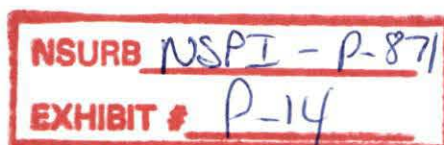


P-871.
(B-4)



**BEFORE THE
NOVA SCOTIA UTILITY AND REVIEW BOARD**

RE: APPLICATION FOR APPROVAL FOR LOAD RETENTION RATE - P-871

NOVA SCOTIA POWER INC.

DIRECT EVIDENCE OF

Jatinder Kumar

**On Behalf of
Nova Scotia Utility and Review Board**

January 7, 2000

**BEFORE THE
NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE PUBLIC UTILITIES
ACT. R.S.N.S., 1989, C.380 AS AMENDED
AND
IN THE MATTER OF AN APPLICATION BY
NOVA SCOTIA POWER INCORPORATED FOR
APPROVAL OF A LOAD RETENTION RATE

DIRECT EVIDENCE
OF
JATINDER KUMAR**

APPEARANCE

Q. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.

A. My name is Jatinder Kumar and I am President of Economic & Technical Consultants, Inc., energy and public utility consultants. My business address is 6241 Executive Blvd., Rockville, MD 20852, U.S.A.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. My educational background and experience are appended to my Direct Evidence.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of the Nova Scotia Utility and Review Board ("UARB").

PURPOSE

Q. WHAT IS THE PURPOSE OF YOUR DIRECT EVIDENCE?

A. The purpose of my Direct Evidence is to present my review and analysis of a "load retention" ("LR") rate proposed by the Nova Scotia Power Incorporated ("NSPI"). I will also present any recommendations related to the proposed LR rate. My testimony is organized in the following three sections:

1. Background.
2. Analysis of NSPI's Proposal.
3. Conclusions and Recommendations.

BACKGROUND

Q. PLEASE PROVIDE A BRIEF BACKGROUND OF THIS PROCEEDING.

A. In a letter dated September 30, 1999, NSPI proposed to UARB a generic tariff involving the LR rate. On December 6, 1999, NSPI filed its application ("Application") seeking the UARB's approval of its proposed LR rate. As stated by NSPI, natural gas ("gas") will soon be available in its service territory and some of its large customers may find it technically and economically feasible to install their own generation plant. NSPI proposed the LR rate which it would offer to such customers so that they do not install their own

generation. By doing so, NSPI states that it hopes not to lose these customers' loads and thus it would not shift the entire amount of fixed costs to other rate payers which it currently recovers from these large customers.

ANALYSIS OF NSPI'S PROPOSAL

Q. TO WHOM WILL NSPI BE OFFERING THE LR RATE?

A. NSPI is proposing to offer the LR rate to customers with a minimum load of 2,000 KVA or 1,800 KW.

Q. ARE YOU OPPOSED TO THE IMPLEMENTATION OF THE PROPOSED LR RATE?

A. No, I am not, however, I have a few concerns and comments about the proposed LR rate and some of the points raised by NSPI in its application and supporting Direct Evidence filed by its witnesses Christopher Huskison and M. E. Whalen.

Q. WHAT ARE THE ISSUES AND CONCERNS YOU WILL DISCUSS IN YOUR DIRECT EVIDENCE?

A. The issues and concerns discussed in my Direct Evidence are:

1. Loss of revenue due to load loss
2. NSPI's analysis of LR rates offered by other utilities
3. Lack of discussion of a competitive market
4. NSPI's basis for proposing the LR rate
5. Anticompetitive effect of the proposed LR rate
6. Minimum level of LR rate
7. Availability of LR Rate
8. Lack of some mitigation efforts
9. Confidentiality provision.

Loss of Revenue

Q. WHAT ARE YOUR COMMENTS RELATED TO THE LOSS OF REVENUE?

A. On page 8 of his Direct Evidence, Mr. Whalen stated that the loss of the recovery of fixed costs due to the load loss, "would have to be absorbed by other customers". As an illustration, he also computed a loss of about \$13.5 million based on an assumed loss of 20% of its load to alternate generation. First, I should point out that the revenue loss computed by Mr. Whalen may be overstated as he computed this loss based on the NSPI's average energy cost. The proper way of computing a revenue loss is to use the marginal energy cost rather than the average energy cost.

Q. ARE THERE OTHER PROBLEMS WITH NSPI'S ILLUSTRATION OF ITS REVENUE LOSSES?

A. Yes. In response to UARB IR-14, NSPI acknowledged that the customers who install their own generation would need to acquire from NSPI some ancillary services such as backup service and voltage and frequency control services. Therefore, some revenues // losses caused by load loss to self generation would be offset by the revenues from the ancillary services. Further, the cost of such services should be considered in evaluating the cost of customers' self generation.

Q. HAVE YOU COMPARED THE LARGE CUSTOMERS' REVENUES WITH NSPI'S MARGINAL COST?

A. Yes, I have.

Attachment 1 to my Direct Evidence presents the average revenue of customer classes with loads exceeding 1,800 KW. Attachment 1 shows the following average revenues or rates.

Rates, Cents/KWH

Class	1995	1998	1999
Large Industrial - Firm	4.710	4.642	4.693
Large Industrial - Interruptible	4.766	4.577	4.605
Total Large Industrial	4.746	4.596	4.626
Large Commercial	6.547	6.475	6.458
Total 1.8 MW	4.980	4.797	4.803

The above table shows the average rates declined between 1995 and 1999 for all classes.

The average rate for all large customer classes in 1999 was 4.803 cents/KWH and the average rate for the Large Industrial class was 4.626 cents/KWH.

Attachment 2 to my Direct Evidence presents NSPI's purchased power and fuel costs. The average purchased power cost in 1998 was 6.697 cent/KWH as compared to NSPI's average fuel cost of 2.45 cents/KWH. NSPI's responses to UARB IR-33 shows that the average cost for the power purchased from non-utility generators in 1998 ranged between 6.20 cents/KWH to 7.76 cents/KWH which substantially exceeded the average revenue from large customers. For the off system purchases, the average cost in 1998 was 4.794 cents/KWH, which also exceeds the average rate for Large Industrial customers.

NSPI's response to UARB IR-26 shows that in 1998, NSPI's marginal energy cost during winter peak hours was \$34.96/MWH or 3.496 cents/KWH. The marginal energy cost for other hours was less than 3.496 cents/KWH. However, as stated earlier, Attachment 2 shows that the off system purchase power cost in 1998 was 4.794 cents/KWH. I do not know on what basis, NSPI determined its marginal energy costs.

Attachment 3 to my Direct Evidence computes the winter on peak marginal energy and capacity costs for the years 2000-2010. Attachment 3 shows that for all these years, the total marginal cost will substantially exceed the 1999 average Large Industrial revenue of 4.626 cents/KWH. In fact, Attachment 3 shows that after 2001, the average revenue at current rates from the Large Industrial customers will not even recover NSPI's on peak marginal energy cost. Lower rates would result in further losses.

It should also be pointed out that the above comparison is based on utilizing Large Customers' average revenue and if the marginal revenue is used then one may find that the marginal revenue may be substantially below the cost of NSPI's off system purchases as well as its computed marginal costs.

Q. DO YOU AGREE WITH MR. WHALEN'S COMMENT THAT ITS OTHER CUSTOMERS HAVE TO ABSORB THE LOSS OF REVENUE ASSOCIATED WITH

POTENTIAL LOAD LOSSES?

A. No, I do not. Mr. Whalen's statement seems to be based on a general regulatory principle that a utility's customers have to pay for all of the utility's cost of service. Although such assertion is generally correct, this may not be applicable to revenue losses caused by rate discounts implemented by a utility to enhance its competitive position. Further, it is not a general practice to look at one aspect of a utility's cost only before considering any additional cost to be charged to the customers. Generally, regulators look at all elements of the utility's cost of service. If one assumes that Mr. Whalen's approximation of revenue loss is reasonable, this loss may be offset by other cost reductions. In response to Sempra IR-6, NSPI also agrees with the assertion that its revenue losses may be offset by its cost reductions. It should also be pointed out that a utility is not guaranteed to recover all of its lost revenues or increased costs. Further, as I will demonstrate later, NSPI could sell a part off its excess power to other markets at a decent profit.

Q. CAN YOU CITE SOME OF THE DECISIONS BY REGULATORY COMMISSIONS IN SUPPORT OF YOUR ASSERTION THAT THE RECOVERY OF REVENUE LOSS IS NOT GUARANTEED?

A. Yes. In a case involving Consumers Pennsylvania Water Company, Pennsylvania Public Utility Commission stated:

Negotiated rates must not become merely a means by which utilities shift the responsibility for lost revenues to core customers who have no competitive alternative. At the same time, however, we realize that the loss of a large industrial customer to an alternative source of supply is harmful to all remaining customers. For this reason we support negotiated incentive rates providing that it can be demonstrated that without such rates the customer can and will switch to a competitive source of supply, and that the rates charged are designed to recover all marginal costs of serving that customer plus some contribution to the utilities' fixed costs. We also insist the utility have a strong incentive to drive a hard bargain with the customer.

In a generic discounted rates proceeding (Docket No. DR 91-172), the New Hampshire Public Utilities Commission stated:

We believe that the element of risk of revenue loss is critical in any special contract request. We do not believe it is appropriate to establish a risk sharing formula at this time, but may consider development of such a formula through the rulemaking or legislative process in the future. Under no circumstances, however, will we approve any special contract which puts the State as a whole or other ratepayers at substantial risk. We may, on a case by case basis, approve special contracts subject to the risk of revenue loss being shared between ratepayers and shareholders, or borne by shareholders in their entirety. Further, we shall consider disallowance of any lost revenue in future rate cases if we find that evidence shows that a utility's representations regarding the need for a discount were inaccurate or that the utility otherwise acted imprudently in seeking approval for such a discount.

In its Guidelines for Special Rates, Contracts or Incentives in Case No. PUE 970695, the Virginia State Corporation Commission stated:

Second, we are concerned that the language contained therein may be construed as implicitly assuring utilities that any revenues that may be "lost" as the result of a customer no longer taking power

from the utility or purchasing electricity pursuant to a special rate under Article 56.235.2 A will be automatically recovered from the remaining customers. We emphasize that we do not make any such finding in this order. Utilities historically have borne the risk of losing customers as a result of, for example, a customer's decision to self generate or to relocate to a different state. The Commission does not guarantee that a utility is entitled to recover from the remaining ratepayers any revenue it would have received under a rate or tariff approved by the Commission if one or more customers leave the system.

Q. ARE THERE OTHER CONSIDERATIONS WHICH COULD OFFSET THE REVENUE LOSSES AS A RESULT OF INSTALLATION OF GAS BASED GENERATION BY SOME OF ITS LARGE CUSTOMERS?

A. Yes. In its Application, NSPI raises the possibility of load losses due to the availability of gas in Nova Scotia. However, it did not point out the potential increase in electricity demand because of the availability of gas. On page 3 of its 1998 Annual Report to stockholders, NSPI stated, "Our electric business will benefit from the growth in industrial and residential energy use that has already begun". In response to UARB IR-28, NSPI clarified this statement by stating that the availability of gas will result in a growing economy which will normally increase the demand for electricity.

On pages 18 and 19, the 1998 Annual Report discusses NSPI's concerns for its fuel supplies and costs. For example on page 18, the Report states, "Fuel expenses increased in 1998 due to higher industrial volume, a weather-related decline in hydroelectric production and unexpected interruptions in the Company's regular coal supply from the

Cape Breton Development Corporation (CBDC) causing increased reliance on oil fired production". Thus, the loss of load, if any, may result in alleviating some of these concerns. Reduced reliance on oil and coal will also result in lower emissions.

Analysis of LR Rates Offered By Other Utilities

Q. HAVE YOU REVIEWED MR. WHALEN'S DIRECT EVIDENCE RELATED TO LR RATES OFFERED IN OTHER JURISDICTIONS?

A. Yes, I have. In his Direct Evidence and Table A attached thereto, Mr. Whalen listed 15 utilities which, according to him, offer LR rates. In response to UARB IR-19, NSPI provided details of its survey which formed the basis of Table A. However, Table A does not provide all the relevant information. In order to use the information collected as a result of NSPI's survey to formulate an opinion on LR rate, it may be useful to evaluate more details. Therefore, in Attachment 4 to my Direct Evidence, I presented additional information for each utility for which Mr. Whalen summarized the information in Table A. Attachment 4 shows the following facts:

- a. Out of 15 utilities listed, three utilities offer economic development rates and as per NSPI's response to Irving Oil IR-4, NSPI already has rates similar to the economic development rate.

- b. Three listed utilities do not offer "load retention" rates and two more listed utilities have ceased to offer the load retention rate. Three more utilities will soon cease to offer load retention and economic development rates.
- c. Most of the load retention and economic development rates will not be offered after the implementation of retail choice.

Q. WHAT ARE YOUR CONCLUSIONS OF THE ABOVE ANALYSIS?

A. A detailed analysis of the rates offered by utilities listed in Table A of Mr. Whalen's Direct Evidence indicates that the load retention rates similar to the one proposed by NSPI are not prevalent and will be phased out with the implementation of retail choice or retail wheeling. Attachment 4 to my Direct Evidence also shows that only two utilities, NIPSCO and Commonwealth Edison, offer rates to prevent self generation similar to the one proposed by NSPI. Another utility, Central Maine Power, offers rates to prevent generation by only two types of industries.

Q. DOES NSPI'S SURVEY SUPPORT ITS PROPOSED LR RATE?

A. If NSPI is relying on the widespread use of such a rate in other jurisdictions, then as I pointed out above the survey does not support the adoption of the LR rate. However, in my opinion this is not an important consideration. The LR rate or any other rate proposal

should be mainly judged on its merits.

Lack of Discussion of a Competitive Electric Market

Q. HAS NSPI ADDRESSED THE COMPETITIVE ELECTRIC MARKET?

A. No, it has not done so in its Application, however, on page 4 of its 1998 Annual Report, NSPI acknowledges the increasing competition in the electric market. Page 4 of the Report states, "Electric companies are now expected to compete for the loyalty of other customers - just like any other business". Page 4 of the Annual Report further states, "a growing number of jurisdictions are opening up their electric markets to competition". As I pointed out earlier, other utilities cited by NSPI which offer "LR" type rates, will stop offering such rates when retail competition is implemented.

NSPI's Basis for Proposing LR Rates

Q. BESIDES DESCRIBING A GENERAL NEED AND PURPOSE FOR ITS LR RATE, DID NSPI PROVIDE ANY SPECIFIC BASIS FOR ITS PROPOSAL?

A. No, it did not. On page 2 of his Direct Evidence, Mr. Huskilton states, "For some of our customers, preliminary studies indicate that such a strategy may be economically attractive....". However, in response to UARB IR-16, NSPI did not provide any such

study or any other cost/benefit analysis in support of his statement.

Anticompetitive Effect

Q. WHAT ARE YOUR CONCERNS RELATED TO THE ANTICOMPETITIVE EFFECT OF NSPI'S PROPOSAL?

A. It may not be unreasonable for an entity to lower its rates to avoid a loss of customers to its competitors, however, it is not reasonable for such an entity to engage in competition at the cost of its captive customers in a monopolized market. In a monopolized utility market, regulators generally make sure that a utility does not use rates solely to strengthen its monopoly power and inhibit competition, especially at the cost of its captive customers. Further, the UARB should make sure that the LR rate is made available to all customers on non discriminatory basis and is not used by NSPI's affiliates in which NSPI has significant financial interest.

Minimum Rate Level

Q. DID NSPI PROPOSE ANY MINIMUM RATE LEVEL WHICH IT WILL CHARGE CUSTOMERS UNDER THE LR RATE?

A. Although NSPI's proposed tariff states that it will offer the LR rate to a customer where

it can be shown that, "Retaining the customer's load, at the price offered by this rate, is better for other electric customers than losing the customer load in question", NSPI does not specify any minimum rate level. However, in response to Sempra IR-12, NSPI stated that the LR rate should recover its incremental cost plus some contribution to its fixed costs.

Q. IS IT REASONABLE TO RECOVER AT LEAST A PART OF FIXED COSTS?

A. Yes. If there is no contribution to the fixed costs, there is no economic reason to retain or serve a load. On page 9 of his Direct Testimony, Stora Enso's witness Dr. Alan Rosenberg, recognizes this assertion. On pages 12 and 13, Dr. Rosenberg also acknowledges the fact that the Central Illinois Public Service Company's tariff requires the discounted rate to exceed its incremental costs.

Q. ON PAGE 12, DR. ROSENBERG SEEMS TO ARGUE THAT THE LR RATE SHOULD BE LOWER THAN WHAT COULD BE THE COST OF SELF GENERATION. DO YOU AGREE WITH THIS ASSERTION?

A. No, I do not. In fact, a customer would not leave for economic reasons even if its rates are slightly higher than the cost of its generation. The reason is that self generation, as recognized by Stora Enso's other witness, Mr. Fred Hussey, would tie up substantial capital which a customer can use for other purposes. Further, the customer can avoid

other construction related problems and uncertainties by not installing its own generation. The customer with self generation cannot achieve the same degree of reliability of service that it can get from a utility with a diversified supply sources unless the customer has duplicate facilities or full back-up service. Therefore, it is not unusual to add a premium to the cost of self generation.

Availability of LR Rate

Q. DID NSPI PROPOSE WHEN IT WOULD START OFFERING AND THE DURATION FOR WHICH IT WOULD OFFER THE LR RATE?

A. No, it did not.

Q. DO YOU HAVE ANY COMMENTS ON THIS ISSUE?

A. Yes, I do. The gas may not be available for the next one to two years and it takes about two to three years for installing a gas based generating plant. Therefore, there is no economic reason for giving the LR rate to any customer before the customer can have self generation. Further, the LR rate should not extend beyond the period when NSPI installs or acquires more long term capacity especially the marginal cost of this capacity is higher than the LR rate revenue.

Lack of Cost Mitigation Efforts

Q. BESIDES ITS PROPOSED EFFORT TO RETAIN LOADS AT LR RATES, DID NSPI PROPOSE ANY EFFORTS TO MITIGATE COSTS CAUSED TO OTHER RATE PAYERS BY ITS REVENUE LOSSES?

A. No, it did not. Although NSPI did not propose any mechanism in this proceeding to recover the losses caused by its proposed rate reduction resulting from its LR rate, as I stated earlier, NSPI assumes that the losses would be recovered from other customers. This may be the reason for NSPI's failure to investigate or discuss measures to mitigate cost increases to other customers which may be caused by NSPI's load losses..

Q. WHAT ARE THE COST MITIGATION EFFORTS NSPI COULD CONSIDER?

A. As stated earlier, it is possible that even with its current incremental revenue from large customers, NSPI may not be recovering its cost of purchasing off-system power or marginal costs. Therefore, before offering the LR rate, NSPI should investigate the cost/benefit of implementing a mechanism or tariff provision for reducing sales to large customers during the time periods when it purchases off-system power.

NSPI should also attempt to sell power in the U.S. market especially during those hours when and where prices are much higher than it may be able to obtain under its LR rate.

Q. WHICH MARKETS ARE YOU REFERRING TO?

A. In response to UARB IR-30, NSPI stated that it has sold power in Maine, a part of NEPOOL and in Maryland, a part of PJM. NEPOOL and PJM are interconnected with New York Power Pool and ECAR. All four of these pools have a very active power market and NSPI should be able to sell power into all these pools. These pools generally peak in summer as opposed to NSPI which peaks in winter and recently the prices in summer have been very high in these pools.

Q. DO YOU HAVE SOME EXAMPLES OF SUCH PRICES?

A. Yes. Attachment 5 shows the hourly PJM spot prices for the month of July 1999. Attachment 5 shows that during 27 hours, the spot prices were higher than \$900 per MWH and during 62 hours, the prices exceeded \$100 per MWH. Attachment 6 shows some of the historical prices in the New England area. Attachments 7, 8 and 9 present some examples of the future prices in a number of power markets. I should point out that the spot prices during some hours in the Midwest USA were close to \$5,000/MWH in the summer of 1999 and \$10,000/MWH in the summer of 1998.

Q. BESIDES THESE HIGH SPOT PRICES, CAN YOU GIVE US EXAMPLES OF LONG TERM CONTRACT PRICES?

A. Yes. The current long term delivered prices under one year or longer term contracts are about \$40.00/MWH.

Q. IS IT REASONABLE TO CONSIDER RECOVERY OF EXIT FEES AND STRANDED COSTS AS A MITIGATION APPROACH?

A. It is correct that a number of jurisdictions have considered and allowed such provisions, however, in my opinion, these are not proper regulatory responses to a competitive market. As NSPI stated, the proper response is to allow the utilities to implement flexible rate approaches with proper customer protections.

Confidentiality Provision

Q. WHAT ARE YOUR COMMENTS RELATED TO THE NSPI'S PROPOSED ~~CONFIDENTIALITY~~ PROVISION?

A. Although it has been my position that knowledge is a prerequisite to competition, I am not opposed to the confidentiality provision proposed by NSPI. However, I should emphasize that a customer requesting LR rate should be required to provide all the relevant data and information to NSPI which is needed for the LR rate. Further, all the data, information and analyses needed and used by NSPI's acceptance of a customer's request for LR rate should be made available to the UARB.

CONCLUSIONS AND RECOMMENDATIONS

Q. MR. KUMAR, PLEASE SUMMARIZE YOUR CONCLUSIONS?

A. In my opinion, NSPI's proposed LR rate provision is a proper response to a competitive market. However, NSPI's proposal lacks certain customer protection provisions which I have discussed in my Direct Evidence.

Q. WHAT ARE YOUR RECOMMENDATIONS?

A. I recommend that UARB allow NSPI to implement its LR rate with the following conditions:

1. The LR rate will be made available on a non discriminatory basis.
2. The LR rate should be made available at the time a customer can possibly install its own generator.
3. The LR rate may not be made available after NSPI installs or acquires new long term capacity.

4. The LR rate will not be offered to any entity in which NSPI has a financial interest of more than 25%.
5. NSPI will allow open access and retail choice to all of its LR rate customers who may become eligible under the UARB's rules whenever such choice becomes available.
6. The LR rate should be at least equal to 10% of the higher of NSPI's short term or long term marginal costs.
7. NSPI should investigate all the efforts to mitigate losses caused by the implementation of the LR rate and then it should implement the technically and economically feasible loss mitigation approaches. The UARB may provide some incentives for the implementation of these mitigation approaches.
8. NSPI should not be assured that it will be able to recover all losses caused by its LR rate.

Q. MR. KUMAR, DO YOU HAVE SPECIFIC EXAMPLES OF THE MITIGATION APPROACHES AND THE INCENTIVES WHICH THE UARB CAN PROVIDE?

- A. Yes. These are two approaches for loss mitigation. One is to provide economic incentives to LR rate and other large customers to voluntarily curtail or interrupt their loads whenever NSPI's short term marginal cost is higher than its marginal revenue. NSPI should also consider such an optional provision for curtailing and interrupting such customers whenever it can sell power at a rate higher than its marginal revenue from such customers.

In order to provide incentives to NSPI and its customers, the UARB may allow the sharing of the net margin among the NSPI's stockholders, the customers whose loads are curtailed/interrupted and other customers who may be responsible for absorbing the losses caused by the implementation of the LR rate. The sharing could be as follows:

- a. LR customers whose loads are curtailed/interrupted: 25%
- b. Stockholders: 25%
- c. Other customers: 50%

Q. MR. KUMAR DOES THAT CONCLUDE YOUR DIRECT EVIDENCE?

- A. Yes, it does.

QUALIFICATIONS and EXPERIENCE
of
Jatinder Kumar

QUALIFICATIONS and EXPERIENCE
of
Jatinder Kumar

EDUCATION

B.S., Petroleum Technology, 1963, Indian School of Mines, Dhanbad, India

Diploma in French Language, 1965, Besancon University, France

Post Graduate Diploma, Petroleum Engineering, 1965, French Petroleum Institute, Paris, France

M.S., Mechanical Engineering, 1966, University of California, Berkeley

Advanced Studies toward Ph.D., Mechanical Engineering, 1969, University of California, Berkeley

Evening and correspondence courses: Business Management, Corporate Organization, Risk Analysis, Economics, Accounting, Management and Organization, Business Finance, Thermal Recovery of Petroleum, Technical Supervision, Operation Research, Waste Water Treatment, Corrosion, General Electric Time Share Computer Programming, Solid State Control, Instrumentation and Control, Log Interpretation, Properties and Application of Plastics, Supervisory Control, Spanish, German.

EXPERIENCE

President of Economic & Technical Consultants, Inc, December, 1980 to present

Vice President, Associated Regulatory Consultants, April 1973, to November 1980

Utility Consultant Engineer, Van Scoyoc & Wiskup, Inc., September 1972 to April 1973

Design and Project Engineer, Pacific Gas & Electric Company of California, San Francisco, December 1969 to September 1972.

Staff Petroleum Engineer, Standard Oil Company of California, Bakersfield, California, August 1967 to August 1969

Assistant Engineer, University of California, Berkeley, August 1969 to December 1969

Research Assistant, University of California, Berkeley, October 1966 to August 1967

Extra Assistant Director, Indian Standards Institution, New Delhi, India, April 1964 to May 1965

Drilling Engineer, Oil India Ltd., India, January 1963 to April 1964

Senior Technical Assistant, Oil & Natural Gas Commission, India, August 1963 to December 1963

Mr. Kumar has appeared in more than 200 proceedings before FERC, ICC, 21 retail jurisdictions and ten judicial proceedings before 25 separate State and Federal regulatory and judicial bodies as an expert witness in the matters relating to public utilities and energy matters; electric and gas restructuring, unbundling, competition, merger/acquisition, incentive rate making; gas and electric power acquisition and transmission; competition, anti-trust and "price-squeeze" issues; contracting and buyouts; ratemaking and operation issues; accounting, economic, regulatory and technical matters. Mr. Kumar has advised the White House as well as advised a member of the Senate Sub-Committee on Energy on energy-related matters. Besides his experience in the utility consulting business, Mr. Kumar served as an alternate member of the Pipeline Committee of the International Standards Organization. He has working knowledge in the areas of utility operations; oil and gas production and reserve estimation; drilling; underground gas storage; designing technical facilities; project engineering and evaluation; environmental control; supply and demand analysis of various fuel supplies; feasibility of alternative fuels; and management efficiency studies. He has authored more than 30 technical papers. Mr. Kumar is listed in the 1996 Edition of Marquis Who's Who in Finance and Industry.

MEMBERSHIPS

The National Association of Accountants

The American Society of Mechanical Engineers

Registered Professional Engineer in the States of Maryland and Virginia

Representative Publications and Program Appearances
Jatinder Kumar

I. Representative Publications

"Nuclear Magnetic Relaxation Time of Water in a Porous Medium with Heterogenous Surface Wettability", Journal of Applied Physics, Vol. 40, No. 10, September 1969, p.4165 (with Dr. I. Fatt and Dr. D.N. Saraf).

"Nuclear Magnetic Resonance Study of Porosity, Permeability and Surface Area of Unconsolidated Porous Materials", The Log Analyst, January-February 1970, p. 13 (with Dr. I. Fatt).

"Rating Alternatives to Chromates in Cooling Water Treatment", Chemical Engineering, April 26, 1976, p.111.

"Specified Surface of Porous Materials", Society of Petroleum Engineer Journal, March 1970, p.4 (with Dr. I. Fatt).

"Determination of Wettability of Porous Materials by the Nuclear Magnetic Resonance Techniques", Indian Journal of Technology, Vol. 8, April 1970, p. 125 (with Dr. D.N. Saraf and Dr. I. Fatt).

"Determination of Specific Permeability from Electric Logs", World Oil, February 1, 1971, p.38.

"Nuclear Magnetic Relaxation Time of Blood and Blood Velocity", Science, Vol. 175, February 18, 1972, p.794 (with V. Kumar, M.D.) //

"Selecting and Installing Synthetic Pond Linings", Chemical Engineering, Vol. 1, No. 3, February 5, 1963, p. 67 (with Mr. J.A. Jedlicka).

"Quick Visual Comparison of Fuel Values", Chemical Engineering, February 18, 1974, p.156.

Comments on Cost Allocation, Public Utilities Fortnightly, February 17, 1977, Volume 99, No. 4, page 5.

Comments on Impact of Tax Reform Act, Public Utilities Fortnightly, June 25, 1987.

Natural Gas Transportation and Transportation Rates, Journal of Petroleum Technology, Vol. 40, No. 2, page 237.

II. Representative Program Appearances

"Synthetic Liners for Ponds", presented at 1976 Water and Wastewater Equipment Manufacturers

Association Conference at Houston, April 1, 1976.

"Corrosion of Subsurfaces Equipment in Producing Oil and Gas Wells", presented at a Seminar, University of California, Berkeley, February 1967.

"Problems of Steam Recovery", presented at a Seminar, University of California, Berkeley, February 1967.

"Role of Explosives in Petroleum Industry", presented at High Explosives Corporation of India Silver Jubilee Seminar, March 1965.

"Effects of Poisson's Ratio on Rock Properties", presented at the Society of Petroleum Engineers 51st Annual Fall Meeting, New Orleans, October 3-6, 1976.

"The Role of Anaerobic Digestion for the Production of Methane from Municipal Waste", presented at 1976 American Society of Mechanical Engineers Solid Waste Processing Conference at Boston, May 23, 26, 1976.

"Trends in Natural Gas Regulation" (with John W. Griggs), presented at the Society of Petroleum Engineers 59th Annual Technical Conference held in Houston, September 19, 1984.

Open Access for Alternate Gas Supplies (Orders 436 and 500). Presented a speech at the annual meeting of the National Association of Gas Consumers, Lake of the Ozarks, MO, October 29, 1987.

"Gas Market Restructuring through Regulation and Legislations". Presented at the Society of Petroleum Engineers 63rd Annual Conference held in Houston, Texas, on October 3-5, 1988. //

Important Points for Gas Acquisition and Contract. A speech presented at the Annual Conference of National Association of Gas Consumers, October 19, 1988.

"Solution of Blasius Flow Equation by Electronic Analog Computers".

"Estimation of Thermal Conductivity of Porous Materials", Part I and Part II, American Petroleum Institute Project Report, 1970 (with Prof. W. H. Somerton).

Impact of FERC's Rate Design Policy Statement. Presented at NASUCA's meeting held in June 1990 at Santa Fe, New Mexico.

"Tax Implications of Utility Restructuring", presented at NASUCA's Semi Annual Conference, Charleston, SC, June, 1997.

"Gas Marketing Restructuring through Regulations and Legislations", presented at the Society of Petroleum Agencies meeting in New York, December 7, 1988.

"Engineering Aspects of Gas from Wellhead to Burntip", presented at a conference arranged by the District of Columbia Office of People's Counsel, (1989)

"Natural Gas Contracting", presented at the International Power Conference, Tampa, Florida, February 1992.

"Tax Implications of Utility Deregulation", presented at Michigan State University's Annual Conference, Williamsburg, VA, December 3, 1997.

"Independent System Operators (ISO), Issues and Impact on Electric Market", presented at International Power Conference, Dallas, TX, December 10, 1997.

III. Other Reports and Studies Prepared

Offshore oil spills

"Summary and Explanation of FERC Order 436". Prepared for Department of Energy, March 1986.

Gas from Eastern U.S. Shale, prepared for Gulf Oil Company.

Summary of Court Order Remanding and Vacating FERC Order 436.

Summary of FERC Order 500.

"Alternatives in Permeability of Sandstones after Super-Cooling", Research Report, Indian School of Mines, Dahnbad, India, May 1963.

A comparative Study of Gas Pipeline Flow Equations.

Working Capital for Electric Utilities.

Correlations: Types and Applications in Public Utilities.

Future Gas Marketing Strategies.

Cost of Service Manual for Electric Utilities prepared for Bonneville Power Administration (with Edgar H. Bernstein and Ken Robertson).

Summary of Amendment to Clean Air Act.

Summary of FERC Order 636.

Price Indexing in Gas Industry.

Evaluation of Formulae Used for Gas Flows Through Pipelines

Summary of FERC Orders 888, 888 A and 888 B.

Brief Description of Electric Utility Ratemaking Process.

How Electric Utilities Rates Can Be Made More Competitive Through Ratemaking

Problems with ISO Locational Marginal Pricing.

How ISO Can Perform "Balancing Only" Function?

Electric Price Forecast, Prepared for US Department of Energy

CASES IN WHICH ANALYSIS WAS PERFORMED
BUT NO TESTIMONY WAS SUBMITTED

JATINDER KUMAR

CASES IN WHICH ANALYSIS WAS PERFORMED
BUT NO TESTIMONY WAS SUBMITTED

JATINDER KUMAR

<u>COMPANY</u>	<u>CASE NO.</u>	<u>JURISDICTION</u>
Chesapeake and Potomac Telephone Co.	6651	Maryland
Chesapeake and Potomac Telephone Co.	777	District of Columbia
Michigan-Wisconsin Pipeline Co.	RP75-96	FERC
Michigan-Wisconsin Pipeline Co.	RP77-60	FERC
National Gas Pipeline Co.	RP81-49	FERC
Southern Natural Gas Co.	RP72-74	FERC
Maryland Fuel Clause	6759	Maryland
Massachusetts Fuel Clause	1766	Massachusetts
All Maryland Electric Utilities Fuel Case Investigation	6759	Maryland
Crab Run Gas Co.	CP75-329	FERC
East Ohio Gas Co.	75-404GA-GMR	Ohio
Hampshire Gas Co.	RP79-97	FERC
Delmarva Power & Light Co. (Phase II)	ER76-494	FERC
Ontario Hydro	Canada	
Missouri Utilities	ER80-124 & 125	FERC
Trunkline Gas Co.	TA81-504	FERC
Potomac Electric Power Co.	785	District of Columbia
Delmarva Power & Light Co.	ER82-751-000	FERC
Northern Natural Gas Co.	RP83-73-000	FERC
Union Electric Co.	ER83-646	FERC
Union Electric Co.	ER81-450	FERC
Union Electric Co. (Wheeling)	ER84-582	FERC
Kansas City Power & Light Co.	EO85-224	Missouri
UGI Corp. (Remand)	821899 & 832331	Pennsylvania
Gulf States Utilities	U-16950	Louisiana
Delmarva Power & Light Co. (Complaint Filing)	EL86-11-000	FERC
Gas Rulemaking	844	District of Columbia
Panhandle Eastern Pipeline	CP86-232	FERC
Wisconsin Power & Light Co.	EL86-40-999	FERC
Gas Co. of New Mexico	1871	New Mexico
Potomac Electric Power Co. (Productivity Improvement Group)	766	District of Columbia
Delmarva Rate Reduction	ER82-751(Rev'd)	FERC
Delmarva Power & Light Co.	CA84-1033	Court of Appeals
General Rulemaking (Phase II)	834	District of Columbia

Tennessee Gas Pipeline Co.	RP81-54 et al.	FERC
Mountain Fuel Supply (PGA)	87-057-01	Utah
Natural Gas Regulations for the District of Columbia	FC 844	District of Columbia
Potomac Electric Power Co. (Regulation of Cold Power Contract)	FC 766	District of Columbia
Commonwealth Edison Co.	ICC87-0427	Illinois
Kansas City Power & Light Co.	ER86-701	FERC
Union Electric Co. (Amendment to Transmission Service)	ER87-419-000	FERC
Delmarva Power & Light Co. (Rate Filing)	ER87-556-00 0	FERC
Delmarva Power & Light Co. (Complaint Re Fuel and Purchased Power Costs)	EL87-58-001	FERC
Mountain Fuel Supply (TRA)		Utah
Mountain Fuel Supply (Gas Transportation)		Utah
Mountain Fuel Resources	RP86-7	FERC
Union Electric Co. vs. FERC and WDG vs. FERC	88-1125	Court of Appeals
Williams Natural Gas Co.	RP86-325	FERC
Wisconsin Power & Light Co.		FERC
Washington Gas Light Co.	849	District of Columbia
Delmarva Power & Light Co.	CA88-1557	D.C. Court of Appeals
KPL Gas Service Co.	GR89-62	Missouri
Potomac Electric Power Co.	FC 881	District of Columbia
Northern Natural Gas Co.	RP88-259	FERC
El Paso Natural Gas Co.	RP88-44	FERC
Delmarva Power & Light Co.	EL89-10	FERC
LaClede Gas Co.	GC89-85	Missouri
Delmarva Power & Light Co.	EL89-16	FERC
Gas Co. of New Mexico	2147	New Mexico
Washington Gas Light Co.	FC 849	District of Columbia
Potomac Electric Power Co. (Least Cost Planning)	FC 884	District of Columbia
El Paso Natural Gas Co.	RP89-132	FERC
Williams Natural Gas Co. (Take-or-Pay)	RP89-40 & RP89-142	FERC
Vesta Energy Co. vs. Williams Natural Gas Co.	RP89-152	FERC
Williams Natural Gas Co. (Rate Case)	RP89-183	FERC
Colorado Take-or-Pay Investigation	89I-288G	Colorado

Potomac Electric Power Co.	FC 889	District of Columbia
KPL Gas Service Co.	GR90-50	Missouri
Duquesne Light Company	ER90-152	FERC
Louisiana Power & Light Co.	EL90-12	FERC
Louisiana Power & Light Co.	EL90-15	FERC
Alleghany Power Service Corp.	ER90-174	FERC
KPL Gas Company	GR90-40	Missouri
KPL Gas Service Co.	GR91-149	Missouri
Gas Co. of New Mexico	2361	New Mexico
KPL Gas Service Co.	GR91-286	Missouri
KPL Gas Service Co.	GR91-291	Missouri
Gas Co. of New Mexico	2395	New Mexico
KPL Gas Service Co.	GR-91-296	Missouri
KPL Gas Service Co.	GR-91-337	Missouri
KPL Gas Service Co.	GR-92-9	Missouri
Delmarva Power & Light Co.	ER-92-236	FERC
West Gas Co.	CPUC915-552G	Colorado
Williams Natural Gas Co.	RP91-152	FERC
Southern Companies	EL 91-14 &	FERC
	ER 91-570	
Gas Company of New Mexico Blanco Hub	04-07-016	New Mexico
Gulf States Utilities	ER 87-051-000	FERC
Gas Company of New Mexico	2449	New Mexico
Integrated Resource Planning		
Potomac Electric Power Company	8466	Maryland
West Virginia Power	92-0401-E	West Virginia
	42T	
Questar Pipeline Company	RP93-18	FERC
Union Electric Company	ER93-267	FERC
Delmarva Power & Light	ER93-340-000	FERC
and Baltimore Gas & Electric		
Public Service Company of Colorado	93S-001EG	Colorado
Southwestern Electric Power Company	ER93-399-000	FERC
Delmarva Power & Light Company	EL93-24-000	FERC
(Fuel Cost Waiver)		
Union Electric Company	ER93-517-000	FERC
Productivity Improvement Analysis	FC 766	D.C.
KPL Gas Company	GR90-40	Missouri
Delmarva Power & Light Company	ER92-236 &	FERC
	EL92-113	
Williams Natural Gas Company	RP92-152	FERC
Gas Company of New Mexico	2422	New Mexico
Public Service Co. of Colorado	92A-352G-3	Colorado
(West Gas Merger)		
New Mexico Transportation Rules	2472	New Mexico

Gas Co. of New Mexico	2449	New Mexico
Integrated Resource Planning		
Potomac Electric Power Co.	8466	Maryland
Western Resources, Inc	GR93-240	Missouri
Delmarva Power & Light Co.	EL93-47	FERC
(Complaint Billing Selection)		
Delmarva Power & Light Co.	ER93-731-000	FERC
(Power Sale to LILCO)		
Delmarva Power & Light Co. vs. FERC	93-1819	D.C. Court of Appeals
Delmarva Power & Light Co. (Power Sale)	EL94-23-000	FERC
Philadelphia Electric Co.	EL94-8	FERC
Delmarva Power & Light/	ER94-967-000	FERC
New York State E&G (Power Sale)		
Delmarva Power & Light Co.	ER94-48-000	FERC
(Fuel Clause Waiver)		
Gas Company of New Mexico(TOP)	2503	New Mexico
Delmarva Power & Light Co. vs. FERC	93-1819	Dist Court of Appeals
Effect of Cold Weather on PJM	EL94-23-000	FERC
Old Dominion Electric Coop.	TX94-5-000	FERC
(Wheeling Request)		
Delmarva Power & Light Co.	ER94-1265	FERC
(Wheeling Rates)		
LDC Regulations	8683	Maryland
Delmarva Power & Light Co.	ER94-1319-000	FERC
(Partial Requirement Rates)		
Delmarva Power & Light Company	ER94-1377	FERC
(Power Sales to PSE&G)		
Delmarva Power & Light Company	EL94-78	FERC
(Declaratory Order)		
Old Dominion Electric Coop.	EL94-77	FERC
(Waiver)		
Delmarva Power & Light	ER94-1501	FERC
(Smyrna Agreement)		
Duquesne Power & Light Company	TX94-8-000	FERC
FERC Audit Report	FA92-39-000	FERC
Delmarva Power & Light Company	ER94-1628-000	FERC
(Clayton Settlement)		
Delmarva Power & Light	ER94-1620	FERC
(Fuel Cost Adjust.)		
Duquesne Light Company	TX94-10-000	FERC
PECO Energy	ER94-1673	FERC
PECO Energy Company	ER95-145-000	FERC
(Power Sale to ODEC)		
Conowingo Power Company,	EC95-3-000	FERC

Delmarva Power & Light Co. (Merger)	et al	
PECO Energy (Power Sale)	ER95-312 & ER95-316	FERC
Delmarva Power & Light Co. (Power Agreements)	ER95-521 & ER95-524	FERC
Union Electric Co.(Remand)	ER84-560-036	FERC
Delmarva Power & Light Company (Network Transmission)	ER95-222-000	FERC
Gas Company of New Mexico/ Southern Union Gas Company	2639	New Mexico
Industrial Gas Sales, Inc. vs. GCNM	2649	New Mexico
Mega NOPR	RM95-8 & RM94-7	FERC
Union Electric Co.	ER95-1437	FERC
Delmarva Power & Light (Open Access Tariff)	ER95-1639	FERC
Questar Pipeline Co.	RP95-407-000	FERC
PECO Energy	ER96-641-000	FERC
Ameren Corp. (Open Access Tariff)	ER96-923-000	FERC
PJM Pool	ER96-821-000	FERC
(Power Contract with Enron)		
Delmarva Power & Light Co.	ER96-1360	FERC
Enron Power Marketing & PJM	ER96-821-000	FERC
Delmarva Power & Light Co.	ER96-852-000	FERC
PJM Interconnection Agreement	ER96-1433-000	FERC
Delmarva Power & Light Co. (Retail Wheeling)	96-83	Delaware
Delmarva Power & Light (Rate Increase)	ER96-1962-000	FERC
CRT NOPR	RM96-11-000	FERC
PECO Energy Co.	OA96-13-000	FERC
Delmarva Power & Light Co. (Order 888 Filing)	OA96-90 & OA96-165-000	FERC
PECO Energy (Pool Filing)	ER96-2668-000	FERC
PJM Pool, Inc. (Restructuring Filing)	EC96-28	FERC
Illinois Power Co.	OA96-66-000	FERC
CIPS Filing	OA96-154-000	FERC
Delmarva Power & Light Co. (Market Based Rates)	ER96-2571-000	FERC

Soyland Power (Wholesale Power)	ER96-2974	FERC
Power Cost Analysis		FERC
Soyland Power (Short term Sale)	ER96-2969 & 2970	FERC
Industrial Gas Sales vs. PNMGS	Case #2734	New Mexico
NMIEC vs. PNMGS	Case #2720	New Mexico
Delmarva Power & Light Sales to Marketers	ER97-440-000	FERC
Merger of Delmarva Power & Light Co. and Atlantic City Electric	EC97-7-000	FERC
Delmarva Power & Light Co. (Order 889 Filing)	ER97-912-000	FERC
PJM Interconnection (Open Access Filing)	ER97-881-000	FERC
Illinois Power/Soyland Power	NRC Docket #50-461	NRC
Illinois Power Co. (Sale and Trans. Contracts)	ER97-1809, et al	FERC
PNM Gas Service (GAC Rule Making)	2670	New Mexico
Duke Power Co./ Pan Energy Merger	EC97-13-000	FERC
PNM Gas Service (Service Rate Case)	Case # 2762	New Mexico
DPL/ACE Merger (Transfer of Nuclear Plant)	50-354	NRC
PJM Interconnection Filing by PJM Companies (Restructuring)	ER97-3189 & EC97-38	FERC
IP/Soyland Contract	ER97-3090	FERC
ISO Filing by PECO	ER97-3273	FERC
PNM Gas Service (PGAC Rule)	2759 & 2772	New Mexico
PNM Gas Service (Levelized PGAC)	2777	New Mexico
PJM Companies (Market Based Rate)	ER97-3729-000	FERC
PJM Revised Tariffs	ER97-3385 & ER97-3415	FERC
PJM Open Access Tariffs	OA-97-678-000	FERC
Delaware Retail Electric Restructuring	97-229	FERC
RTO Transmission Rates	ER97-3189-003	FERC
PJM Interconnection	OA97-261-000	FERC

(Installed Capacity)
PJM Interconnection
(FTR Auction)
PNM Gas Service
(Fuel and Losses)
Shenandoah Gas Co.
Southwestern vs. Soyland
Soyland Power Coop.
West Virginia American Water Co.

Et al FERC
ER98-1581-000 FERC

2811 New Mexico
04-C-07/018
98-0289-G-42T W. Virginia
 FERC
ES98-22-000 FERC
98-0246-W-42T W. Va. Cons. Advocate

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February 10, 1998

TESTIMONY SUBMITTED

JATINDER KUMAR

TESTIMONY SUBMITTED**JATINDER KUMAR**

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
Detroit Edison Co. (Steam)	U-4024	Michigan
Detroit Edison Co. (Electric)	U-4257	Michigan
Union Electric Co. (Direct)	E-8215	Federal Power Commission
Union Electric Co. (Rebuttal)	E-8215	Federal Power Commission
Washington Gas Light Co.	6738	Maryland
Boston Gas Co.	DPU 19885	Massachusetts
Columbia Gas Co.	6810	Maryland
Frederick Gas Co.	6839	Maryland
Union Electric Co.	E-9496	Federal Power Commission
Delmarva Power & Light Co.	6860	Maryland
Baltimore Gas & Electric Co.	7033	Maryland
Upper Peninsula Generating Co.	15852-C	Michigan (Court)
Upper Peninsula Generating Co.	18852-C	Michigan (Air Pollution Control Commission)
Delmarva Power & Light Co.(Direct)	7065	Maryland
Delmarva Power & Light Co. (Surrebuttal)	7065	Maryland
Upper Peninsula Generating Co.	18852-C	Michigan (Water Pollution Control Commission)
Potomac Electric Power Co.	630	District of Columbia
Delmarva Power & Light Co.	E-8947	Federal Power Commission
Washington Gas Light Co.	6977	Maryland
Illinois Power Co.	E-9520	Federal Power Commission
Delmarva Power & Light Co.	ER76-494	Federal Power Commission
Missouri Power & Light Co.	ER76-539	Federal Power Commission
Bridgeport Hydraulic Co.	7703301	Connecticut
Commonwealth Edison Co.	76-0698	Illinois
Purchased Gas Adjustment Investigation (Direct)	6865	Maryland
El Paso Electric Co.	522	Texas
Baltimore Gas & Electric Co.	7070	Maryland
Purchased Gas Adjustment Investigation (Rebuttal)	6865	Maryland
El Paso Electric Co.	1360	New Mexico
Potomac Electric Power Co.	7149	Maryland
Union Electric Co.	ER77-614	FERC
Indiana & Michigan Electric Co.	U-5608	Michigan

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
Missouri Utilities Co.	ER77-354	FERC
El Paso Electric Co.	1481	Texas
Union Electric Co. (Direct)	ER77-614	FERC
Union Electric Co. (Rebuttal)	ER77-614	FERC
Public Service Co. of New Mexico	1419	New Mexico
Illinois Power Co.	ER77-531	FERC
Delmarva Power & Light Co. (Cost of Service)	ER78-414	FERC
Michigan Consolidated Gas Co. (Interim)	U-5955	Michigan
Michigan Consolidated Gas Co. (Direct)	U-5955	Michigan
Columbia Gas of Ohio	771204-GA-CRC	Ohio
Delmarva Power & Light Co. (Price Squeeze)	ER78-414	FERC
Union Electric Co. (Surrebuttal)	ER77-614	FERC
Union Electric Co. (Rebuttal to Supplemental)	ER77-614	FERC
Michigan Consolidated Gas Co. (Rebuttal)	U-5955	FERC
Detroit Edison Co. (Direct)	U-6006	Michigan
Detroit Edison Co. (Rebuttal)	U-6006	Michigan
Detroit Edison Co. (Surrebuttal)	U-6006	Michigan
Detroit Edison Co. (Steam)	U-6103	Michigan
Delmarva Power & Light Co. (Fuel)	ER78-414	FERC
Delmarva Power & Light Co. (Rebuttal Price Squeeze)	ER78-414	FERC
Mobile Gas Service Corporation	17820	Alabama
Columbia Gas of Ohio (Supplemental)	77-1204-GA-CRC	Ohio
Potomac Electric Power Co.	7384	Maryland
Indiana-Michigan Electric Co.	U-6148	Michigan
Michigan Consolidated Gas Co. (Direct)	U-6372	Michigan
Consumers Power Co.	U-5732-R	Michigan
Michigan Consolidated Gas Co. (Rebuttal)	U-6372	Michigan
Marshall-Durbin & Co. vs. The Jasper Utility Board	CV 77-39	Alabama Circuit Court
Detroit Edison Co. (Electric)	U-6488	Michigan
Public Service Co. of Colorado	1425	Colorado
Consumers Power Co.	U-6360	Michigan
Implementation of Michigan Rule # 1980-139	U-6590	Michigan
Central Illinois Power & Light Co.	80-0157	Illinois
Wolverine Electric & Northern Michigan	U-5407 & U-5408	Michigan
Detroit Edison Co. (Abandonment of Nuclear Units)	U-6474	Michigan
Brooklyn Union Gas Co.	27855	New York
Potomac Electric Power Co.	748	District of Columbia
Public Service of New Hampshire (Direct)	DR 79-187	New Hampshire

COMPANY	CASE	NO. JURISDICTION
Interstate Commerce Commission (Nationwide Coal Rate Guidelines Ex Parte No. 347 (Sub-No. 1))		
Interstate Commerce Commission		
Gas Co. of New Mexico (Interim)	1568	New Mexico
Public Service of New Hampshire (Supplemental)	DR 79-187	New Hampshire
Delmarva Power & Light Co.	ER80-363	FERC
Washington Gas Light Co.	768	District of Columbia
Stierren Farms	QF 80-28	FERC
Niagara-Mohawk (Direct)	ER81-499	FERC
Potomac Electric Power Co. (Cogeneration)	757	District of Columbia
Gas Co. of New Mexico (General)	1629	New Mexico
Consumers Power Co. (Interim Rate Relief)	U-6923	Michigan
Consumers Power Co. (Direct)	U-6923	Michigan
Niagara-Mohawk (Rebuttal)	ER81-499	FERC
UGI Corp. (Direct)	R-811488	Pennsylvania
Union Electric Co. (Remand)	ER77-614	FERC
Detroit Edison Co. (Direct)	U-6949	Michigan
UGI Corp. (Rebuttal)	ER81-1488	FERC
Delmarva Power & Light Co. (Direct)	ER81-504-000	FERC
UGI Corp. (Direct)	R-821899	Pennsylvania
Detroit Edison Co. (Rebuttal)	U-6949	Michigan
Union Electric Co. (Supplemental)	ER77-614	FERC
Delmarva Power & Light Co. (Supplemental)	ER81-504-000	FERC
Gas Co. of New Mexico	1710	New Mexico
Columbia Gas Transmission	RP75-105 & RP75-106	FERC
UGI Corp. (Rebuttal)	R-821899	Pennsylvania
Detroit Edison Co. (Steam)	U-7126	Michigan
Pennsylvania Gas & Water Co.	R-821961	Pennsylvania
Toledo Edison Co.	82165ELEFC	Ohio
New York State Electric & Gas Corp.	82-410-000	FERC
Consumers Power Co. (GCR Clause)	U-7487	Michigan
Michigan Consolidated Gas Co.(GCR Clause)	U-7479	Michigan
Consumers Power Co. (GCR Factor)	U-7488	Michigan
Consumers Power Co. (PSCR Clause)	U-7511	Michigan
Michigan Consolidated Gas Co. (GCR Factor)	U-7480	Michigan
Gas Co. of New Mexico	1787	New Mexico
Pennsylvania GCR Investigation (Direct)	M-78050055 D-79800192	Pennsylvania
Detroit Edison Co. (PSCR Clause)	U-7510	Michigan
Consumers Power Co. (PSCR Clause)	U-7512	Michigan

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
Pennsylvania GCR Investigation (Surrebuttal)	M-78050055	
	D-79800192	Pennsylvania
United Gas Pipe Line Co.	RP82-57	FERC
Detroit Edison Co. (PSCR Factor)	U-7550	Michigan
Gas Co. of New Mexico	1787	New Mexico
UGI Corp.	R-832331	Pennsylvania
Consumers Power Co.	U-7650	Michigan
Gas Co. of New Mexico (Gas Costs)	1796	New Mexico
East Ohio Gas Co.	83-19GAGCR	Ohio
Potomac Electric Power Co. (Phase III)	759	District of Columbia
Wisconsin Power & Light Co.	ER83-429-000	FERC
Commonwealth Edison Co.	830537	Illinois
Potomac Electric Power Co. (Direct)	813	District of Columbia
Potomac Electric Power Co. (Rebuttal)	813	District of Columbia
Gas Co. of New Mexico	1875	New Mexico
Detroit Edison Co. (Steam)	U-7906	Michigan
New England Power Co.	EL84-6000	FERC
Houston Light & Power Co.	5779	Texas
New England Power Co. (Rebuttal)	EL84-6000	FERC
Wisconsin Power & Light Co.	ER84-57-6000	FERC
Union Electric Co.	ER84-56-0000	FERC
Consumers Power Co.	U-5732	Ingham County Court, Michigan
Union Electric Co.	CA77-094-7(C)-2	Federal District Court
Southwestern Public Service Co.	6465	Texas
Utah Associated Municipal Power System	85201101	Utah
Mountain Fuel Resources	RP867000	FERC
Union Electric Co. (Rebuttal)	ER84-56-000	FERC
Commonwealth Edison Co.	84-0554	Illinois
National Fuel Gas Co.	29375	New York
Review of Gas Distribution Applications	86-057-03	Utah
Consumers Power Co.	U-7830	Michigan
Union Electric Co.	CA 83-2756C(C)	Federal District Court
Consumers Power Co. (Rebuttal)	U-7830	Michigan
Mountain Fuel Resources (436 Filing)	RP86-87-001	FERC
MichCon (Gas Transmission)	U-8635	Michigan
Consumers Power Co. (Gas Transmission)	U-8678	Michigan
Delmarva Power & Light Co.	DA77-254	Federal District Court
Williams Natural Gas Co.	RP87-33-000	
	& RP87-39-000	FERC
Williams Natural Gas Co.	CA87-1463K	Federal District Court
Consumers Power Co. (Step 3B)	U7830	Michigan
Potomac Electric Power Co.	7972	Maryland
Gas Co. of New Mexico (Gas Transportation)	2068	New Mexico

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
Gas Co. of New Mexico (Standby Service)	2068	New Mexico
Gas Co. of New Mexico	2147	New Mexico
Potomac Electric Power Co.	8079	Maryland
Williams Natural Gas Co.(Gathering Facilities)	RP87-33	FERC
Potomac Electric Power Co.	FC 869	District of Columbia
Union Gas Co. vs. DOE	238-88C	U.S. Court of Claims
Questar Pipeline Co.	RP88-93-000	FERC
Gas Co. of New Mexico	2183	New Mexico
Questar Pipeline Co. (Direct)	RP88-93	Phase II FERC
Questar Pipeline Co. (Rebuttal)	RP88-93	Phase II FERC
Questar Pipeline Co. (Surrebuttal)	RP88-93	Phase II FERC
Colorado Gas Utilities (Gas Cost Adjustment and Transportation Investigation)	5721	Colorado
Gas Co. of New Mexico	2307	New Mexico
Central Louisiana Electric Co. (Direct)	ER90-39-000	FERC
Central Louisiana Electric Co. (Rebuttal)	ER90-39-000	FERC
Gas Co. of New Mexico	2320	New Mexico
KPL Gas Service Co.	GR90-16	Missouri
Gas Co. of New Mexico	2366	New Mexico
Pennsylvania Gas & Water Co.	R-901699	Pennsylvania
Potomac Electric Power Company	905	District of Columbia
Potomac Edison Co.	8341	Maryland
Gas Co. of New Mexico (Direct)	2353	New Mexico
Gas Co. of New Mexico (Rebuttal & Supplemental)	2353	New Mexico
Potomac Electric Power Co. (Direct)	912	District of Potomac
Electric Power Co. (Rebuttal)	912	Columbia
Questar Pipeline Co. (Direct)	RP-91-140-	FERC
Questar Pipeline Co. (Rebuttal)	000, et al	
Mississippi Valley Gas	U-5307	Mississippi
IRP for Gas Utilities	91-667-G	South Carolina
Western Gas Supply Company and Public Service Company of Colorado	92A-352G3	Colorado
Gas Company of New Mexico (Supplemental Direct)	2353	New Mexico
Gas Company of New Mexico (Rebuttal)	2352	New Mexico
Gas Service to Wisconsin Towns	5820-CG-100, 4220-CG-114, 4220-CG-117	Wisconsin
Cajun Electric Power	EC92-21-000, ER92-806-000	FERC
Delmarva Power & Light	EL93-42	FERC

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
J.W. Spedden et al vs. B. Ajmera et al (Damage Case)	CAL91-16034	Dist. Court of Maryland
Central Louisiana Electric Company	ER90-39-000	FERC
Union Gas Company's Protest to Energy Board	EBCNA No. 435-12-89 & 436-12-89	U.S. Claims Court
Entergy/Gulf States Utilities (Merger Case)	EC92-21 & ER92-806	FERC
Gas Company of New Mexico	2340	New Mexico
Potomac Electric Power Company	FC 905	Dist. of Columbia
Pennsylvania Gas & Water Company	RP91-1980	Pennsylvania
IRP for Gas Utilities	91-667-G	South Carolina
West Virginia Power	92-0401-E-42T	W. Virginia
Questar Pipeline (Restructuring Comments)	RS092-9-000	Utah Div. of Public Utilities
Delmarva Power & Light Company	ER93-96 & EL93-11	FERC
Potomac Electric Power Co. (Direct)	FC 929	Dist. of Columbia
Potomac Electric Power Co. (Rebuttal)	FC 929	District of Columbia
Gas Company of New Mexico SCPSC Section 712,	2521	New Mexico
Implementation of EPACT 1992 (Comments)	93-231E	South Carolina
EPACT Section 115, Gas Utilities	93-730-G	South Carolina
Energy Efficiency (Comments)		
Public Service Co. of Colorado	93A-561G	Colorado
EPACT Section 111, Electric Utilities Energy Efficiency	93-748-E	South Carolina
Oil Institute of Long Island vs. LILCO Gas Company of New Mexico (PGA)		
94/011879	2508	New York State Court
New Mexico Gas Company of New Mexico (Balancing Rule)	2526	New Mexico
Niagara Mohawk Long Island Lighting Co.	94-E-0098 et al 93-E-1123	New York
Gas Company of New Mexico	2587	New Mexico
Delmarva Power & Light Company	EL93-24	FERC
PNM Gas Service (Gas Purchasing Practices)	2759	New Mexico
ARKA Union Electric/CIPS (Merger Case)	95-401-U	Arkansas
Long Island Lighting Co. (Show Cause Notice)	EC96-7-000	FERC
PNM Gas Service (Unbundling)	96-E-0132	New York
Granite State Gas Transmission	2760	New Mexico
PNM Gas Service (Collapse of Rate Riders)	CP96-610-000	FERC
Exxon Pipeline Co.	2752	New Mexico

<u>COMPANY</u>	<u>CASE</u>	<u>NO. JURISDICTION</u>
PJM Utilities et al	OR96-1-000	FERC
PNM Gas Service (Rate Case)	P-00971168	Pennsylvania
West Virginia-American Water Company	2762	New Mexico
Shenandoah Gas Company	98-0246-W-42T	W. Virginia
	98-0289-G-42T	W. Virginia

ATTACHMENTS
TO
DIRECT EVIDENCE OF
JATINDER KUMAR

NOVA SCOTIA POWER, INC.

Attachment 1

Average Rate, Cents/Kwh

Class	1995	1996	1997	1998	1999
Large Industrial - Firm Classes	4.710	4.596	4.521	4.642	4.693
Large Industrial - Interruptible Classes	4.766	4.924	4.855	4.577	4.605
Total Large Industrial	4.746	4.801	4.732	4.596	4.626
Large Commercial	6.547	6.637	6.554	6.475	6.458
Total >2 MVA / 1.8 MW	4.980	5.052	4.980	4.797	4.803

Source: Response to Information Request Question IR-17

Source: Tables UARB-IR-31-C and UARB-IR-31-C, Response to Information

NOVA SCOTIA POWER, INC.

Attachment 2

Average Purchased Power Costs

<u>Year*</u>	<u>Amount*</u> <u>Purchased</u> <u>MWH</u>	<u>Cost</u>	<u>Average Rate,</u> <u>Cents/KWH</u>	<u>Off System</u> <u>Purchase Rate</u> <u>Cents/KWH</u>	<u>Fuel Cost*</u> <u>Cents/KWH</u>
1993	218,900	6,469,294	2.955	2.988	2.55
1994	216,200	6,867,993	3.177	3.111	2.55
1995	499,500	15,109,881	3.025	3.140	2.50
1996	254,600	17,179,806	6.748	4.096	2.45
1997	340,200	21,653,635	6.365	4.933	2.40
1998	242,000	16,206,960	6.697	4.794	2.45
<u>Projected</u>					
2000	304,100			4.724	
2001	278,600			4.810	
2002	346,400			4.741	
2003	415,600			4.957	
2004	402,400			5.016	

* From 1998 Annual Report to Stockholders

Source: Tables UARB-IR-33-A, UARB-IR-33-B, UARB-IR-33-D, UARB-IR-33-E
Response to Information Request Question IR-33

NOVA SCOTIA POWER, INC.

Marginal Power Cost

Year	Winter On-Peak Marginal Energy Cost, \$/MWH	Marginal Capacity Cost, \$/KW-yr				Total Marginal Capacity, \$/MWH	Total On-Peak Marginal Cost, \$/MWH
		Generation	Transmission	Distribution	Total		
2000	40.11	1.42	28.51	10.66	40.59	8.28	48.39
2001	43.25	4.29	29.08	10.88	44.25	9.02	52.27
2002	48.44	13.98	29.66	11.10	54.74	11.16	59.60
2003	54.89	24.75	30.25	11.32	66.32	13.52	68.41
2004	61.16	14.58	30.86	11.54	56.98	11.62	72.78
2005	65.50	27.39	31.47	11.77	70.63	14.40	79.90
2006	74.84	5.18	32.10	12.01	49.29	10.05	84.89
2007	64.92	10.62	32.75	12.25	55.62	11.34	76.26
2008	71.05	28.53	33.40	12.50	74.43	15.17	86.22
2009	79.90	16.49	34.07	12.75	63.31	12.91	92.81
2010	82.98	39.03	34.75	13.00	86.78	17.69	100.67

* At 56% Load Factor

Source: Tables 1 and 2, Response to NSUARB Information Request Question IR-26

OTHER CHARACTERISTICS OF LOAD RETENTION

Utility	Available For/To	Load Limitation	Other Limitations	Contract Term	Other Remarks
Allegheny	To self generators as standby, supplemental or maintenance power			Not less than 1 yr.	Not a load retention rate and encourages rather than discourages self generation
Alliant (Minnesota Service Area)	To customers who have access to unregulated power suppliers	Minimum 2,000 KW	Not available to compete with a district heating utility and to a customer in which Alliant has a financial interest greater than 50%	Not less than 1 yr. & not more than 5 yrs.	May not be able to compete with a gas provider
Alliant (Wisconsin Svc Area)	Offers parallel generation rate to self generators	Minimum 20 KW			Not a load retention rate and encourage self generation
Ameren/CIPS	Only to applicants approved thru the earlier of 1/1/2001 or when the reserve margin falls below a certain level				Will not be available after retail choice
Baltimore Gas & Electric	Available thru 12-31-99	Minimum 5,000 KW			Customer may exit after retail choice is implemented
Central Maine Power	To leather tanning and finishing industry and sawmills with all electric saws to prevent from generation	Minimum 20 KW	Not available after 2/29/2000		Will not be available after retail choice
Commonwealth Edison	To prevent bypass		Will not be available if company has to add capacity. Not more than 25 contracts at this rate	Not to exceed 5 years	
Consumers Power	Special contract for large industrial customers	80 MW			Not a general rate tariff. Company bears the loss if any. Rate discount treatment has to be justified
El Paso Electric	For load retention	Minimum 1,500 KW		1 year minimum	
Hydro Quebec	For load retention or financial difficulties or to meet competition			12 to 24 months	
Northern Indiana Public Service Co.	To defer self generation	Minimum 500 KW		Maximum 5 years	
Ontario Hydro	To meet competition			Maximum 5 years	
PP&L	a) For economic development Rider for customers eligible before 12/31/1989 b) Competitive rate Rider to meet competition. No new application after 8/27/98	Minimum 500 KW	Terminate on January 1, 2010. Applies only once per customers		Interruptible service Interruptible service
PECO	To meet competition	Minimum 5,000 KW		Minimum 5 years	Allows to receive service from competitions
Southwestern California Edison	Economic Development Rate	Minimum 200 KW	Provides declining rate discounts for 5 years. Combined eligible load of 100 MW. Not available after March 31, 2000		Not available after retail choice

EXAMPLES OF PJM

PJM HOURLY ENERGY PRICES

July 05, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/5/1999	1600	0.9440	944.0000
7/5/1999	1700	0.9440	944.0000
7/5/1999	1800	0.8735	873.5000
7/5/1999	1900	0.7625	762.5000
7/5/1999	2000	0.6208	620.8300
7/5/1999	2100	0.5500	550.0000
7/5/1999	2200	0.6775	677.5000
7/5/1999	2300	0.0590	59.0000
7/5/1999	2400	0.0368	36.7900

July 06, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/6/1999	900	0.0575	57.4675
7/6/1999	1000	0.0799	79.9402
7/6/1999	1100	0.4774	477.3687
7/6/1999	1200	0.9200	920.0000
7/6/1999	1300	0.9200	920.0000
7/6/1999	1400	0.9200	920.0000
7/6/1999	1500	0.9200	920.0000
7/6/1999	1600	0.9200	920.0000
7/6/1999	1700	0.9200	920.0000
7/6/1999	1800	0.9200	920.0000
7/6/1999	1900	0.9200	920.0000
7/6/1999	2000	0.9083	908.3300
7/6/1999	2100	0.1967	196.6700
7/6/1999	2200	0.1656	165.6000
7/6/1999	2300	0.0583	58.2556

July 26, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/26/1999	1000	0.0510	51.0400
7/26/1999	1100	0.0745	74.4700
7/26/1999	1200	0.7567	756.6700
7/26/1999	1300	0.0308	30.7800
7/26/1999	1400	0.3108	310.8000
7/26/1999	1500	0.9196	919.5800
7/26/1999	1600	0.5633	563.3300
7/26/1999	1700	0.2208	220.8300
7/26/1999	1800	0.4042	404.1700
7/26/1999	1900	0.0667	66.7497
7/26/1999	2000	0.0617	61.6928

July 27, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/27/1999	1400	0.0841	84.1500

EXAMPLES OF PJM

PJM HOURLY ENERGY PRICES

7/27/1999	1500	0.6201	620.0800
7/27/1999	1600	0.9350	935.0000
7/27/1999	1700	0.9350	935.0000
7/27/1999	1800	0.9350	935.0000
7/27/1999	1900	0.8425	842.5000
7/27/1999	2000	0.6197	619.6700
7/27/1999	2100	0.0793	79.2500

July 28, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/28/1999	900	0.0487	48.7200
7/28/1999	1000	0.0669	66.8600
7/28/1999	1100	0.2039	203.8900
7/28/1999	1200	0.4500	450.0000
7/28/1999	1300	0.5425	542.5000
7/28/1999	1400	0.9350	935.0000
7/28/1999	1500	0.9350	935.0000
7/28/1999	1600	0.9350	935.0000
7/28/1999	1700	0.9350	935.0000
7/28/1999	1800	0.6079	607.9200
7/28/1999	1900	0.0930	92.9700
7/28/1999	2000	0.0767	76.7200
7/28/1999	2100	0.0993	99.2800
7/28/1999	2200	0.1030	103.0200
7/28/1999	2300	0.0430	43.0200

July 29, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/29/1999	1000	0.0280	28.0300
7/29/1999	1100	0.0507	50.6687
7/29/1999	1200	0.0375	37.4686
7/29/1999	1300	0.1966	196.5800
7/29/1999	1400	0.5708	570.8300
7/29/1999	1500	0.9194	919.4200
7/29/1999	1600	0.9985	998.5000
7/29/1999	1700	0.9990	999.0000
7/29/1999	1800	0.9990	999.0000
7/29/1999	1900	0.4074	407.4200
7/29/1999	2000	0.0655	65.4706
7/29/1999	2100	0.1015	101.4997
7/29/1999	2200	0.1313	131.3116
7/29/1999	2300	0.0567	56.6688

July 30, 1999

Date	Time (Hours)	Price, \$/kWh	Price, \$/MWh
7/30/1999	1000	0.0581	58.0900
7/30/1999	1100	0.2552	255.1900

EXAMPLES OF PJM

PJM HOURLY ENERGY PRICES

7/30/1999	1200	0.3200	320.0000
7/30/1999	1300	0.4539	453.9300
7/30/1999	1400	0.9985	998.5000
7/30/1999	1500	0.9990	999.0000
7/30/1999	1600	0.9990	999.0000
7/30/1999	1700	0.9990	999.0000
7/30/1999	1800	0.9793	979.3300
7/30/1999	1900	0.1718	171.7900
7/30/1999	2000	0.0748	74.7957
7/30/1999	2100	0.0660	65.9906
7/30/1999	2200	0.0649	64.9247

July 31, 1999

<u>Date</u>	<u>Time (Hours)</u>	<u>Price, \$/kWh</u>	<u>Price, \$/MWh</u>
7/31/1999	1200	0.0685	68.4752
7/31/1999	1300	0.0707	70.7271
7/31/1999	1400	0.1808	180.7743
7/31/1999	1500	0.4435	443.5296
7/31/1999	1600	0.2454	245.4441
7/31/1999	1700	0.4304	430.4200
7/31/1999	1800	0.2025	202.4700
7/31/1999	1900	0.0748	74.7705

NEPOOL HISTORICAL DATA
FOR THE MONTH OF NOVEMBER

YEAR	MON	DAY	HOUR	LOAD	DRY BULB	DEW POINT	OP4	ENERGY PR	TMSR PR	TMNSR PR	TMOR PR	AGC PR	OPCAP PR
99	11	1	1	9263	55.7	43.6	0	12.04	2.14	0.02	0.01	2.6	0
99	11	1	2	8954	52.6	43.5	0	14.87	1.81	0.02	0	2.6	0
99	11	1	3	8860	51.6	42.5	0	15.31	1.83	0.02	0.01	2.6	0
99	11	1	4	8899	49.2	41.4	0	15.58	1.93	0.02	0.01	2.6	0
99	11	1	5	9256	47.9	40.7	0	16.55	1.97	0.02	0.01	2.6	0
99	11	1	6	10541	46.6	40.3	0	22.73	8.44	0.04	0.02	2.6	0
99	11	1	7	12718	46.9	39.4	0	29.68	8.28	4	0.22	3.95	0
99	11	1	8	14134	51.2	39.1	0	28.64	5.51	4	0.12	4.9	0
99	11	1	9	14588	55.2	38.8	0	31.66	4.4	4	0.02	2.88	0
99	11	1	10	14811	58.8	37.1	0	33.64	4	4.09	0	2.93	0
99	11	1	11	15022	60.8	35.3	0	33.88	3.9	4.3	0	3.01	0
99	11	1	12	15052	62.1	34.4	0	35.02	4.32	4.41	0	3.01	0
99	11	1	13	14969	62.9	34.6	0	34.6	3.61	4.01	0	3.01	0
99	11	1	14	14935	63.3	33	0	33.84	3.59	4.06	0	2.88	0
99	11	1	15	14735	63.3	36.5	0	32.05	3.47	3.24	0	2.52	0
99	11	1	16	14648	61.5	37.9	0	29.2	3.56	3	0.04	2.88	0
99	11	1	17	15239	58.3	35.9	0	31.38	3.62	3.09	0.05	3	0
99	11	1	18	16659	56.2	36.8	0	44.08	4.53	6.52	3.23	3	0.61
99	11	1	19	16509	54.3	39.6	0	53.65	4.52	4.17	1.12	2.52	0.34
99	11	1	20	15864	52.2	42.5	0	30.99	3.9	4.26	0.36	4.9	0
99	11	1	21	15059	50.5	44.2	0	30	3.13	2.6	0.1	2.89	0
99	11	1	22	13765	49.6	44.7	0	19.3	3.98	2.99	0.01	2.89	0
99	11	1	23	12301	48.6	43.9	0	22.8	3.24	4.23	0	2.85	0
99	11	1	24	10984	48.3	44.7	0	20.3	2.6	0.1	0	2.6	0
99	11	2	1	10114	46.8	43.7	0	18.8	2.26	0.1	0	2.6	0
99	11	2	2	9707	46	43.5	0	17.01	1.94	0.1	0	2.32	0
99	11	2	3	9492	46.1	44	0	16.25	1.8	0.1	0	2.3	0
99	11	2	4	9479	45.5	43.6	0	16.2	1.97	0.1	0	2.3	0
99	11	2	5	9761	45.5	43.9	0	16.55	2.16	0.1	0	2.33	0
99	11	2	6	10912	47.2	42.1	0	17.82	2.6	0.1	0	2.42	0
99	11	2	7	13052	48.9	42.9	0	22.18	12.15	3.75	0	3.28	0
99	11	2	8	14416	51.2	44.7	0	22.18	5.12	3.99	0	4.9	0
99	11	2	9	14804	52.8	45.9	0	26.84	4.4	3.9	0	3.57	0
99	11	2	10	15069	54.9	47.2	0	27.62	3.79	3.4	0	3.01	0
99	11	2	11	15205	56	48.6	0	26.96	3.9	3.4	0	2.92	0
99	11	2	12	15285	58.1	49.5	0	26.97	3.8	4	0	2.52	0
99	11	2	13	15240	59.7	51	0	26.84	3.61	4	0	2.52	0
99	11	2	14	15241	60.9	54.5	0	27.15	3.59	3.29	0	2.52	0
99	11	2	15	15223	63.5	59.7	0	27.15	3.47	3.09	0	2.52	0
99	11	2	16	15437	63	60.2	0	29.01	3.56	3	0	2.77	0
99	11	2	17	16284	63.6	60.4	0	33.27	4.3	6.74	0	3.12	0.17
99	11	2	18	17156	64.2	60.8	0	42.85	13.17	77.28	0.01	3.76	1.13
99	11	2	19	16868	64.9	61.3	0	37.45	5.45	29.88	0	3.76	0.63
99	11	2	20	16206	65.3	61.6	0	32.24	3.55	3.93	0	4.9	0.17
99	11	2	21	15317	65.2	61.7	0	28.28	2.38	2.6	0	3.76	0
99	11	2	22	13899	64.9	61.6	0	15.12	3.83	2.6	0	3.31	0
99	11	2	23	12318	64.3	61.6	0	18.02	16.77	3.42	0	2.7	0

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CONTRACT	LAST	OPEN	HIGH	LOW	MOST RECENT SETTLE	CHG	OPEN INTEREST	PREVIOUS DAY'S TOTAL VOLUME	LAST UPDATED
NOV 1999	N/A	26.25	26.25	26.00	26.25*	0.25	0	0	01:57:12
DEC 1999	N/A	25.00	26.00	26.00	25.00*	-1.75	11	0	09:18:00
JAN 2000	N/A	29.40	29.00	29.00	29.40*	-1.10	40	0	09:17:50
FEB 2000	N/A	28.40	29.50	29.50	28.40*	-1.60	30	0	09:17:50
MAR 2000	N/A	27.00	26.50	26.50	27.00*	0.25	27	0	09:17:52
APR 2000	N/A	26.25	25.50	25.50	26.25*	1.25	32	0	09:17:54
MAY 2000	N/A	31.00	32.75	32.00	31.00*	0.00	50	0	09:17:54
JUN 2000	N/A	55.60	59.00	58.90	55.60*	-1.95	145	0	09:17:56
JUL 2000	N/A	93.00	80.00	80.00	93.00*	14.00	28	0	09:17:56
AUG 2000	N/A	83.00	86.00	86.00	83.00*	-3.00	35	0	09:17:56
SEP 2000	N/A	34.75	35.50	35.50	34.75*	-0.40	27	0	09:17:56
OCT 2000	N/A	27.00	24.00	24.00	27.00*	3.00	25	0	09:17:59
NOV 2000	N/A	26.00	26.00	26.00	26.00*	0.00	0	0	09:18:00
DEC 2000	N/A	27.00	27.00	27.00	27.00*	0.00	0	0	09:18:00
JAN 2001	N/A	32.00	32.00	32.00	32.00*	0.00	0	0	09:17:50
FEB 2001	N/A	31.00	31.00	31.00	31.00*	0.00	0	0	09:17:52

N/A: Not Available

+ Trading closed, settlement price unavailable.

* No recent trade activity. Data from date contract last traded.

Click on individual contract to view intraday chart
 All quotes delayed 30 min.

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Options Contract Prices

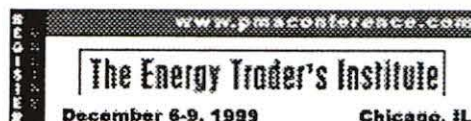
CONTRACT	LAST	OPEN	HIGH	LOW	MOST RECENT SETTLE	CHG	OPEN INTEREST	PREVIOUS DAY'S TOTAL VOLUME	LAST UPDATED
NOV 1999	N/A	23.80	23.80	23.75	23.77*	0.37	0	0	09:11:17
DEC 1999	N/A	20.70	20.70	20.70	20.70	-0.30	225	5	09:11:18
JAN 2000	26.50	26.50	26.50	26.50	N/A	0.00	103	0	12:30:10
FEB 2000	N/A	25.00	25.00	25.00	25.00*	0.25	78	0	10:54:40
MAR 2000	N/A	24.75	25.75	24.75	24.50*	0.25	0	0	09:11:11
APR 2000	N/A	25.00	25.00	25.00	24.50*	-0.25	10	0	09:11:11
MAY 2000	N/A	29.85	29.85	29.85	29.90*	0.00	7	0	09:47:27
JUN 2000	N/A	70.00	70.00	70.00	70.00*	0.25	69	0	10:50:14
JUL 2000	N/A	147.00	147.00	147.00	147.00*	-1.00	22	0	10:52:16
AUG 2000	N/A	95.00	95.00	95.00	125.00*	29.00	30	0	10:50:20
SEP 2000	N/A		33.50	33.50	33.50*	0.00	0	0	09:40:46
OCT 2000	N/A		23.50	23.50	24.00*	0.50	0	0	09:11:14
NOV 2000	N/A		24.50	24.50	25.00*	0.50	0	0	09:11:14
DEC 2000	N/A		25.00	25.00	26.00*	1.00	0	0	09:11:17
JAN 2001	N/A		31.00	31.00	31.00*	0.00	0	0	09:11:09
FEB 2001	N/A		28.70	28.70	29.00*	0.30	0	0	09:11:11

N/A: Not Available

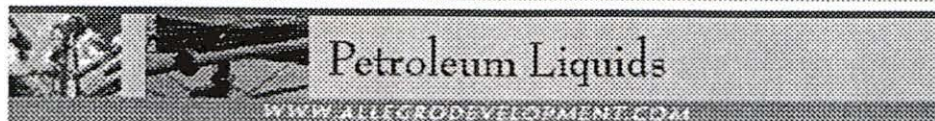
+ Trading closed, settlement price unavailable.

* No recent trade activity. Data from date contract last traded.

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Electricity Futures for Monday, November 29, 1999

Exchanges closed for the day

COB - NYMEX	Open	High	Low	Last	Change	Volume
December 99	0.0000	31.5000	30.9000	31.1500	-0.9600 ▼	264
January 2000	0.0000	28.5000	28.0000	28.2500	0.2500 ▲	33
6 month strip ave		25.9667	25.7833	25.8667	-0.0433 ▼	
12 month strip ave		32.4667	32.3750	32.4167	-0.1217 ▼	
PaloVerde - NYMEX	Open	High	Low	Last	Change	Volume
December 99	0.0000	27.8500	27.7500	27.7900	-0.2100 ▼	69
January 2000	0.0000	27.0000	26.0000	26.4000	0.2500 ▲	28
6 month strip ave		26.1583	25.9750	26.0483	0.2150 ▲	
12 month strip ave		35.1250	35.0333	35.0700	-0.0175 ▼	
Cinergy - NYMEX	Open	High	Low	Last	Change	Volume
December 99	0.0000	20.7000	20.7000	20.7000	-0.3000 ▼	5
January 2000	0.0000	26.5000	26.5000	26.5000	0.0000	2
6 month strip ave		23.9000	23.9000	25.1833	-0.0500 ▼	

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12 month strip ave	24.1400	24.1400	47.9667	-0.0250 ▼	
Entergy - NYMEX	Open	High	Low	Last	Change
December 99	0.0000	22.0500	22.0500	22.0500	0.0000
January 2000	0.0000	29.1500	29.1500	29.1500	0.0000
6 month strip ave	26.8333	26.8333	26.8333	0.0000	
12 month strip ave	46.2727	46.2727	48.2500	0.0000	
ComEd Hub - CBOT	Open	High	Low	Last	Change
December 99	0.0000	0.0000	0.0000	0.0000	0.0000
January 2000	0.0000	0.0000	0.0000	0.0000	0.0000
6 month strip ave	0.0000	0.0000	0.0000	0.0000	
12 month strip ave	0.0000	0.0000	0.0000	0.0000	
TVA - CBOT	Open	High	Low	Last	Change
December 99	0.0000	0.0000	0.0000	0.0000	0.0000
January 2000	0.0000	0.0000	0.0000	0.0000	0.0000
6 month strip ave	0.0000	0.0000	0.0000	0.0000	
12 month strip ave	0.0000	0.0000	0.0000	0.0000	
Twin Cit Peak - MGE	Open	High	Low	Last	Change
December 99	0.0000	24.0000	24.0000	24.0000	0.0000
January 2000	0.0000	29.5000	29.5000	29.5000	0.0000
6 month strip ave	25.5833	26.1250	26.1250	0.0000	
12 month strip ave	35.9444	26.1250	30.9000	10.0000 ▲	
Twin Cit Off - MGE	Open	High	Low	Last	Change
December 99	0.0000	0.0000	0.0000	0.0000	0.0000
January 2000	0.0000	0.0000	0.0000	0.0000	0.0000
6 month strip ave	0.0000	0.0000	0.0000	0.0000	
12 month strip ave	0.0000	0.0000	0.0000	0.0000	
PJM - NYMEX	Open	High	Low	Last	Change
December 99	0.0000	25.0000	25.0000	25.0000	-1.1000 ▼
January 2000	0.0000	29.4000	29.4000	29.4000	0.0000
6 month strip ave	27.2100	27.2100	27.8417	-0.1833 ▼	
12 month strip ave	41.4000	41.4000	40.5333	-0.0917 ▼	

* Averages are computed using the prompt month contract
plus the following five or eleven months respectively