should be allowed to escalate at a 2% "real rate" after 1987, we are in disagreement that a 1% "real rate" should be used for escalating coal prices after 1987 and believe that an analysis should be made of the effects of allowing coal prices to escalate at say a 2% rate.

D. Other Assumptions

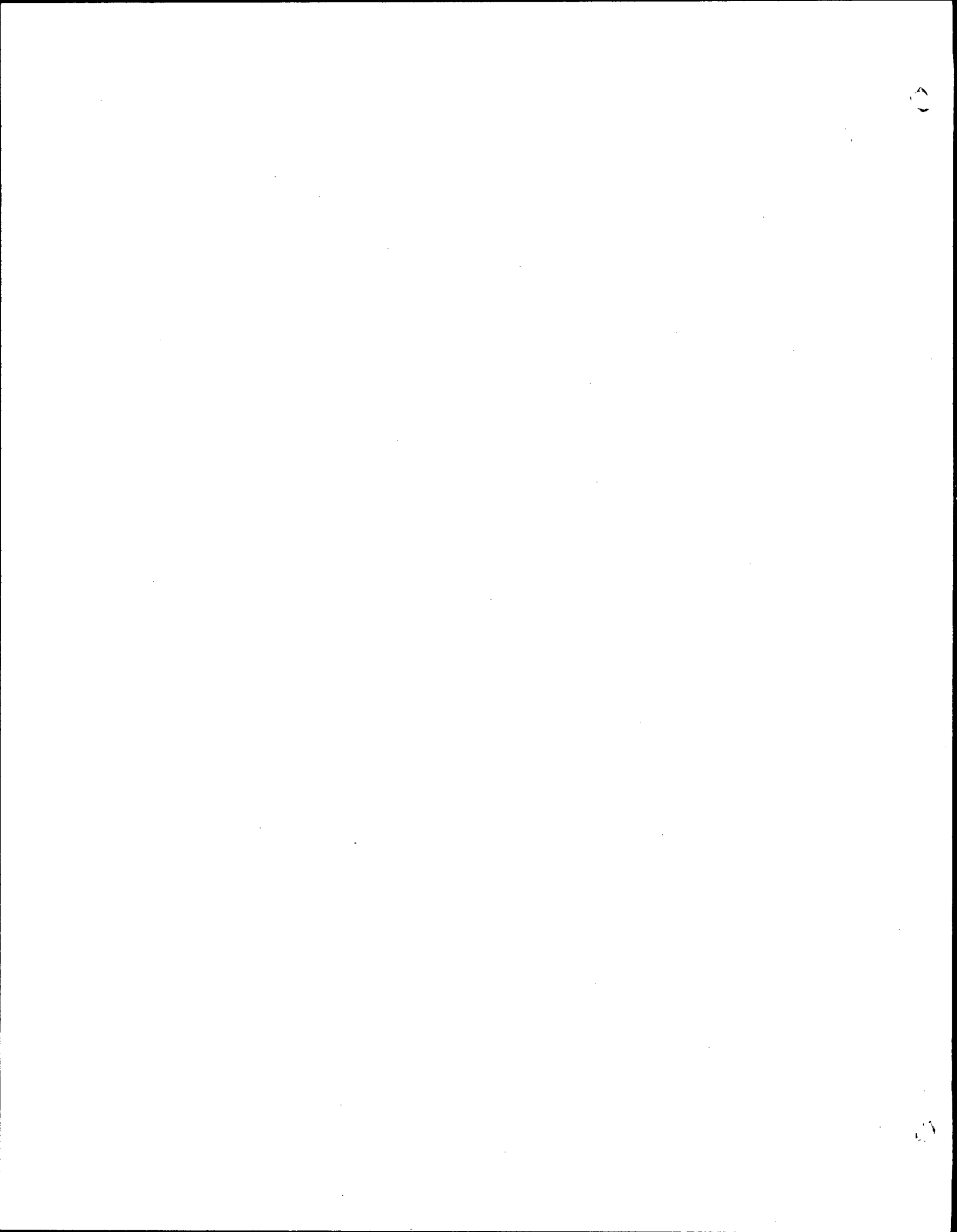
1. LILCO's assumption that their cost of money would not be affected by the abandonment of Shoreham appears to be on the surface rather naive. We strongly feel that there very definitely will be a higher cost of money associated with an abandonment scenario. Nevertheless, since LILCO's senior debt is already rated at a very low level, we understand LILCO's difficulty in making further assumptions in this area.
2. While we are certain that the New York Public Service Commission will act in a responsible manner, protecting the interests of both Company and consumers alike, we find little allowance being made by LILCO for the political realities and the kind of pressures that would come to bear upon the PSC were LILCO forced to abandon a \$3.2 billion investment. We feel confident that the Commission would most likely allow for the amortization of the majority of the sunk costs associated with Shoreham, but we do not feel as sanguine about being able to predict the period over which that amortization would take place. While we realize that for the



purposes of the study this type of assumption would have to be made, we would like to caution that this unknown element could have one of the most serious effects upon the validity of LILCO's study. Any period of amortization greater than 20 years would seriously affect the results. The magnitude of the abandonment penalty would increase considerably.

The LILCO study has been carried out in a professional manner utilizing state-of-the-art methods. The techniques used are well known and accepted for use in studies of this kind. Our criticism has centered on the assumptions used for the reasons stated earlier.

In another section of this report we will show the effect on LILCO's results of making small changes in the assumptions required for the study.



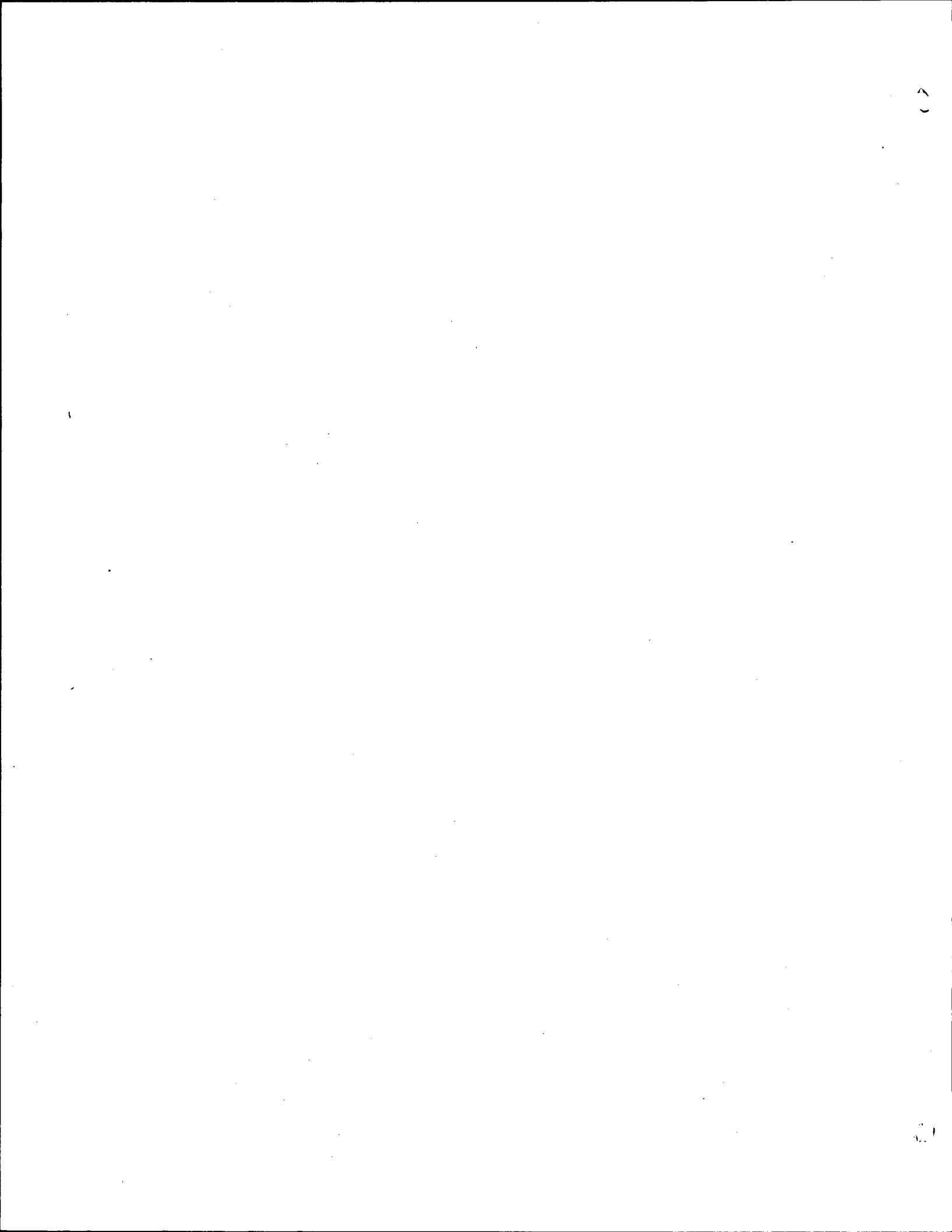
## VII. Coopers & Lybrand's Approach

We at Coopers & Lybrand are well aware of the importance and sensitive nature of evaluating the potential impact on LILCO and the community if the Shoreham Nuclear Power Plant were to be abandoned. While the conclusions and recommendations of this study are of necessity financial and economic in nature, the foundation and basis for the analysis finds its genesis in utility engineering and planning principles. Therefore, in reviewing LILCO's study for the purposes of qualifying its propriety, we have taken nothing for granted. We have relied on our judgement and experience in the utility field and have asked ourselves the question, what will be the most prudent, sensible and businesslike way for LILCO to proceed if the Shoreham plant were to be abandoned. While our discussions with LILCO personnel have revealed a sense of commitment to the consumers of Long Island we have also found their thinking to be a bit restrictive in measuring the short run consequences.

After reviewing LILCO's base study which provides a comparison of a 40-year planning scenario with and without Shoreham and the resulting revenue requirements deficiency, we have proceeded to establish our own basic planning criteria for the purposes of our audit.

Our base case varies from the Company's in two regards:

- a. there will be 100 MW less capacity available by 1990 due to our belief that unconventional sources may not be available to LILCO;



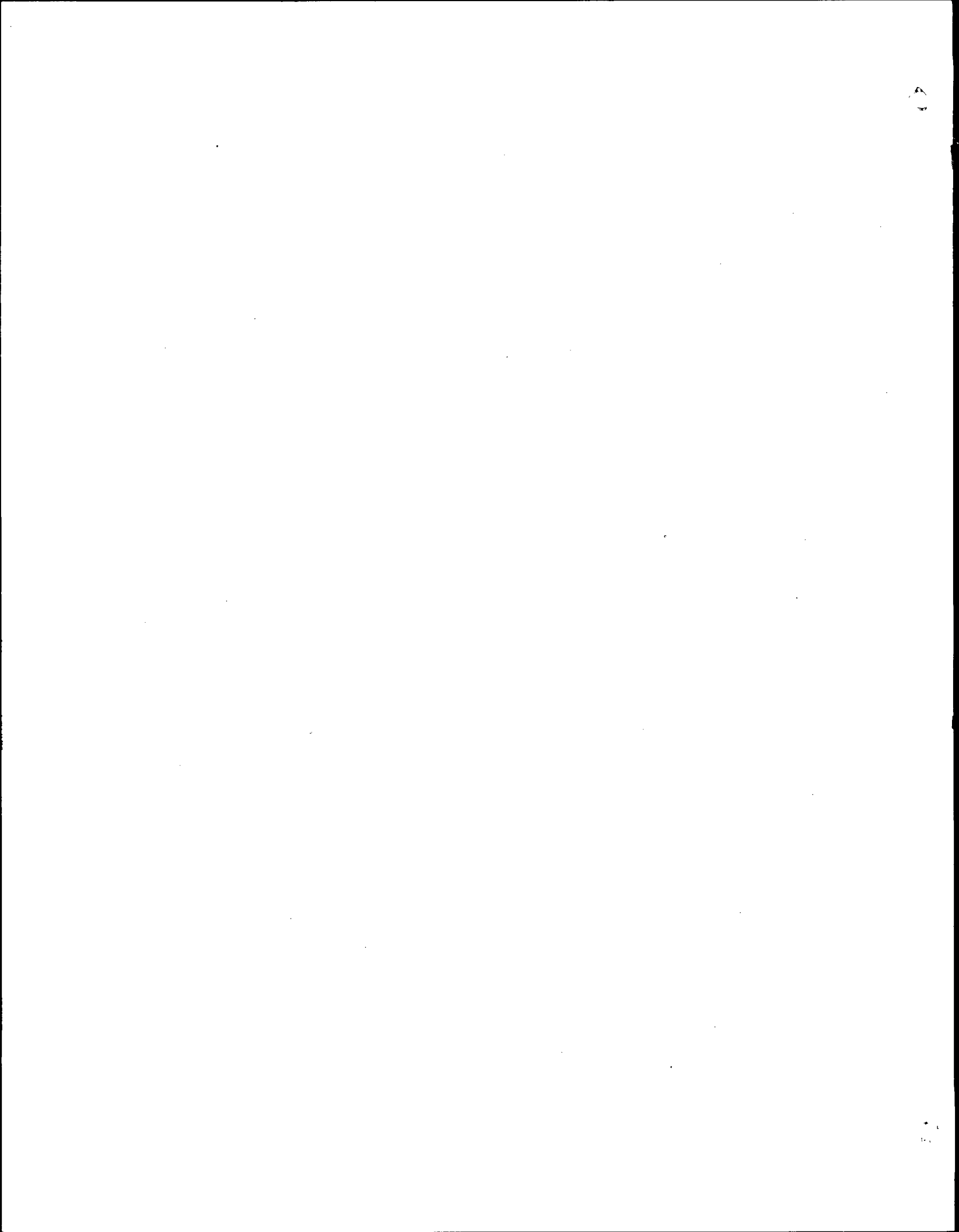


- b. the in-service date of Nine Mile Point #2 will be slipped by one year.

All other LILCO assumptions were used and, like the Company we have examined one scenario with Shoreham in service and one with Shoreham abandoned. A comparison between C&L's case and that of the Company shows that the cumulative total of additional revenue requirements generated by the abandonment decrease by some \$1.5 billion under C&L's assumption. However, the capacity deficiency has increased causing system reliability to decrease because of the unavailability of the 100 MW of unconventional generation.

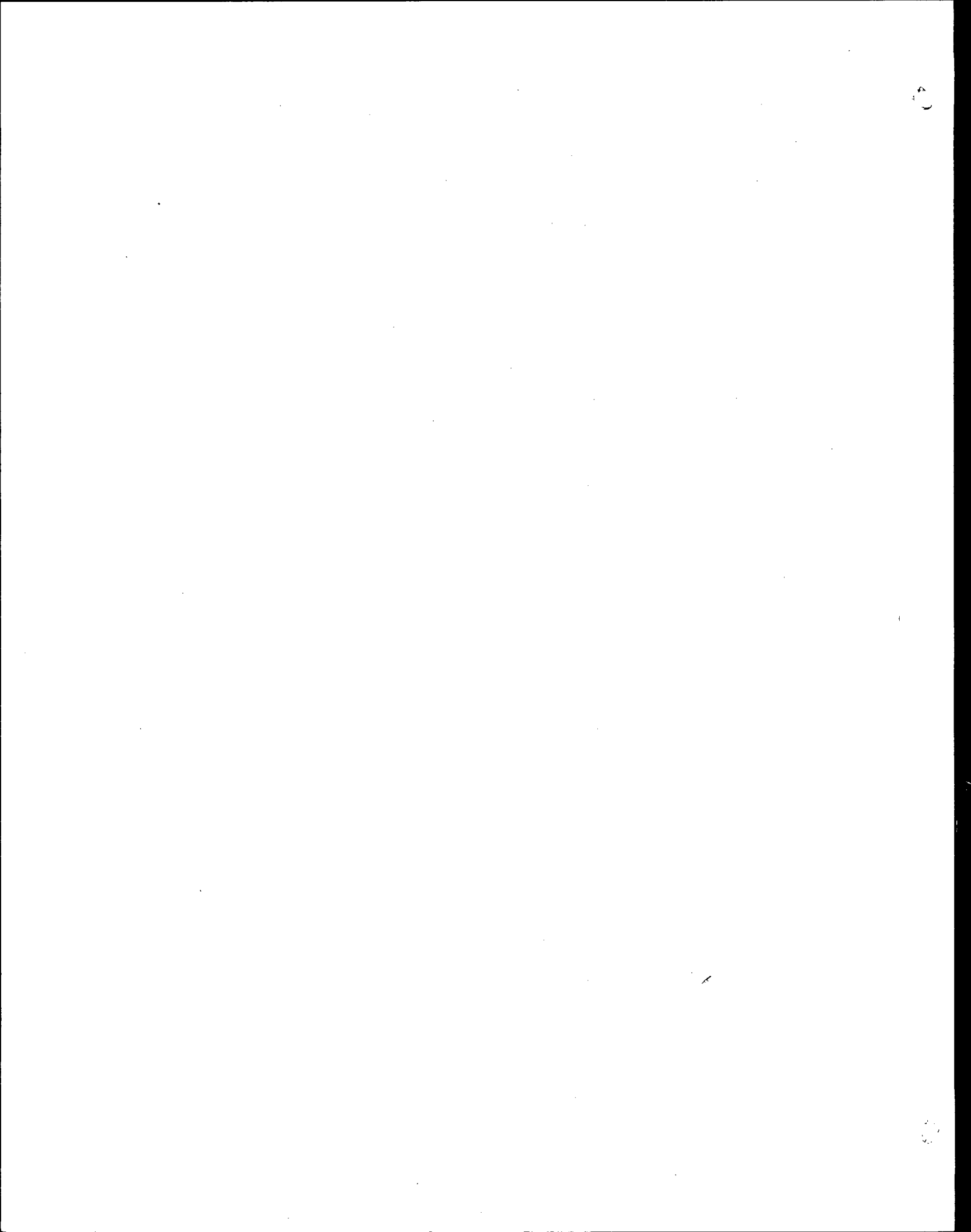
Our first sensitivity analysis was a case in which we held constant all of our base case assumptions, with the single exception of the load forecast. The load forecast was changed to reflect a growth rate of 2.5% instead of the 1.7% used by LILCO. As might have been expected, the cost of both scenarios increases because additional capacity was required to supply the added load on the system. In this case the cumulative total of the additional revenue requirements due to abandonment come to some \$0.8 billion less than those computed by the Company. Again the system capacity deficiency has increased along with a decrease in system reliability.

For the second sensitivity analysis we chose a case with the same growth rate (2½%) and the same planning scenarios used in our first sensitivity analysis. However, for this analysis we have assumed that the cost of coal escalates at a "real rate" of 2% per year and that the cost of money is ¼% greater than heretofore. The resulting revenue requirements are greater than in any other case studied and the revenue requirements in excess of those with Shoreham in



service are some \$30 billion over the study period. The results of our studies are summarized and compared with those of the Company in the appendix attached hereto.

In order to measure the potential direct impact that abandonment would have on the rate and tax payers we have performed some preliminary computations of the expected increase in electricity prices over the next ten years that would result to LILCO's customers. We have also measured the real estate tax impact of abandonment on the residents of Suffolk County, the Town of Brookhaven and the Wading River-Shoreham School District. These results are also summarized in the appendix.



APPENDIX

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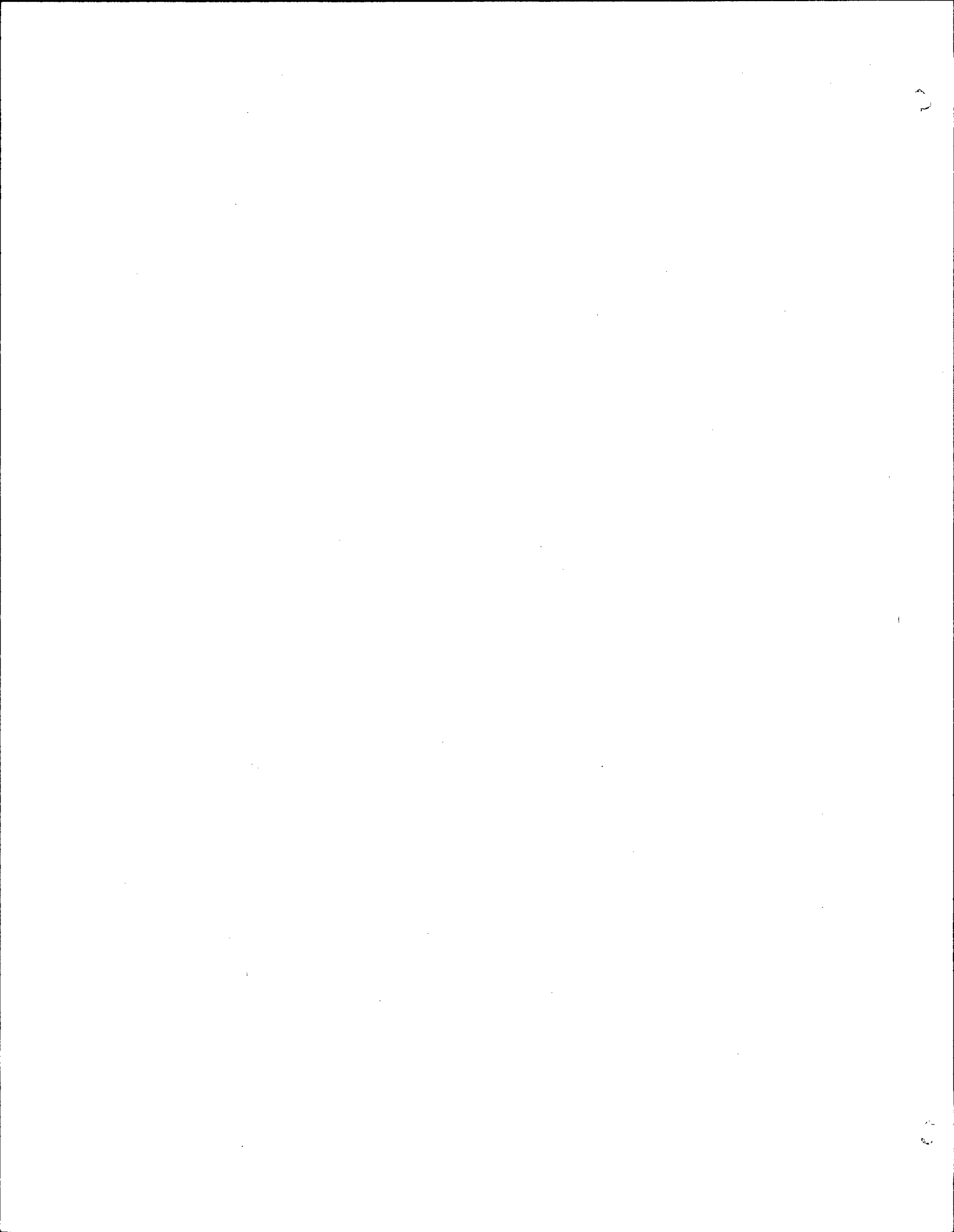


INSTALLED CAPACITY DEFICIENCY TABLE  
LILCO BASE CASE

MW

	<u>SHOREHAM - IN SERVICE</u>			<u>SHOREHAM - ABANDONED</u>		
	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>
1984	4,569	3,764	805	3,760	3,764	(4)
1985	4,580	3,817	763	3,771	3,817	(46)
1986	4,580	3,865	715	3,771	3,865	(94)
1987	4,774	3,947	827	3,775	3,947	(172)
1988	4,774	3,988	786	3,771	3,988	(217)
1989	4,774	4,024	750	3,767	4,024	(257)
1990	4,824	4,065	759	3,813	4,065	(252)
1991	4,824	4,101	723	3,999	4,101	(102)
1992	4,824	4,165	659	3,999	4,165	(166)
1993	4,824	4,242	582	3,999	4,242	(243)
1994	4,776	4,307	469	4,351	4,307	44
1995	4,776	4,378	398	4,351	4,378	(27)
1996	4,728	4,472	256	4,703	4,472	231
1997	4,722	4,561	161	4,697	4,561	136
1998	4,604	4,649	(45)	4,579	4,649	(70)
1999	4,881	4,738	143	4,856	4,738	118
2000	4,755	4,818	(63)	4,730	4,818	(88)
2001	5,155	4,901	254	5,130	4,901	229
2002	4,932	4,983	(51)	4,911	4,983	(72)
2003	5,300	5,068	232	5,279	5,068	211
2004	5,110	5,154	(44)	5,093	5,154	(61)
2005	5,510	5,242	268	5,893	5,242	651
2006	5,580	5,331	249	5,567	5,331	236
2007	5,336	5,422	(86)	5,323	5,422	(99)
2008	6,038	5,514	524	6,025	5,514	511
2009	5,848	5,607	241	5,839	5,607	232
2010	5,623	5,703	(80)	5,614	5,703	(89)
2011	6,183	5,800	383	6,174	5,800	374
2012	6,183	5,899	284	6,174	5,899	275
2013	6,613	5,999	614	6,604	5,999	605
2014	6,243	6,101	142	6,234	6,101	133
2015	6,243	6,204	39	6,234	6,204	30
2016	6,243	6,309	(66)	6,234	6,309	(75)
2017	7,043	6,417	626	7,034	6,417	617
2018	6,673	6,525	148	6,664	6,525	139
2019	6,673	6,638	35	6,664	6,638	26
2020	6,673	6,750	(77)	6,664	7,650	(86)
2021	7,473	6,983	490	7,464	6,983	481
2022	7,473	6,982	491	7,464	6,982	482
2023	7,103	7,100	3	7,094	7,100	(6)
2024	7,903	7,220	683	7,894	7,220	674
2025	7,903	7,343	560	7,894	7,343	551
2026	7,903	7,468	435	7,894	7,468	426
2027	7,903	7,596	307	7,894	7,596	298

\* Installed capacity includes purchases.



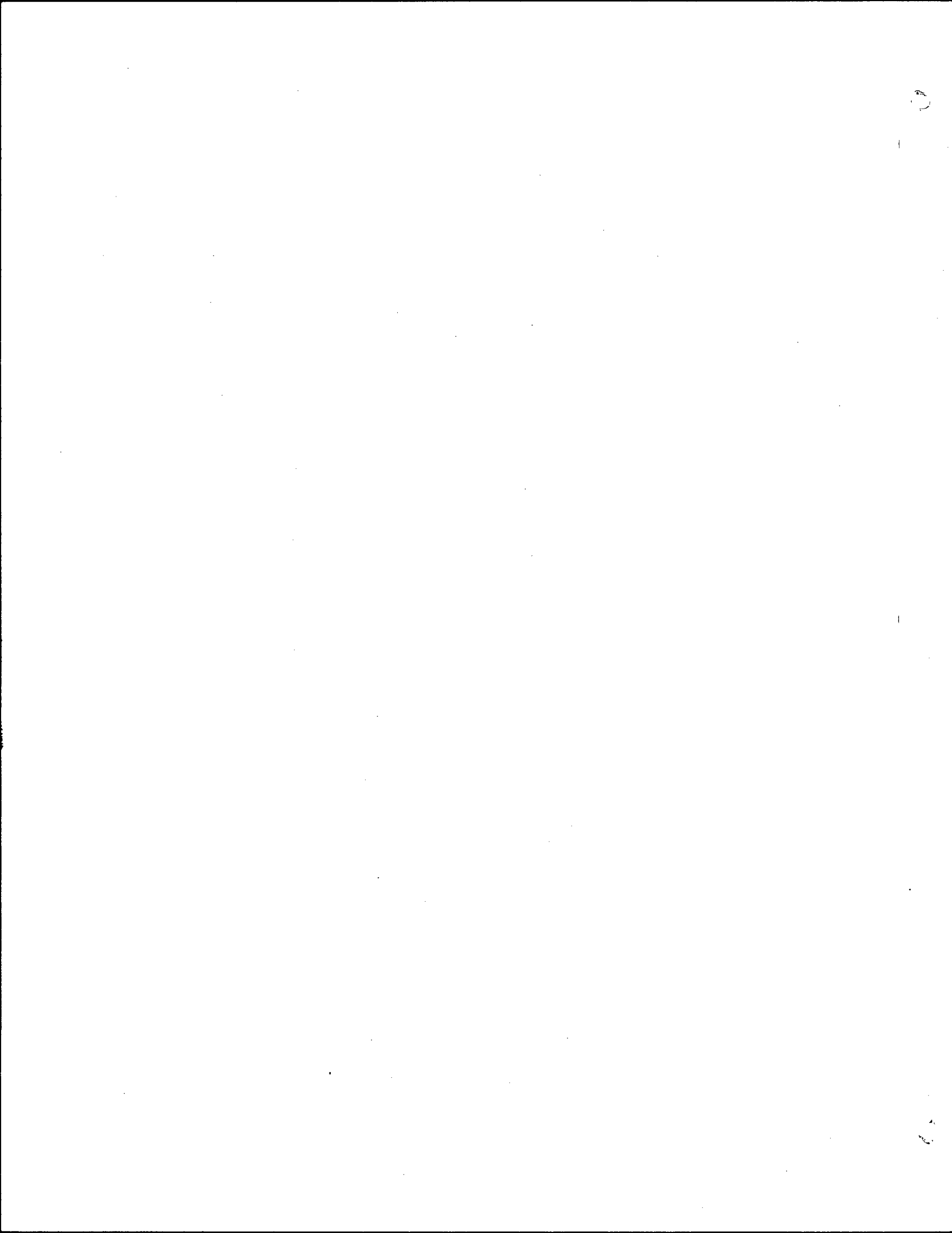


INSTALLED CAPACITY DEFICIENCY TABLE  
COOPERS & LYBRAND BASE CASE

MW

	<u>SHOREHAM - IN SERVICE</u>			<u>SHOREHAM - ABANDONED</u>		
	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>
1984	4,569	3,764	805	3,760	3,764	(4)
1985	4,530	3,817	713	3,721	3,817	(96)
1986	4,530	3,865	665	3,721	3,865	(144)
1987	4,530	3,947	583	3,531	3,947	(416)
1988	4,724	3,988	736	3,721	3,988	(267)
1989	4,724	4,024	700	3,717	4,024	(307)
1990	4,724	4,065	659	3,713	4,065	(352)
1991	4,724	4,101	623	3,899	4,101	(202)
1992	4,724	4,165	559	3,899	4,165	(266)
1993	4,724	4,242	482	3,899	4,242	(343)
1994	4,676	4,307	369	4,251	4,307	(56)
1995	4,676	4,378	298	4,651	4,378	273
1996	4,628	4,472	156	4,603	4,472	131
1997	4,622	4,561	61	4,597	4,561	36
1998	4,904	4,649	255	4,879	4,649	230
1999	4,781	4,738	43	4,756	4,738	18
2000	5,055	4,818	237	5,030	4,818	212
2001	5,055	4,901	154	5,030	4,901	129
2002	5,232	4,963	249	5,211	4,983	228
2003	5,200	5,068	132	5,179	5,068	111
2004	5,410	5,154	256	5,793	5,154	639
2005	5,410	5,242	168	5,793	5,242	551
2006	5,480	5,331	149	5,467	5,331	136
2007	6,036	5,422	614	6,023	5,422	601
2008	5,938	5,514	424	5,925	5,514	411
2009	5,748	5,607	141	5,739	5,607	132
2010	6,323	5,703	620	6,314	5,703	611
2011	6,083	5,800	283	6,074	5,800	274
2012	6,083	5,899	184	6,074	5,899	175
2013	6,513	5,999	514	6,504	5,999	505
2014	6,143	6,101	42	6,134	6,101	33
2015	6,143	6,204	(61)	6,134	6,204	(70)
2016	6,943	6,309	634	6,934	6,309	625
2017	6,943	6,417	526	6,934	6,417	517
2018	6,573	6,525	48	6,564	6,525	39
2019	6,573	6,638	(65)	6,564	6,638	(74)
2020	7,373	6,750	623	7,364	6,750	614
2021	7,373	6,983	390	7,364	6,983	381
2022	7,373	6,982	391	7,364	6,982	382
2023	7,003	7,100	(97)	7,794	7,100	694
2024	7,803	7,220	583	7,794	7,220	574
2025	7,803	7,343	460	7,794	7,343	451
2026	7,803	7,468	335	7,794	7,468	326
2027	7,803	7,596	207	7,794	7,596	198

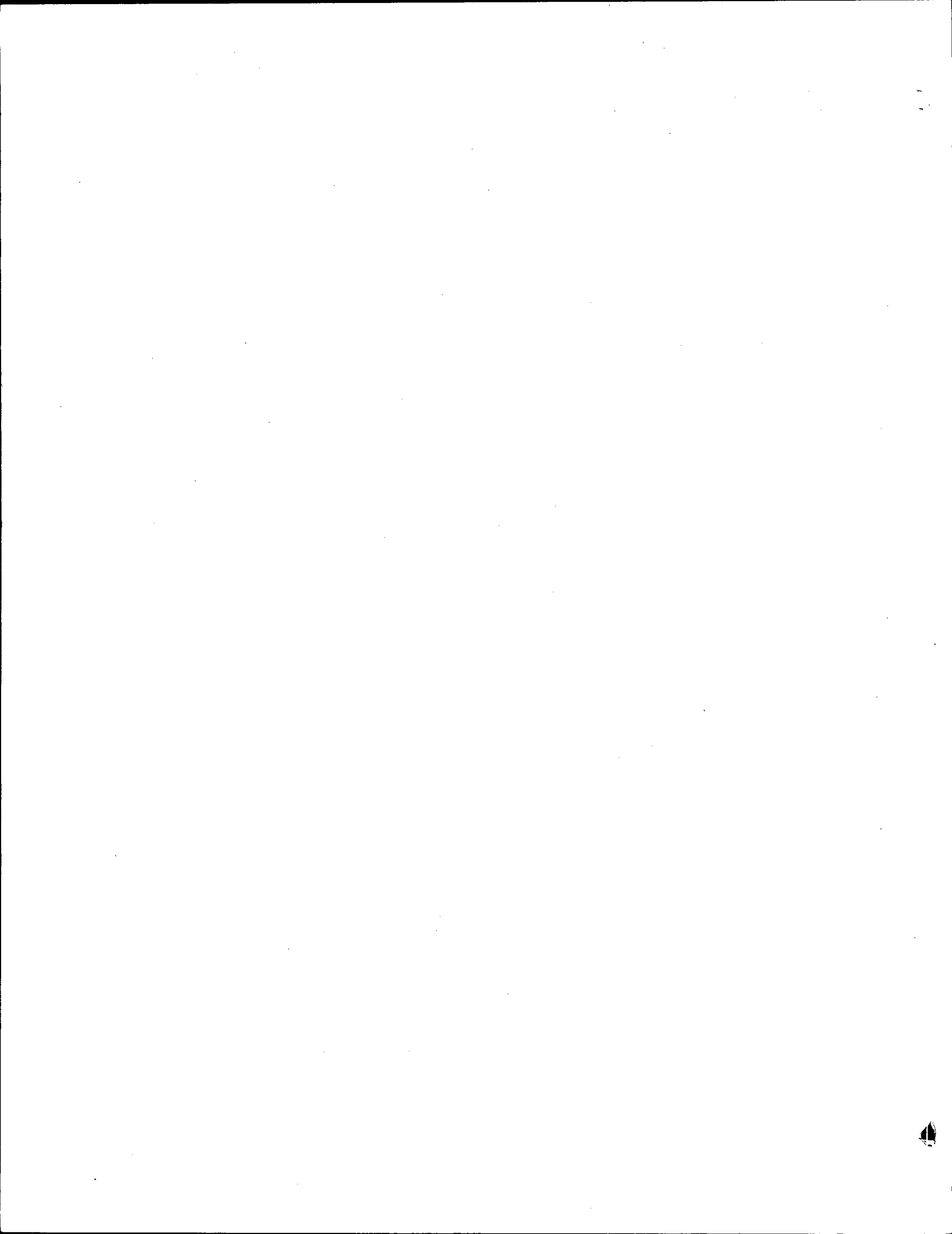
\* Installed capacity includes purchases.



INSTALLED CAPACITY DEFICIENCY TABLE  
COOPERS & LYBRAND SENSITIVITY I & II  
 MW

	<u>SHOREHAM - IN SERVICE</u>			<u>SHOREHAM - ABANDONED</u>		
	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>	<u>Installed*</u>	<u>Required</u>	<u>(Deficiency) /Excess</u>
1984	4,569	3,764	805	3,760	3,764	(4)
1985	4,530	3,859	671	3,721	3,859	(138)
1986	4,530	3,954	576	3,721	3,954	(233)
1987	4,530	4,053	477	3,531	4,053	(522)
1988	4,724	4,155	569	3,721	4,155	(434)
1989	4,724	4,259	465	3,717	4,259	(542)
1990	4,724	4,365	359	3,713	4,365	(652)
1991	4,724	4,475	249	3,899	4,475	(576)
1992	4,724	4,587	137	3,899	4,587	(688)
1993	4,724	4,701	23	3,899	4,701	(802)
1994	5,076	4,818	258	4,251	4,818	(567)
1995	5,076	4,939	137	4,651	4,939	(288)
1996	5,028	5,062	(34)	4,603	5,062	(459)
1997	5,422	5,188	234	5,397	5,188	209
1998	5,304	5,318	(14)	5,279	5,318	(39)
1999	5,981	5,452	529	5,956	5,452	504
2000	5,855	5,588	267	5,830	5,588	242
2001	5,855	5,728	127	5,830	5,728	102
2002	6,432	5,871	561	6,411	5,871	540
2003	6,400	6,018	382	6,379	6,018	361
2004	6,210	6,168	42	6,193	6,168	25
2005	7,010	6,322	688	6,993	6,322	671
2006	6,680	6,481	199	6,667	6,481	186
2007	7,236	6,642	594	7,223	6,642	581
2008	7,138	6,809	329	7,125	6,809	316
2009	6,948	6,979	(31)	6,939	6,979	(40)
2010	7,523	7,153	370	7,514	7,153	361
2011	7,283	7,331	(48)	7,274	7,331	(57)
2012	8,083	7,515	568	8,074	7,515	559
2013	7,713	7,703	10	7,704	7,703	1
2014	8,143	7,895	248	8,134	7,895	239
2015	8,143	8,094	49	8,134	8,094	40
2016	8,943	8,295	648	8,934	8,295	639
2017	8,943	8,503	440	8,934	8,503	431
2018	9,373	8,715	658	9,364	8,715	649
2019	9,373	8,934	439	9,364	8,934	430
2020	9,373	9,157	216	9,364	9,157	207
2021	9,373	9,386	(13)	9,364	9,386	(22)
2022	10,173	9,621	552	10,164	9,621	543
2023	9,803	9,860	(57)	9,794	9,860	(66)
2024	10,603	10,107	496	10,594	10,107	487
2025	10,603	10,359	244	10,594	10,359	235
2026	10,603	10,618	(15)	10,594	10,618	(24)
2027	10,603	10,083	520	11,394	10,883	511

\* Installed capacity includes purchases.



INCREASED REVENUE REQUIREMENTS  
DUE TO SHOREHAM ABANDONMENT  
(\$X10<sup>6</sup>)

YEAR	CUMULATIVE INCREASED REVENUE REQUIREMENTS			
	LILCO	C&L BASE	C&L SENS 1	C&L SENS 2
1984	0	-6	-3	13
1985	677	661	659	683
1986	874	861	840	881
1987	1165	1163	1135	1198
1988	1307	1317	1292	1375
1989	1472	1489	1500	1602
1990	1555	1581	1630	1758
1991	1669	1697	1802	1956
1992	1736	1759	1947	2135
1993	1769	1757	2094	2296
1994	2320	2240	2192	2403
1995	2821	3129	2676	2918
1996	3718	4045	3189	3476
1997	4645	4973	4053	4397
1998	5631	5577	4885	5290
1999	6310	6167	5693	6168
2000	6962	6639	6459	7023
2001	7465	7080	7188	7842
2002	7971	7518	7928	8647
2003	8473	7973	8626	9438
2004	9033	9249	9329	10262
2005	10243	10294	9849	10919
2006	10993	10831	10531	11734
2007	11658	11400	11214	12577
2008	12413	12015	11946	13500
2009	13117	12618	12618	14356
2010	13851	13211	13298	15205
2011	14532	13846	13990	16086
2012	15265	14495	14703	17008
2013	15978	15162	15424	17966
2014	16747	15827	16178	18981
2015	17519	16546	16929	20027
2016	18367	17257	17732	21150
2017	19203	18036	18555	22332
2018	20076	18849	19413	23574
2019	20989	19705	20309	24880
2020	21940	20604	21244	26253
2021	22939	21545	22223	27700
2022	23985	22537	23259	29226
2023	25081	23577	24325	30836

LILCO BASE CASE: 50 MW unconventional 1985, Nine Mile 1987,  
50 MW unconventional 1990

C&L BASE CASE: No unconventional, Nine Mile 1988

C&L SENSITIVITY 1: No unconventional, Nine Mile 1988, growth 2.5%

C&L SENSITIVITY 2: No unconventional, Nine Mile 1988, growth 2.5%,  
Coal @2% real, ¼% higher cost of money.



SCHEDULE 3  
TABLE 1

INCREASED COSTS PER KILOWATT HOUR  
DUE TO  
A SHOREHAM ABANDONMENT

YEAR	TOTAL SALES GWH / <sup>1</sup>	CUMULATIVE INCREASED REVENUE REQUIREMENTS \$X10 <sup>6</sup> / <sup>2</sup>				CUMULATIVE INCREASED COST PER KWH - \$/per KWH			
		LILCO	C&L	C&L	C&L	LILCO	C&L	C&L	C&L
		BASE CASE	BASE	SENS 1	SENS 2	BASE CASE (COL 2 ÷ COL 1)	BASE (COL 3 ÷ COL 1)	SENS 1 (COL 4 ÷ COL 1)	SENS 2 (COL 5 ÷ COL 1)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
1984	13023	0	-6	-3	13	.000	.000	.000	.001
1985	13146	677	661	659	683	.052	.050	.050	.052
1986	13258	874	861	840	881	.066	.065	.063	.067
1987	13499	1165	1163	1135	1198	.086	.086	.084	.089
1988	13555	1307	1317	1292	1375	.096	.097	.095	.101
1989	13909	1472	1489	1500	1602	.106	.107	.108	.115
1990	14172	1555	1581	1630	1758	.110	.112	.115	.124
1991	14466	1669	1697	1802	1956	.115	.117	.125	.135
1992	14745	1736	1759	1947	2135	.118	.119	.132	.145
1993	15038	1769	1757	2094	2296	.118	.117	.139	.153

LILCO BASE CASE: 50 MW unconventional 1985, Nine Mile 1987, 50 MW unconventional 1990

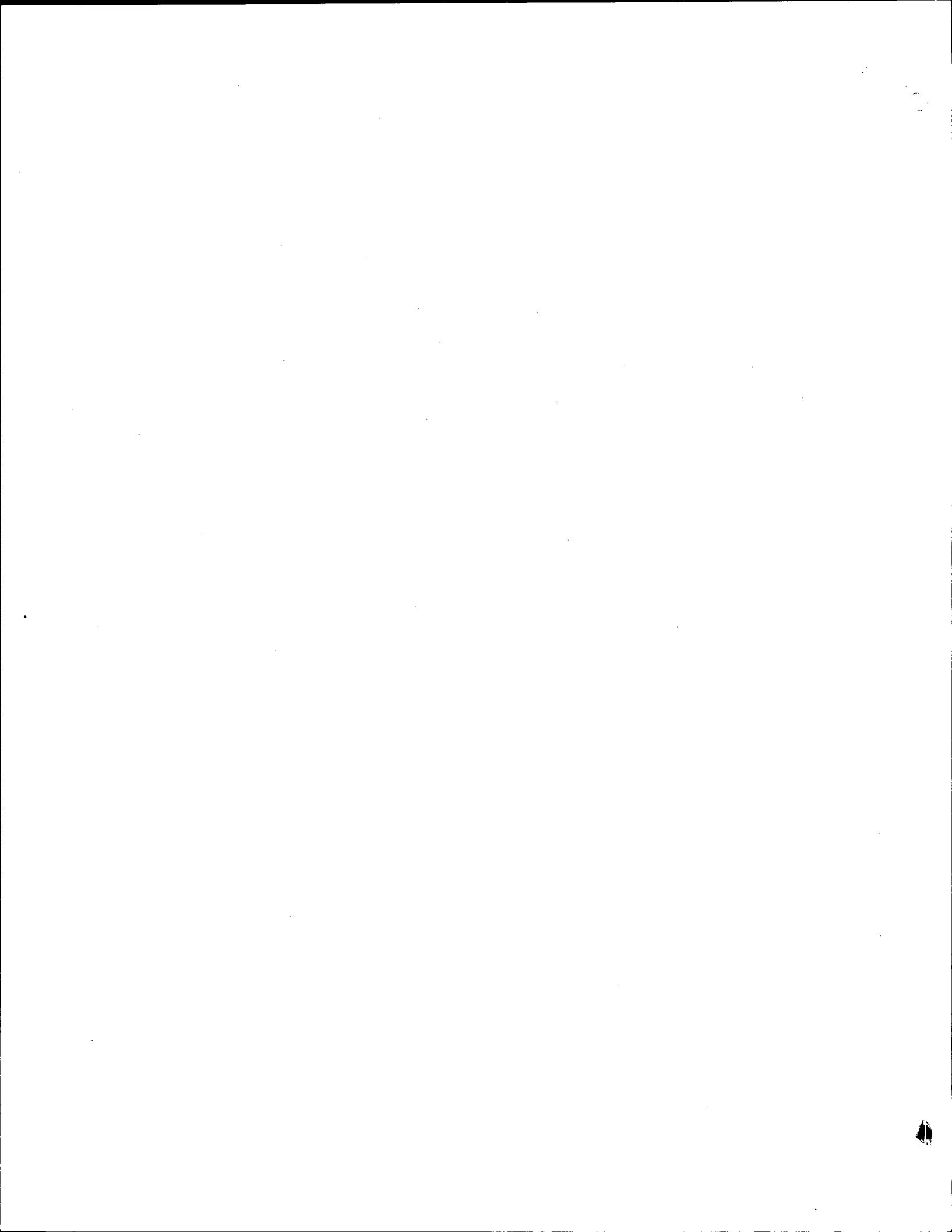
C&L BASE CASE: No unconventional, Nine Mile 1988

C&L SENSITIVITY 1: No unconventional, Nine Mile 1988, growth 2.5%

C&L SENSITIVITY 2: No unconventional, Nine Mile 1988, growth 2.5%  
Coal @2% real, ¼% higher cost of money

<sup>1</sup> From Table 32, Page 158, 1983 Vol. 1, Report of Member Electric Systems of the New York Power Pool

<sup>2</sup> From Schedule 1





SCHEDULE 3  
TABLE 2

INCREASED COST OF ELECTRICITY TO RESIDENTIAL CONSUMERS  
DUE TO  
A SHOREHAM ABANDONMENT

YEAR	/1 TOTAL RESIDENTIAL CUSTOMERS	/2 TOTAL RESIDENTIAL SALES - GWH	KWH/ CUSTOMER (2÷1)	CUMULATIVE INCREASE COST PER KW - \$/KW				CUMULATIVE ANNUAL COST INCREASE PER CUSTOMER - \$			
				LILCO	C&L	C&L	C&L	LILCO	C&L	C&L	C&L
				BASE CASE	BASE	SENS 1	SENS 2	BASE CASE	BASE	SENS 1	SENS 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1984	838,597	5751	6858	.000	.000	.000	.001	0	0	0	7
1985	846,302	5769	6817	.052	.050	.050	.052	354	341	341	354
1986	854,007	5776	6763	.066	.065	.063	.067	446	440	426	453
1987	862,371	5946	6895	.086	.086	.084	.089	593	593	579	614
1988	868,092	6011	6924	.096	.097	.095	.101	665	672	658	699
1989	873,813	6084	6963	.106	.107	.108	.115	738	745	752	801
1990	879,534	6176	7022	.110	.112	.115	.124	772	786	808	871
1991	885,255	6269	7082	.115	.117	.125	.135	814	829	885	956
1992	890,976	6379	7160	.118	.119	.132	.145	845	852	945	1038
1993	896,697	6502	7251	.118	.117	.139	.153	856	848	1008	1109

LILCO BASE CASE: 50 MW unconventional 1985, Nine Mile 1987, 50 MW unconventional 1990

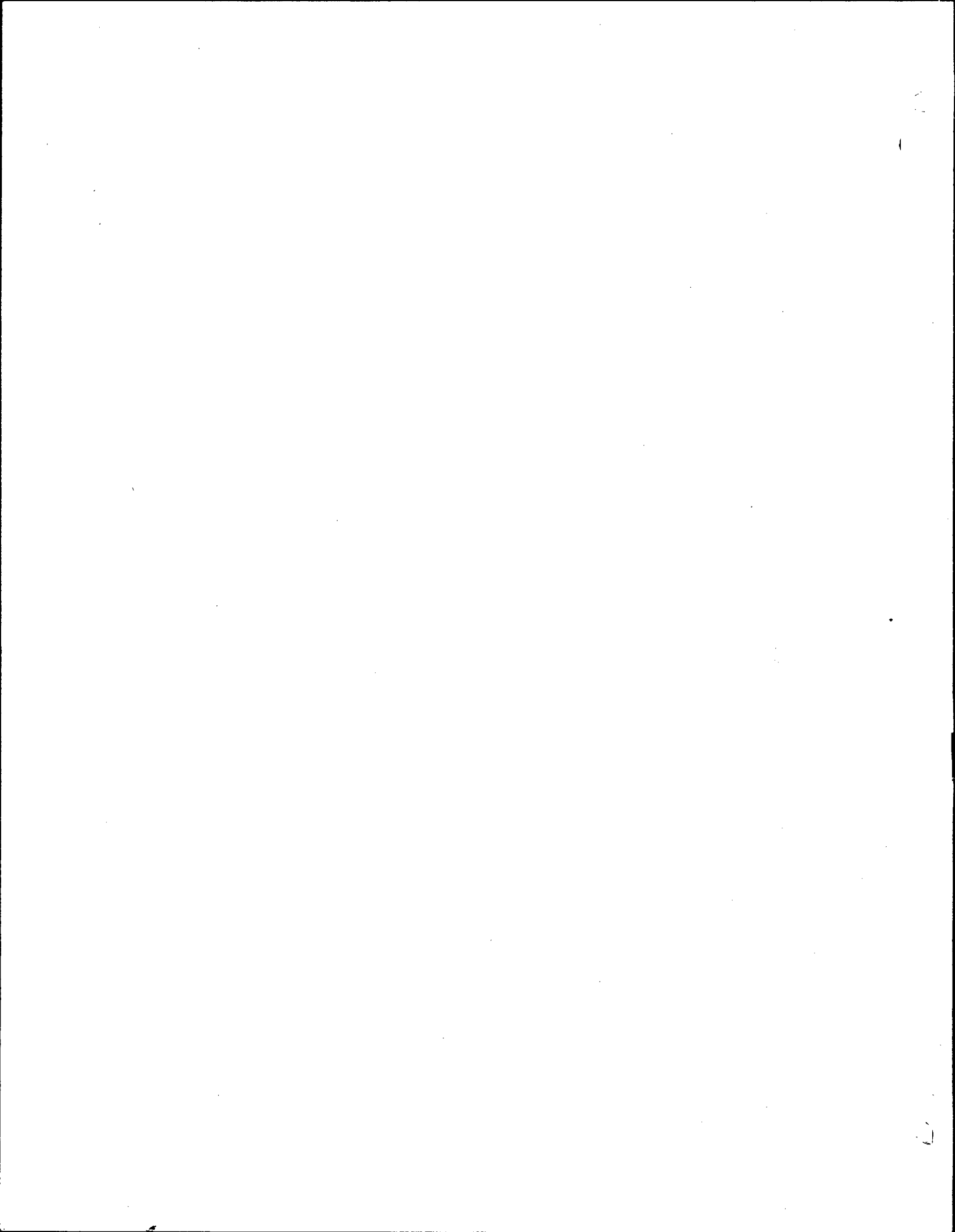
C&L BASE CASE: No unconventional, Nine Mile 1988

C&L SENSITIVITY 1: No unconventional, Nine Mile 1988, growth 2.5%

C&L SENSITIVITY 2: No unconventional, Nine Mile 1988, growth 2.5%  
Coal @2% real, ¼% higher cost of money

/1 From Table 1, Page 128, 1983 Vol. 1, Report of Member Electric Systems of the New York Power Pool

/2 From Table 32, Page 158



## ESTIMATED TAX INCREASE DUE TO SHOREHAM ABANDONMENT

Year	# of Households			Tax Dollars-\$X10 <sup>6</sup>			Effect Per Household-\$		
	Suffolk	Brookhaven	Wading River -Shoreham	County	Town	School	Suffolk	Brookhaven	Wading River -Shoreham
	(1)	(2)	(3)	(4)	(5)	(6)	(7) (4÷1)	(8) (5÷2)	(9) (6÷3)
1984	407,430	118,045	2,680	22@	11.6@	21.3@	*	*	*
1985	413,380	120,130	2,870	24.2	12.8	23.4	*	*	*
1986	419,400	122,260	3,065	23.9	12.7	23.2	56.99	103.88	7,569.34
1987	425,540	124,425	3,275	26.4	13.9	25.6	62.04	111.72	7,816.80
1988	431,750	126,625	3,500	29.0	15.3	28.1	67.17	120.83	8,028.58
1989	438,050	128,870	3,740	32.0	16.9	30.9	73.06	131.14	8,262.04
1990	444,450	131,150	3,995	35.1	18.5	34.0	78.98	141.06	8,510.64
1991	450,940	133,470	4,270	38.6	20.4	37.4	85.60	152.85	8,758.79
1992	457,525	135,830	4,560	42.4	22.4	41.1	92.68	164.92	9,013.16
1993	464,200	138,240	4,875	46.7	24.7	45.3	100.61	178.68	9,292.31
				<u>320.3</u>	<u>169.2</u>	<u>310.3</u>	<u>617.13</u>	<u>1,105.08</u>	<u>67,251.66</u>
Coopers & Lybrand. 1986-93				274.1	144.8	265.6			

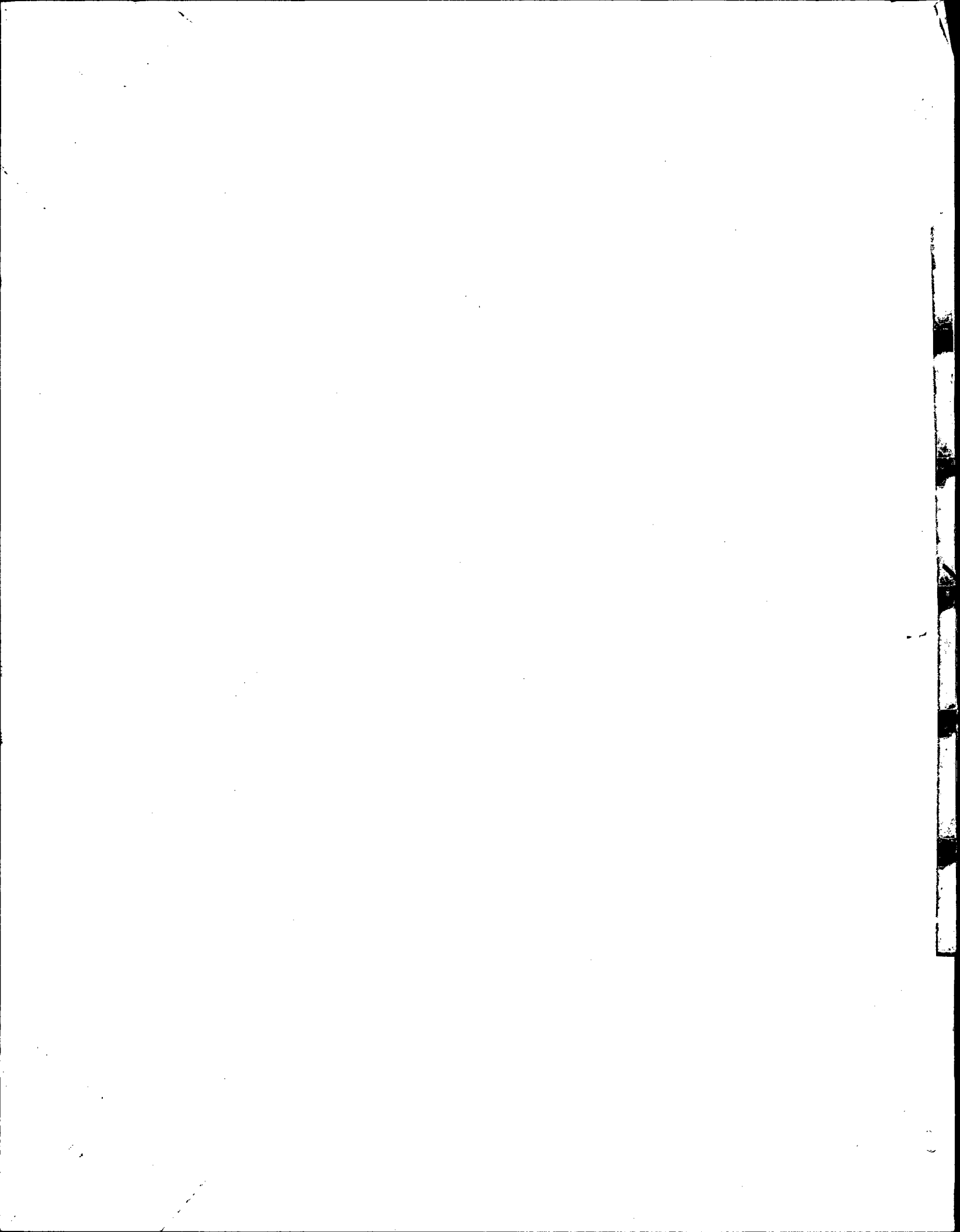
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Coopers &amp; Lybrand.

An evaluation of the Long  
Island Lighting Company's

\* It is assumed that the abandonment of Shoreham begins tax losses in 1986.

@ These amounts represent a 10% per year increase in taxes. It is assumed that 10% of the tax loss will be absorbed by other LILCO properties.



ESTIMATED TAX INCREASE DUE TO SHOREHAM ABANDONMENT(ASSUME SCHOOL DISTRICT TAXES ARE ABSORBED BY TOWN OF BROOKHAVEN)

	# of Households Brookhaven	TAX DOLLARS-X10 <sup>6</sup>			Per Household-\$ (Col. 4 ÷ Col. 1)
		Town	School	Total	
	(1)	(2)	(3)@	(4)@	(5)
1984	118,045	*	*	*	*
1985	120,130	*	*	*	*
1986	122,260	12.7	23.2	35.9	269.10
1987	124,425	13.9	25.6	39.5	317.46
1988	126,625	15.3	28.1	43.4	342.74
1989	128,870	16.9	30.9	47.8	370.92
1990	131,150	18.5	34.0	52.5	400.30
1991	133,470	20.4	37.0	57.4	430.06
1992	135,830	22.4	41.1	63.5	467.50
1993	138,240	24.1	45.3	70.0	506.37
		<hr/>	<hr/>	<hr/>	<hr/>
		144.8	265.6	410.0	3,104.45

It is assumed that the tax loss due to the abandonment of Shoreham begins in 1986.

@ These amounts represent a 10% per year increase in taxes. It is also assumed that 10% of the tax loss will be absorbed by other LILCO properties.

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