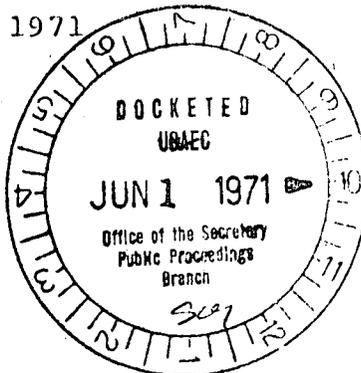


LAW OFFICES OF  
LEBOEUF, LAMB, LEIBY & MACRAE  
1821 JEFFERSON PLACE, N.W.  
WASHINGTON, D.C. 20036

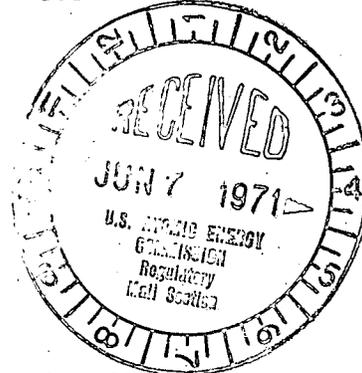
ARVIN E. UPTON  
EUGENE B. THOMAS, JR.  
LEONARD M. TROSTEN  
WASHINGTON PARTNERS

May 28, 1971

ONE CHASE MANHATTAN PLAZA  
NEW YORK, N.Y. 10005



WASHINGTON TELEPHONE:  
202 FEDERAL 8-0111



Anthony Z. Roisman, Esq.  
Berlin, Roisman & Kessler  
1910 N Street, N.W.  
Washington, D.C. 20036

Re: Indian Point No. 2  
Docket No. 50-247

Dear Mr. Roisman:

Attached hereto are the Applicant's answers to CCPE questions Sets G and J. All questions are answered except G 6 and 7 (which were ruled irrelevant by the Board's order of April 13, 1971) and J 3(b), 8, 9, 10, and 13. Applicant considers that the referenced Set J questions are also not within the purview of the Board's order.

In order to facilitate the process of answering these questions the Applicant has refrained from objecting to questions which in its view are, at best, peripherally relevant and material. Applicant reserves its rights to interpose objections to the offer into evidence of any of the answers supplied herewith depending upon the purpose for which the answers are offered.

In the event that the answers are introduced into evidence the sponsoring witnesses would be as follows:

Joseph A. Prestele

G 1

William J. Cahill, Jr.

G 8(a)  
G 9  
J 14

Arthur Hauspurg

G 2, 3, 4, and 5  
J 1, 2, 3(a), 4 (except (d)), 5, 6, 7, 11, and 12

8110230373 710528  
PDR ADOCK 05000247  
G PDR

John J. Grob, Jr.

G 8(b)  
G 4(d)

Very truly yours,

Howard M. Trosten

Attachment

cc: Samuel W. Jensch, Esq., w/enc.  
John C. Geyer, w/enc.  
R. B. Briggs, w/enc.  
Myron Karman, Esq., w/enc.  
J. Bruce MacDonald, Esq., w/enc.  
Louis J. Lefkowitz, w/enc.  
Algie A. Wells, Esq., w/enc.  
Secretary, USAEC, w/enc. (2)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

Indian Point Station, Unit No. 2

Docket No. 50-247

Applicant's Responses to Questions Submitted  
by the Citizens' Committee for the  
Protection of the Environment (Set J)

May 28, 1971

Question No. J-1

Question: Describe in detail the interconnection between the Con Ed system and other power systems. In particular indicate:

- a. the amount of power which Con Ed has contracted to give or receive;
- b. are the interconnections open or closed and indicate when and for how long;
- c. the transmission line capacity of the interconnecting lines;
- d. the time, if any when such interconnections are not available for Con Ed to receive power or when Con Ed must provide power. If there are grades of commitment with regard to Con Ed's obligation please describe the criteria applicable to these obligations; and
- e. under normal operation what power does Con Ed export and what power does Con Ed import from whom and what are the contractual relationships.

Answer: a. Con Edison has under negotiation purchases of 920 megawatts of Firm Power for the summer of 1971 as follows:

	<u>Megawatts</u>
Ontario Hydro (via Niagara Mohawk)	300
Rochester Gas & Electric Corporation	270
New York State Electric & Gas Corporation	150
Northeast Utilities	<u>200</u>
	<u>Total - 920</u>

Con Edison is negotiating to sell 390 Megawatts of off-peak power to Ontario Hydro (via Niagara Mohawk) to replace fuel used by Ontario in selling

to Con Edison the 300 Megawatts of on-peak capability shown in the above table. This obligation is incorporated in the terms of Con Edison's Firm Power Contract with Ontario in 1971.

b. The interconnections are operated closed.

c. The following are Con Edison's existing interties:

<u>Con Edison Station</u>	<u>Neighboring Utilities Station</u>	<u>No. of Circuits</u>	<u>Thermal Capacity MVA</u>
Pleasant Valley	New Scotland - Niagara Mohawk	2	1912
Pleasant Valley	Southington - Connecticut Light and Power	1	920
Pleasant Valley	Greenbush - Niagara Mohawk	2	240
Pleasant Valley	Unionville (via Milan) Niagara Mohawk	2	248
Pleasant Valley	Fishkill Plains - Central Hudson	1	125
Pleasant Valley	Manchester - Central Hudson	1	192
Pleasant Valley	Reynolds - Central Hudson	1	192
Buchanan	Lovett - Orange and Rockland	1	165
Jamaica	Valley Stream - LILCO	2	277
Goethals	Linden - Public Service Electric & Gas	1	562

d. These transmission interconnections are an integral part of the interconnected operating system and as such are available at all times to carry electric

power into and out of Con Edison's system. As to the grades of commitment for the purchase or sale of power for which Con Edison has contracted, see the answers to Part "e" of this question.

- e. In addition to the firm purchases of capacity such as are described in the answer to Part "a" of this question, Con Edison, as a member of the New York Power Pool, has agreed to purchase and sell Operating Capability and energy as set forth in the New York Power Pool agreement, a copy of which is attached hereto. That agreement, which is on file with both the Federal Power Commission and the New York State Public Service Commission, also provides that Con Edison can enter into contracts with others who are not parties to the agreement for the purchase or sale of emergency or economy interchanges or of operating capability and energy.

The Company has entered into such contracts with adjoining utility systems to provide for the interchange of power. These contracts are available for inspection at the Company's offices.

AGREEMENT made as of the 31st day of March, 1971, by and among CENTRAL HUDSON GAS & ELECTRIC CORPORATION ("Central Hudson"), CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. ("Edison"), LONG ISLAND LIGHTING COMPANY ("Long Island"), NEW YORK STATE ELECTRIC & GAS CORPORATION ("State"), NIAGARA MOHAWK POWER CORPORATION ("Niagara"), ORANGE AND ROCKLAND UTILITIES, INC. ("Rockland") and ROCHESTER GAS AND ELECTRIC CORPORATION ("Rochester"), all corporations organized under the laws of the State of New York, and the POWER AUTHORITY OF THE STATE OF NEW YORK ("PASNY"), a corporate municipal instrumentality of the State of New York;

WITNESSETH:

WHEREAS, the parties other than PASNY own and operate electric generating, transmission and distribution facilities and are engaged, among other things, in the business of producing and selling electric energy to other distributors of electric energy and to the general public in the State of New York; and

WHEREAS, PASNY owns and operates electric generating and transmission facilities and is engaged in the business of producing and selling electric energy to other distributors of electric energy and to industries in the State of New York; and

WHEREAS, the parties believe that substantial mutual benefits may be obtained through the coordinated operation of their electric systems, including increased reliability of service and reduced capital costs made possible by coordinated system planning, and reduced operating costs made possible by the interchange of electric energy for economy purposes; and

WHEREAS, the parties desire to achieve optimum coordination in the planning and operation of their electric systems and to provide a means whereby all parties may realize and share in the mutual benefits which can be obtained thereby; and

WHEREAS, the parties other than PASNY established the New York Power Pool ("Power Pool") by agreement made as of the 21st day of July, 1966; and

WHEREAS, the parties intend that said agreement shall be superseded by this Agreement; and

WHEREAS, PASNY desires to cooperate with the other parties hereto in the coordination of planning and operations but not to participate in transactions concerning the purchase and sale of electric generating capability and energy provided for hereunder; and

WHEREAS, the parties have established and staffed a Power Pool Power Control Center ("Control Center") facility located near Albany, New York, for the principal purposes of (1) coordinating the operations of the member companies of the Power Pool insofar as they may affect the reliability of the bulk power supply on the interconnected systems in New York State; (2) dispatching energy requirements on an economy basis; and (3) monitoring the internal and external operations of the Power Pool to insure unimpaired overall security of bulk power supply at all times;

Now, THEREFORE, in consideration of the premises and of the mutual covenants and agreements herein set forth, the parties hereto do hereby agree with each other, for themselves and for their successors and assigns, to operate the Power Pool in accordance herewith.

ARTICLE 1

DEFINITIONS

For the purpose of this Agreement, certain terms used herein are defined as follows:

SECTION 1.01. *Maximum One Hour Independent Net Load.* The Maximum One Hour Independent Net Load of any party for any period shall be the electric energy used to supply the load on that party's system during the clock hour when such usage is greatest in such period. Such usage

shall include electric energy delivered to or for the account of other utilities under firm load contracts (i.e., where the supplier is obligated to back up the load covered by the contract with reserve capability) but shall exclude:

(1) electric energy delivered within the amounts of generating capability sold to other utilities (including parties to this Agreement) under separate contracts, deliveries of emergency and economy energy, any other deliveries of electric energy to other utilities for other than firm load, and the internal system losses in connection with such deliveries;

(2) loads which are not supplied from the party's Net System Capability; and

(3) internal system losses incurred in the through transmission of energy for others.

SECTION 1.02. *Capability Period.* Capability Periods of approximately six months each are established, as follows: (1) From the last Sunday in April up to but not including the last Sunday in October; and (2) from the last Sunday in October up to but not including the last Sunday in April of the following year, or such other dates as may be determined by the Operating Committee.

SECTION 1.03. *Firm Capability.* Firm Capability, purchased or sold under separate contract is generating capability which has substantially the same availability to buyer as the buyer's own generating capability.

SECTION 1.04. *Net System Capability.* The Net System Capability of each party hereto in any Capability Period shall be the following:

(1) the dependable net maximum generating capability of installations on its own system; plus

(2) Firm Capability purchases and any reserve generating capability which is made available to the buyer by contract to back up such Firm Capability purchases; less

(3) Firm Capability sales and any reserve generating capability which is made available by the seller by contract to back up such Firm Capability sales.

SECTION 1.05. *Capability Margin.* The Capability Margin of each party hereto, expressed as a percentage of the Maximum One Hour Independent Net Load of such party, shall be the amount by which such party's Net System Capability exceeds its Maximum One Hour Independent Net Load in any Capability Period.

SECTION 1.06. *Required Capability Margin.* The Required Capability Margin for each party hereto, expressed as a percentage of the Maximum One Hour Independent Net Load of such party, shall be the Capability Margin set forth in Schedule A, attached hereto and made a part hereof, or such lesser percentage as may be determined under provisions of Section 6.02.

SECTION 1.07. *Pool Capability Margin.* The Pool Capability Margin, expressed in kilowatts, shall be the amount by which the aggregate of each party's Net System Capability exceeds the aggregate of each party's Maximum One Hour Independent Net Load in any Capability Period.

SECTION 1.08. *Required Pool Capability Margin.* The Required Pool Capability Margin, expressed in kilowatts, shall be the aggregate of the amounts, expressed in kilowatts, determined for each party hereto from the percentages set forth in Schedule A hereof, in any Capability Period.

SECTION 1.09. *Required System Capability.* The Required System Capability of each party hereto for any Capability Period shall be its Maximum One Hour Independent Net Load in such Capability Period multiplied by 1.0 plus its Required Capability Margin expressed as a decimal.

SECTION 1.10. *Surplus Capability.* The Surplus Capability of each party hereto in each Capability Period shall be the amount, if any, by which its Net System Capability exceeds its Required System Capability.

SECTION 1.11. *Capability Deficiency.* The Capability Deficiency of each party hereto in each Capability Period shall be the amount, if any, by which its Required System Capability exceeds its Net System Capability.

SECTION 1.12. *Executive Committee.* See Article 3.

SECTION 1.13. *Operating Committee.* See Article 4.

SECTION 1.14. *Planning Committee.* See Article 5.

SECTION 1.15. *Operating Capability.* The dependable net capability of generating equipment carrying load or ready to take load within time limits determined by the Operating Committee.

SECTION 1.16. *Operating Reserve Capability.* The excess of Operating Capability over load, and firm sales requirements, at any time.

SECTION 1.17. *Required Minimum Pool Operating Reserve Capability.* The minimum Operating Reserve Capability which must be provided on the interconnected systems of the parties hereto, as determined by the Operating Committee (see Section 4.07).

SECTION 1.18. *Required Minimum Operating Reserve Capability.* Each party's allocated share of Required Minimum Pool Operating Reserve Capability.

SECTION 1.19. *Operating Capability Requirements.* The amount of Operating Capability required to supply a party's load, firm sales and its Required Minimum Operating Reserve Capability.

SECTION 1.20. *Emergency Capability and Energy.* Operating Capability and Energy supplied from the seller's Operating Reserve Capability in excess of its load and firm commitments to others and purchased during periods when buyer experiences an outage and buyer has insufficient Operating Capability to supply its load and firm commitments to others. A buyer shall be entitled to Emergency Capability and Energy only for the period and under the conditions specified in Section 7.06 hereof.

SECTION 1.21. *Supplemental Capability.* Operating Capability, other than Firm Capability or Assured Economy Capability, required to meet Operating Capability Requirements.

SECTION 1.22. *Supplemental Energy.* Energy scheduled within the limits of Supplemental Capability purchased.

SECTION 1.23. *Assured Economy Capability.* Operating Capability purchased for a mutually agreed-upon period when, for economy purposes, the buyer withholds specified generating facilities from service or schedules less than maximum quantities of Operating Capability available under contracts in effect during such periods.

SECTION 1.24. *Assured Economy Energy.* Electric energy scheduled for an agreed-upon period within the limits of Assured Economy Capability purchased.

SECTION 1.25. *Economy Energy.* Electric Energy purchased on an hourly basis during periods when, for economy purposes, the buyer restricts the generation of energy from its Operating Capability or restricts the purchase of energy available under contracts in effect during such periods.

SECTION 1.26. *Buyer's Value for Energy.* The estimated decremental fuel and maintenance cost or purchased energy cost, adjusted for losses on the buyer's transmission system, which a buyer will avoid by restricting the generation of energy from its own Operating Capability or by restricting the

purchase of energy under contracts for the purchase of capability, and by purchasing instead the equivalent quantity of Assured Economy Energy or Economy Energy.

SECTION 1.27. *Buyer's Value for Operating Capability.* The estimated aggregate of all applicable costs, such as start-up and shut-down costs and hourly operating costs, including labor costs, which a buyer will avoid by withholding operable generating facilities from operation or by restricting the purchase of Operating Capability under contracts for the purchase of Firm Capability, and by purchasing instead the equivalent quantity of Assured Economy Capability hereunder.

SECTION 1.28. *Seller's Cost for Energy.* The estimated incremental fuel and maintenance cost or purchased energy cost, adjusted for losses on the seller's transmission system, which a seller incurs in order to generate energy or purchase energy for resale hereunder.

SECTION 1.29. *Seller's Cost for Operating Capability.* The estimated aggregate of all applicable additional costs, such as start-up and shut-down costs, and hourly operating costs, including labor costs, incurred by a seller to provide Operating Capability or to purchase from other than Pool members Operating Capability for resale.

SECTION 1.30. *Energy Savings.* The difference between Buyer's Value for Energy and Seller's Cost for Energy after both are adjusted for losses, if any, to the point of receipt on the buyer's system.

SECTION 1.31. *Operating Capability Savings.* The difference between Buyer's Value for Operating Capability and Seller's Cost for Operating Capability.

SECTION 1.32. *Party.* A signatory to this Agreement; provided, however, that PASNY shall be deemed a party hereto and shall assume all the rights and obligations of a party hereto only with respect to the provisions of Articles 3, 4 and 5 and with respect to such other provisions of this Agreement as expressly stated therein.

SECTION 1.33. *Intervening Party(ies).* Any party or parties whose transmission facilities are required by other parties hereto to accommodate any of the Operating Capability or energy transactions provided for under Article 7 hereof.

## ARTICLE 2

### SCOPE

SECTION 2.01. The parties, including PASNY, agree to coordinate the development and operation of their respective electric production and transmission facilities in order to obtain optimum reliability of service and efficiency upon the interconnected systems of the parties hereto.

SECTION 2.02. In accordance with the terms and conditions hereinafter specified, each party other than PASNY agrees to (1) provide and maintain Required System Capability and Operating Capability Requirements; (2) purchase and sell Firm Capability and transmit the energy associated therewith under separate contract with any of the other parties hereto upon mutually satisfactory terms and conditions; (3) purchase and sell Operating Capability and energy for the purposes and under the conditions set forth herein; and (4) make the capacity of its transmission facilities not otherwise committed available for transactions involving the purchase and sale of Operating Capability and energy.

PASNY will continue to sell Firm Capability and to transmit the energy associated therewith under its existing contracts and such future contracts as it may execute subject to terms and conditions satisfactory to all parties involved in such transactions. PASNY will not participate in Power Pool transactions involving the purchase and sale of Operating Capability and energy, but will make the

capacity of its transmission facilities not otherwise committed available to the other parties hereto under separate contract upon mutually satisfactory terms and conditions.

SECTION 2.03. In accordance with the terms and conditions hereinafter specified, each party, including PASNY, agrees to (1) coordinate the maintenance of its generating facilities with the maintenance schedules of all other parties hereto; and (2) coordinate its planning with that of the other parties hereto with respect to the nature, location, and date of installation of additional generating and interconnecting transmission facilities.

SECTION 2.04. Transactions involving sales of Operating Capability or energy, and the transmission of energy, shall be made with due recognition of each party's responsibility for the supply of its own load, as well as its cooperative responsibility to the Power Pool, as provided for hereinafter in Sections 7.01 and 7.05.

SECTION 2.05. Any party may enter into emergency and economy interchange arrangements with others who are not parties hereto with respect to the purchase or sale of Operating Capability and energy. The parties hereto may contract with each other or with others who are not parties hereto for the purchase or sale of generating capability to the extent that such contract may be performed without impairing the ability of any party hereto to fulfill its obligations under Articles 6 and 7 hereof.

SECTION 2.06. Articles 3, 4 and 5 hereof establish an Executive Committee, an Operating Committee, and a Planning Committee to permit the parties to effectively administer this Agreement. The unanimous affirmative vote or consent of all members of the Executive Committee, the Operating Committee, or the Planning Committee, as appropriate, other than the representatives of PASNY, shall be required to authorize any action, determination, or recommendation by such committees relating to transactions concerning the purchase and sale of electric generating capability and energy pursuant to Article 2, and Articles 6 through 11 of this Agreement. The unanimous affirmative vote or consent of all members of each committee shall be required to authorize any other action, determination or recommendation by such committee.

### ARTICLE 3

#### EXECUTIVE COMMITTEE

SECTION 3.01. The parties shall establish an Executive Committee to determine policy with respect to all matters within the scope of this Agreement and to arrange for the administering of this Agreement and the carrying out of its provisions. The Executive Committee shall provide for the coordination of the planning and operating functions of the members of the Power Pool in order that, to the greatest extent possible, such coordination will be directed to providing for the electric power needs of New York State as a whole.

SECTION 3.02. Each party to this Agreement shall designate a senior officer, and as an alternate, a second officer authorized to act on his behalf, to serve on the Executive Committee. The expenses of each member of the Executive Committee shall be borne by the party he represents. Subject to the provisions of Section 2.06, the unanimous affirmative vote or consent of all members of the Executive Committee shall be required to authorize any action or determination by such Committee.

SECTION 3.03. At its first meeting, the Executive Committee shall select from among its members a chairman and a vice chairman to serve for one year from such first meeting; and for each year thereafter the chairman shall be the member of the Committee who served as vice chairman during the preceding year, and the vice chairman shall be a member selected by the Committee. The Executive Committee shall meet at least quarterly and at such other times as the chairman may determine.

SECTION 3.04. The Executive Committee shall review and direct the activities of the Operating Committee and Planning Committee established hereunder. The Executive Committee shall arrange

for the services of an Executive Director of the Power Pool, a Power Pool Operating Manager and a Power Pool Planning Manager, and of sufficient clerical and technical staff and consultants to permit the Operating and Planning Committees to fulfill their responsibilities hereunder. The Executive Director shall act as liaison between the Executive Committee and the other Committees; shall attend committee meetings in a non-voting capacity; shall administer and coordinate the activities of the Operating and Planning Committees of the Power Pool and carry out such other duties as may be assigned by the Executive Committee. The Power Pool Operating Manager, under the direction of the Operating Committee, shall supervise the operation of the Control Center. The Power Pool Planning Manager, under the direction of the Planning Committee, shall supervise the electrical system planning work undertaken by the technical staff of the Power Pool.

SECTION 3.05. All expenses arising out of the administration of this Agreement, other than the expenses incurred by each member or alternate member of the Executive Committee, Operating Committee, or Planning Committee, shall be subject to the approval of the Executive Committee, in accordance with procedures to be established by the Executive Committee, and shall be allocated among the parties hereto in accordance with the formula for payment of carrying charges and expenses of the Control Center which may be in effect at the time such expenses are incurred.

SECTION 3.06. After consideration of the recommendations of the Operating Committee and the Planning Committee, the Executive Committee may amend the schedules attached hereto. The Chairman of the Executive Committee is hereby designated the agent of each of the parties hereto for the purpose of filing changes in, or supplements to, this Agreement with the Federal Power Commission or other regulatory agencies.

## ARTICLE 4

### OPERATING COMMITTEE

SECTION 4.01. The parties shall establish an Operating Committee to coordinate the operations of the parties hereunder. Each party shall designate a senior executive responsible for electric system operations and an alternate to serve on the Operating Committee. The expenses of each member of the Operating Committee shall be borne by the party he represents. Subject to the provisions of Section 2.06, the unanimous affirmative vote or consent of all members of the Operating Committee shall be required to authorize any action, determination or recommendation of such committee. If the Operating Committee is unable to reach unanimous agreement on any matter upon request of any member of the Operating Committee the matter shall be referred to the Executive Committee for settlement.

SECTION 4.02. The Operating Committee shall select members to act as chairman and vice chairman. The offices of chairman and vice chairman shall be changed annually in rotation among members of the Committee. Each year the vice chairman of the committee during the preceding year shall succeed to the chairmanship. The Operating Committee shall meet at regularly scheduled times and at such other times as the chairman may determine.

SECTION 4.03. The Operating Committee shall direct the activities of the Power Pool Operating Manager and shall establish such rules and practices as may be required to coordinate the operation of the bulk power supply systems of the parties hereto so as to insure reliability of service and economic operation. The Operating Committee may establish subcommittees and task forces as required to fulfill its responsibilities hereunder.

SECTION 4.04. The Operating Committee shall be responsible for modifications to, maintenance, and operation of the physical facilities at the Control Center.

SECTION 4.05. The Operating Committee shall formulate uniform standards and procedures for the determination of costs used as the basis of transactions hereunder.

SECTION 4.06. The Operating Committee shall establish coordinated maintenance schedules for the Power Pool.

SECTION 4.07. The Operating Committee in consultation with the Planning Committee shall determine the Required Minimum Pool Operating Reserve Capability to be operated within the Power Pool and shall establish methods of allocating a portion thereof to each individual party as Required Minimum Operating Reserve Capability.

SECTION 4.08. The Operating Committee shall review the Required Capability Margin of the parties hereto periodically in cooperation with the Planning Committee, and if experience or the results of studies indicate the desirability of change, shall recommend changes thereto to the Executive Committee.

SECTION 4.09. The Operating Committee through its Chairman shall submit regular reports of its activities to the Executive Committee, the Executive Director, and the Planning Committee. The Executive Committee may modify or reject any action, determination, or recommendation of the Operating Committee.

## ARTICLE 5

### PLANNING COMMITTEE

SECTION 5.01. The parties shall establish a Planning Committee to coordinate and develop plans for the installation of additional generating capability and interconnecting transmission facilities within the Power Pool. The Planning Committee shall coordinate planning between the Power Pool and adjoining Pools and with other regional power coordinating agencies to the extent appropriate. The Planning Committee shall also direct the activities of the Power Pool Planning Manager.

SECTION 5.02. Each party shall designate a senior executive responsible for electric system planning and an alternate to serve on the Planning Committee. The expenses of each member of the Planning Committee shall be borne by the party he represents. Subject to the provisions of Section 2.06, the unanimous affirmative vote or consent of all members of the Planning Committee shall be required to authorize any action, determination or recommendation of such committee. If the Planning Committee is unable to reach unanimous agreement on any matter, upon request of any member of the Planning Committee, the matter shall be referred to the Executive Committee for settlement.

SECTION 5.03. The Planning Committee shall select members to act as chairman and vice chairman. The offices of chairman and vice chairman shall be changed annually in rotation among the members of the committee. Each year the vice chairman of the committee during the preceding year shall succeed to the chairmanship. The Planning Committee shall meet at regularly scheduled times and at such other times as the chairman may determine.

SECTION 5.04. The Planning Committee shall study the need for additional generating and transmission facilities to best implement the purposes of the Power Pool and shall submit regular reports thereon to the Executive Committee, the Executive Director, and the Operating Committee. These studies, which shall be made in consultation with the Operating Committee, will include such transmission network studies of the systems of the parties hereto as may be required to determine the need for and the best location of additional generating equipment and transmission facilities, additional interconnections with other electric systems, and any other matters of a similar or related nature which will aid in achieving the purposes of this Agreement.

SECTION 5.05. The parties hereto shall furnish the Planning Committee system load and capability forecasts, statistical data, and any other information which may reasonably be required in the course of the studies undertaken by the committee.

SECTION 5.05. If the Planning Committee determines that a need exists within the Power Pool for the installation of additional generating or transmission facilities, the committee shall report its recommendations with respect thereto to the Executive Committee, the Executive Director, and the Operating Committee.

SECTION 5.07. The Planning Committee, in consultation with the Operating Committee, shall review the Required Capability Margin of the parties hereto periodically, and, if experience or the results of studies indicate the desirability of change, shall recommend changes thereto to the Executive Committee and the Executive Director. The Planning Committee in consultation with the Operating Committee shall also examine and review the Net System Capability of the parties hereto, the adequacy of system interconnections, and the load forecasts of the parties, and recommend to the Executive Committee and the Executive Director such action as it considers desirable.

## ARTICLE 6 INSTALLED CAPABILITY

SECTION 6.01. Prior to the commencement of each Capability Period, each party hereto shall estimate its Required System Capability for the ensuing Capability Period and shall provide and maintain a Net System Capability at least equal to such estimated Required System Capability throughout the ensuing Capability Period.

SECTION 6.02. If, in any Capability Period, the Pool Capability Margin is less than the Required Pool Capability Margin, the Required Capability Margin of each of the parties hereto shall be reduced proportionately in the ratio of the Pool Capability Margin to the Required Pool Capability Margin.

SECTION 6.03. At the end of each Capability Period after the effective date hereof, the Maximum One Hour Independent Net Load actually experienced by each party hereto during the preceding Capability Period, the Required Capability Margin, and the Net System Capability of each party hereto, adjusted, if appropriate, pursuant to Section 6.04 hereof, shall be used to determine the actual Required System Capability and the Surplus Capability or Capability Deficiency of each party during the preceding Capability Period.

SECTION 6.04. In the event the generating capability available to a party changes during a Capability Period due to a change in the capability of generating installations on its own system or on another system from which it is purchasing Firm Capability, the party's Net System Capability shall reflect the change as of the nearest first day of the month to the actual date upon which the change occurs. If the change occurs on the sixteenth day of a thirty-one day month, the adjustment shall become effective as of the first day of the month in which the change occurs.

A party changing its Net System Capability during a Capability Period shall have its Required System Capability determined as follows:

(1) For the months of the Capability Period prior to a change in Net System Capability, a party's Required System Capability shall be determined on the basis of its Maximum One Hour Independent Net Load experienced in those months.

(2) For the months of the Capability Period after a change in Net System Capability, a party's Required System Capability shall be determined on the basis of its Maximum One Hour Independent Net Load experienced in those months.

SECTION 6.05. In the event of an extended outage of generating equipment or directly related equipment due to any of the circumstances stated in Article 12 hereof, the following shall obtain:

(1) If it is determined that the generating equipment subject to such outage is repairable, and if the person or persons owning such equipment proceeds with due diligence to effect the repairs necessary to restore such equipment to service, the capability of the generating equipment subject

to such outage shall continue to be included, without diminution, as a component of a party's Net System Capability pending restoration of such equipment to service. The Net System Capability of other parties purchasing capability from the party sustaining such outage shall not be subject to adjustment.

(2) Notwithstanding the provisions of Article 12, if it is determined that the generating equipment subject to such outage is damaged beyond repair, the capability of such equipment shall be deemed to be unavailable to any party for any purpose from and after the first day of the month in which such determination is made, and the obligations of the parties hereto shall be redetermined to reflect such determination.

(3) The determination of whether or not generating equipment is repairable shall be made by the person or persons owning such equipment.

## ARTICLE 7

### OPERATING CAPABILITY AND ENERGY

SECTION 7.01. Control Center personnel shall schedule pursuant to information supplied by the parties and dispatch Operating Capability and energy to meet the Power Pool load and operating reserve requirements in a reliable and economical manner.

SECTION 7.02. Control Center personnel shall coordinate the operation of the Power Pool with other systems or pools.

SECTION 7.03. The Required Minimum Operating Reserve Capability to be operated by each party hereto shall be determined by the Control Center personnel in accordance with the method of allocating Required Minimum Pool Operating Reserve Capability established by the Operating Committee.

SECTION 7.04. Each party agrees to provide either from its own resources or through purchase from others its Required Minimum Operating Reserve Capability.

SECTION 7.05. All transactions for the purchase or sale of Operating Capability or energy hereunder shall be scheduled by Control Center personnel, acting within the limits of the rules, practices and procedures established by the Operating Committee.

SECTION 7.06. Any party, when called upon to do so, subject to the provisions of Section 2.04, shall supply Emergency Capability and Energy to any other party requesting such service. Such service shall be billed as Emergency Capability and Energy to the extent that the following conditions are met:

(1) buyer's schedule for the day has provided for sufficient Operating Capability to meet its Operating Capability Requirements.

(2) the period of such purchase shall be limited to the time required for buyer expeditiously to start additional generation on its own system, to schedule Firm Capability to which it is entitled by contract or to purchase Supplemental Capability.

To the extent that the foregoing conditions are not met, the service rendered shall be billed as Supplemental Capability and Energy.

SECTION 7.07. Subject to the provisions of Section 2.04, any party, when called upon to do so, shall supply Supplemental Capability, if available, to any other party requesting such service. Supplemental Capability is not to be purchased to avoid Capability Deficiency payments.

SECTION 7.08. The purchase of Supplemental Capability or of Assured Economy Capability shall entitle the buyer to schedule receipt of all or any part of the energy associated therewith, for the period

of the capability purchase, in maximum hourly quantities not exceeding the quantity of such capability purchased. Subject to the provisions of Section 2.01, service shall not be terminated during such period without the buyer's consent.

SECTION 7.09. Supplemental Capability or Assured Economy Capability sold hereunder shall be provided by the seller in addition to the seller's own Operating Capability Requirements.

SECTION 7.10. No party shall at any time remove capability from service for scheduled maintenance purposes unless the Operating Capability available to it from its own or purchased generating sources, is, for the expected duration of the outage, sufficient to carry its Operating Capability Requirements.

SECTION 7.11. In order to facilitate the coordinated, economic operation of the generating equipment of the parties hereto, generating equipment shall be withdrawn from service for maintenance in accordance with schedules established by the Operating Committee.

SECTION 7.12. All electric energy purchased and sold hereunder shall be three-phase, 60 cycle, alternating current. Suitable equipment for controlling frequency and inter-company tie-line loading shall be provided and maintained by each of the parties hereto. The parties agree to operate such equipment in a manner consistent with the coordinated intersystem operation which is the objective of this Agreement.

SECTION 7.13. Each party will endeavor to control the flow of reactive kilovolt-amperes upon its system so as not to affect adversely the systems of the other parties hereto.

## ARTICLE 8

### CHARGES

SECTION 8.01. Each party incurring a Capability Deficiency in any Capability Period shall pay the parties having Surplus Capability during such Capability Period their proportional share of the Capability Deficiency Charge specified in Schedule B, attached hereto and made a part hereof. Payments shall be apportioned among the parties having Surplus Capability in proportion to each party's contribution to the total Surplus Capability available.

In the event that a party increases or decreases its Net System Capability during a Capability Period, the extent to which parties having Capability Deficiencies are obligated to make Capability Deficiency payments and the allocation of Capability Deficiency payments to parties having Surplus Capability shall then be determined from the Capability Deficiencies and Surplus Capabilities of each party during the months of the Capability Period prior to and following the change in Net System Capability.

SECTION 8.02. *Emergency Capability and Energy* purchased hereunder shall be paid for on the basis of scheduled deliveries at the aggregate of Seller's Cost for Operating Capability and Energy, as defined in Sections 1.29 and 1.28, plus ten per cent. The buyer shall compensate any Intervening Party for losses incurred.

SECTION 8.03. *Supplemental Capability and Supplemental Energy* purchased hereunder shall be paid for at the rates set forth in Schedule C-1, attached hereto and made a part hereof. The buyer shall compensate each Intervening Party for losses incurred and shall pay each Intervening Party the transmission facility charge set forth in Schedule C-2, attached hereto and made a part hereof.

SECTION 8.04. *Supplemental Capability Without Energy* purchased hereunder shall be paid for at the rate set forth in Schedule C-3, attached hereto and made a part hereof. The buyer shall pay each Intervening Party the transmission facility charge set forth in Schedule C-2.

Section 8.05. *Assured Economy Capability* purchased hereunder shall be paid for on the basis of scheduled deliveries as follows:

(1) The buyer shall pay the seller Seller's Cost for Operating Capability plus the seller's share of the Operating Capability Savings resulting from such purchase.

(2) The buyer and seller shall each receive one-half of the Operating Capability Savings resulting from the purchase of Assured Economy Capability unless one or more Intervening Parties participate in the transaction, in which event the buyer and seller shall each receive one-third of the Operating Capability Savings and the Intervening Party or Parties, collectively, shall receive one-third.

(3) When Assured Economy Capability is purchased or sold on a share-the-savings basis from or to a source outside the Power Pool, one-half of the share of the savings accruing to the parties within the Power Pool shall be retained by the buyer or seller and the remainder divided equally among the Intervening Parties within the Power Pool participating in the transaction.

(4) The buyer shall make payment directly to the seller and to any Intervening Party, unless the seller is a source outside the Power Pool, in which event payment for capability and the seller's and Intervening Party's share of the savings shall be made to the party directly interconnected with the source outside the Power Pool.

Section 8.06. *Assured Economy Energy* purchased hereunder shall be paid for on the basis of scheduled deliveries at the following rates:

(1) The buyer shall pay the seller Seller's Cost for Energy plus the seller's share of the Energy Savings resulting from the purchase.

(2) If Assured Economy Energy is delivered to a buyer over the transmission system of an Intervening Party, the buyer shall pay such Intervening Party the Intervening Party's share of the Energy Savings resulting from the transaction plus losses attributable to transmission over the Intervening Party's system.

(3) The buyer and seller shall each receive one-half of the Energy Savings resulting from the purchase of Assured Economy Energy unless one or more Intervening Parties participate in the transaction, in which event the buyer and seller shall each receive one-third of the Energy Savings and the Intervening Party or Parties, collectively, shall receive one-third.

(4) When Assured Economy Energy is purchased or sold on a share-the-savings basis from or to a source outside the Power Pool, one-half of the share of the savings accruing to parties within the Power Pool shall be retained by the buyer or seller and the remainder divided equally among the Intervening Parties within the Power Pool participating in the transaction.

(5) The buyer shall make payment directly to the seller and to any Intervening Party, unless the seller is a source outside the Power Pool, in which event payment for energy and the seller's and the Intervening Party's share of the savings shall be made to the party directly interconnected with the source outside the Power Pool.

Section 8.07. *Economy Energy* purchased hereunder shall be paid for on the basis of scheduled deliveries at the following rates:

(1) The buyer shall pay the seller Seller's Cost for Energy plus the seller's share of the Energy Savings resulting from the purchase.

(2) If Economy Energy is delivered to a buyer over the transmission system of an Intervening Party, the buyer shall pay such Intervening Party the Intervening Party's share of the Energy Savings resulting from the transaction, plus losses attributable to transmission over the Intervening Party's system.

(3) The buyer and seller shall each receive one-half of the Energy Savings resulting from the purchase of Economy Energy unless one or more Intervening Parties participate in the transaction, in which event the buyer and seller shall each receive one-third of the Energy Savings and the Intervening Party or Parties, collectively, shall receive one-third.

(4) When Economy Energy is purchased or sold on a share-the-savings basis from or to a source outside the Power Pool, one-half of the share of the savings accruing to parties within the Power Pool shall be retained by the buyer or seller and the remainder divided equally among the Intervening Parties within the Power Pool participating in such transaction.

(5) The buyer shall make payment directly to the seller and to any Intervening Party, unless the seller is a source outside the Power Pool, in which event payment for energy and the seller's and Intervening Party's share of the savings shall be made to the party directly interconnected with the source outside the Power Pool.

SECTION 8.08. Any energy inadvertently interchanged (that is, the difference between net energy import or export as scheduled and as metered) shall be returned to the supplying parties by the receiving parties as soon as practicable after receipt under load conditions reasonably equivalent to those under which it was received and in such quantities and at such times as may be mutually agreeable.

## ARTICLE 9

### INTERCOMPANY BILLING

SECTION 9.01. The Control Center personnel shall collect, prepare and disseminate all data required for billing for Operating Capability and Energy transactions hereunder.

SECTION 9.02. Bills for transactions hereunder shall be rendered by the party providing service as soon as practicable after the first day, but not later than the twentieth day of each calendar month. Payment of the amount so billed shall be made within ten days after presentation of the bills.

SECTION 9.03. Billing data upon which Capability Deficiency charges are based together with a summary of payment due after each Capability Period to each party having Surplus Capability in any Capability Period shall be prepared by the Control Center personnel in conjunction with the Operating Committee and furnished to each party hereto as soon as practicable after the end of each Capability Period. Bills based upon such data shall be rendered by parties having Surplus Capability not later than the twentieth day of the month following the end of the Capability Period in question. Payment of amounts so billed shall be made within ten days after presentation of the bill.

SECTION 9.04. Billing for all energy transactions shall be based upon scheduled deliveries. The subdivision of the net import or export of energy into the various classifications of energy utilized hereunder shall be determined as the algebraic summation of the hourly amounts of each of the various classifications of energy scheduled for purchase or sale by each party.

## ARTICLE 10

### POINTS OF DELIVERY AND METERING

SECTION 10.01. Electric energy will be delivered and received at the several points of interconnection between the systems of the parties hereto and at such other points of interconnection as may from time to time be established. Appropriate metering devices shall be installed as required to measure the energy flow at each point of interconnection.

SECTION 10.02. All metering equipment used to record transactions hereunder shall be read and maintained by the respective owners thereof. Procedures with respect to maintenance, testing, calibration, correction and registration records, and presumed tolerances of all metering equipment shall be in

adequacy with good operating practice and with standards which may be established by the Operating Committee.

## ARTICLE 11

### Records

Each party hereto and the Control Center shall keep complete and accurate records, meter readings, and memoranda of its operations hereunder and shall maintain such data as may be necessary to determine with reasonable accuracy any item required to be estimated hereunder. The Executive Committee, the Operating Committee, the Planning Committee and the Control Center personnel shall have the right to call for and examine all such records, meter readings and memoranda insofar as may be necessary for the purpose of ascertaining the reasonableness and accuracy of any estimates or statements of costs relating to transactions hereunder.

## ARTICLE 12

### UNCONTROLLABLE FORCES

A party hereto shall not be considered to be in default in respect of any obligation hereunder if prevented from fulfilling such obligation by reason of storm, flood, lightning, earthquake, fire, explosion, equipment failure, civil disturbance, labor dispute, act of God or the public enemy, restraint by a court or other public authority, negligence on the part of any employee, servant or agent, or any cause beyond the control of the party affected. Any party unable to fulfill its obligations by reason of any of the foregoing shall exercise due diligence to remove the disability incurred.

## ARTICLE 13

### LIABILITY

Each party agrees that it will indemnify, protect, and save the other parties harmless from and against any and all loss or liability for or on account of any injury (including death) or damage to any person or property, due to the negligence or misconduct of itself or any of its officers, agents or employees in or about the performance of this Agreement.

## ARTICLE 14

### WAIVER

Any waiver at any time of the rights of any party as to any default on the part of any other party or parties to this Agreement or as to any other matter arising hereunder shall not be deemed a waiver as to any default or other matter subsequently occurring.

## ARTICLE 15

### ASSIGNMENT

The written consent of all other parties hereto shall be required to effect an assignment of the rights or obligations of any party to this Agreement, including PASNY.

## ARTICLE 16

### EFFECTIVE DATE AND TERMINATION

SECTION 16.01. This Agreement shall become effective as of the date it is accepted for filing as a rate schedule by the Federal Power Commission, and it shall continue in effect until terminated as of the close of any Capability Period by the unanimous agreement of all persons then parties hereto.

Section 16.02. Any party, including PASNY, may withdraw from this Agreement effective as of the close of any Capability Period upon three years written notice to each other party; provided, however, that any party submitting notice of intent to withdraw shall be obligated to pay its allocated share of the administrative expenses of the Pool for the full calendar year within which such termination shall become effective.

#### ARTICLE 17

##### SUPERSESSION OF PRIOR AGREEMENTS

The agreement among the parties hereto other than PASNY dated July 21, 1966, which established the Power Pool, and the correspondence between PASNY and the Power Pool dated October 11, 1967 pursuant to which PASNY agreed to participate in Power Pool Committee activities, are superseded in their entirety by this Agreement.

#### ARTICLE 18

##### SHORT TITLE

This Agreement shall be known as the New York Power Pool Agreement.

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed in its corporate name by its proper officers, and its corporate seal to be affixed hereunto, as of the day and year first above written.

CENTRAL HUDSON GAS & ELECTRIC CORPORATION

[SEAL]

By ..... JOHN WILKIE .....  
Chairman

Attest:

..... JOSEPH F. FURLONG .....

Secretary

CONSOLIDATED EDISON COMPANY OF NEW YORK,  
INC.

[SEAL]

By ..... LOUIS H. RODDIS .....  
President

Attest:

..... CLIFFORD G. SOMMER .....

Assistant Secretary

LONG ISLAND LIGHTING COMPANY

[SEAL]

By ..... EDWARD C. DUFFY .....  
President

Attest:

..... KATHLEEN M. BROWN .....

Assistant Secretary

NEW YORK STATE ELECTRIC & GAS CORPORATION

By WILLIAM A. LYONS  
President

[SEAL]

Attest:

DOLORIS R. HIX  
Asst. Secretary

NIAGARA MOHAWK POWER CORPORATION

By JAMES A. O'NEILL  
President

[SEAL]

Attest:

JOHN G. BENACK  
Secretary

ORANGE AND ROCKLAND UTILITIES, INC.

By DEAN B. SEIFRIED  
President

[SEAL]

Attest:

HENRY C. PETERSON  
Asst. Secretary

ROCHESTER GAS AND ELECTRIC CORPORATION

By FRANCIS E. DRAKE, JR.  
Chairman

[SEAL]

Attest:

FRANCIS A. SULLIVAN, JR.  
Assistant Secretary

POWER AUTHORITY OF THE STATE OF NEW YORK

By W. S. CHAPIN  
General Manager

[SEAL]

Attest:

INES GRAHAM  
Assistant Secretary

SCHEDULE A

REQUIRED CAPABILITY MARGIN

Initially, the Required Capability Margin of the parties hereto shall be as follows:

Central Hudson Gas & Electric Corporation .....	14%
Consolidated Edison Company of New York, Inc. ....	14%
Long Island Lighting Company .....	14%
Orange and Rockland Utilities, Inc. ....	14%
New York State Electric & Gas Corporation .....	12%
Niagara Mohawk Power Corporation .....	12%
Rochester Gas and Electric Corporation .....	12%

SCHEDULE B

CAPABILITY DEFICIENCY CHARGE

The Capability Deficiency charge payable under Section 8.01 of this Agreement by any party incurring a Capability Deficiency in any Capability Period shall be \$7.00 per kilowatt per Capability Period.

SCHEDULE C-1

SUPPLEMENTAL CAPABILITY AND  
SUPPLEMENTAL ENERGY

Supplemental Capability and Supplemental Energy purchased hereunder shall be paid for as follows: (1) at a combined rate of \$20 per megawatt of capability per day, based upon the maximum quantity of capability scheduled each day, and 5 mills per kilowatt hour of energy scheduled for delivery at the point where the energy leaves the seller's system; or (2) at a combined rate of Seller's Cost for Operating Capability and Energy, plus ten per cent, for the capability and energy scheduled each day, whichever is greater.

SCHEDULE C-2

INTERVENING PARTY TRANSMISSION FACILITY CHARGE

The transmission facility charge payable under Section 8.03 and 8.04 of this Agreement shall be determined as follows:

(1) five per cent. of the charges set forth in Schedule C-1 or Schedule C-3 when the Intervening Party is Central Hudson, Long Island, State, Rochester or Rockland; and

(2) five per cent. of the charges set forth in Schedule C-1 or Schedule C-3 when the Intervening Party is Niagara and its transmission facilities are used for the benefit of Rochester and State; and

(3) five per cent. of the charges set forth in Schedule C-1 or Schedule C-3 when the Intervening Party is Edison and only its overhead transmission facilities are used; and

(4) ten per cent. of the charges set forth in Schedule C-1 or Schedule C-3 when the Intervening Party is Edison and its underground transmission facilities are used; and

(5) ten per cent. of the charges set forth in Schedule C-1 or Schedule C-3 when the Intervening Party is Niagara and its transmission facilities are used in connection with transactions other than those specified in paragraph (2) above.

SCHEDULE C-3

SUPPLEMENTAL CAPABILITY WITHOUT ENERGY

Supplemental Capability Without Energy purchased hereunder shall be paid for at the rate of \$20 per megawatt per day based upon the maximum quantity of capability scheduled, or at Seller's Cost for Operating Capability plus ten per cent, whichever is greater.

Question: What facility limitations prevent or restrict the receipt of power from outside the Con Ed system? With respect to this question indicate:

- a. whether during any brown-out or other reduction of power in the last 5 years by Con Ed there has been outside power available which Con Ed has been unable to receive. If such instances exist describe in detail with respect to each instance the amount of power offered, the amount of power needed to avoid the brown-out or power reduction, the reason for Con Ed's refusal to accept the power; and
- b. the nature and extent of any contracts for stand-by reserve power (if not discussed in the answer to Question 1) from TVA, Canada, New England or other systems.

Answer: Limitations on the receipt of power:

Limitations on the receipt of power fall into three categories; allowable system voltages and line and equipment loadings prior to a disturbance, the stability of the interconnected power system when subjected to a disturbance and allowable system voltages and line and equipment loadings after a disturbance.

In general, a transmission interface is defined as a group of lines which connect a receiving system to a sending system. Using analysis techniques consistent with the three categories listed above, a transmission limit is defined for the interface. For a particular interface, the amount of power that can be transmitted is equal to the transmission limit less any base loading on the interface circuits.

The ability of Con Edison to purchase power from other companies is primarily limited by the total east interface. This interface consists of the ties connecting Eastern New York and New England to the bulk power transmission system in the West and includes the Linden-Goethals intertie. In addition, another interface that could limit the receipt of power by Con Edison consists of the 345 Kv and 138 Kv lines between Pleasant Valley and Millwood. The flow across this interface is limited to 1,000 Mw under normal conditions to protect the 138 Kv lines from severe overloads following the loss of the two 345 Kv lines.

- a. During the last five years, there were a number of instances when facility limitations restricted the receipt of power from outside the Con Edison system. These limitations involved both the cross-state transmission in Upstate New York and the interconnection with the PJM system at Goethals. Had additional transmission capacity into Con Edison been available, i.e., the Southern Tier circuits, the number of instances would have been significantly reduced. During the last five years, transmission limitations could have prevented the purchase of emergency power during periods of voltage reduction on the Con Edison system several times. A specific instance

where capacity which had been contracted for was unavailable because of transmission limitations occurred in 1970. Approximately 75 mw of power were made available through negotiations with aluminum companies in the Niagara Mohawk Corporation's service area. This power could not be delivered to Con Edison due to transmission system limitations. The proposed Southern Tier transmission line would have permitted the receipt of this power and would have limited the number of brownouts during the summer of 1970.

- b. See the answer to Question J-1e.

Question: With respect to Con Ed's load growth estimates (Question G-3) answer the following:

- a. What were the specific projections for growth of residential, industrial and commercial uses and what facts and studies were these projections based upon. Please attach copies. If the projections included any single developments which would increase demand by more than 1% of the then peak load identify the development (i.e., the commercial industrial or residential user), the date such demand would begin and the facts upon which Con Ed relied in including the projection; and

Answer: a. At the time the decision was made to construct Indian Point Unit No. 2, the load growth estimate of Con Edison subdivided between non-weather sensitive and weather sensitive load, was as follows:

Year	Peak Load Estimate - MW		Total
	Non-Weather Sensitive	Weather Sensitive	
1965	3900	2150	6050
1966	4000	2275	6275
1967	4150	2400	6550
1968	4325	2525	6850
1969	4500	2650	7150
1970	4675	2775	7450
1971	4850	2900	7750
1972	5025	3025	8050
1973	5200	3150	8350
1974	5375	3275	8650
1975	5550	3400	8950
1976	5725	3525	9250

Con Edison's peak load projections are not made on a class of customer basis. Rather, the basic load subdivisions on which projections are made, and which have proved to be satisfactory, are the non-weather sensitive and weather sensitive components.

However, in making projections on this basis, a number of factors are considered. These factors consist primarily of the Company's own load, sendout, sales and customer trends and analyses of the factors underlying them, and additional information of a local nature which can be properly analyzed. The latter relates primarily to such items as population, construction, city planning activities and equipment sales. Projections developed from these data may then be tempered to some extent by the past and projected statistics of governmental and private organizations engaged in analyzing the economy of the country. As an example of this, the load estimate for 1965, shown in the above table, included 30 Megawatts for the anticipated demand of the New York World's Fair.

Question: With respect to Con Ed's finally adopted power system of which Indian Point No. 2 is a part describe in detail and attach a copy of the analysis of the system response under transient conditions caused by short circuits, switching in and out of service of various facilities, transmission line openings and the sudden loss of generation or loss of load. With respect to this question explain in substantial detail:

- a. The manner in which the operation of Indian Point No. 2 affects the transient stability of the system under the conditions referred to above. In particular how does the operation of Indian Point No. 2 when it is not connected to the load frequency control system (Answer B-11) and when it is connected with the load frequency control system (Con Ed's Summary of Application (pp. 19-20)) affect this transient stability:
- b. Describe how it is possible to avoid severe instability in the system where trips of other non-nuclear reactors substantially increases or decreases the load on the Con Ed system and where Indian Point No. 2 must be adjusted manually to this condition. Where the trip occurs in 2 . 10 seconds, 30 seconds, 1 minute, 5 minutes and results in a substantial power surge into Con Ed's system or a substantial loss of power from the system. With respect to this question, discuss the change in phase, frequency, cycle, pulsation of alternating current and generator speed of any generating facilities on the system and Indian Point No. 2's response to that change, and the affect of such change;
- c. Discuss the manner in which Indian Point No. 2 remaining in continued operation during the time sequences referred to in paragraph b of this question will affect the operation of automatic circuit breakers on the Con Ed system and other interconnected systems;

- d. To the extent that Indian Point No. 2 will be connected to the load frequency control and will have its power output automatically adjusted as power demands increase or decrease please describe the operation of the reactor itself during these fluctuations in demand. In particular discuss the operation of control rods and other devices for control of the reactor's power output during normal fluctuations and during sudden fluctuations such as those referred to in the main body of this question. Discuss this operation of Indian Point No. 2 in light of the changes if any required or occurring in the phase, frequency, cycle, pulsation of alternating current or generator speed at the Indian Point No. 2 facility;
- e. Discuss in detail with respect to this question the manner in which Indian Point is part of the interconnected system and the operation of Indian Point how the system is designed to avoid loss of the Indian Point No. 2 operating capacity causing a cascading failure throughout the system and attach copies of the studies upon which your conclusion is based. With respect to all of the parts of this question 4. assume failures in transmission lines and load variations, etc. as severe as those which occurred in the November 9 and 10, 1965 Northeast Power Failure;
- f. Discuss the extent to which Indian Point No. 2 is planned now or in the future to provide a spinning reserve for the Con Ed system, the amount of reserve normally expected and the amount of reserve normally expected and the time needed to obtain the power from that reserve. What are the plants, their capacity and their method of generation upon which Con Ed now depends for spinning reserves? Also what is the time factor involved in the utilization of each reserve; and
- g. To the extent that studies or analysis of the factors and concepts referred to in this question have not been conducted please explain this omission in light of the following recommendation of the FPC in its December 6, 1965 Report to the President on the Northeast Power Failure of November 9 and 10, 1965:

The stability studies carried out by the systems in the CANUSE area - that is, the studies of how the systems would function under emergency conditions -

did not postulate an emergency of the proportions which occurred. Additional stability studies are urgently required based upon the more stringent assumptions as to credible incidents which have now been shown to be necessary, and such studies are under way.

Answer: a. Stone and Webster has reported on a study of the 1973 Con Edison system entitled "Report on Transmission Plans for 1973", a copy of which will be provided separately. In this study, the Con Edison system was analyzed to determine if it met the Con Edison system design criteria, which are as stringent as those of the Federal Power Commission. These criteria require that New York City remain interconnected with the rest of the country following the loss of an entire station, the loss of an entire right of way or a 3-phase fault with breaker failure. Stone and Webster concluded that the Con Edison system as planned for 1973 meets the established design criteria.

In addition, we have previously made available (on January 18, 1971 in response to CCPE Document Request No. 13), the output of a transient stability case which simulated the loss of Ravenswood No. 3 while loaded at 1000 MW during a period of very heavy power transfers. This case was run as part of a New York Power Pool study of Summer 1970 conditions and was found to be stable by the members of

the study group. This incident, loss of the most heavily loaded unit in Southeast New York, was considered to be the most severe test of the stability of the power system under accepted operating criteria. Its loss would be as severe a disturbance to the system as the loss of Indian Point No. 2.

If Ravenswood No. 3 were lost and Indian Point Unit No. 2 were in service, the presence or absence of load frequency control on the Indian Point Unit would not significantly affect the transient stability of the system.

- b. The loss of any unit in Southeast New York, even the most heavily loaded does not cause instability even during times of heavy power transfers. Since Southeast New York is part of the interconnected power system, no one unit experiences a great change in its loading due to the loss of any other unit. This is demonstrated in the transient stability case supplied (for loss of Ravenswood Unit No. 3). Changes in the parameters referred to in this question are shown in the Stone and Webster report referenced in the answer to Part "a".

If, due to some unforeseen incident, the bulk power transmission system has experienced instability and

if, as a result of this instability, an island were formed consisting of Indian Point and other machines, the system frequency would decline if the total load in the island exceeded the generation in the island. The fact that Indian Point is a nuclear unit would not make its response to such an imbalance any different than that of a conventionally fired unit. Con Edison has installed underfrequency relays on its system that will detect such an imbalance and automatically disconnect blocks of load to restore the load-generation balance.

- c. Circuit breakers would operate to open transmission lines in the event of instability. The circuit breakers that would operate and, as a consequence, the island that would be formed is a function of the incident that initiated the instability. Indian Point would contribute to maintaining stability in the area in which it was connected and would be no different in this regard from any other unit of the same capacity.
- d. Whether or not Indian Point 2 is connected to the Con Edison Load Frequency Control (LFC) system, the plant in either the manual or automatic mode of operation can respond in the power range (15% to 100% of full load) to the following generation load changes without reactor trip:

- (1) 10% step change in load without turbine bypass
- (2)  $\pm$  5% per minute loading and unloading
- (3) -50% change in load from approximately 100% load with steam dump

The Reactor Control System is designed to enable the reactor to follow load changes automatically when the plant output is above 15% of nominal power. Control rod positioning may be performed automatically when plant output is above this value, and manually at any time (see Indian Point Unit No. 2 FSAR, Section 7.3).

A description of the operation of the Reactor Control System for the generation load changes mentioned above is contained in the FSAR on Pages 7.3-23 and 7.3-24. Automatic protective systems on both the turbine-generator and reactor will initiate a turbine and reactor trip whenever pre-set safety limits are reached (see FSAR Sections 3, 7 and 10).

Whether the unit is connected to the load frequency control system or not and within the range of transients (1), (2) and (3) above, changes in phase, frequency, cycle, pulsation of alternating current or generator speed at Indian Point Unit No. 2 would be small and within normal acceptable limits.

- e. As demonstrated in the Stone and Webster Report, previously referred to, the loss of Indian Point does not cause cascading failure throughout the system.
- f. Indian Point No. 2 will normally be base loaded and not used for spinning reserve. Only economics dictate that it not be used for spinning reserve. Spinning reserve is distributed among the conventional steam-driven units operating on the Company's system. The amount is specified by New York Power Pool Operating Policy and is dictated by the output of the most heavily loaded generating unit within the Pool.

That portion of unused generating capability which is synchronized, which will respond immediately, and which is fully available within five minutes is considered Spinning Reserve. Particular plants are not used to expressly provide a fixed amount of spinning reserve on a continuing basis. Rather, the total amount of spinning reserve required at any particular time is supplied by those units which are synchronized to the system at that time, or which can supply load within five minutes.

g. The Stone and Webster report previously referred to contains an analysis of the Con Edison system in light of the recommendations made by the F.P.C. in its December 6, 1965 Report to the President on the Northeast Power Failure. That report states in part that "Con Edison system design criteria are more stringent than the NPCC criteria and meet the very stringent FPC criteria."

Question: What is Con Ed's present base load demand and what is it expected to be over the next ten years. Attach copies of the studies upon which these projections are based.

Answer: Defining base load as the minimum load in a year, Con Edison's current base load is approximately 1975 MW. The table below shows the forecasted base load through 1980.

<u>Year</u>	<u>Base Load - MW</u>
1972	2125
1973	2250
1974	2400
1975	2575
1976	2750
1977	2925
1978	3125
1979	3325
1980	3350

Question No. J-6

Question: In discussing the peak load and base load indicate what portion of the load represents interruptible power users. Provide similar analysis with respect to the portion of the load which is firm power.

Answer: There is no interruptible load.

Question: Describe in detail the criteria used by Con Ed in making available interruptible power and firm power to its customers. Provide a rate schedule for each type of power.

Answer: Power is supplied to all customers within Con Edison's franchise area who apply for service and who qualify under any of the service classifications in the Company's tariff schedule. The tariff schedule is available for inspection by the public at the Company's offices and details all the criteria referred to in this question.

Question No. J-11

Question: In brown-outs experienced on the Con Ed system over the last five years how much of the interruptible load was dropped? Describe your procedure and criteria for shedding the interruptible power in cases where the power demand from all customers exceeds the available supply.

Answer: There is no interruptible load on the Con Edison Electric System. The criteria for shedding load was explained in the answer to Question No. G-4.

Question No. J-12

Question: How much of the present firm load could be placed in the category of interruptible load. Discuss this answer in light of the criteria referred to in Question No. 7.

Answer: Because of the nature of its service area and of its customers, interruptible electric power rates would not serve to significantly reduce demand on Con Edison's system in peak periods.

The service supplied by the Company consists primarily of supply to a very large number of customers, each with a small demand, rather than of service to a few customers with large demands. The industrial load is both small in total and comprised of a large number of small customers, none of whom has significant load in terms of system requirements.\*

The Company's largest customers cannot be classed as having interruptible load. The five largest customers on its system are the Transition Authority, the City of New York, the New York City Housing Authority, Rockefeller Center and Kennedy Airport. None of these can be said to have potentially interruptible load.

\* The 1969 Census of Manufacturers shows that of 26,833 manufacturing establishments in New York City, 17,299 have less than 20 employees.

The Company's Commercial load includes multi-story buildings, many of which are constructed so that windows cannot be opened and are, therefore, dependent upon electricity for ventilation and air conditioning as well as for lighting and elevator service.

Question: In Question 9-G include a discussion of the present cost per kilowatt hour of generating electricity by Con Ed, the cost per kilowatt hour of generating electricity at Indian Point Unit No. 1 (the average cost based upon past experience including costs for non-operating days) and the cost per kilowatt hour of generating electricity at Con Ed's most efficient non-nuclear facility with a capacity in excess of 500 MW(M).

Answer: The total cost of energy produced by Indian Point Unit No. 1 was calculated to be 15.86 mills per kilowatt hour for the year 1969. A calculation of the cost of energy produced by the Ravenswood generating station, which consists of three modern units, was made which indicated a cost of 9.28 mills per kilowatt hour in 1969 which is a representative number for Con Edison's most efficient non-nuclear facility having a capacity in excess of 500 MW.

The computations of these costs are shown in the attached table which also shows data for all of the energy produced on the Con Edison system.. The system cost was 12.51 mills per kilowatt hour.

Reference to that table, which contains a breakdown of the total cost of producing energy between fixed charges and operating expenses, shows that Indian Point Unit No. 1, given the investment which has been made in constructing it, produced energy at 5.13 mills per

kilowatt hour. In contrast, the Company's most efficient fossil station (Ravenswood) produced energy at 4.30 mills per kilowatt hour, and the average cost of all energy produced during 1969 on the Company's system was 6.68 mills per kilowatt hour.

The high fixed charges for Indian Point Unit No. 1 result from the fact that that unit was among the first large-scale pressurized water power reactors to be built and a significant portion of the large investment (\$484 per kilowatt) resulted from the higher design and construction costs to be expected in such an effort. Among the benefits derived from construction of Unit No. 1 is the fact that the Company now has a large staff of trained personnel capable of constructing and operating nuclear units.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

TOTAL PRODUCTION COSTS

YEAR 1969

	<u>Indian Point Unit No. 1</u>	<u>Ravenswood Station</u>	<u>System</u>
Capacity - MW	265	1,827	8,035
Cost Per KW	\$484	\$156	\$164
Plant Cost	\$128,358,000	\$284,487,000	\$1,317,364,000
Fixed Charge Rate	14.00%	15.43%	13.69%
Annual Plant Factor	72.1%	55.1%	43.9%
Energy Delivered (10 <sup>6</sup> KWHR)	1,674	8,813	30,926
Fuel Cost - Mills/KWHR	3.51	3.71	4.51

Generation

Annual Fixed Costs - \$1,000

Plant	\$17,970	\$43,896	\$180,347
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Annual Operating Costs - \$1,000

Fuel	\$5,876	\$32,693	\$139,476
Operation and Maintenance	2,712	5,202	66,994
Total	\$8,588	\$37,895	\$206,470

Total Generation Costs -  
Mills/KWHR

Fixed Costs	10.73	4.98	5.83
Operating Costs	5.13	4.30	6.68
Total	15.86	9.28	12.51