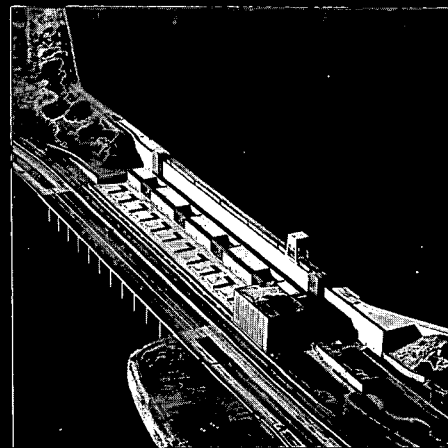
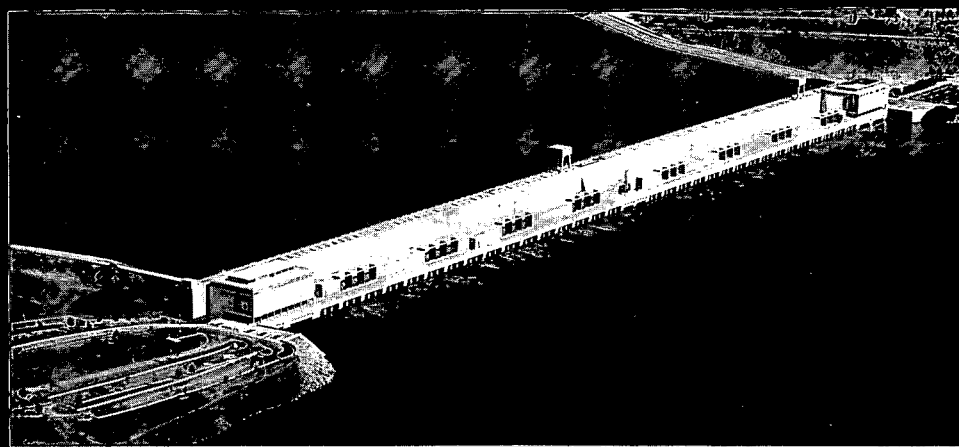
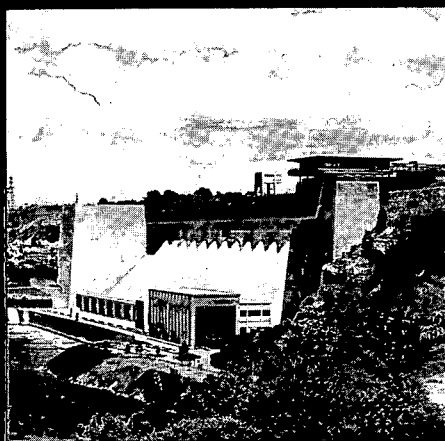
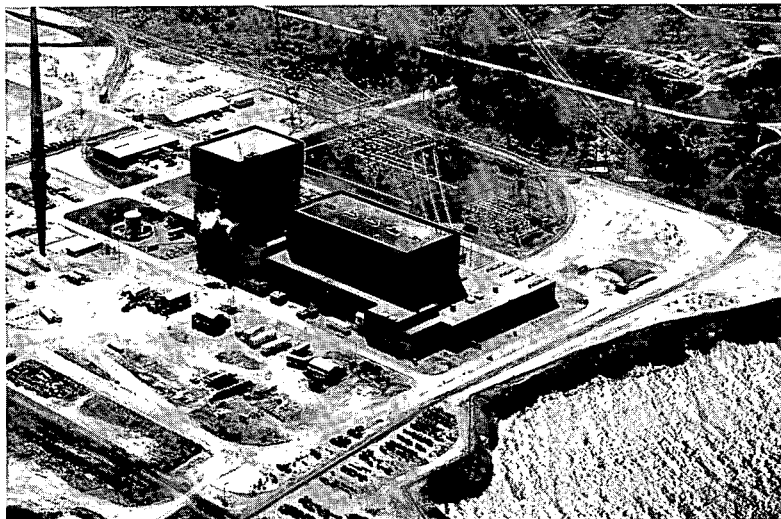


# Annual Report 1974

Power Authority  
of the State of New York



8111110647 750423  
PDR ADOCK 05000286  
A PDR

# 1974 Annual Report

March 11, 1975

To the Governor, Legislature and Comptroller  
of the State of New York

Pursuant to the provisions of Sections 1002 and 2500 of the Public Authorities Law, Power Authority of the State of New York herewith submits its Forty-Fourth Annual Report covering the 1974 calendar year.

Respectfully,

James A. FitzPatrick, *Chairman*  
George L. Ingalls, *Vice-Chairman*  
Raymond J. Lee  
William J. Ronan  
Daniel J. Reidy (retired January 28, 1975)

George T. Berry, *General Manager and Chief Engineer*  
Scott B. Lilly, *General Counsel*  
Wilbur L. Gronberg, *Assistant General Manager—Engineering*  
John W. Boston, *Director of Power Operations*  
Thomas F. McCrann, Jr., *Controller*  
John C. Bruel, *Secretary*

Power Authority of the State of New York  
Room 1800, 10 Columbus Circle  
New York, N.Y. 10019

Power Authority of the State of New York is a public benefit corporation of the state. It finances, builds and operates power plants for purposes specified by the Legislature and Governor. The projects are built without use of tax monies or state credit. They are financed by sale of Authority bonds to private investors. The bonds are repaid and the projects operated using revenues from operations.

The Authority is composed of five trustees appointed by the Governor with advice and consent of the State Senate to serve overlapping terms of five years.

The Authority is a wholesale power supplier and sells its electricity to municipal systems and rural electric cooperatives, to private utilities, for resale to retail customers, to specified industries, and to the Plattsburgh Air Force Base. Federally-mandated allocations of Niagara and St. Lawrence power have also been made to Vermont and to a group of rural cooperatives in Pennsylvania and New Jersey. Authority service will be extended to public agencies in the Metropolitan New York area when projects now authorized are completed.

Construction of the Authority's fourth generating project, the 821,000-kilowatt James A. FitzPatrick Nuclear Plant in Oswego County, was completed in 1974 and the plant is undergoing tests prior to commercial operation.

Other operational facilities are the one-million-kilowatt Blenheim-Gilboa Pumped Storage Power Project on Schoharie Creek in the towns for which it is named; the 800,000-kilowatt St. Lawrence Project on the St. Lawrence River near Massena; and the 2,400,000-kilowatt Niagara Project on the Niagara River near Niagara Falls.

The Authority has constructed transmission lines to connect its projects with the statewide grid to assure a reliable flow of power.

Seven additional generating and transmission facilities are in various stages of construction, licensing or planning to fulfill the Authority's legislative mandates. Their completion will increase the Authority's peak capability to more than 10 million kilowatts by 1983.



1974 Trustees — From left are Raymond J. Lee, Vice-Chairman George L.

# Highlights of 1974

## Generation

Niagara and St. Lawrence produce 24.9 billion kilowatt hours of electricity  
Blenheim-Gilboa generates 1.2 billion kwh in first full year of operation

## James A. FitzPatrick Nuclear Plant

Construction completed and operating license issued  
Fuel loaded in reactor and operational testing program begun

## Acquisitions and Construction

Astoria 6 unit purchased; construction continues

## Power Marketing

Rural and domestic consumers of Authority power save \$55-million  
Municipal and cooperative systems join in conservation program

## Future Construction

Hearings underway on routes of two transmission lines  
New York City site prime location for plant that could use coal, oil and refuse as fuel

## The Covers

Back Front

Beach at St. Lawrence  Page 27			Loading Fuel at FitzPatrick Plant  Page 5
Transmission  29	Lansing Manor Visitors' Center  31	James A. FitzPatrick Nuclear Power Plant  3	Laboratory, FitzPatrick Plant  4
Power Usage 19		Robert Moses Niagara Power Plant  16	Moses-Saunders Power Dam, St. Lawrence  17
		Blenheim-Gilboa Project  14	Lewiston Pump- Generating Plant  16

# Annual Report

## Generation

The Authority's Niagara and St. Lawrence Projects generated 24,932,212,000 kilowatt hours (kwh) in 1974, approximately 23 per cent of the electricity produced in New York State.

Generation at the two projects was slightly below the 25 billion kwh record of 1973 as the result of a modest decrease in river flows, but it was almost two billion kwh above the next best year.

In addition, the Blenheim-Gilboa Pumped Storage Project produced 1,226,957,000 kwh at periods of peak consumer demand during its first full calendar year of operation. It set a record one-day production of 7,841,000 kwh on June 10.

## Construction

Construction of the James A. FitzPatrick Nuclear Power Plant was essentially completed during 1974. The Atomic Energy Commission issued an operating license for the plant in October. After loading of fuel in the reactor was completed in November, the testing program began. First power was produced on February 1, 1975.

## Acquisitions

Legislation enabling the Authority to acquire and complete two Consolidated Edison Company generating plants was enacted in 1974. The Authority purchased Con Ed's Astoria 6 oil-fired unit in New York City on December 13 and expects to complete construction in 1976.

Engineering evaluation and financial audits of Con Ed's investment in the Indian Point 3 nuclear unit in Westchester County are continuing.

## Future Projects

The Authority has applied for a certificate of environmental compatibility to build a 700,000-kilowatt fossil-fired unit. Prime site is in an industrial area along the Arthur Kill on Staten Island in New York City.

Public hearings are underway on the routes for two transmission lines. One is a 765,000-volt line from the St. Lawrence Project to Utica with a connection to Quebec. The other is a 230,000-volt line from the St. Lawrence Project to the Plattsburgh area.

An application for a Federal Power Commission license to build the Breakabeen Pumped Storage Project is pending before the Commission.

Studies are nearing completion on a nuclear plant to be located either at Athens or Cementon.

## Finances

### General Purpose Bond Resolution of 1974

On November 26, 1974, the Authority adopted the General Purpose Bond Resolution under which its

future projects are expected to be financed. On November 27, 1974, \$150-million of 6¼ per cent promissory notes maturing June 16, 1975 were sold, of which \$115-million were used to pay a portion of the cost of acquisition and completion of Astoria 6, the first project to be financed under the resolution. The remaining \$35-million were used to repay a bank loan previously obtained by the Authority to finance preliminary expenditures required for its future projects. On December 30, 1974, \$125-million of 7¼ per cent Bond Anticipation Notes maturing on December 15, 1975 were issued to pay an additional portion of the cost of acquisition and completion of Astoria 6. On January 30, 1975, the Authority sold the first issue of permanent financing under the resolution, the issue consisting of \$25-million of serial bonds priced to yield 6½ per cent for bonds due January 1, 1987 to 7.3 per cent for 1995 maturities, and \$125-million of 7⅞ per cent term bonds due January 1, 2010. The bonds were sold for Astoria 6.

### Revenue Bond Resolution of 1970

No bonds or notes were issued during the year for the 1970 Project which went into partial operation on August 1, 1974. Revenues from the Blenheim-Gilboa Project after that date totaled \$8.712-million of which \$1.75-million were deducted for operating expenses. Bond service on all 1970 bonds exclusive of that provided from the temporary interest fund was \$15.791-million. The 0.44 ratio of net revenues to bond service is expected to improve substantially when the FitzPatrick Plant, now testing, is in commercial operation. First revenues from this plant were recorded in February 1975.

### General Revenue Bond Resolution of 1954

Revenues of \$121.598-million from the Niagara and St. Lawrence Projects again exceeded previous years. While revenues from power sales decreased by approximately \$1-million, this was offset by a \$1.2-million increase in earnings on investments. The sum of \$19.350-million was deposited in the operating fund and \$1.2-million in the improvement fund. The remainder of \$101.048-million enabled the Authority to meet all the requirements of the 1954 Bond Resolution. Interest on the bonds in the amount of \$20.021-million was paid. Bonds retired during the year totaled \$82.406-million at a cost of \$76.517-million, reducing the amount of 1954 bonds outstanding to \$478.912-million at January 1, 1975. The purchases enabled the Authority to maintain a favorable position with respect to the schedule of 1954 bond retirements required by the 1970 Bond Resolution.



## James A. FitzPatrick Nuclear Power Plant

The James A. FitzPatrick Plant was undergoing a series of power ascension tests, raising pressures and temperatures toward operating levels, at the close of 1974. Electricity was produced for the first time February 1, 1975.

Plant construction was virtually complete at year-end, six years and seven months after enactment in 1968 of legislation directing the Authority to construct nuclear power plants.

The 821,000-kilowatt plant is located on the south shore of Lake Ontario seven miles northeast of Oswego.

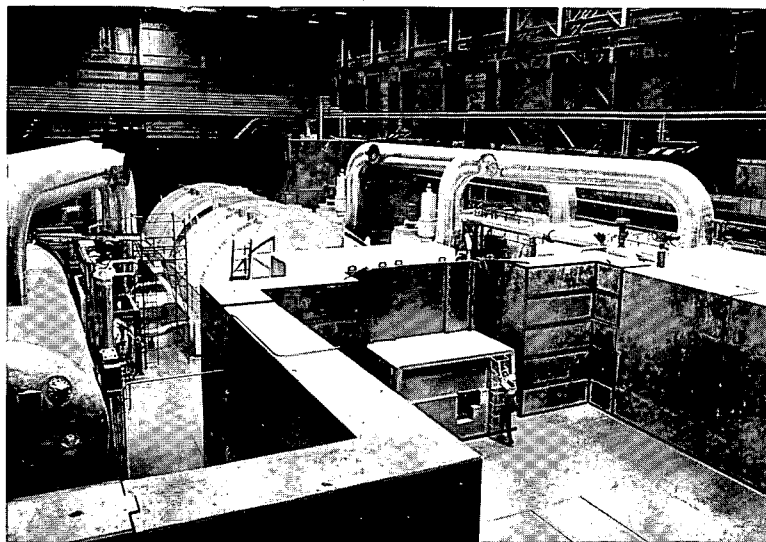
The Atomic Energy Commission authorized loading of fuel in the reactor on October 17, 1974 and issued an operating license for the plant.

After the fuel was installed, the reactor achieved its first controlled reaction on November 17 when withdrawal of a group of control rods initiated the process of nuclear fission. Steam was produced in the reactor for the first time on December 26.

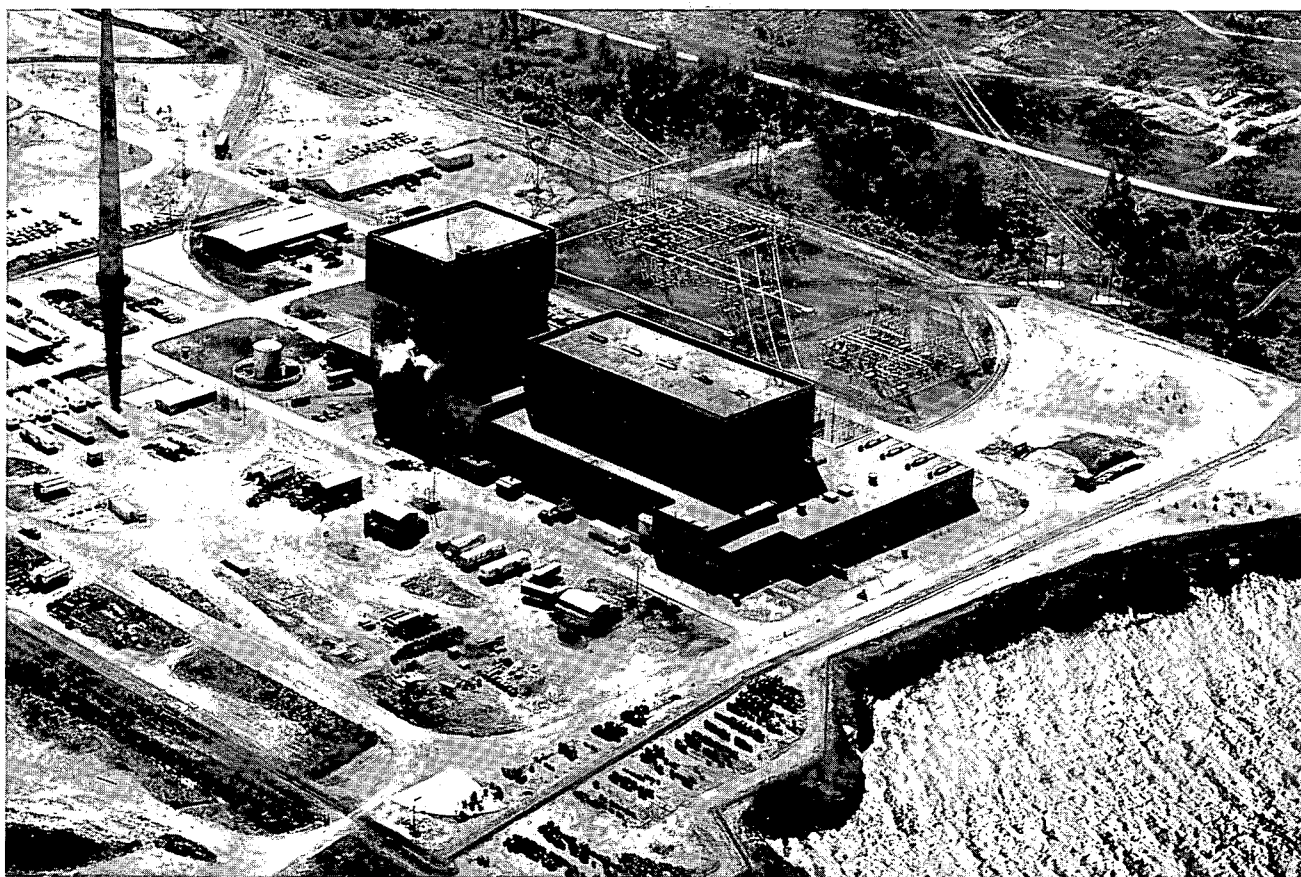
The FitzPatrick Plant is the Authority's first nuclear facility and the fifth nuclear generating unit licensed for operation in New York State. Eight million barrels of oil or two million tons of coal would be required each year to produce the anticipated electrical output of the FitzPatrick Plant.

Legislation directing the Authority to build nuclear plants was enacted in 1968. The Atomic Energy Commission authorized preliminary work in 1969 and issued a full-scale construction permit in May 1970.

The plant uses a General Electric boiling water reactor. The reactor building surrounds the 503-ton steel pressure vessel containing the nuclear fuel



Turbine and steam lines of FitzPatrick Plant



James A. FitzPatrick Nuclear Power Plant

core. The vessel, core and associated systems form the reactor where controlled nuclear fission produces heat to transform water into the steam that turns the turbine-generator.

Personnel of the Niagara Mohawk Power Corporation will operate the plant during its initial years on a reimbursable cost basis under overall control of the Authority, which will market and dispatch the plant's power. Niagara Mohawk's Nine Mile Point Nuclear Station is located 3,000 feet west of the FitzPatrick Plant.

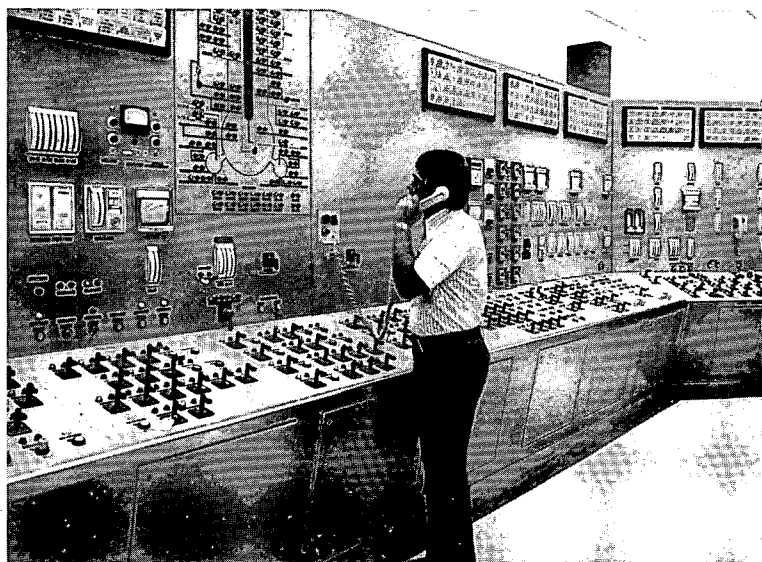
Power from the FitzPatrick Plant will be transmitted to the Authority's main cross-state lines over its 345,000-volt line to Utica and two Niagara Mohawk lines to the Syracuse area.

Extensive environmental studies were conducted prior to and during construction of the plant as detailed on Page 28. They are continuing. An environmental surveillance laboratory has been established at the site, along with an atmospheric tower and monitoring stations to measure air and water quality, radiation levels, the distribution of fish and other wildlife and underwater conditions.

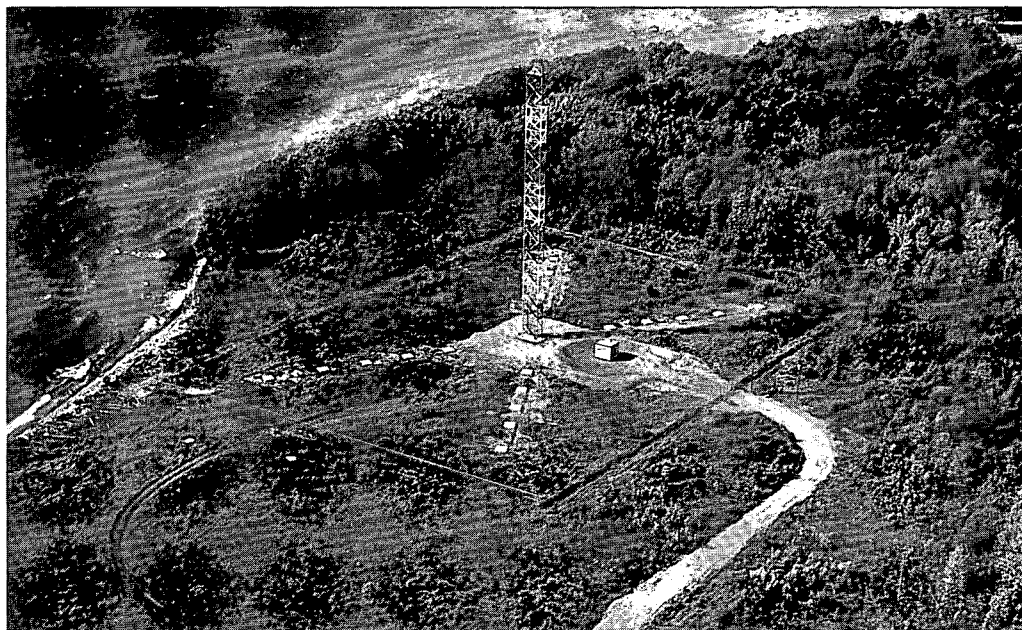
Stone & Webster Engineering Corporation was retained to design the plant and supervise construction. Uhl, Hall & Rich Division of Chas. T. Main of New York, Inc., were engineers for the 345,000-volt transmission line.



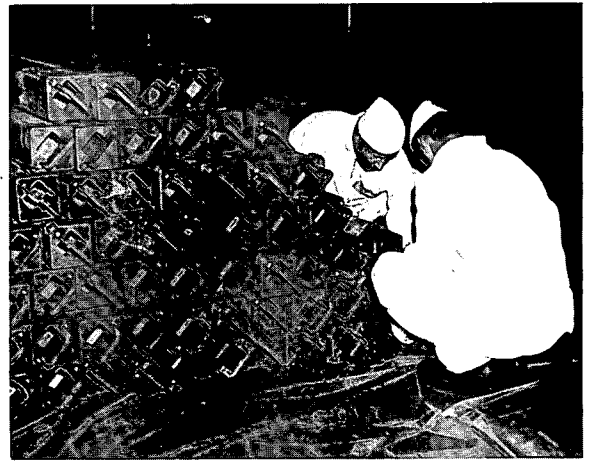
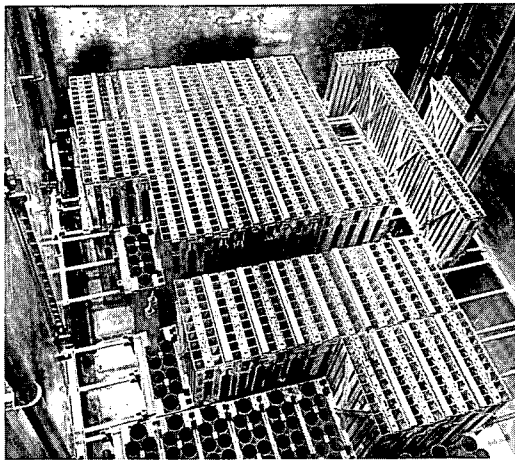
Microscopic examination of animal and plant life from the bottom of Lake Ontario is part of continuing environmental surveillance



FitzPatrick Plant control room

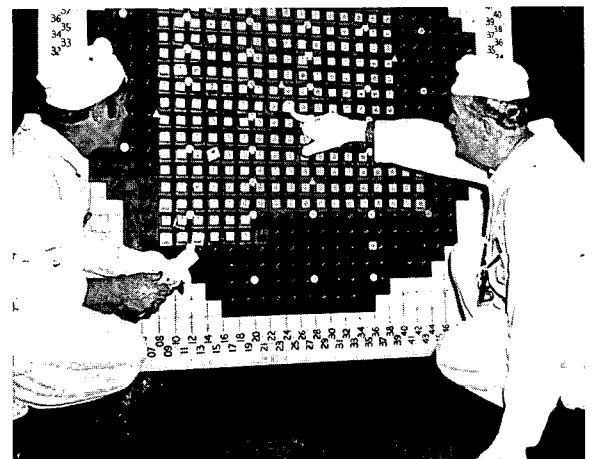
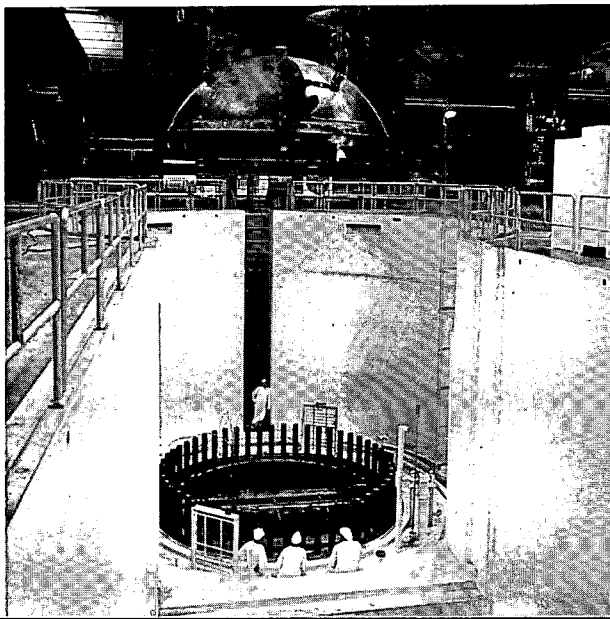
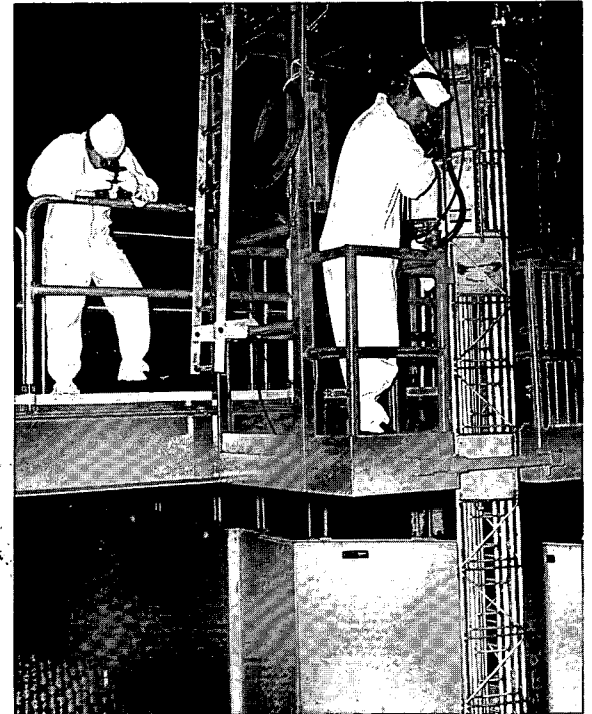
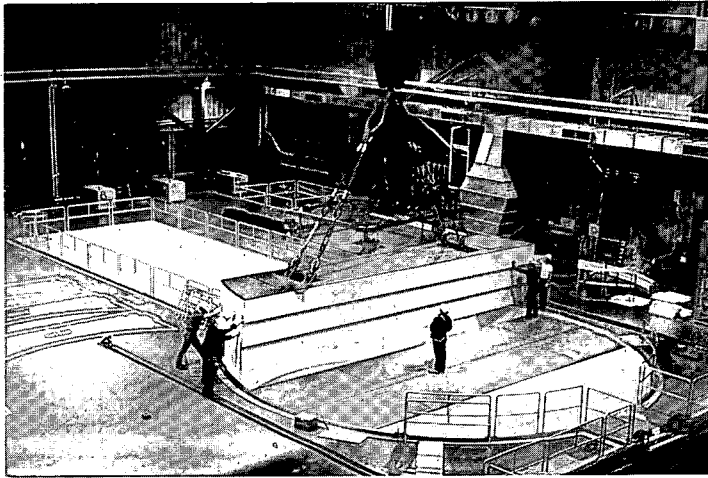


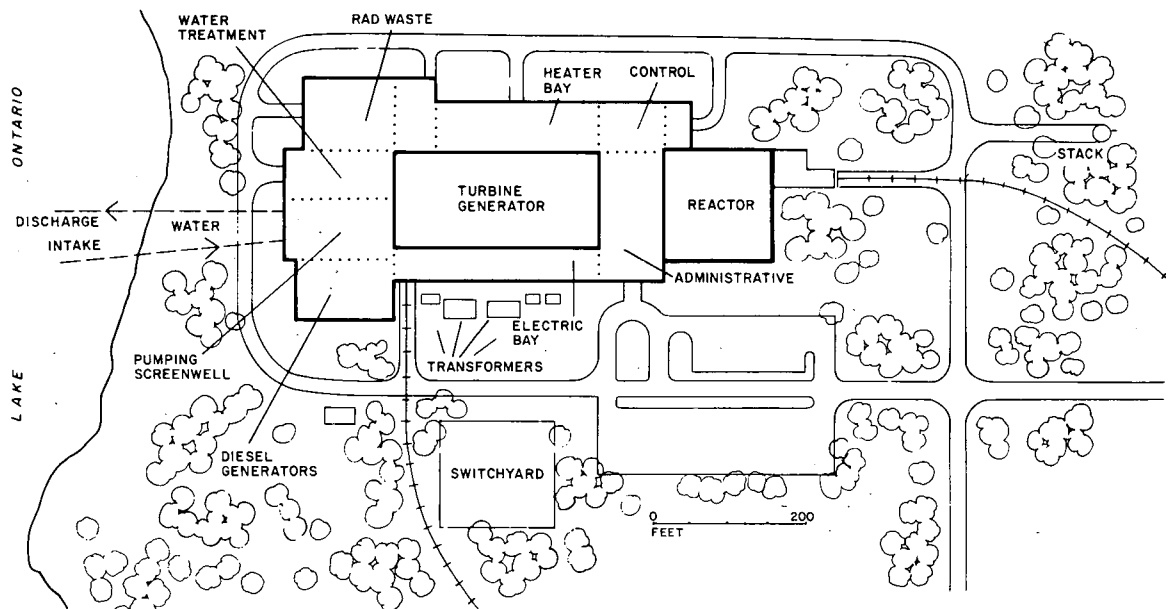
Meteorological tower measures wind direction and velocity, humidity, temperature, and other environmental factors



## Fuel loading...

... at the FitzPatrick Plant involved (clockwise from upper left) fuel assembly storage racks in the spent fuel storage pool, removing simulated assemblies used to position control rods, visual monitoring of fuel placement in the reactor core, recording the location of each fuel assembly on a monitor board, lowering the head on the reactor pressure vessel after fueling, and replacing the reactor cavity shield plugs after sealing the pressure vessel and primary containment.





## Operation of Plant

The FitzPatrick Plant uses the heat of a controlled nuclear chain reaction to produce steam which turns a turbine connected to a generator with a capability of producing 821,000 kilowatts of electricity.

Water pumped into the reactor vessel from the bottom boils as it rises through the nuclear core.

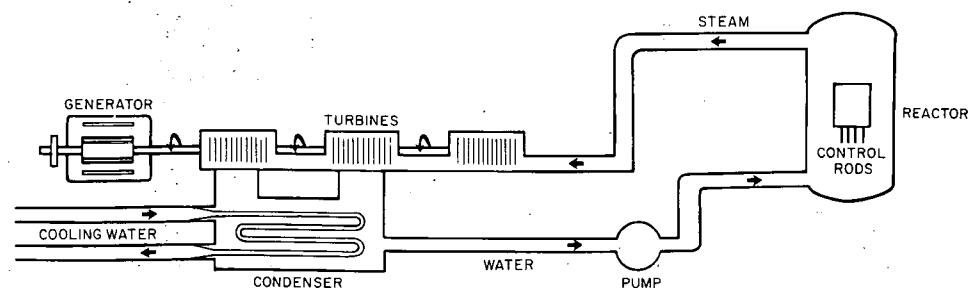
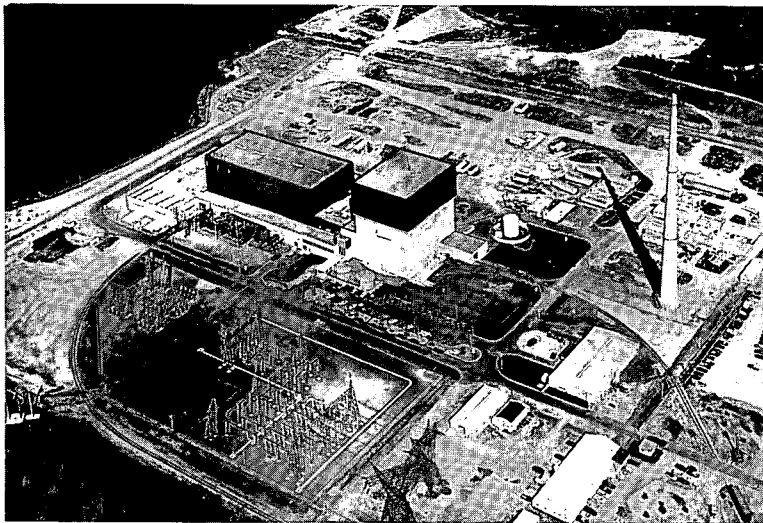
The resulting steam passes through steam separators and driers at the top of the vessel, then flows through the main steam lines to rotate the turbine.

After passing through the turbine, the steam exhausts into the condenser to be cooled back to water and returned to the reactor, completing the cycle.

The condenser consists of steel structures containing tubes through which cooling water from Lake Ontario is circulated. The lake cooling water does not pass through the reactor and essentially none of it is consumed in the cooling process.

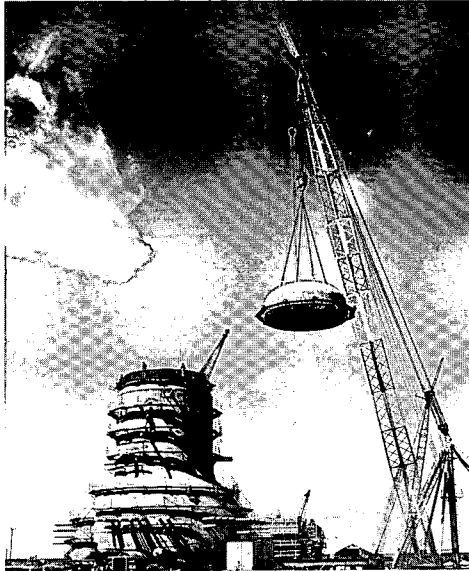
The cooling water is brought into and taken from the plant through intake and discharge tunnels drilled through the bedrock of the lake bottom.

The lake end of the 1150-foot-long discharge tunnel is crossed at right angles by a 774-foot-long diffuser system, consisting of 12 nozzles mounted in pairs 150 feet apart. The discharge water leaves the nozzles in a sub-surface fountain that provides rapid cooling. The diffuser was developed by the Authority to meet stringent New York State standards for thermal discharges into Lake Ontario. The system has since been adapted into the design of plants by other utilities.

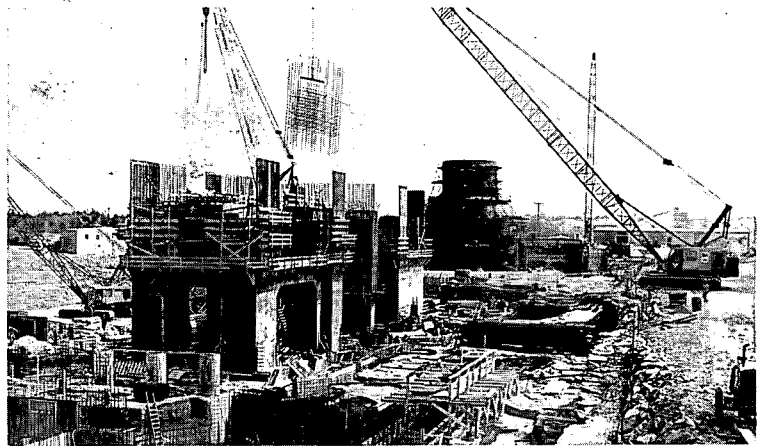




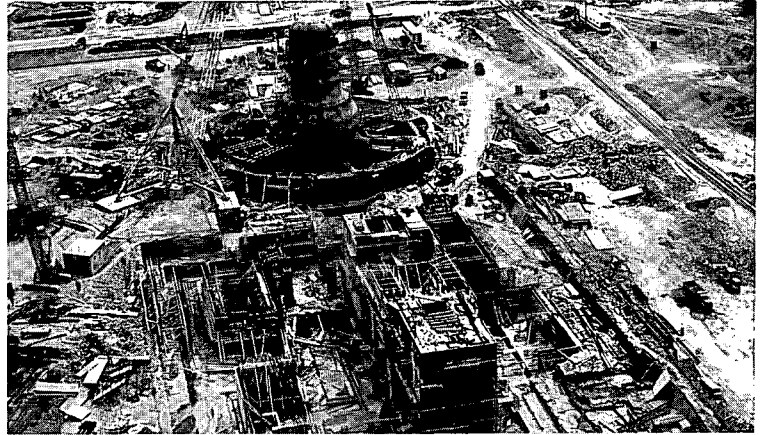
## Highlights of FitzPatrick Plant Construction



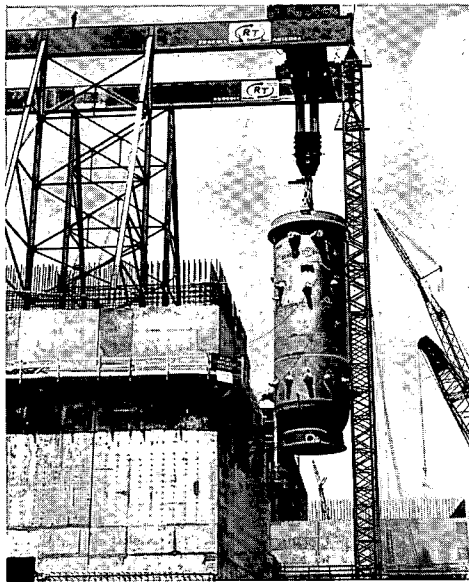
Capping 1,650-ton containment system, 1970



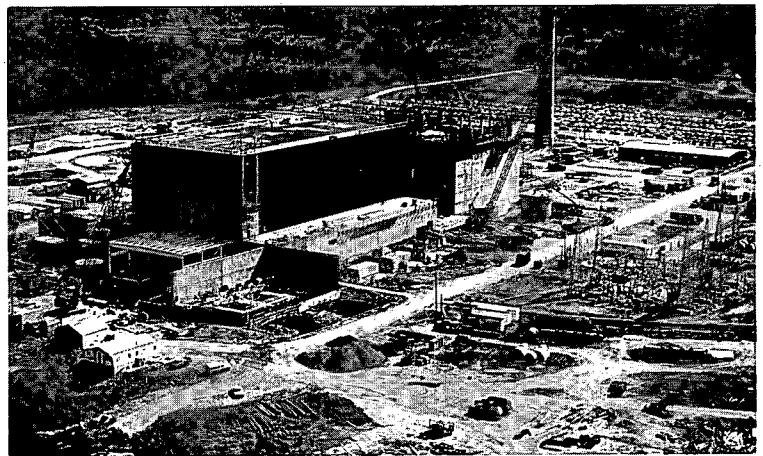
Reactor containment and turbine pedestal, 1970



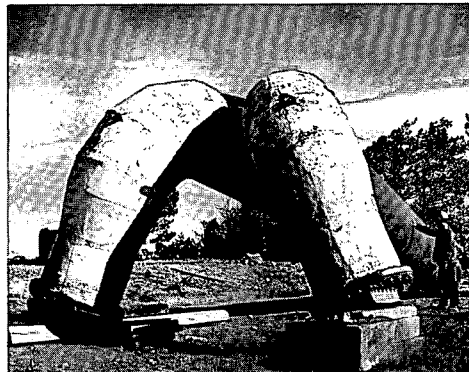
Concrete work at turbine pedestal, 1970



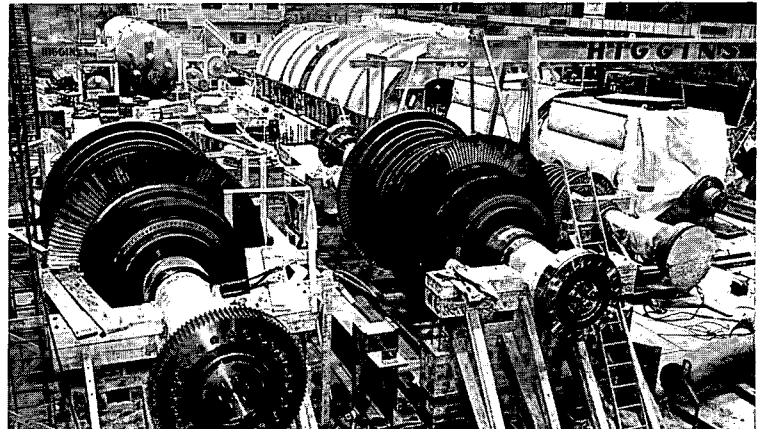
Installing 503-ton reactor pressure vessel, 1971



FitzPatrick Plant, 1971



Inspecting underwater discharge nozzles, 1970



Turbine components await assembly, 1972

## Construction and Acquisitions

In 1974 the State Legislature authorized the Authority to acquire and complete two partially built Consolidated Edison generating plants to help alleviate the then-severe financial plight of the utility. Legislation was also enacted increasing the number of public agencies in the metropolitan area eligible to purchase electricity from the Authority.

The first of the Con Edison acquisitions was completed on December 13 when title to the Astoria No. 6 oil-fired unit was transferred to the Authority. It has a projected generating capability of 800,000 kilowatts.

The acquisition followed an intensive seven-month investigation that included financial audits and engineering evaluations by the Authority staff and consultants. The engineering evaluation was conducted by Stone and Webster Engineering Corporation, and the financial audit by Arthur Young & Company, certified public accountants.

Prior to transfer, the Authority conducted a public hearing at which no opposition to the acquisition was voiced. Transfer of title occurred after State Comptroller Levitt approved the initial payments of approximately \$189-million to Con Edison for its expenditures through last May 31. The company's expenditures between June 1 and the date of acquisition, subject to the continuing audit and the State Comptroller's approval, will bring the total purchase price to approximately \$220-million.

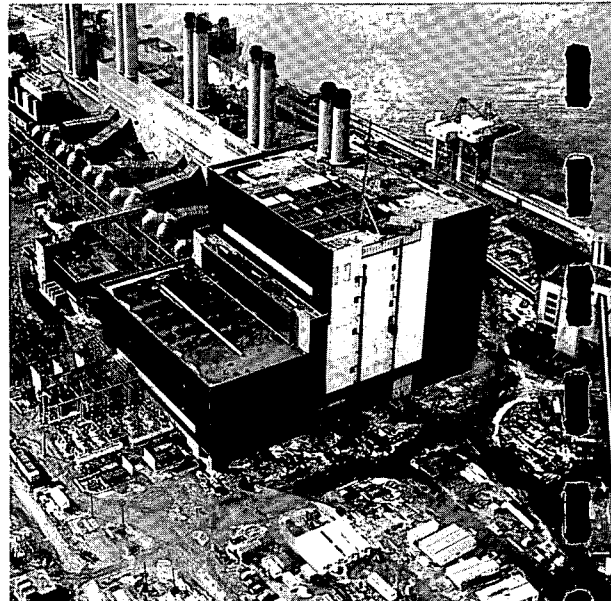
The Authority estimates it will cost about \$162-million to complete the plant, including facilities needed to insure independent operation and a three-month, \$25-million oil supply. An additional \$78-million bonds is estimated to provide interest during construction, financing costs and required bond reserves.

Completion of the Astoria 6 unit is scheduled for 1976.

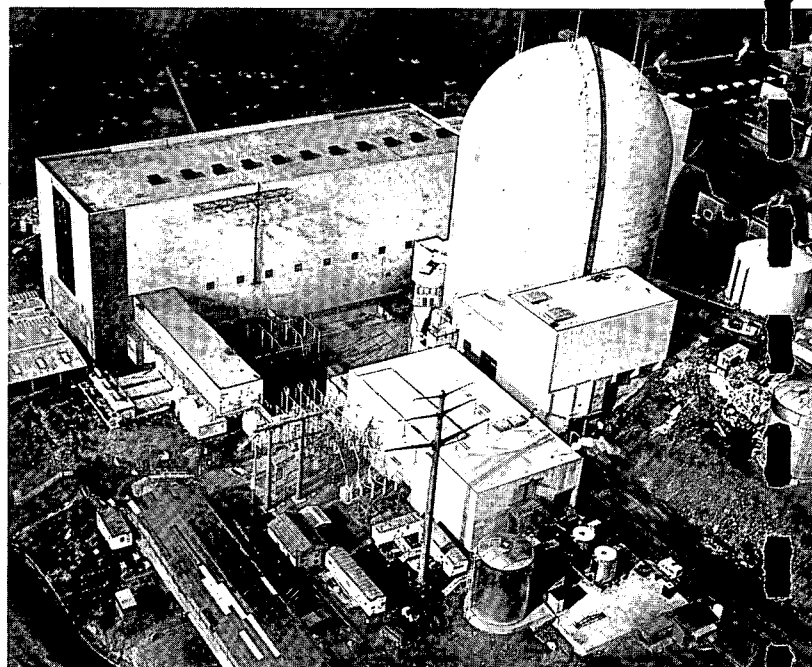
The second plant is the Indian Point No. 3 Nuclear Station, located at Buchanan near Peekskill. Extensive engineering and financial audits are continuing.

Preliminary estimates by the Authority indicate commercial power production from this plant will begin in December 1975. It will have a generating capacity of about 900,000 kilowatts. Steam will be produced in a pressurized water reactor.

The costs of acquisition and completion of the facilities are being financed by sale of Authority bonds to private investors without use of tax monies or state credit.



Astoria 6 Generating Plant (foreground), purchased from Consolidated Edison in 1974



Indian Point 3 Nuclear Unit; Con Edison will retain ownership of two other units, located to the right beyond photo.

# Future Construction

## Studies for Baseload Plants

Extensive environmental studies to evaluate power plant sites have been underway since 1972 when the Legislature and Governor directed the Authority to build baseload facilities to provide electricity for metropolitan area mass transit.

Thirty-two potential locations were evaluated initially. Three were selected for detailed study early in 1973. Cementon and Athens in Greene County were designated as possible nuclear plant sites. Athens and a quarry south of Poughkeepsie in Dutchess County were studied as possible fossil-fueled plant sites.

Two New York City locations, Hart Island in The Bronx and an industrial area along the Arthur Kill on Staten Island, were included as possible fossil plant sites as the Authority explored the possibility of using solid waste as a supplemental fuel.

Data collected by other agencies were made available to the Authority, including results of intensive investigations of environmental conditions in the New York City area over a period of many years.

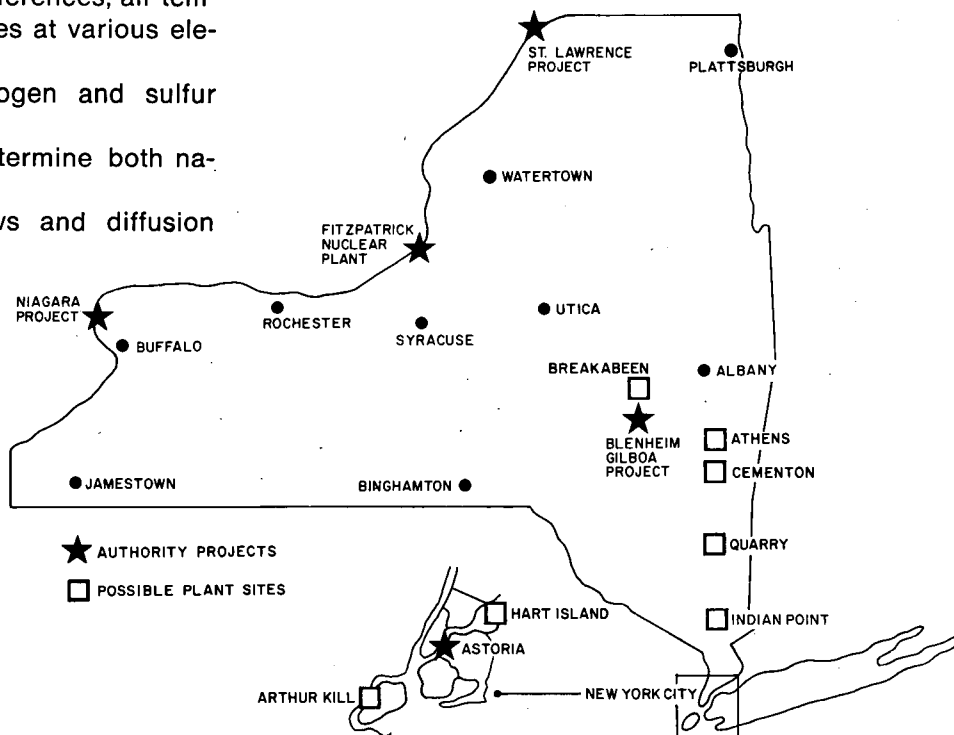
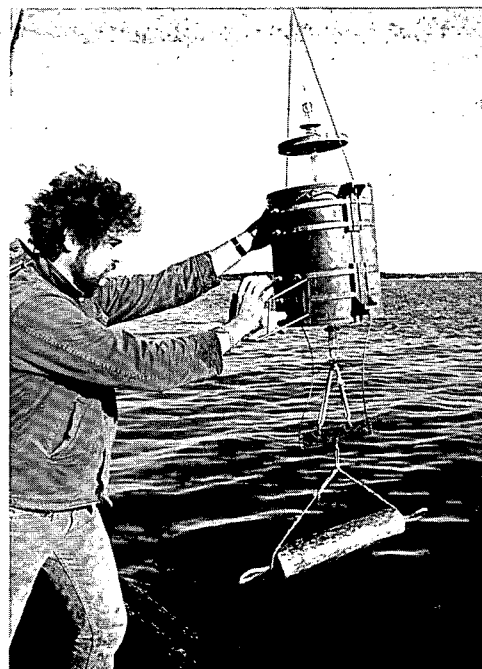
A variety of studies was conducted, with the types depending on whether evaluation of a site was for nuclear or fossil plant construction. In addition to engineering studies, the investigations included examinations of environmental, social and economic factors. A laboratory was established near Kingston to house personnel involved in collection of data on ecological conditions at the three upstate sites. More than 70 persons worked at the lab at the peak of the study period.

The studies included:

- Meteorological measurements, including wind velocity and direction, air flow differences, air temperature and temperature changes at various elevations and air moisture content.
- Air quality sampling for nitrogen and sulfur compounds and particulates.
- Water quality sampling to determine both natural components and additives.
- River current and water flows and diffusion

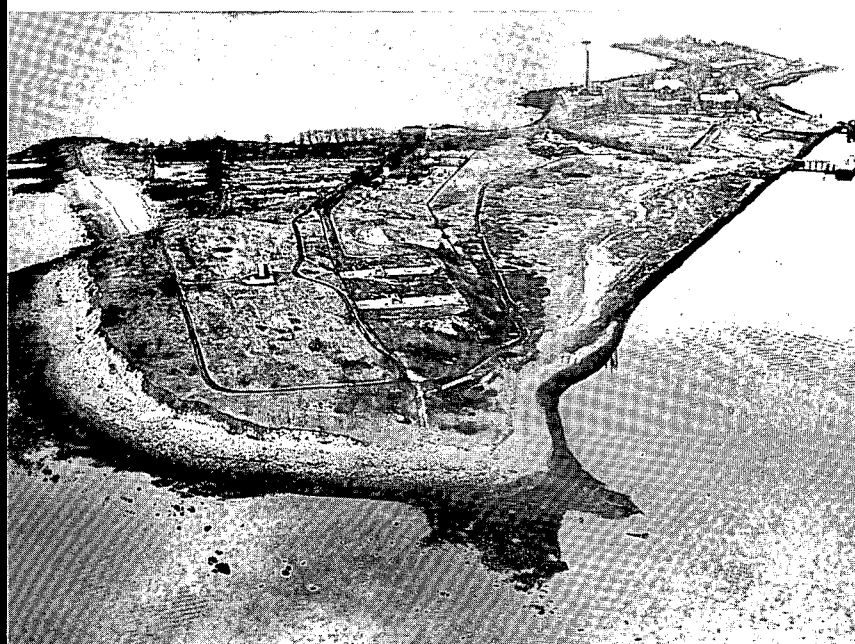


Fish netting at Arthur Kill (above) and water sampling at Hart Island (below) are examples of environmental studies at potential power plant sites





Aerial view of Arthur Kill area, prime site for fossil plant



Hart Island, an alternate site for the fossil plant

analyses in which a harmless biodegradable red dye was placed in the water so that dispersion could be measured and mapped.

- Aquatic and terrestrial ecology studies to determine the types of plant and animal life existing in the water and on the land in the vicinity of the potential site.
- Geological and seismological investigations, including extraction of core samples of earth and rock. Excavation to permit detailed examination of bedrock conditions was underway at the Cementon location at year-end.
- Ambient noise levels were determined near potential plant sites at different times of day and night and in different seasons of the year.
- Aerial and ground photography to record land use and esthetics.

### Fossil-Fired Plant

The Authority in December filed an application with the New York State Board on Electric Generation Siting and the Environment seeking certification to build a 700,000-kilowatt fossil-fired electric generating plant. The board is empowered to approve the location of steam electric generating plants in the state.

The Authority designated the Arthur Kill location as the primary site, with the other three—Athens, the quarry south of Poughkeepsie and Hart Island—listed as alternates.

The 22-volume application provides data on environmental, engineering, economic and other aspects of the proposed project.

The primary site encompasses about 165 acres in an industrial area on the west side of Staten Island on the east bank of the Arthur Kill, a waterway which separates the island from the New Jersey mainland. Scheduled completion date for the \$562-million plant is 1980.

The plant would be designed to burn either coal or oil. It would also have the capability of using each day about 2,100 tons of refuse as a supplementary fuel if it is located in New York City.

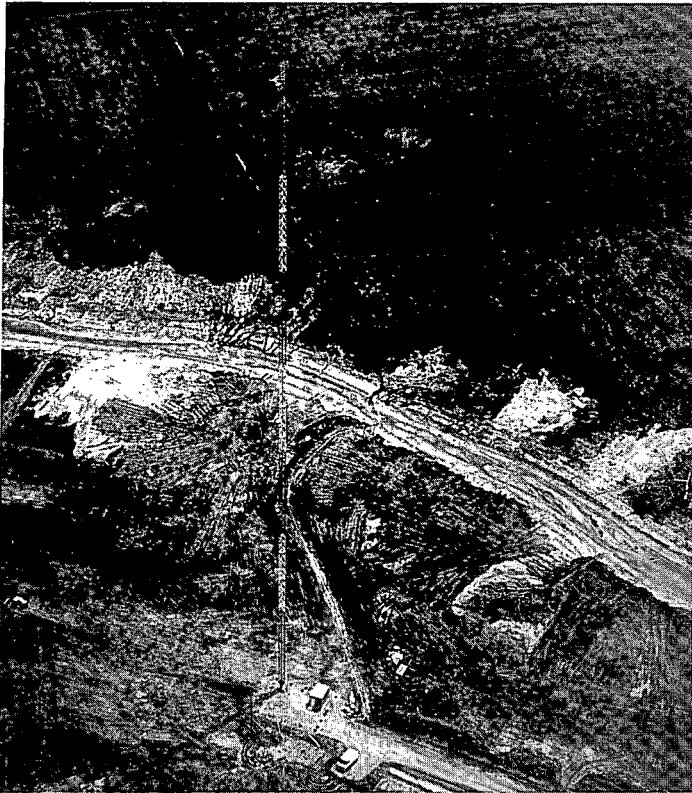
The plant design would incorporate advanced pollution control equipment, including an electrostatic precipitator, a sulfur dioxide scrubber system and a closed-cycle cooling system with a natural draft cooling tower. The boiler would be designed to control nitrous oxides.

Sargent & Lundy Engineers has been selected to design and supervise construction of the plant for the Authority.

### Greene County Nuclear Power Plant

The Greene County Nuclear Power Plant is the





Meteorological tower at Athens

second baseload generating facility planned to provide for mass transit and other public agency electrical needs.

Studies indicate that either Cementon or Athens in Greene County will be suitable for construction of a nuclear plant. Geologic investigations were continuing at the close of 1974 prior to selection of one of the locations as the prime site for the plant, scheduled for completion by 1983. The plant will have a generating capacity of about 1,200,000 kilowatts.

The Authority contracted with the Babcock & Wilcox Company for purchase of the nuclear steam supply system and fuel for the plant, which will use a pressurized water reactor. The contract was entered into after evaluation of proposals by the five domestic manufacturers of reactors.

The Authority contracted with the Atomic Energy Commission for long-term uranium enrichment services starting in 1981. The contract has an initial term of 10 years with options for two 10-year extensions.

Stone & Webster Engineering Corporation has been selected to design and supervise construction of the plant.

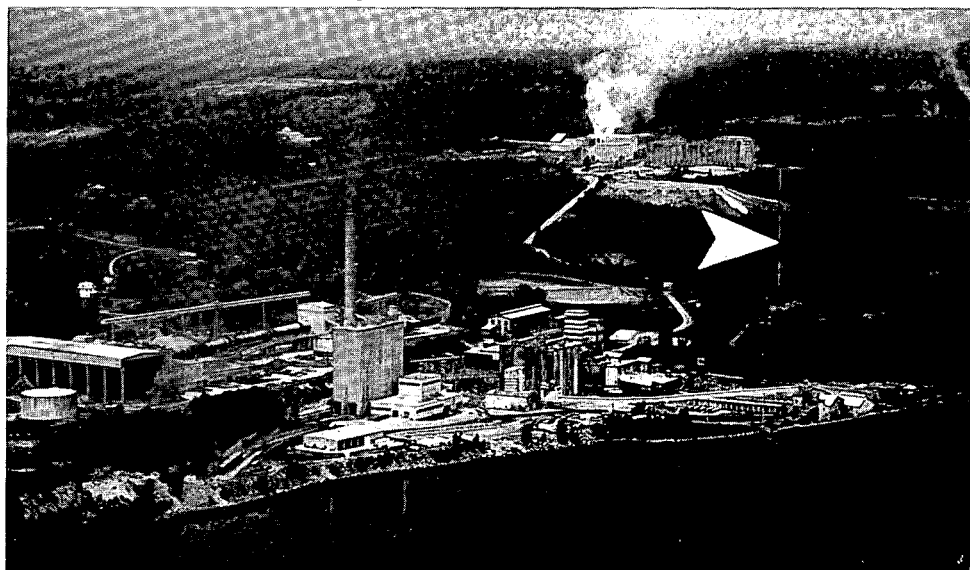


Aerial view of meteorological tower at quarry south of Poughkeepsie.



Trenching to uncover bedrock at Cementon

Arrow locates Authority meteorological tower at Cementon



## Breakabeen Pumped Storage Project

The Authority applied on March 30, 1973 for a Federal Power Commission license to build the one-million kilowatt Breakabeen Pumped Storage Power Project. The project would be located between the Villages of Breakabeen and North Blenheim in Schoharie County, about five miles north of the Blenheim-Gilboa Project.

At the end of 1974, completion by the FPC of its draft environmental impact statement was awaited.

The application includes the Authority's environmental impact statement, maps, charts, statistical tables, engineering drawings and other exhibits prepared during the 2½ years of study that preceded the application.

During this period, the Authority consulted with officials at various governmental levels and others in an attempt to incorporate their suggestions in planning the project.

Study of the project started in October, 1970, when Governor Rockefeller asked the Authority to build a pumped storage project to help ease the power shortage in Southeastern New York.

Sites in the area east of Binghamton and south of Albany were studied. Breakabeen was tentatively selected in May 1971. Feasibility of the project was confirmed by the completion in March, 1972 of detailed hydrological, engineering and geological studies.

Before the license application was filed, further detailed investigations were made of the potential impact of the project on land use, agriculture, conservation, recreation and other social and economic fields.

The project will use two reservoirs and an underground powerhouse to produce one million kilowatts of electricity at times of peak demand or in emergencies.

It has been designed to permit downstream release of at least three million gallons of water where Schoharie Creek now often runs dry in summer months. It also will provide a measure of flood control unprecedented in the valley.

Year-round land and water-based recreation facilities for boating, fishing, hiking, ice skating and other sports have been proposed. The recreational program would be coordinated with features already provided by the Authority at the Blenheim-Gilboa Project.

Only 4½ miles of additional transmission line right-of-way would be required.

The historic covered bridge at North Blenheim would not be disturbed. A park-like setting and scenic restoration of the surrounding area has been proposed. In addition, the Authority would move or replace the Blenheim Town Hall and Fire Hall to

permit improvement of the area if the community desires.

The project would remove about 500 acres of good cropland from production. This acreage is included in a 5,000-acre agricultural district conceived after the Authority announced in 1971 that it was studying the area as a possible project site.

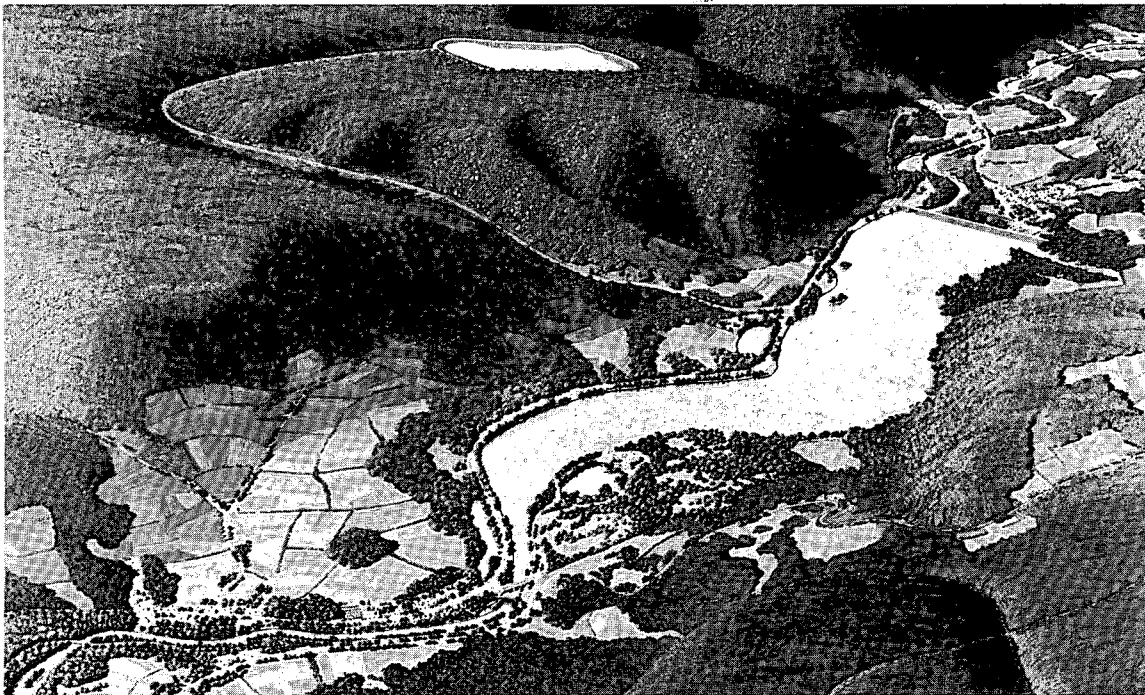
The application notes that social and economic benefits from power generation, recreational facilities, enhancement of fishery resources and increased downstream flows in dry periods would far outweigh any losses resulting from changes in water and land uses.

Three sites studied simultaneously with Breakabeen were Port Jervis in Orange County, Gardiner in Ulster and Orange Counties, and Livingstonville in Schoharie County. None of them was as suitable as Breakabeen for economic, engineering or environmental reasons.

The application said that alternate sites and alternate designs for development showed higher costs, lesser net recreational benefit and equal or greater environmental impact. Other sources of electricity, if available at all, would be less suitable for the intended purpose and require equal or greater capital investment.



Archeological exploration at Breakabeen site



Artist's rendering of Breakabeen Project

### **St. Lawrence to Utica Transmission**

Public hearings before a Public Service Commission examiner continued in 1974 on the Authority's application for a certificate of environmental compatibility for construction of a 765,000-volt transmission line between the St. Lawrence Project and Utica, with a connection to Quebec.

The line will permit import of at least 800,000 kilowatts of hydroelectric power from Quebec five months in 1977 and seven months annually for the next 19 years. It will also increase capability for transfer of power among Authority projects and to load centers throughout the state.

It is projected that a minimum of 60 billion kilowatt hours of electricity will be imported into New York State over the new transmission network during the 20-year period. About 100 million barrels of oil or 25 million tons of coal would be required to produce that quantity of electricity. At least one additional thermal generating plant, either fossil or nuclear, will be required in New York State if the importation is not made.

The proposed transmission system includes a new substation at Massena; an eight-mile, double-circuit 230,000-volt line connecting it with the St. Lawrence Project switchyard; a 134-mile, 765,000-volt line from the Massena substation to a new substation near Utica; and a 21-mile, 765,000-volt link from the Massena substation to Quebec.

The proposed facilities are expected to cost approximately \$130-million. The Authority proposed that much of the 163-mile-long line be located adjacent to existing transmission lines. Most of the right-of-way is already owned by the Authority and Niagara Mohawk which has agreed to sell its right-of-way to the Authority.

In September, the Authority opened a field office at the Oneida County Airport in Oriskany to administer design and construction of the line.

### **St. Lawrence to Plattsburgh Transmission**

Hearings also are underway before a PSC examiner on the Authority's application to build a 71-mile, 230,000-volt transmission line between the St. Lawrence Power Project and Plattsburgh. The line is urgently needed to provide for the region's increasing electric power requirements.

Proposed route of the line is parallel and adjacent to the existing 230,000-volt line built in 1958 between the St. Lawrence Project and the Plattsburgh Substation. The proposed route will minimize the amount of land required and avoid establishment of a new transmission corridor.

Wood pole structures are planned, similar to those on the existing line.

The new facilities will include a substation to be constructed at about the mid-point of the line near Willis Road at South Chateaugay. The substation will step down voltage to 115,000 volts for interconnection with existing and future lines of that voltage in the area. A second transformer will be added at Plattsburgh Substation to reduce voltage from 230,000 to 115,000 volts.

The new line and substation will also provide benefits in reliability and economy by eliminating low voltage problems and thermal overload that could result from an outage of the existing 230,000-volt line, by increasing the ability to take transmission facilities out of service for necessary maintenance and by reducing total transmission losses.

## Blenheim-Gilboa Project

Jack M. Collyer, Resident Manager

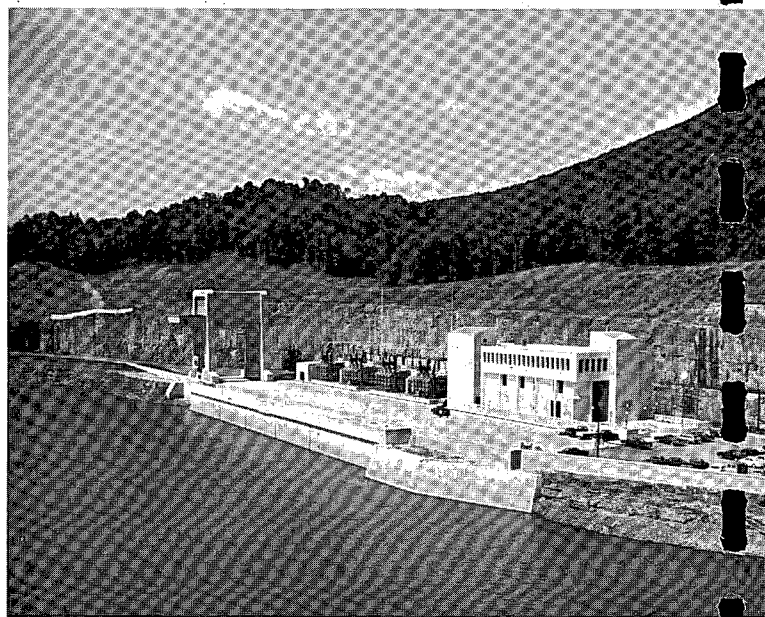
The Blenheim-Gilboa Pumped Storage Power Project generated more than 1.2-billion kilowatt hours (kwh) of electricity in 1974, its first full calendar year of operation.

The project is located in the Schoharie County Towns of Blenheim and Gilboa about 40 miles southwest of Albany.

It can generate over one million kilowatts at times of peak consumer demand. Water is pumped from a lower reservoir to an upper reservoir during periods of minimum demand for electricity, using power from another source. At times of maximum need for electricity, the pump-generating units are reversed. The water flows "downhill" to produce electricity.

The 1974 Blenheim-Gilboa production was almost seven times the annual generation estimated when the project was planned in the late 1960's, reflecting reliability, economy and flexibility of the project. Units can be started quickly at times of peak consumer demand or in emergencies. Pumping energy can come from the most efficient baseload units available. Cost and availability of the fuel to be used in producing the pumping energy also can be considered.

Principal features of the project are the reservoirs, a tunnel system entirely within Brown Mountain and a four-unit powerhouse and switchyard linked to the state grid by two 345,000-volt transmission lines. A third line will be built on a route awaiting determination by the Federal Power Commission.



Powerhouse of Blenheim-Gilboa Pumped Storage Power Project

The reservoir atop Brown Mountain was formed by an embankment composed of 5½ million cubic yards of earth and rock. The embankment is over two miles long and encloses an area of 360 acres. It provides usable storage capacity of 15,000 acre-feet and can contain almost five billion gallons of water with an energy potential of 12 million kwh of electricity.



Powerhouse, switchyard, lower reservoir and Brown Mountain from Mine Kill State Park





Aerial view of Blenheim-Gilboa lower reservoir

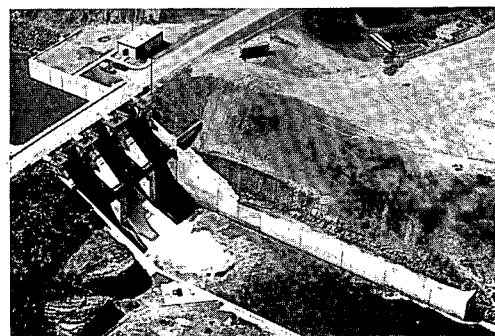
The lower reservoir, located 1,100 feet below at the base of the powerhouse, has a surface area of about 430 acres and a capacity of five billion gallons. The water is impounded behind a 1,000-foot-long, earth and rock dam across Schoharie Creek downstream from the powerhouse. The dam contains a gated spillway and a low-level outlet.

The powerhouse is a reinforced-concrete, semi-outdoor type structure 526 feet long and 130 feet high. It contains four reversible hydraulic pump-turbines, each connected to a generator-motor. Each unit has a capability as a generator of 250,000 kilowatts under minimum operating head. Power generated at 17,000 volts is stepped up to 345,000 volts for transmission.

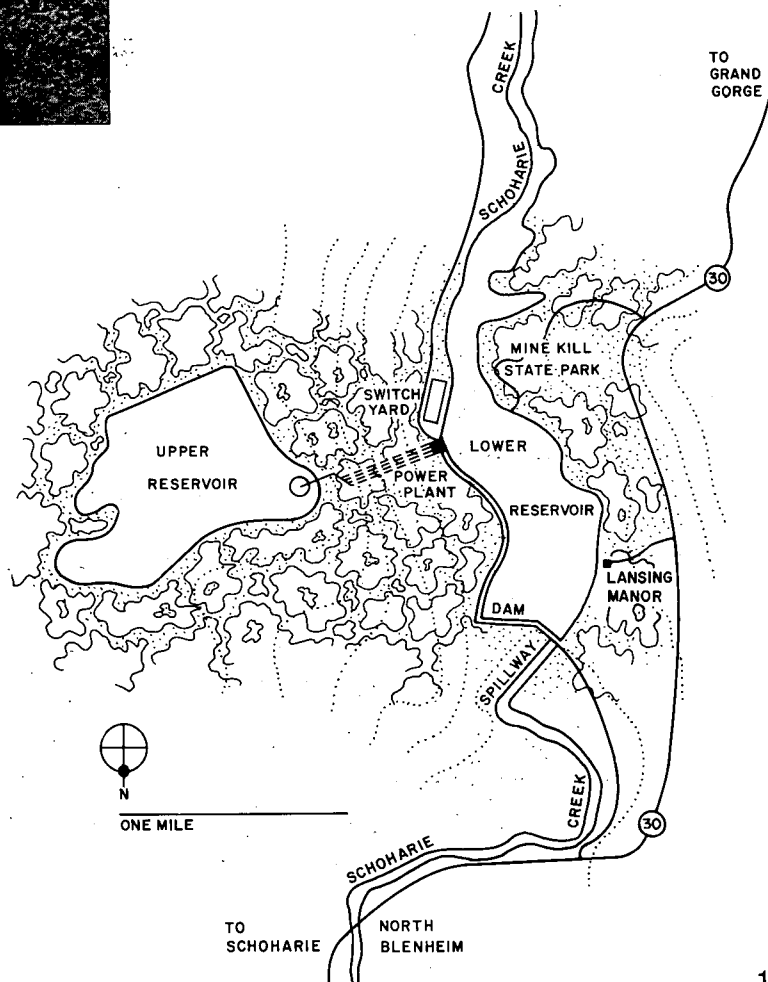
First power was produced July 5, 1973, less than four years after the project ground-breaking and about five years after the Legislature directed the Authority to build pumped storage projects. The full rated capacity of one million kilowatts was generated for the first time on December 17, 1973.



Upper reservoir and powerhouse



Lower reservoir dam and spillway



# Niagara Project

Eugene L. Gochbauer, Resident Manager

The Niagara Power Project remains one of the world's largest electric power producers. It has generated more than 179-billion kilowatt hours of electricity since operation began in 1961.

The project was designed to develop the full potential of the United States' share of the Niagara River waters available for power diversion after preserving the scenic beauty of Niagara Falls.

The United States and Canada agreed in a 1950 treaty that 100,000 cubic feet of water per second must flow over the Falls during daylight hours in the tourist season from April 1 through October. At other times, the flow may be reduced to 50,000 cubic feet per second.

The remainder of the water in the river, which has an average flow of 202,000 cubic feet per second, is available to both countries to be shared equally, after certain adjustments, to produce power.

To provide for the most efficient use of water under these conditions, the Niagara Project includes a pumped storage power plant in addition to a main generating station.

By locating the main generating station 4½ miles below the Falls and the water intakes 2½ miles above the Falls, the project takes advantage of 310 feet of the 326-foot drop in elevation between Lakes Erie and Ontario.

Visible parts of the water intakes are a concrete bulkhead and two gate structures nearly 100 feet high. The latter house 400-ton gates which can stop the flow of water into the two underground conduits.

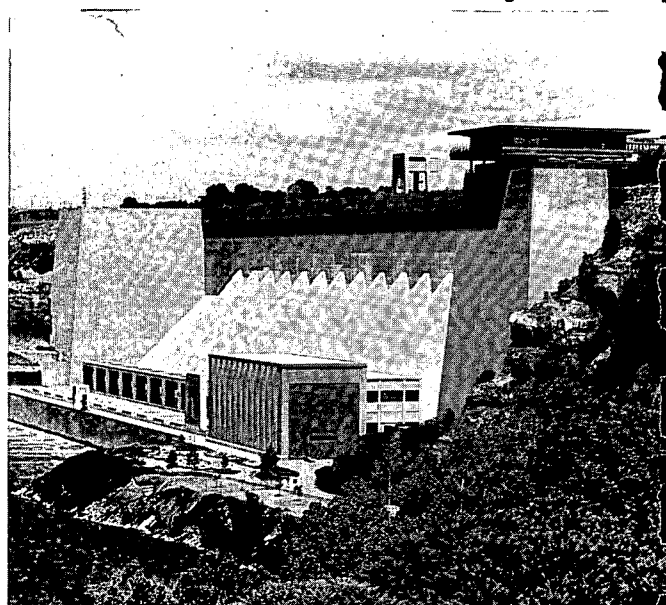
These conduits are each 46 feet by 66 feet, and carry the water four miles under the City of Niagara Falls to the open canal and forebay connecting the Lewiston Pump-Generating Plant and the main Robert Moses Niagara Power Plant. The conduits are completely covered and the ground above is landscaped.

Behind the pump-generating plant is a reservoir covering 1,880 acres of land, capable of holding 60,000 acre-feet of water. At night, when additional diversion is permitted and at other times when power demands are reduced, water is pumped into the reservoir using power from the main plant.

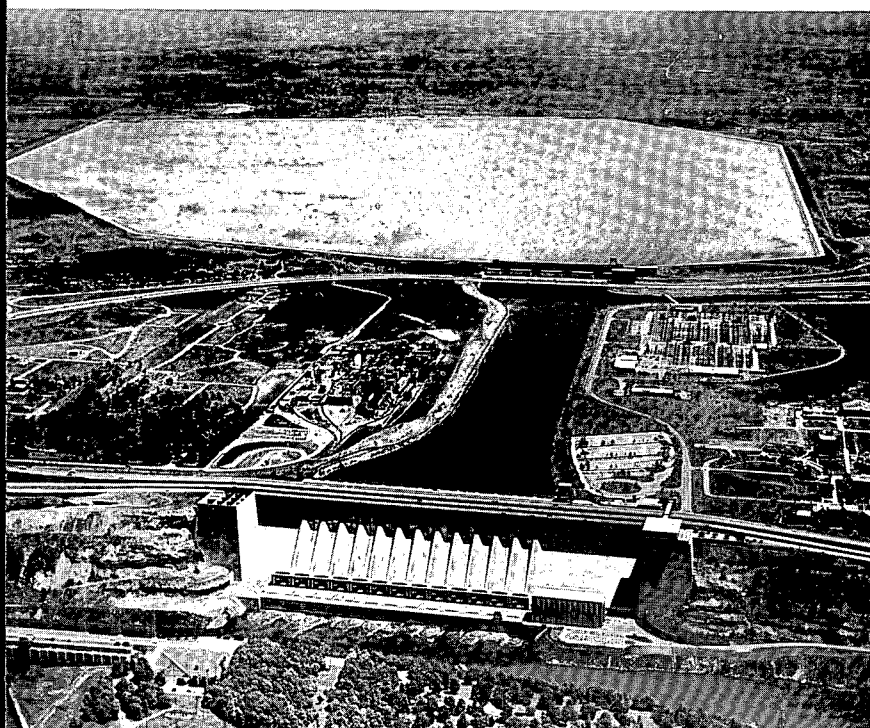
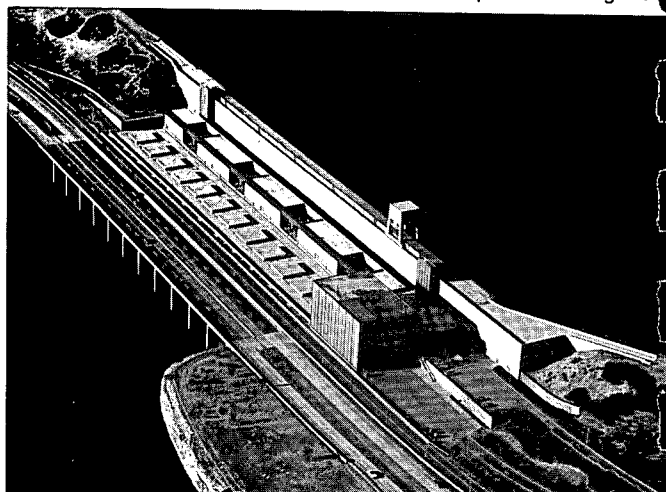
When power demands are increased, the 12 pump-motor units of the storage plant are reversed to become turbine-generators.

The stored water then joins that coming directly from the river. The intermingled water flows to the 13 generators of the main plant after which it is discharged into the lower river. The two Niagara plants, operated together, have a firm capability of 2,400,000 kilowatts, although the nameplate rating of the units is 2,190,000 kilowatts.

Robert Moses Niagara Power Plant



Lewiston Pump - Generating Plant



Niagara Project

# St. Lawrence Project

Robert D. Conner, Resident Manager

The St. Lawrence Project, the Authority's first, consists of three dams and many miles of dikes, involved channel excavation spread over 40 miles of the St. Lawrence Valley, and created the 60-square-mile Lake St. Lawrence which tamed the International Rapids section of the river to improve navigation and make power production possible.

Constructed jointly by the Authority and The Hydro-Electric Power Commission of Ontario, the project began generating power in July 1958. Since then, the Power Authority's generators have produced approximately 102 billion kilowatt hours of electric energy.

The Robert Moses-Robert H. Saunders Power Dam, extending 3,300 feet from Barnhart Island near Massena, New York to Cornwall, Ontario, contains 32 turbine-generators, 16 on each side of the international boundary. The generators in New York have a total firm capability of 800,000 kilowatts; similar units on the Canadian side have a comparable capability.

The power dam closed the northern channel of the St. Lawrence River in the vicinity of the rapids. Long Sault Dam closed the southern channel and directs the flow of the river toward the power dam 3½ miles downstream. Long Sault Dam is a curved-

axis concrete structure, 2,960 feet long, with 30 spillway gates. Some or all of the gates can be opened to pass the entire river flow or a portion of it during periods of exceptionally high water conditions. It is situated entirely within the United States, extending from the New York mainland to Barnhart Island.

Iroquois Dam, located at the western end of Lake St. Lawrence about 28½ miles upstream from the power dam, was designed to regulate the outflow of Lake Ontario. It is 1,980 feet long and has 32 sluiceways to accommodate the large river flow, with releases through the dam ranging from 180,000 to 350,000 cubic feet per second. Adjacent to the Canadian end of the Iroquois Dam is Iroquois Lock, uppermost of seven Seaway locks on the St. Lawrence River.

Upstream from Long Sault Dam, extensive excavation was accomplished to provide an adequate channel for Seaway navigation and to reduce river velocities to enable an ice cover to form in winter. This has served to alleviate the danger of ice jams that could disrupt power production and damage shore properties.

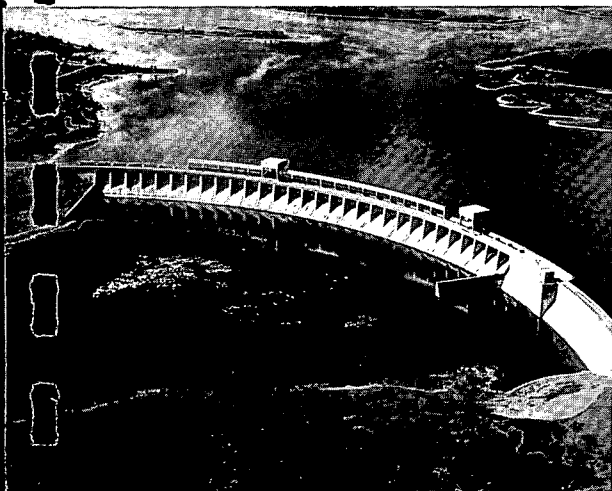
The dikes which form Lake St. Lawrence were built under carefully controlled construction conditions and have long since blended into the natural topography of the valley.

The Massena Intake control structure, flanked by a series of dikes at the upper end of the Massena Canal, provides the water supply both to the Village of Massena and the Alcoa plant.

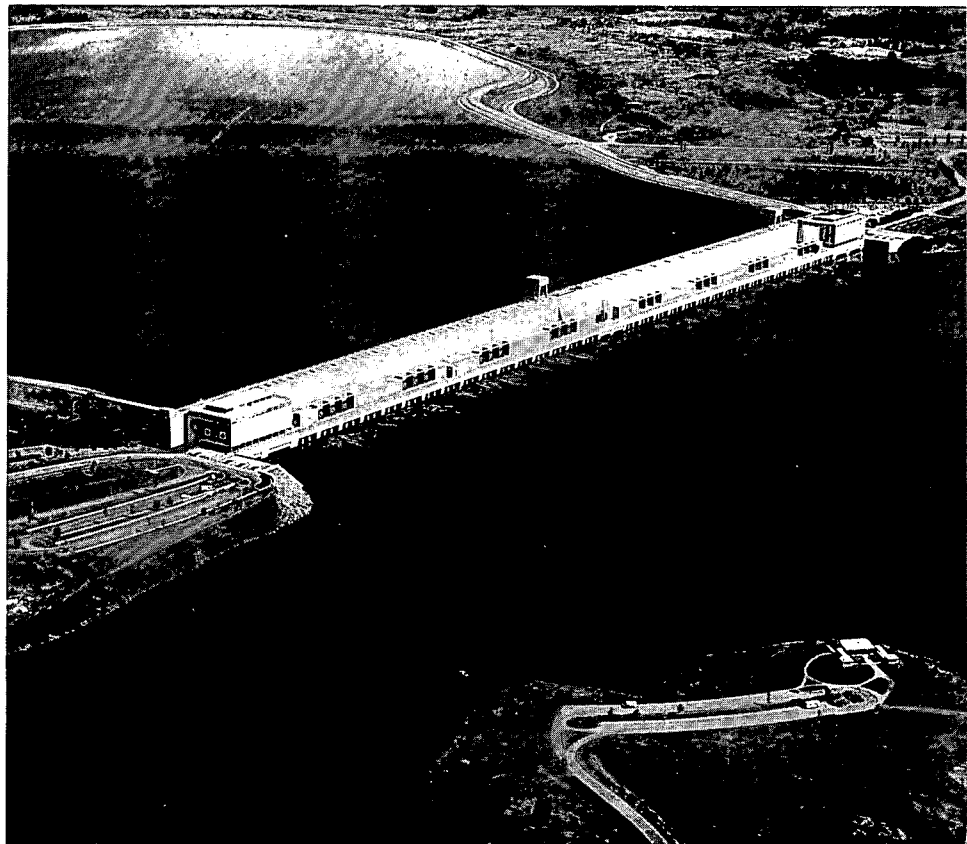
Iroquois Dam



Long Sault Dam



Robert Moses-Robert H. Saunders Power Dam



## Power Marketing

Allocations by the Authority of power from the FitzPatrick Nuclear Plant were the subject of public hearings during the year. The allocations are designed to carry out the 1968 legislative mandate directing the Authority to build nuclear plants for specific purposes: to firm the capacity of the Niagara and St. Lawrence Projects, to supply the future needs of existing municipal and rural cooperative system customers in New York State, to provide for expansion of high load factor industries and to help maintain a dependable supply of electricity in the state.

A total of 385,400 kilowatts (kw) of the 700,000 kw of FitzPatrick power to be sold as firm power has been reserved for the future needs of the Authority's existing municipal and rural electric cooperative customers. They are expected to begin calling on this supply when the Niagara power reserved for their growth is exhausted in about three years.

Industrial allocations total 314,600 kw, resulting in creation or retention of more than 1,370 permanent jobs and construction of some \$171-million in new plant facilities in Niagara, Erie, St. Lawrence and Albany Counties.

Until the public systems' growth requires the nuclear power allocated to them, it will be sold to the state's seven private utilities to assist in maintaining a dependable supply of electricity.

Industrial contracts approved by the Authority and Governors Rockefeller and Wilson provide allocations to Aluminum Company of America, Massena; Airco Industrial Gases Division of Airco, Albany County; Hooker Chemicals and Plastics Corporation, Niagara Falls; Air Products and Chemicals, Inc., Albany County; Airco Industrial Gases Division of Airco, Buffalo; Reynolds Metals Company, Massena; Airco Speer Graphite Division of Airco, Niagara Falls; Burdiox, Inc., Niagara Falls; DuPont, Niagara Falls; Dresser Transportation Equipment Division of Dresser Industries, Depew; Olin Corporation, Niagara Falls.

The final two industrial contracts have been submitted to Governor Carey for his consideration. The allocations of 14,600 kw each to Hooker Chem-

icals and Plastics Corporation and Airco Alloys Division of Airco, Inc., were approved by the Authority after a public hearing at which no opposition was voiced. Both plants are located in Niagara Falls.

The 121,000 kw of FitzPatrick output not designated for public systems and industries will be sold to the other members of the New York Power Pool in exchange for providing backup for other FitzPatrick power customers when the plant is out of service for refueling or maintenance.

Proposed contracts, subject to approval by the trustees and the Governor, will enable the utilities to purchase power reserved for the public systems and industries until it is required by the permanent customers. The tentative allocations will be on a diversity basis, providing areas with winter peak loads greater amounts at that time of year and those with summer peaks a greater share during the warmer months.

The Authority, after a public hearing in 1974, approved an allocation of 30,000 kilowatts of Niagara Project power to Allegheny Electric Cooperative, a group of 15 electric cooperatives in Pennsylvania and New Jersey. Governor Wilson subsequently approved the contract.

The allocation brought to 180,000 kilowatts the amount of Niagara Power sold out of state, pursuant to the requirement of the federal Niagara Redevelopment Act that the Authority sell a portion of the output of the project to neighboring states within economic transmission distance.

The allocation was the subject of a competing application from the State of Vermont, which is challenging the Authority decision before the Federal Power Commission and contending that additional Niagara power should be sold to Vermont. Vermont receives 50,000 kilowatts of Niagara power and 100,000 kilowatts of St. Lawrence power under terms of federal laws and licenses for the projects.

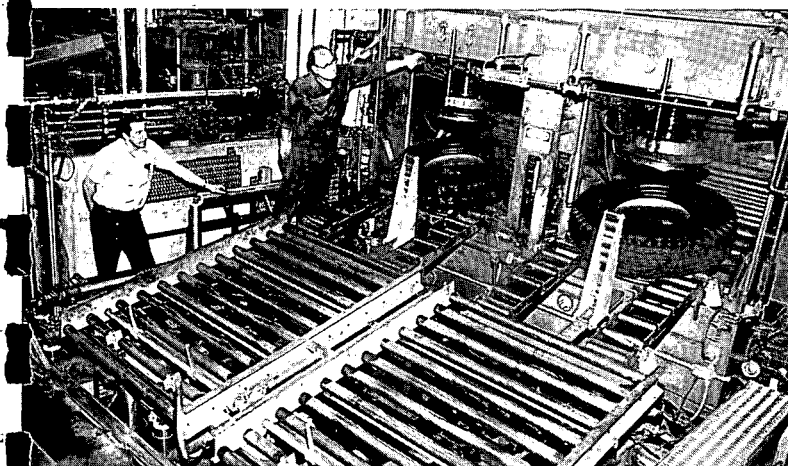
Allocations of electricity were increased to seven municipal and cooperative systems effective at the beginning of 1975. They are the Villages of Boonville, Little Valley, Rouses Point, and Solvay, and

## Electric Sales by Power Authority: Municipal Systems and Rural Electric Cooperatives

1959 ■ 173 million kwh

1974 ■ 2382 million kwh

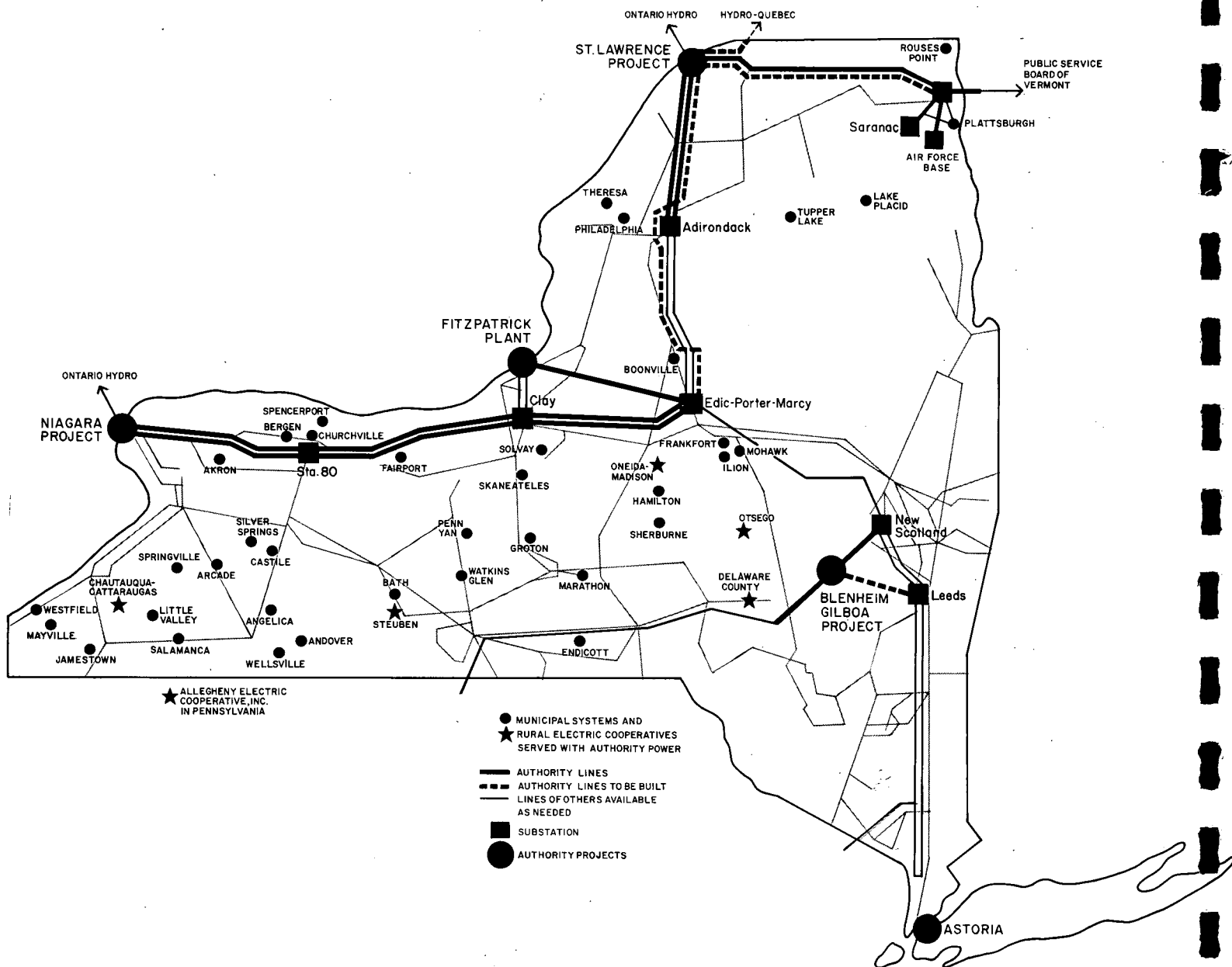




## Authority-produced power...

... serves many uses, among them (counter-clockwise from above) for industries, such as the Prestolite Company and the Dunlop Tire & Rubber Corp., for municipal systems such as Theresa, for residential and rural consumers, for pollution control systems, for farms and, in the future, for mass transit.





the Chautauqua-Cattaraugus, Oneida-Madison, and Steuben rural electric cooperatives.

Inflationary pressures and the need for capital improvements to maintain and upgrade the electric departments have caused a number of the systems to request rate increases. In 1974, the Authority approved increases for the Villages of Endicott, Ilion, Bergen, Boonville, Little Valley, Watkins Glen, Solway, Penn Yan, and Groton, and the Oneida-Madison Electric Cooperative. In most cases, the residential rates remain lower than they were prior to start of service to such systems by the Authority.

Contracts for sale of a portion of the power produced at Niagara and St. Lawrence to three utilities provide for monthly credits to rural and residential customers. The credits reflect savings experienced by serving a portion of the needs of these customers

with Authority power instead of the utilities' own generation.

During 1974, Niagara Mohawk credited rural and domestic customers with \$2,557,866; New York State Electric and Gas credited \$1,639,600; and Rochester Gas and Electric credited \$647,928.

Major additional benefits not reflected in the credits accrued to the residential and rural customers of the three utilities. Because part of their electricity was generated at the two Authority hydroelectric projects, no fuel adjustment was charged for that power while escalating fuel costs increased the cost of power produced at the utilities' steam generating plants.

Savings to rural and domestic residential consumers in fuel adjustment charges amounted to about \$50-million in 1974.

## Transmission

Electricity from Authority projects is transmitted to load centers over lines built and operated by the Authority and other members of the New York Power Pool.

Power from the FitzPatrick Plant flows to the main cross-state transmission network over the Authority's newest line, a 70-mile-long, 345,000-volt transmission link to the Edic Substation near Utica.

The Authority owns two 345,000-volt circuits extending from Niagara Falls to Utica, a distance of 199 miles. They deliver power to Station 80 of Rochester Gas and Electric Corporation near Rochester, to Niagara Mohawk Power Corporation's Clay Substation and to Niagara Mohawk's Edic Substation.

At Edic, the Authority lines connect with those of Niagara Mohawk, which extend to a connection with Consolidated Edison, north of New York City.

A connection also is made at Utica to two Niagara Mohawk 230,000-volt lines which run northerly to the Authority's Adirondack Substation. From Adirondack, two 230,000-volt, 86-mile-long lines owned by the Authority extend to the St. Lawrence switchyard, completing the connection between Niagara and St. Lawrence Projects.

The Authority owns a 230,000-volt, 71-mile line from Massena to an Authority substation near Plattsburgh where voltage is reduced to 115,000 and 46,000 volts. An application for a second line to Plattsburgh is pending before the Public Service Commission.

From the Plattsburgh Substation, power is transmitted to Vermont at 115,000 volts, utilizing an overhead transmission line to and submarine cables

under Lake Champlain. The New York portion of the line is owned by the Authority and the Vermont portion by the Vermont Electric Power Company.

Power from the Plattsburgh Substation also is transmitted over a 115,000-volt line to the Authority's Saranac Substation, where there is an interconnection with the New York State Electric and Gas Corporation system.

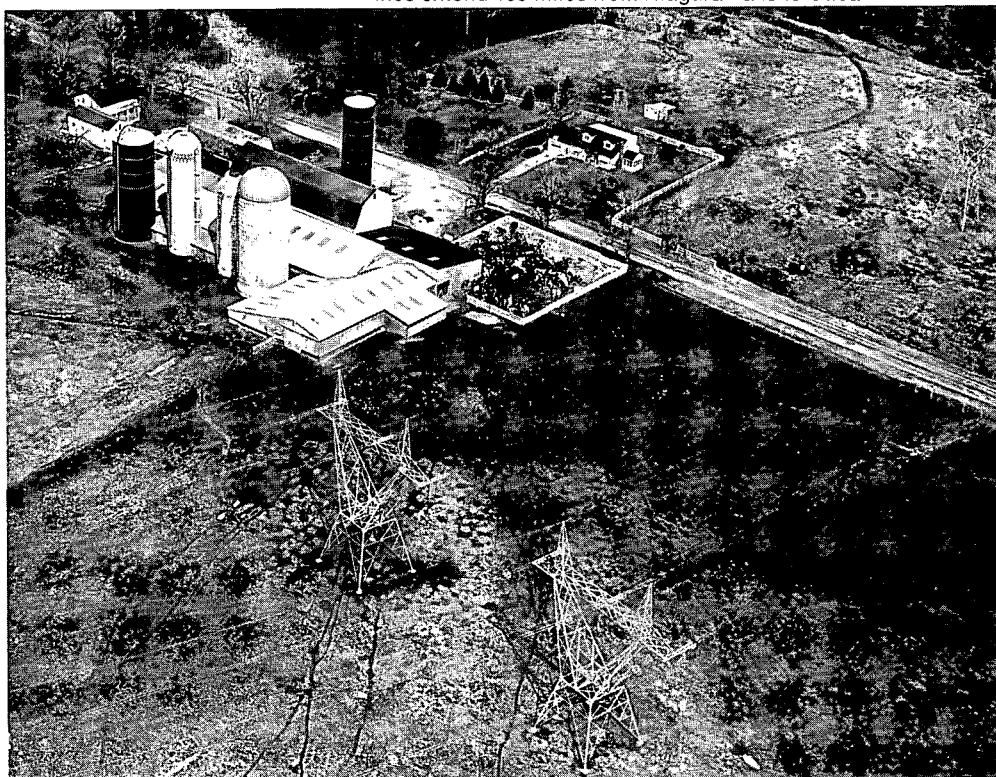
The United States Air Force Base near Plattsburgh purchases all of its electric power directly from the Authority via a 46,000-volt line which the Authority built from its Plattsburgh Substation.

The City of Plattsburgh built a 115,000-volt line from its Receiving Station No. 1 to the Authority's Plattsburgh Substation and constructed its No. 2 Receiving Station to obtain power from the Authority's Plattsburgh-Saranac Line.

Power to and from the Blenheim-Gilboa Project flows over two 345,000-volt lines, each about 30 miles long. One to the southwest connects with a New York State Electric and Gas line near Delhi in Delaware County. The other, running northeast from the project, connects with the New Scotland Substation of Niagara Mohawk in Albany County. A third line was licensed by the Federal Power Commission to connect with the Leeds Substation southeast of the project. The route and design have been in litigation since 1969.

Plans to build additional transmission lines to improve reliability of the northeastern New York State network and to permit import of at least 800,000 kilowatts of Quebec power are discussed in detail on Page 13.

The Authority's cross-state, 345,000-volt transmission lines extend 199 miles from Niagara Falls to Utica



## Operations, Maintenance and Improvements

In 1974, river flows in the Niagara and St. Lawrence ebbed slightly from the record highs of the preceding year. However, continuing high flows enabled the Authority to generate 24.9 billion kilowatt hours (kwh) of electricity at its hydroelectric projects on the two rivers during the year.

The Authority continued to provide assistance in combating shoreline damage resulting from the high level of Lake Ontario. At Niagara, the Authority provided surplus rock to Niagara County lakefront property owners without charge. The Niagara County Office of Natural Disaster and Civil Defense directed and controlled removal, transportation and distribution of the rock, excavated during construction of the Niagara Project. Virtually all of the more than 130,000 tons of surplus rock was used in the two-year program, benefiting approximately 200 property owners.

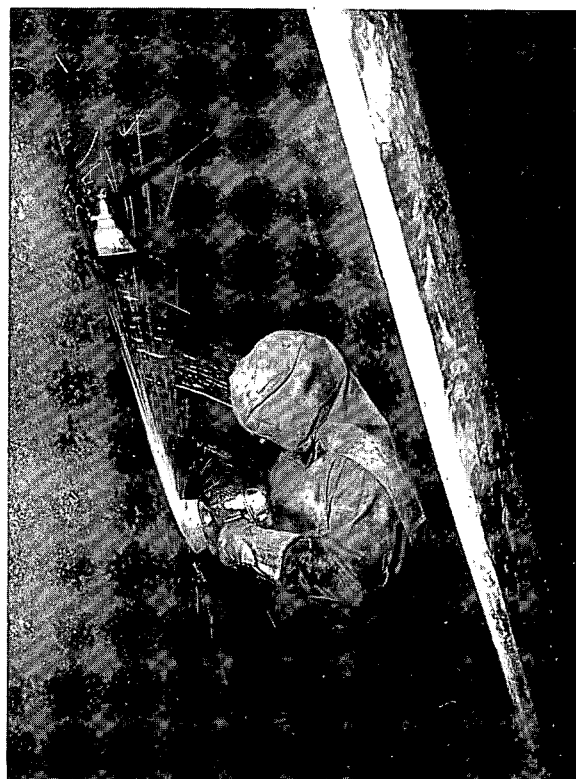
For the second straight year, the St. Lawrence Project released water through Long Sault Dam to help ease high water conditions on the lake. The level of Lake Ontario is controlled by releases through the project dams in accordance with instructions of the International Joint Commission.

The St. Lawrence Project generated 7.6 billion kwh during the year and produced its 100 billionth kwh since operations began in 1958.

Niagara's net generation was 17.3 billion kwh.

The Blenheim-Gilboa Project generated 1.2 billion kwh to meet peak consumer demands in its first full calendar year of operation.

Ice booms jointly installed by the Authority and Ontario Hydro at Niagara and St. Lawrence again operated successfully throughout the winter, despite continued high water levels. It was the 15th straight year at St. Lawrence and the 10th at Niagara in which the booms permitted formation of a stable ice cover under which the full flow of the rivers could move freely without the extensive ice jams that once caused flooding, damage to public and private property and reduced power production.



Grinder smooths weld during maintenance of Lewiston Plant turbine-runner

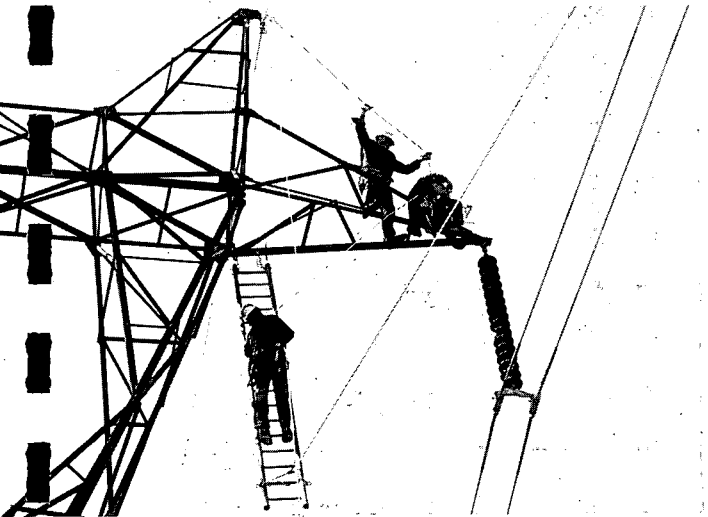
Normal maintenance operations were accomplished at all projects, utilizing schedules that insure maximum use of water and maximum availability of units, particularly during periods of heavy power demand.

At St. Lawrence, work began in 1974 on extensive switchyard additions to permit a second high voltage transmission tie to Ontario Hydro.

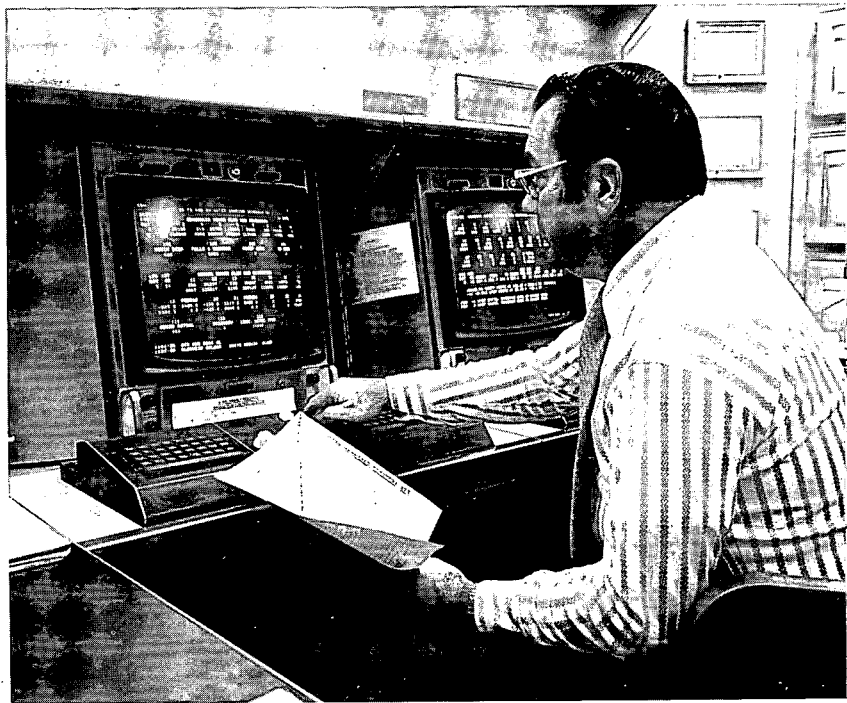
At Niagara, purchase and installation of a spare stator reduced maintenance downtime for generator repairs.

Niagara and St. Lawrence River flows are shown in the following table:

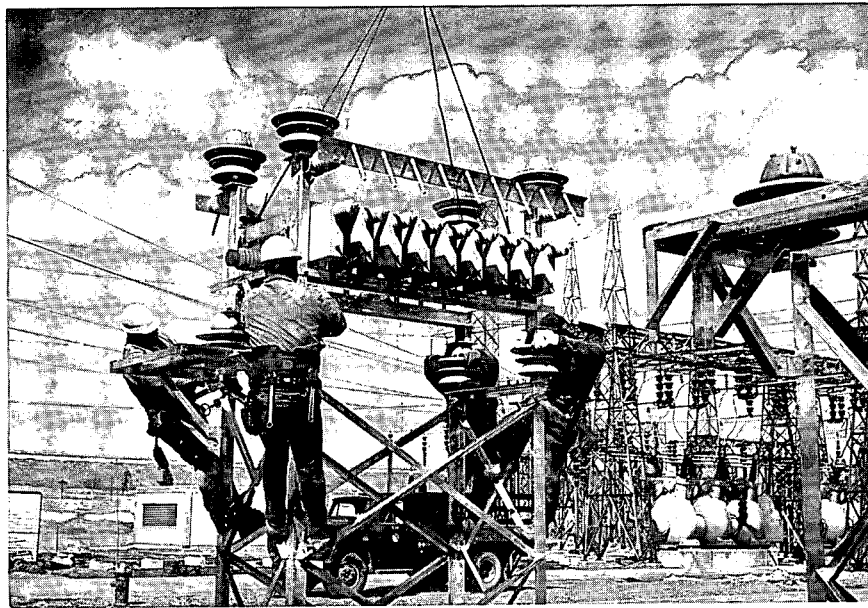
	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	Long Term Average
Average Annual Niagara River Flow (cfs)	243,000	247,000	229,000	213,000	209,800	219,600	207,000	194,000	186,000	172,000	202,000
End of Year Lake Erie Level (IGL 1955)	571.6	571.5	572.3	571.6	571.0	571.4	570.5	570.4	569.8	569.6	569.6
Average St. Lawrence River Flow (cfs)	299,000	308,100	280,800	258,000	249,800	265,800	252,000	234,000	220,000	195,000	246,000
End of Year Lake Ontario Level (IGL 1955)	243.9	244.7	245.7	243.7	244.2	243.7	244.3	244.7	244.3	244.2	243.9



Replacing transmission line insulator



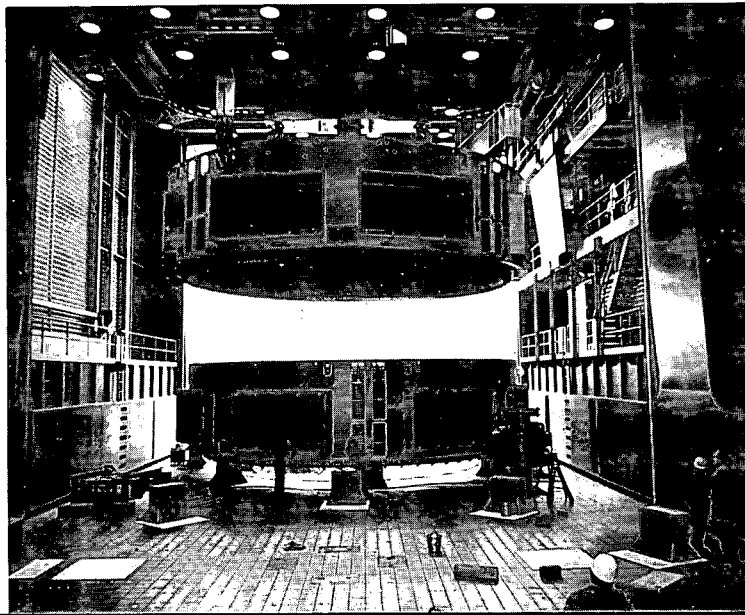
Computer at Niagara Production Control Center coordinates Authority power dispatching



Installation of capacitors at St. Lawrence switchyard to improve voltage support and reliability of service



Generator stator rewinding at Niagara





## Conservation of Energy

Municipal systems and rural cooperatives served by the Authority, along with private systems throughout the state, instituted a three per cent voltage reduction during the first three months of the year. The move helped to conserve supplies of fossil fuels used to generate electricity in the state during a period of shortages due to the foreign oil embargo. Although all of the Authority's power was produced at hydroelectric facilities, the cooperative venture permitted fuel conservation at fossil fuel-fired generating stations.

Industrial users of Authority-produced power, as well as the public systems, devised and implemented conservation measures.

Authority projects and offices continued conservation programs that included reduction of lighting, lowering of heat levels and elimination of non-essential electrical use.

A folder on energy conservation, outlining contributions individuals can make to reduce energy consumption, was prepared and distributed by the Authority.

## Research Programs

Empire State Electric Energy Research Corporation (ESEERCO) continues to seek improved methods of producing and delivering electric power. It was formed in 1973 by the state's major electric utility companies and the Authority to coordinate research and development activities.

The research organization is an extension and restructuring of the former Empire State Atomic Development Associates (ESADA) formed by the utilities in 1960 and joined by the Authority in 1972.

Through ESEERCO, the Authority is participating in research projects related to its programs, including cooling tower design, and high-temperature gas-cooled reactor design and development.

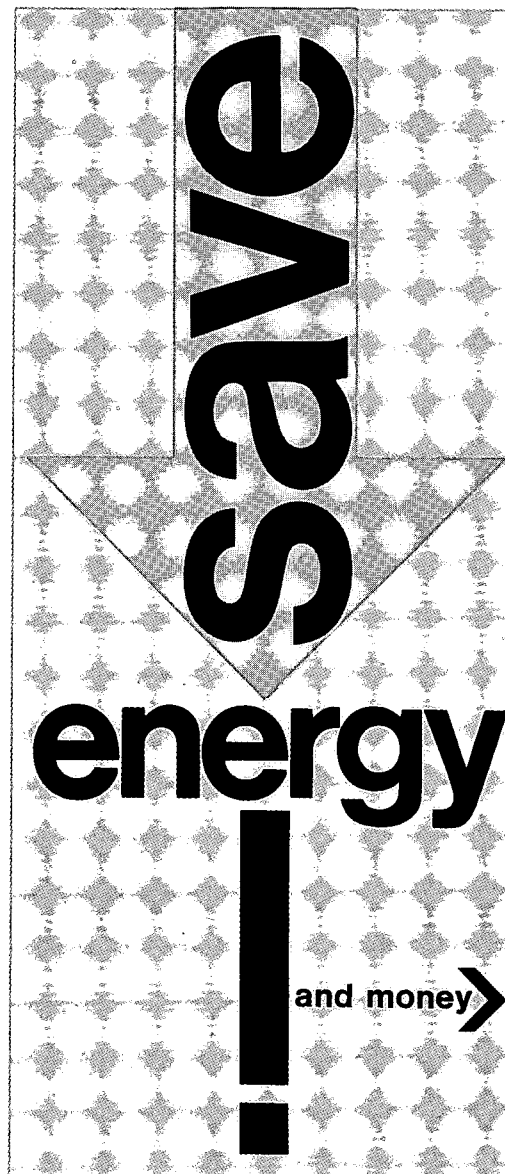
As part of the research, the Authority's FitzPatrick Nuclear Plant has been equipped with a prototype monitor for improved and continuous detection of any vibration both inside and outside its reactor.

The Authority, Central Hudson Gas and Electric Corporation, Consolidated Edison Company, Orange and Rockland Utilities and the New York State Atomic and Space Development Authority are coordinating aquatic studies of the Hudson River in a program planned with and approved by the State Department of Environmental Conservation.

## New York Power Pool

The New York Power Pool (NYPP) Control Center near Albany continues to coordinate the reliable and economic dispatch of power produced by Pool members and imported from outside the state.

In addition, the Pool increased its role as a center



Energy conservation folders  
available at Authority offices

for combining the talents and resources of its member systems in such fields as environment, energy conservation, and long-range planning.

The Power Authority and the state's seven major private utilities are members of the pool.

The control center was opened in 1969 to schedule and dispatch power with speed and reliability through the use of highly-sophisticated equipment. It is connected by voice and data communication links with the Authority's production control center at Niagara, similar centers of other members, and the New England, Ontario and Pennsylvania-New Jersey-Maryland power pool control centers.

In July, NYPP coordinated production, import and dispatch of power to meet a statewide demand of 19,509,000 kilowatts. The 1974 peak was second to

the record demand of 20,267,000 kilowatts in 1973. In 1972, the peak demand was 18,890,000 kilowatts.

### **Great Lakes Commission**

The Authority continues its participation in the work of the Great Lakes Commission, an informal consultative body of the eight Great Lakes states — New York, Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania and Wisconsin.

The participating states form an informal panel for consultations on matters affecting the Great Lakes Basin and provide recommendations to member states and the federal government.

### **Northeast Power Coordinating Council**

The Authority is an active member of the Northeast Power Coordinating Council, an association of 21 electric power systems in New York, New England, and the Canadian Provinces of New Brunswick and Ontario. The member systems' plants total more than 60 million kilowatts, approximately 98 per cent of the region's generating capability.

During the year, the Authority's director of power operations was named chairman of the council's system design coordinating committee.

### **Ice and Power**

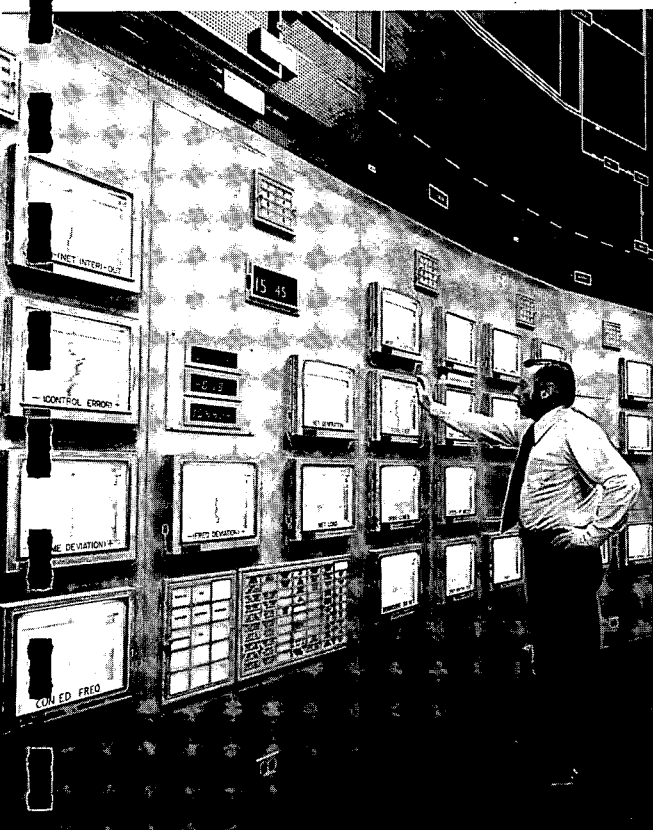
The Authority in 1974 assisted in the design, loca-

tion and test schedule of an experimental ice boom as part of continuing cooperation in navigation season extension studies by the U. S. Winter Navigation Board.

At year-end, the U. S. Seaway Development Corporation was placing this boom in Lake St. Lawrence, about four miles upstream of the St. Lawrence Power Project, which is operated jointly by the Authority and Ontario Hydro under direction of the International Joint Commission.

The Seaway boom is in addition to the six booms the power agencies place in the river each winter to protect shoreline property, power production and other interests. Since the first placement in 1959, the booms have successfully maintained a stable ice cover that prevents formation of additional ice in sufficient quantities to cause jamming and flooding.

The Authority and Ontario Hydro agreed that location of the Seaway boom would have no effect on the level of St. Lawrence flows. The power agencies have maintained that experimentation on behalf of the Seaway after formation of the ice cover behind their booms could only be done with full acceptance by the Seaway of responsibility for any damage caused.



Section of New York Power Pool control room



Ice forms behind Lake Erie ice boom

## Related Improvements and the Environment

Environmental programs, varied in nature, have been an Authority tradition since start of construction of the St. Lawrence Power Project two decades ago.

They have included scenic protection and restoration, outdoor recreation facilities, wildlife sanctuaries, and community improvements undertaken in conjunction with construction of electric generating plants.

These programs have demonstrated that power plants can be good neighbors.

Two noteworthy events occurred in 1974.

At the Niagara Project, the State Office of Parks and Recreation opened Artpark, a major center for visual and performing arts. It is located on the Lewiston State Park land provided by the Authority to the state agency. Authority trustees in 1974 increased by 53 to 193 acres the amount of land provided to the Office of Parks and Recreation to permit it to expand the Artpark program.

At the Blenheim-Gilboa Project, opening of the Authority's visitors' center contributed to development of the historic Lansing Manor property as a major conservation-educational-scientific complex.

### Blenheim-Gilboa Project

Mine Kill State Park was built by the Power Authority as part of its Blenheim-Gilboa Project.

The park, transferred to the Saratoga-Capital District State Park Commission of the Office of Parks and Recreation for operation, is a multi-purpose facility.

It includes a three-pool swimming complex with a 160-foot-long swimming pool, a 40-foot-square diving pool and a 40-foot-long, kidney-shaped children's wading pool, with modern bathhouse and concession building.

The park also offers picnic areas, play fields,

scenic overlooks, hiking trails and a launching ramp that permits access to the lower reservoir for boating and fishing.

Wildlife resources have been preserved in the area of the Mine Kill, a tributary that flows into the park area in a series of small waterfalls. This section of the park is a natural sanctuary for deer and small animals and can be explored only by hiking trails. The Mine Kill also can be viewed from an overlook built along Route 30.

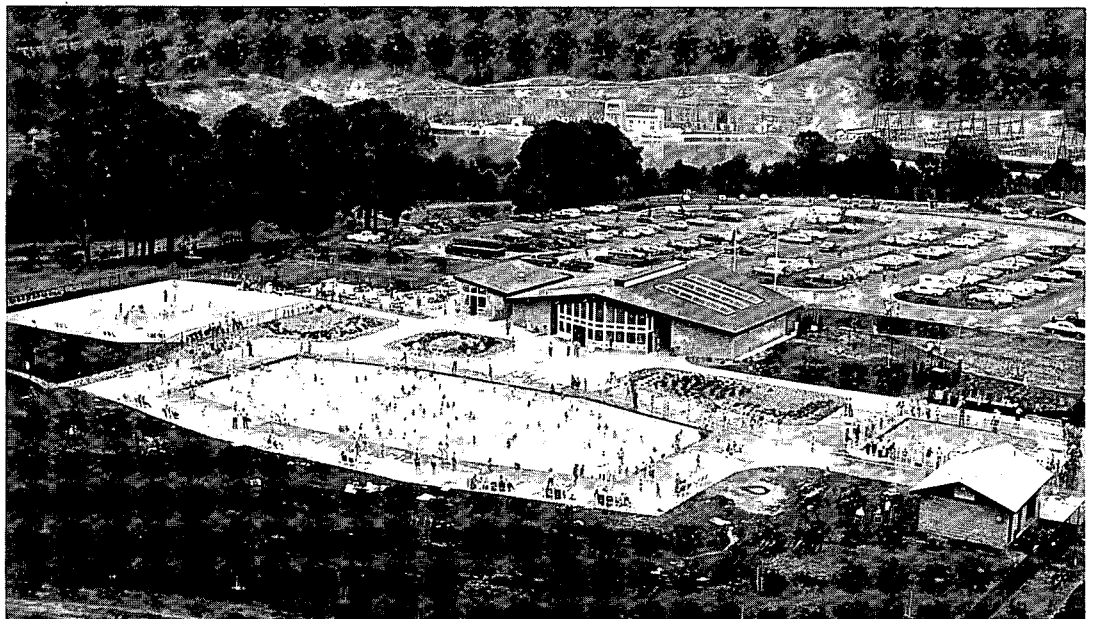
The comprehensive program for use of the Lansing Manor property provided a wildlife management area, supervised by the State Department of Environmental Conservation, while preserving and restoring a historical group of buildings for use as a museum, a weather station and the Authority's visitors' center. The Lansing Manor development is discussed in detail on Page 30.

### St. Lawrence Project

Limited public recreation facilities existed prior to start of St. Lawrence Project construction and development of related conservation and recreation improvements. Over 4,100 acres of parkland and facilities were transferred by the Authority to the Thousand Islands State Park Commission. More than four million persons have used these parklands. The Authority also established wildlife management sanctuaries and provided recreational facilities for area towns and villages.

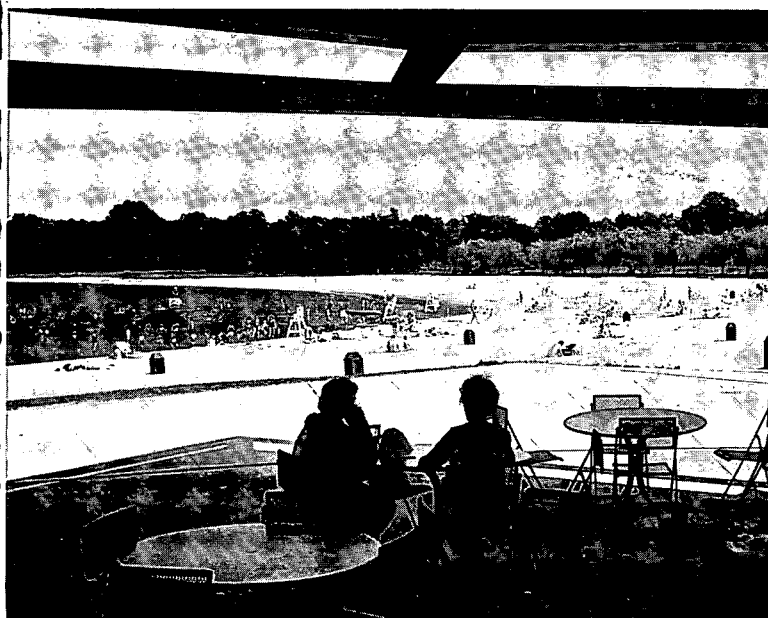
Major features include:

- Wilson Hill Waterfowl Management Area, about 3,000 acres, of which 1,900 are under water. It is located near Wilson Hill, a 350-acre promontory into Lake St. Lawrence. Preserved by the Authority under agreement with and managed by the State Department of Environmental Conservation, it has become a major location for establishment of flocks

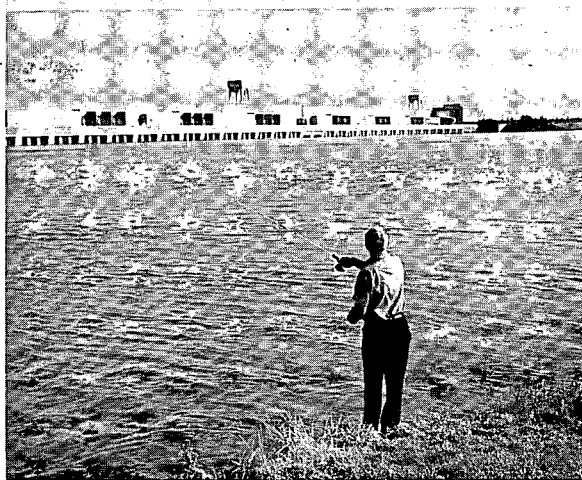


Swimming pools at Mine Kill State Park, Blenheim-Gilboa





Barnhart Island beach, St. Lawrence



Fishing near St. Lawrence Power Dam



Wildfowl at St. Lawrence



Camping at Robert Moses State Park, St. Lawrence

of wild Canada geese and other water fowl.

- Robert Moses State Park, with 700 acres on Barnhart Island and 1,600 acres on the New York mainland, including picnic areas, camping, trailer sites and scenic overlooks. The park is a haven for deer and other wildlife.

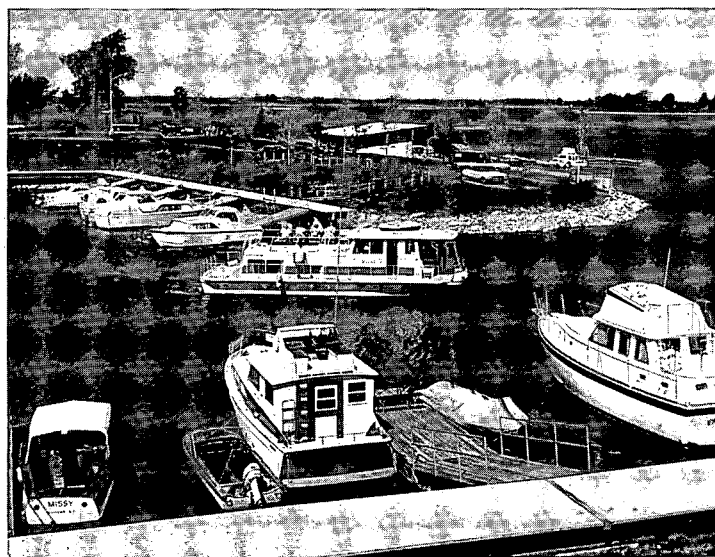
- Barnhart Island Marina, Boat Basin and Picnic Area, a sheltered cove for mooring small craft. Docks, launching ramps and picnicking facilities are located nearby.

- Barnhart Island Beach on the shore of Lake St. Lawrence.

- Hawkins Point Overlook and Boat Launching Ramp on the mainland.

- Coles Creek Marina and Campsite in the Town of Waddington.

- Outdoor recreation facilities for the Towns of Massena, Waddington and Lisbon and the Village of Waddington, among them beaches, parks, boat launching ramps and play areas.



Barnhart Island Marina at St. Lawrence

Islands encompassing some 2,700 acres remain in their natural state under Authority jurisdiction and are available for conservation, recreation and wildlife management uses when needed.

Land not required for power purposes nor reserved for conservation or recreation has been made available for development in accordance with standards protecting scenic and environmental values.

### Niagara Project

Authority contributions in the Niagara area incorporated restoration of natural scenery and construction of facilities for public relaxation and recreation.

The program included:

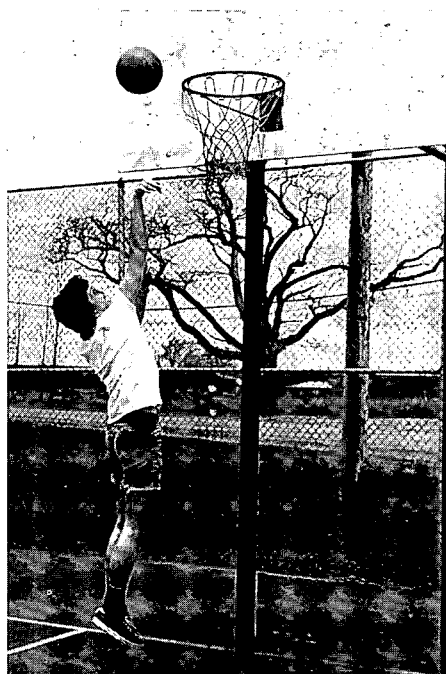
- Expansion of the Niagara Reservation, the state park at the famed cataracts; extension of the upstream end of Goat Island, situated between the American and Horseshoe Falls; and building of the American Rapids Bridge between the mainland and Goat Island. These facilities are operated by the Niagara Frontier State Park and Recreation Commission.
- Construction of a 10-mile section of the Robert Moses State Parkway to provide scenic access and by-pass a congested industrial district.
- Creation of the 132-acre Reservoir State Park and initial development of recreation including use of the reservoir embankment for sledding and skiing.
- Acquisition of land for the 193-acre Lewiston State Park on which the State Office of Parks and Recreation built Artpark.
- Creation of a park near the falls on which the Commission built a geological museum.
- New facilities for the City of Niagara Falls including a 144-acre enlargement of Hyde Park, expansion of the municipal golf course, and construction of a golf course clubhouse, the first playground in the downtown area and a Hyde Park sledding hill.
- Financial contributions to the effort to reduce erosion of the Horseshoe Falls.

At Niagara, as at all Authority projects, buildings were designed to present a pleasing appearance and areas were landscaped.

In addition to land made available without charge for public improvements, the Authority also has disposed of excess property for private development in the best interest of the community and in accordance with local zoning ordinances. Remaining surplus land is available for sale under similar standards.

### FitzPatrick Nuclear Plant

Extensive safety and environmental studies conducted by the Authority provided a plant design that would insure operation without risk to the public. Detailed environmental monitoring is continuing in cooperation with Niagara Mohawk Power Corporation, which has a nuclear plant nearby.



Basketball at Reservoir Park



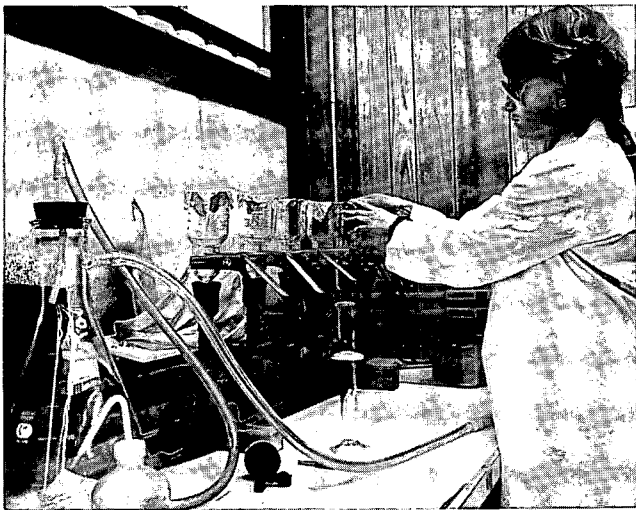
American Rapids Bridge, Niagara Falls

The Authority's nuclear plant will meet the state's rigid standards on thermal discharge. To meet these criteria, hydraulic model studies were conducted, different aspects of the cooling water intake and discharge facilities for the plant were investigated and various structures were tested to arrive at the design most suited to the plant.

Detailed investigations were undertaken of the present and projected population distribution for seven counties within a 40-mile radius and of major industrial activities, land use and agriculture.

Meteorology records dating back 50 years were supplemented by a study using a tower built for the purpose.

Studies of Lake Ontario currents near the site, initiated in 1963, included more than 120 cruises over two years. Additional lake current and temperature surveys were conducted in 1969, using two underwater towers with temperature sensors and current meters mounted at various depths. Current and temperature patterns over a wide area of Lake



Environmental monitoring at  
FitzPatrick Nuclear Plant laboratory

Ontario were charted by boat and airplane teams. Aerial photography was used to record the patterns marked by small floats set adrift. Airborne infrared radiometry measured overall surface temperatures. Results of these investigations were used in the hydraulic model studies and in design of the intake and discharge system.

Geologic and seismologic investigation of the site and surrounding area included test borings, evaluation of the geologic structure and tectonic history of the region and field geophysical measurements.

Ecological field surveys were conducted in three main categories. Benthic studies included examination of the lake bottom by divers to evaluate composition, shape and living organisms. Fish distribution studies utilized a fathometer which records relative sizes of fish and their location above the bottom. Fish netting experiments were carried out to identify species.

A continuing radiation surveillance program will insure that releases and exposures are within established limits. On-site and off-site monitoring stations determine radiation levels on land, in the air and in the water.

Similar studies, underway at potential locations for new hydroelectric, fossil-fired and nuclear plants are discussed in detail in the "future construction" section on pages 9 to 13.

## Transmission

It has been the policy of the Power Authority to provide for multiple use of land along its transmission line rights-of-way.

The Authority generally acquires permanent easements by which it obtains the right to build and maintain the lines. The easements allow the owner to use the land on the right-of-way for any purpose which does not interfere with operation and maintenance of the lines.

The uses to which land has been put include farming, pasturing, recreation and wildlife management.

The Authority's lines for transmission from the Blenheim-Gilboa Project and from the FitzPatrick Plant incorporate guidelines of the Federal Power Commission and the President's Commission on Natural Beauty. The lines are designed to transmit electricity reliably and economically under conditions which will preserve and enhance environmental values.

The routes were designed to reduce to a minimum the number of highway and stream crossings and to utilize terrain variations to preserve esthetics.

Included are:

- Selective clearing in the project areas, at major highway and stream crossings and in certain scenic areas.
- Design and location of transmission towers to provide minimum disruption in the particular terrain and to provide structural forms that will best blend into the terrain while maintaining reliability.
- Continued use of much of the rights-of-way for present purposes, such as agriculture.
- Development of other sections of rights-of-way for recreation or wildlife management by other agencies.

The Authority is continuing its established policy of acquiring easements, but will also obtain broader property rights where other multiple public use of the right-of-way is planned.

An environmental management program is being developed for new lines prior to start of construction.



Cows share transmission line right-of-way

## Visitors' Centers

The Blenheim-Gilboa visitors' center was dedicated at ceremonies attended by more than 3,000 persons in July. About 20,000 persons visited the center during its first five months of operation.

The center is housed in a classic barn, restored and refurbished for public enjoyment on the historic Lansing Manor property which overlooks the power project lower reservoir and adjoins Authority-built Mine Kill State Park. The property originally was acquired for a wildlife management program.

The Authority transformed the group of post-Revolutionary War buildings into a major historical-scientific-educational complex, in cooperation with the Schoharie County Historical Society and the State University of New York (SUNY) at Albany. Paul Schaefer, an expert on historic restorations, supervised restoration for the Authority.

The barn contains exhibits on Schoharie Valley history, culture, and environment; displays explaining past, present and future energy sources; an observatory providing scenic views of the power project and surrounding countryside; and a theater. The latter, once the location for milking operations, is used for a multi-media show.

Also situated in the barn is the Schoharie Valley Field Station of the Atmospheric Sciences Research Center of SUNY, Albany. It contains scientific exhibits. Local weather data is gathered at the site, and daily forecasts are provided.

The Manor House will be operated as a museum by the Schoharie County Historical Society after restoration is completed in 1975.

The Niagara Project Power Vista is a two-level structure capping the main generating plant and overlooking the Niagara River and Gorge 350 feet below. The spectacular scenery can be viewed from open observation decks and a patio, and through floor-to-ceiling display windows. More than 181,000 visitors were counted in 1974, including a multinational group attending the World Energy Conference and other foreign tourists.

The St. Lawrence Project visitors' center tops the Robert Moses Power Dam, 116 feet above the lower level of the St. Lawrence River. From an observation deck, visitors can see as far as the Adirondack Mountains, 30 miles away, as well as the closer beauty of the surrounding parklands. More than 150,000 persons visited the project in 1974.

The centers are equipped with cutaway working models of the power projects, dioramas, terrain maps, motion picture and slide films, and other educational exhibits. Original murals by famed painter Thomas Hart Benton draw attention to historical highlights in each area.

## Student Programs

Special educational programs for students at various grade levels are offered at the three visitors' centers. At Niagara, the Power Vista classroom was used by about 5,000 students in 1974. At St. Lawrence, a similar program provided educational opportunities for about 3,500 students. The Blenheim-Gilboa program, begun in the fall, attracted about 1,000 pupils during the first three months. Guides for teachers are available at Niagara and Blenheim-Gilboa, and one is being developed for St. Lawrence.

## Stimulation of Tourism

Staff members of the Authority actively participate in programs to help attract visitors to project areas to aid local economies. Assistance is provided to Chambers of Commerce and federal, state and local officials in tourist promotion efforts.

## Publications

Booklets explaining operation of its hydroelectric projects are available at Authority visitors' centers and by request from Authority offices. A folder on energy conservation, published in 1974, provides valuable information on the subject.

## Films

Construction and operation of the St. Lawrence and Niagara Projects is told in the 22½ minute color and sound motion picture "Tale of Two Rivers," which has been seen by more than seven million persons since it was produced in 1966.

The Authority's construction of the Blenheim-Gilboa and FitzPatrick Plants is told in a 22-minute color and sound film, "The Second Generation."

A nationally produced film on nuclear power is available for showing by Authority representatives on request.

Thomas Hart Benton mural of French missionary Father Louis Hennepin at Niagara Falls in 1678 is displayed at Niagara Project Power Vista.



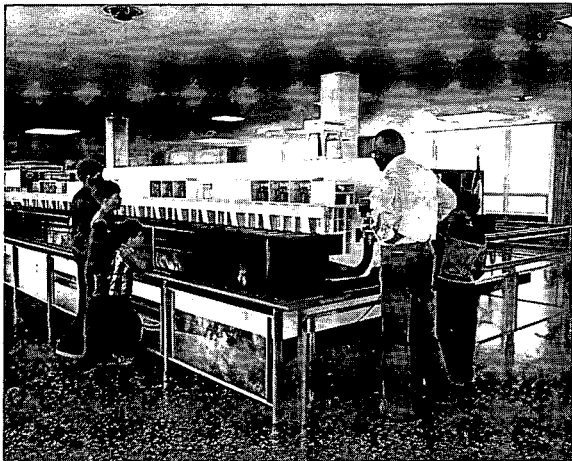




Mine Kill Falls, Blenheim-Gilboa



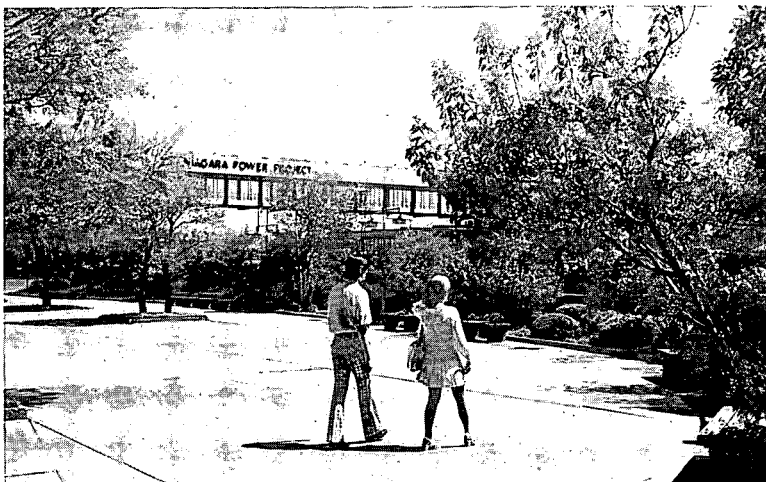
Blenheim-Gilboa visitors' center at Lansing Manor complex



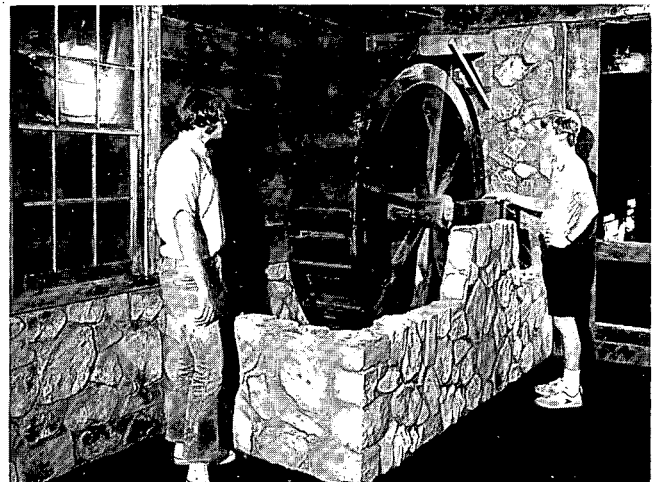
St. Lawrence Project visitors' center



Blenheim-Gilboa visitors' center



Power Vista at Niagara Project



Operating waterwheel, Blenheim-Gilboa visitors' center

# Power Sales and Revenues

	Energy Sales		Revenues	
	Kilowatt-hours (1000's)	Percent of Total	Amount	Percent of Total
Sales for Industrial Use				
Direct Industrial Use	4,713,813	19%	\$ 18,368,432	14%
Sales through Private Power Companies				
Replacement Power	3,703,290	15%	15,227,784	12%
Expansion Power	1,839,381	7%	8,119,594	6%
Total for Industrial Use	10,256,484	41%	\$ 41,715,810	32%
Sales for the Benefit of Domestic and Rural Users				
Other Sales to Private Power Companies	10,294,155	42%	44,672,171	34%
Sales to Vermont	1,137,494	5%	5,907,729	5%
Sales to Municipalities and Cooperatives	2,381,615	10%	14,392,532	11%
Total for Benefit of Domestic and Rural Users	13,813,264	57%	\$ 64,972,432	50%
Sales of Blenheim-Gilboa Pumped Storage Service			17,854,709	13%
Other Sales and Revenues*	527,702	2%	6,558,800**	5%
Total, All Sales and Revenues***	24,597,450	100%	\$131,101,751	100%

\*Includes Plattsburgh Air Force Base sales of 40,929,000 kwh for \$220,073.

\*\*Includes \$4,533,409 of revenue from certain fees from use of transmission lines and other charges which are not related to power and energy sales.

\*\*\*Includes inter-project sales with Blenheim-Gilboa Project.

Energy Sales*			Revenues*			
Year	KWH (1000's)	From Power	From Use of Transmission Facilities	From Wheeling Charges	From Gilboa Pumped Storage Services	Total
1958	1,285,560	\$ 4,345,696	\$ 307,950	\$ 17,901	\$	\$ 4,671,547
1959	5,547,343	20,495,739	1,937,529	290,612		22,723,880
1960**	6,194,552	24,509,004	1,746,763	297,569		26,553,336
1961	12,830,254	45,613,516	1,703,314	403,779		47,720,609
1962	15,783,266	59,045,185	2,821,491	660,835		62,527,511
1963***	16,483,579	64,757,453	2,420,908	802,318		67,980,679
1964	16,306,466	69,040,117	2,552,395	798,858		72,391,370
1965	17,891,473	78,163,168	3,330,981	817,354		82,311,503
1966	19,251,242	84,954,912	4,198,128	1,037,934		90,190,974
1967	19,753,704	88,330,631	4,125,577	1,331,119		93,787,327
1968	20,796,780	91,595,592	4,338,799	1,453,096		97,387,487
1969	22,234,733	96,508,443	4,339,810	1,739,241		102,587,494
1970	20,882,750	93,208,530	4,375,523	1,877,987		99,462,040
1971	21,130,429	93,950,742	4,414,332	2,014,484		100,379,558
1972	22,705,862	98,582,787	4,509,747	2,233,729		105,326,263
1973	24,803,717	106,627,339	4,611,265	2,481,194	4,816,085	118,535,883
1974****	24,597,450	105,994,911	4,632,214	2,619,917	17,854,709	131,101,751 *****
TOTAL	288,479,160	\$1,225,723,765	\$56,366,726	\$20,877,927	\$22,670,794	\$1,325,639,212

\*Inter-project sales and revenues are included in years 1958-1966.

In later years inter-project revenues are excluded to permit better statistical comparisons, even though some inter-project transactions are incorporated in the financial statements.

\*\*First full year with full capacity at St. Lawrence Project.

\*\*\*First full year with full capacity at Niagara Project.

\*\*\*\*First full year with full capacity at Blenheim-Gilboa Project.

\*\*\*\*\*Includes inter-project sales with Blenheim-Gilboa Project.

## Power Customers Served Directly

### St. Lawrence Project Contracts

- S-1 Aluminum Company of America
- S-2 Public Service Board of the State of Vermont \*
- S-3 City of Plattsburgh, N.Y.
- S-4A United States Air Force
- S-5 Reynolds Metals Company
- S-6 Niagara Mohawk Power Corporation \*
- S-7 New York State Electric & Gas Corporation \*
- S-8 Village of Boonville, N.Y.
- S-9 Village of Solvay, N.Y.
- S-10 Village of Rouses Point, N.Y.
- S-11 General Motors Corporation
- S-12 Village of Theresa, N.Y.
- S-13 Village of Philadelphia, N.Y.
- S-14 Village of Ilion, N.Y.
- S-15 Village of Mohawk, N.Y.
- S-16 Village of Hamilton, N.Y.
- S-17 Village of Skaneateles, N.Y.
- S-18 Village of Frankfort, N.Y.
- S-19 Delaware County Electric Cooperative, Inc.
- S-20 Oneida-Madison Electric Cooperative, Inc.
- S-21 Otsego Electric Cooperative, Inc.
- S-22 Village of Sherburne, N.Y.
- S-23 Lake Placid Village, Inc., N.Y.
- S-24 Village of Tupper Lake, N.Y.

### Niagara Project Contracts

- NS-1 Niagara Mohawk Power Corporation \*
- NS-2 City of Salamanca, N.Y.
- NS-3 Village of Andover, N.Y.
- NS-4 Village of Akron, N.Y.
- NS-5 Village of Wellsville, N.Y.
- NS-6 Village of Fairport, N.Y.
- NS-7 Village of Little Valley, N.Y.
- NS-8 Village of Arcade, N.Y.
- NS-9 Village of Springville, N.Y.
- NS-10 Village of Bergen, N.Y.
- NS-11 New York State Electric & Gas Corporation \*
- NS-12 Steuben Rural Electric Cooperative, Inc.
- NS-13 Rochester Gas and Electric Corporation
- NS-14 Village of Westfield, N.Y.
- NS-15 Village of Mayville, N.Y.
- NS-16 Village of Churchville, N.Y.
- NS-17 Village of Spencerport, N.Y.
- NS-18 Chautauqua-Cattaraugus Electric Cooperative, Inc.
- NS-19 Village of Watkins Glen, N.Y.
- NS-20 Public Service Board of the State of Vermont \*
- NS-21 Village of Bath, N.Y.
- NS-22 Village of Endicott, N.Y.
- NS-23 Village of Angelica, N.Y.
- NS-24 Village of Silver Springs, N.Y.
- NS-25 Village of Marathon, N.Y.
- NS-26 Village of Groton, N.Y.
- NS-27 Village of Castile, N.Y.
- NS-28 Village of Penn Yan, N.Y.
- NS-29A Allegheny Electric Cooperative, Inc.
- NS-31 City of Jamestown, N.Y.

\* Served with power from both projects.

### Blenheim-Gilboa Pumped Storage Contracts

- PS-1 Niagara Mohawk Power Corporation
- PS-2 New York State Electric & Gas Corporation
- PS-3 Rochester Gas and Electric Corporation
- PS-4 Central Hudson Electric and Gas Corporation

## Industry Served Indirectly with Niagara Project Power

### Replacement Power:

The Power Authority is required by Federal law to supply 445,000 kilowatts of its low cost firm power to the Niagara Mohawk Power Corporation to replace low cost power previously obtained from the Company's Adams and Schoellkopf Plants at Niagara Falls. This power is largely resold to designated industries at the Power Authority's wholesale firm power rate plus a transmission charge and such state and local revenue taxes as are applicable. The following industries were supplied during the year with this low cost power:

- Airco Alloys Division, Airco, Inc.
- Airco Speer Carbon-Graphite, Division of Airco, Inc.
- Allied Chemical Corporation
- American Radiator & Standard Sanitary Corporation
- Anaconda-American Brass Company
- Atlas Steel Casting Company
- Bethlehem Steel Corporation
- Buffalo Forge Company
- The Carborundum Company
- Donner-Hanna Coke Corporation
- Dresser Transportation Equipment Division
- Dresser Industries, Inc.
- Dunlop Tire & Rubber Corporation
- E. I. duPont de Nemours & Company, Inc.
- FMC Corporation (Inorganic Chemical Div.)
- General Abrasive Company, Inc.
- General Mills, Inc.
- Great Lakes Carbon Corporation
- Hooker Chemicals & Plastics Corporation
- International Multi-Foods Corporation
- International Paper Company
- National Biscuit Company
- Nitec Paper Corporation
- Olin Corporation
- The Pillsbury Company
- The Prestolite Company, Division of Eltra Corporation
- Republic Steel Corporation
- Spaulding Fibre Company, Inc.
- Stauffer Chemical Company
- TAM Div., NL Industries
- Union Carbide Corporation

### Expansion Power:

The Power Authority has allocated all of the 250,000 kilowatts of Niagara Project firm power reserved for sale to industries within thirty miles of the Niagara Project. This power is sold to local utility companies and by them to industries which require low cost power to enable them to expand operations or to establish new industries in the Niagara Frontier area. Allocations of expansion power were provided during the year to the industries listed below:

- Airco Alloys Division, Airco, Inc.
- Airco Industrial Gases, Division of Airco, Inc.
- Airco Speer Carbon-Graphite, Division of Airco, Inc.
- Arcata Graphics Corporation
- Bethlehem Steel Corporation
- The Carborundum Company
- Donner-Hanna Coke Corporation
- E. I. duPont de Nemours & Company, Inc.
- General Mills, Inc.
- General Motors Corporation-Harrison Radiator Division
- Graphite Products Div., The Carborundum Company
- Great Lakes Carbon Corporation
- Hooker Chemicals & Plastics Corporation
- International Multi-Foods Corporation
- Nitec Paper Corporation
- Moog, Inc.
- Olin Corporation
- The Pillsbury Company
- Pyron Co., Unit of American Metal Climax, Inc.
- Republic Steel Corporation
- Spaulding Fibre Company, Inc.
- TAM Div., NL Industries
- Union Carbide Corporation

### Interim Industrial Power:

In accordance with provisions of the state law under which the Authority is building the James A. FitzPatrick Nuclear Power Plant, the Authority will be able to use part of the plant output to supply power to high-load factor manufacturers. Allocations totalling 314,600 kilowatts have been made to the industries listed below under this program. Pending completion of the FitzPatrick plant those industries, to the extent their facilities to use the power have been completed, are being supplied on an interim basis with power from the Niagara and St. Lawrence Projects supported by an arrangement whereby the private utilities would supplement the Authority's generation if, due to low water, the Authority did not otherwise have sufficient energy for those interim loads:

- Air Products & Chemicals
- Airco Alloys Division, Airco, Inc.
- Airco Industrial Gases, Division of Airco, Inc.
- Airco Speer Carbon-Graphite, Division of Airco, Inc.
- Aluminum Company of America
- Burdock, Inc.
- Dresser Transportation Equipment Division
- Dresser Industries, Inc.
- E. I. duPont de Nemours & Company, Inc.
- Hooker Chemicals & Plastics Corporation
- Olin Corporation
- Reynolds Metals Company

# Financial Statements

## Statement of Receipts and Disbursements January 1, 1974 to December 31, 1974

	(In thousands)
<b>Cash Balance January 1, 1974</b>	<u>\$101,096</u>
<b>Cash Receipts:</b>	
Sale of power, etc.	130,760
Earnings on investments	19,192
Lease of property, etc.	66
Bank loans:	
Due November 1, 1975	35,000
Due August 1, 1979	10,500
Notes payable:	
Promissory notes 6¼ % due June 16, 1975	150,000
Bond anticipation notes 7¼ % due December 15, 1975	125,000
Employees' taxes withheld	449
Sale of investments (net)	7,835
Interest purchased	40
<b>Total Receipts</b>	<u>478,842</u>
<b>Total Cash Available</b>	<u>579,938</u>
<b>Cash Disbursements:</b>	
Interest on bonds and notes	58,974
Retirement of bonds:	
Serial (\$17,839,000 Principal amount)	17,819
Term (\$64,567,000 Principal amount)	58,698
Repayment of bank loans:	
Due November 1, 1975	35,000
Due August 1, 1979	16,500
Operations and maintenance including replacements	17,143
Wheeling charges	2,633
Construction costs including additions to electric plant	232,400
Financing costs	74
Taxes withheld	417
Preliminary investigations	12,184
Purchase of U.S. Government securities under agreement to resell (net)	30,000
<b>Total Disbursements</b>	<u>481,842</u>
<b>Cash Balance, December 31, 1974</b>	<u>\$ 98,096</u>

The accompanying notes are an integral part of these financial statements.



# Statement of Condition December 31, 1974

Assets	1954 Project	1970 Project	General Purpose	Total
	(in thousands)			
Expenditures for electric plant (Note B)				
In service	\$1,092,265	\$188,188		\$1,280,453
Construction work in progress	4,915	371,302	\$221,772	597,989
Cash (includes Time Deposits)	53,347	29,549	15,200	98,096
Investment in U.S. Government securities at cost (Principal \$130,522,000 Note B)	52,442	58,405	17,176	128,023
U.S. Government securities purchased under agreement to resell, at cost			35,000	35,000
Interest receivable on investments and time deposits	2,871	3,960	338	7,169
Receivables—power sales, etc.	10,122	1,668		11,790
Deposits (Note F)	1,359			1,359
Materials and supplies (at average cost)	3,383	136		3,519
Prepayments and other assets	950	138		1,088
Preliminary investigations			19,267	19,267
Intra Authority balances	288	(286)	(2)	
	<u>\$1,221,942</u>	<u>\$653,060</u>	<u>\$308,751</u>	<u>\$2,183,753</u>
<b>Liabilities and Other Credits</b>				
Bonds outstanding (Note D)	\$ 478,912	\$654,000		\$1,132,912
Promissory notes payable due June 16, 1975			\$150,000	150,000
Bond anticipation notes payable due December 15, 1975			125,000	125,000
Retained on contracts	280	1,966		2,246
Accounts payable and accrued liabilities	4,858	1,415	33,751	40,024
Total liabilities	<u>484,050</u>	<u>657,381</u>	<u>308,751</u>	<u>1,450,182</u>
Bonds Retired From:				
Bond service	196,067			196,067
Bond reserve	231,728			231,728
General reserve	195,343			195,343
	<u>623,138</u>			<u>623,138</u>
Revenues Allocated To:				
Bond service	7,480	1,036		8,516
Bond reserve	30,693	(5,585)		25,108
General reserve	18,293			18,293
Insurance and improvement fund	27,611			27,611
Working capital	23,136	201		23,337
Additions to electric plant	7,541	27		7,568
	<u>114,754</u>	<u>(4,321)</u>		<u>110,433</u>
	<u>\$1,221,942</u>	<u>\$653,060</u>	<u>\$308,751</u>	<u>\$2,183,753</u>

The accompanying notes are an integral part of these financial statements.

# Summary of Funds 1974

1954 Project							
	General*						Insurance & Improvement
	Revenue	Operating	General Construction	Bond Service	Bond Reserve	General Reserve	
Available Funds January 1, 1974	\$ —0—	\$21,612	\$ 950	\$ 3,452	\$43,362	\$ 4,759	\$27,611
Cash Receipts:							
Sale of power, etc.	113,281						
Earnings on investments	8,251		93				
Lease of property, etc.	66						
Bank Loans:							
Due November 1, 1975							
Due August 1, 1979							
Notes payable:							
Promissory Notes 6¼ % due June 16, 1975							
Bond anticipation notes 7¼ % due December 15, 1975							
Employees' taxes withheld		449					
Total Receipts	121,598	449	93				
Total Available	121,598	22,061	1,043	3,452	43,362	4,759	27,611
Transfer of funds —Revenue	(121,598)	19,350		39,429	15,771	47,048	
—Other						(1,200)	1,200
	\$ —0—	41,411	1,043	42,881	59,133	50,607	28,811
Cash Disbursements:							
Interest on bonds and notes				20,021			
Retirement of bonds:							
Serial (\$17,839,000)				17,566	253		
Term (\$64,567,000)				2,071	19,314	37,313	
Repayment of bank loans:							
Due November 1, 1975							
Due August 1, 1979							
Operations and maintenance including replacements		15,539					
Wheeling charges		2,633					
Construction cost including additions to electric plant		1,189	281				1,501
Financing costs							
Taxes withheld		417					
Preliminary investigations							
Total Disbursements		19,778	281	39,658	19,567	37,313	1,501
Available Funds December 31, 1974		\$21,633	\$ 762	\$ 3,223	\$39,566	\$13,294	\$27,311
Distributed as follows:							
Demand deposits		\$ 1,149	\$ 62	\$ 1,473	\$ 1,575	\$ 4,860	\$ 9,000
Time deposits		20,000	700	1,750	2,800	5,000	13,888
Investment in U.S. Government securities		484			35,191	3,434	13,333
U.S. Government securities purchased under agreement to resell							
Totals		\$21,633	\$ 762	\$ 3,223	\$39,566	\$13,294	\$27,311

\*In hands of Trustees

The accompanying notes are an integral part of these financial statements.

1970 Project							Projects Study	General Purpose	
General*							Projects Study	Astoria 6 Construction Fund	Projects' Study
Revenue	Operating	Construction Fund	Nuclear Fuel Reserve	Temporary Interest*	Bond Service	Bond Reserve			
(In thousands)									
\$ —0—	\$ —0—	\$33,158	\$ 8,428	\$22,108	\$ —0—	\$75,798	\$ 755	\$ —0—	\$ —0—
7,611		9,868							
1,101		9,140					151	447	9
							35,000		
							10,500		
								115,000	35,000
								125,000	
8,712		19,008					45,651	240,447	35,009
712		52,166	8,428	22,108		75,798	46,406	240,447	35,009
(6,712)	1,750				6,962				
					8,829	(8,829)	17,381		(17,381)
\$ —0—	1,750	52,166	8,428	22,108	15,791	66,969	63,787	240,447	17,628
				22,108	15,791		1,054		
							35,000		
							16,500		
	1,604								
	23	39,082	584					189,740	
		66						8	
							11,233		951
	1,627	39,148	584	22,108	15,791		63,787	189,748	951
\$ 123		\$13,018	\$ 7,844	\$ —0—	\$ —0—	\$66,969	\$ —0—	\$ 50,699	\$16,677
\$ 123		\$ 527	\$ 50			\$ 44		\$ 405	\$ 195
		10,535	7,300			10,970		9,000	5,600
		1,956	494			55,955		11,294	5,882
								30,000	5,000
\$ 123		\$13,018	\$ 7,844			\$66,969		\$ 50,699	\$16,677

# Revenues ... Disposition of Revenues — 1974

	1954 Project	(in thousands)	1970 Project*
<b>Revenues</b>			
<b>Power sales</b>			
Demand charges	\$37,005		\$8,084
Energy charges	66,045		1,163
Other	2,945	\$105,995	\$ 9,247
<b>Transmission charges</b>		4,632	
<b>Wheeling charges</b>		2,620	
<b>Investment and other income</b>			
Interest	9,058		4,345
Lease of property, etc.	19	9,077	
		<u>\$122,324</u>	<u>\$13,592</u>
<b>Disposition of Revenues</b>			
<b>Operating expenses</b>			
Operations	\$ 9,419		\$1,924
Maintenance	5,644		198
Wheeling charges	2,620		
Replacement of electric plant	88	\$ 17,771	\$ 2,122
<b>Interest on long term debt</b>		19,496	15,791
<b>Retirement of bonds</b>		81,978	
<b>Additions to electric plant in service or in progress</b>		2,733	27
<b>Additions to accumulated working capital</b>		346	201
		<u>122,324</u>	<u>18,141</u>
<b>Less:</b>			
Provided from bond reserve			4,549
		<u>\$122,324</u>	<u>\$13,592</u>

\*Revenues were paid into the revenue fund beginning August 1, 1974 in accordance with Revenue Bond Resolution. The accompanying notes are an integral part of these financial statements.

## Notes to Financial Statements

### Note A—General

Power Authority of the State of New York is a body corporate and politic, a political subdivision and a corporate municipal instrumentality of the State of New York created by the Legislature of the State by Chapter 772 of the Laws of 1931, approved April 27, 1931, and last amended by Chapter 370 of the Laws of 1974.

Properties and income of the Authority are exempt from taxation.

### Note B—Accounting Policies

(a) Accounts of the Authority are maintained in accordance with the Uniform System of Accounts as prescribed by the Federal Power Commission, adapted to the provisions of the Authority's bond resolutions.

(b) Expenditures for electric plant in service and construction work in progress consist primarily of amounts expended to construct, acquire and complete, and place in operation the generating plants, transmission and related facilities of the Authority and include, in accordance with the bond resolutions, net bond discount and financing costs incurred in the issuance of bonds and notes, interest on bonds and notes (less interest income on unexpended funds), and revenues and ex-

penditures in connection therewith during the period of construction. These expenditures are stated at initial cost and include the cost of additions financed from operating revenues as follows:

#### 1954 Project

General Revenue Bonds \$1,089,639,021  
Operating Revenue \$ 7,541,319

#### 1970 Project

Revenue Bonds \$ 559,463,746  
Operating Revenue \$ 26,441  
General Purpose  
Notes Payable \$ 221,771,739

(c) The Authority's bond resolutions provide that operating expenses shall not include any provision for depreciation, amortization or similar charges. Effective recovery of investment in facilities is accomplished through allocation of available revenues to funds for the retirement of bonds at cost. The excess of principal amount over the cost of retirement of bonds is used for additional bond retirements. Replacements of the facilities are treated as operating expenses.

(d) Investments are stated at cost. The aggregate market value of the investment in U.S. Government securities, based upon published bid prices at December 31, 1974 amounted to \$126,386,311.

(e) Employees of the Authority are covered by the New York State Employees' Retirement System. The Authority contributes the entire amount due under the plan. Pension plan costs for the year 1974 of \$2,246,000 are based on billings received from the Retirement System. The Authority's employees are also covered by the Federal Insurance Contribution Act (Social Security).

(f) Sales and purchases of power between the Niagara and St. Lawrence projects have been eliminated in the presentation of revenues and operating costs.

### Note C—Financing

The Authority has adopted three bond resolutions:

(1) A General Revenue Bond Resolution adopted on December 21, 1954 provides that revenues (received after completion of a project) from the St. Lawrence and Niagara projects and related transmission lines (the 1954 Project), in excess of operating expenses, working capital and necessary reserves are first applied to the payment of bond service (interest and principal installments due on outstanding bonds); then a sum equal to forty per cent of each year's bond service is set aside

in a bond reserve account (the amount in such account above the next year's bond service is used to retire bonds); any remaining revenues are deposited in a general reserve account to be used for the retirement of bonds or paid to the Authority for deposit in an insurance fund or an improvement fund. A total of \$1,102,050,000 bonds was issued under the resolution, of which \$478,912,000 remain outstanding at December 31, 1974. No additional bonds may be issued under the resolution.

(2) A Revenue Bond Resolution adopted as of June 15, 1970 provides that proceeds from the sale of bonds for the Blenheim Gilboa Pumped Storage Project, the FitzPatrick Nuclear Plant and the FitzPatrick-Edic Transmission Line (the 1970 Project), be sufficient to provide for construction costs, to pay interest during construction and a bond reserve requirement of two years' interest. Upon the retirement of all the bonds issued under the 1954 resolution, the bond reserve requirement will be reduced to one year's interest. Revenues (received after completion of the 1970 Project) in excess of operating expenses, working capital and necessary reserves are first applied to the payment of bond service (interest only to December 31, 1984, thereafter interest and principal installments due on outstanding bonds); then a sum equal to twenty five per cent of each year's bond service is set aside in a bond reserve account (the amount in such account above the bond reserve requirement will be used to retire bonds); any remaining revenues are deposited in a general reserve account to be paid to the Authority for any lawful corporate purpose. Upon the retirement of all bonds issued for the 1954 Project not later than December 31, 1984 (the date established in a schedule set forth in the 1970 Revenue Bond Resolution) revenues of the 1954 Project, after providing for operating expenses, working capital and reasonable and necessary reserves, will be applied to the extent necessary to meet any deficiency in the 1970 bond service or bond reserve accounts. A total of \$654,000,000 bonds has been issued under the 1970 resolution, all of which remain outstanding at December 31, 1974. The Authority has the right to issue additional bonds on a parity with the 1970 bonds (i) to complete the 1970 Project, (ii) to refund one or more series of bonds outstanding under the 1970 Resolution or all of the 1954 Bonds then outstanding, and (iii) to finance major repairs, replacements, improvements, betterments or additions to the 1970 Project. No bonds or notes were issued during 1974.

(3) A General Purpose Bond Resolution adopted on November 26, 1974 (the 1974 resolution) provides for the financing of future projects of the Authority. Projects are defined in the resolution to mean any project of the Authority directly or indirectly related to power generation or transmission, whether owned jointly or singly by

the Authority, including any output in which the Authority has an interest, heretofore or hereafter authorized by the Power Authority Act and hereafter specified in the supplemental resolution adopted at the time a series of bonds is issued.

The 1974 resolution pledges the full faith and credit of the Authority to the payment of the bonds as well as all its revenues and other income not subject to previous pledges (i.e., the 1954 and 1970 resolutions). The Authority also pledges not to issue any bonds or notes secured by a charge or lien on such revenues and income equal or prior to the charge or lien of the 1974 resolution. Under the resolution proceeds from the sale of bonds are devoted to the project or projects specified in each supplemental resolution, and all revenues not pledged under the 1954 or 1970 resolutions from any project of the Authority after its completion (after deductions for operating expenses, working capital, necessary reserves and projects' study) are applied first to the payment of bond service, (interest to December 31, 1985, thereafter interest and principal installments due on outstanding bonds), then a sum equal to fifteen per cent of each year's bond service is set aside in a bond reserve account (the amount in such account above the bond reserve requirement will be used to retire bonds); any remaining revenues are deposited in a general reserve account to be paid to the Authority for any lawful corporate purpose. Upon the retirement of all bonds issued for the 1954 Project, that portion of the revenues of such project (after providing for operating expenses, working capital and reasonable and necessary reserves) in excess of the amount required under the 1970 resolution, will be applied to the bonds under the 1974 resolution. The Authority covenants that at all times rates and charges will be sufficient, together with other moneys available therefor, to meet the requirements of the resolution. The resolution provides that upon the issuance of bonds for a project for which bonds have not previously been issued, the Authority will certify that for the five years commencing either in 1986 (the year after the 1954 bonds are covenanted to be retired) or, if later, in the year after the latest estimated date of completion of any project, estimated revenues not subject to the pledge of the 1970 resolution less estimated operating expenses will be at least 1.20 times estimated maximum aggregate bond service for all bonds then estimated to be outstanding.

**Note D—Bonds Outstanding.** The General Revenue Bonds issued for the 1954 Project outstanding at December 31, 1974 bear interest payable semiannually on January 1, and July 1 with maturities and respective interest rates per annum shown in table below:

1954 Project	Amount	Maturity January 1	Interest Rate
Series A—St. Lawrence Power Project			
Term Bonds	\$124,999,000	1995	3.20%
Serial Bonds	6,200,000	1976	2.75%

The 1974 resolution establishes a projects' study fund to finance preliminary efforts of the Authority to determine appropriate methods to fulfill its purposes under the Power Authority Act. There is deposited into the fund (i) out of bond proceeds, the amount set forth in a supplemental resolution, and (ii) if there is no deficiency in bond service, an amount not to exceed two percent of revenues not pledged under the 1954 or 1970 resolutions.

In accordance with a resolution adopted on May 28, 1974, a loan agreement was entered into with a bank on June 4, 1974, to enable the Authority to borrow a maximum of \$50,000,000 for projects' study, including repayment of \$10,500,000 notes outstanding under a loan agreement dated February 1, 1974 which was thereby terminated. The June loan agreement provided that the total amount of the commitment or any part be drawn not later than November 1, 1974. A total of \$35,000,000 was borrowed as evidenced by a \$15,000,000 note issued on June 4, 1974, and a \$20,000,000 note issued on October 28, 1974. The loan agreement was terminated with the repayment of the notes upon the issuance of the promissory notes described below.

On November 27, 1974 the Authority issued, pursuant to the General Purpose Bond Resolution, \$150,000,000 of 6¼% promissory notes due June 16, 1975. Of the proceeds, \$35,000,000 were used to repay the projects study notes and \$115,000,000 to pay a portion of the costs of acquisition and completion of the Astoria 6 Project.

On December 30, 1974, the Authority issued, pursuant to the General Purpose Bond Resolution, the First Supplemental General Purpose Bond Resolution authorizing \$175,000,000 General Purpose Bonds, Series D, adopted on December 17, 1974, and a Loan Agreement dated December 17, 1974, \$125,000,000 of 7¼% Bond Anticipation Notes due December 15, 1975. The proceeds of the notes are to pay a portion of the costs of acquisition and completion of Astoria 6.

On January 30, 1975, the Authority sold for settlement and delivery on February 11, 1975, pursuant to the General Purpose Bond Resolution and the Second Supplemental General Purpose Bond Resolution, adopted on January 30, 1975, \$150,000,000 General Purpose Bonds, Series A. The proceeds of the bonds after provision for bond reserve and temporary interest requirements are to be used to pay a portion of the acquisition and completion of Astoria 6.



Series B—Barnhart Plattsburgh Transmission Line Project Serial Bonds	1,919,000	1976 to 1985	2.75% and 2.80%
Series C—Supplemental Transmission Line Project Serial Bonds	1,962,000	1976 to 1985	3.75%
Series E—Niagara Power Project Term Bonds	79,764,000	2006	4.20%
Serial Bonds	6,025,000	1976 and 1977	3.75%
Series F—Niagara Power Project Term Bonds	79,429,000	2006	4.20%
Serial Bonds	12,900,000	1976 to 1979	3.75%
Series G—Niagara Power Project Term Bonds	48,599,000	2006	4.375%
Serial Bonds	7,730,000	1976 to 1979	4.00%
Series H—Niagara Power Project Term Bonds	34,294,000	2006	4.125%
Serial Bonds	7,500,000	1976 to 1980	3.75%
Series J—Niagara Power Project Term Bonds	42,757,000	2006	3.75%
Serial Bonds	6,420,000	1976 to 1979	3.25% and 3.40%
Series K—Niagara Power Project Term Bonds	9,779,000	2006	3.625%
Serial Bonds	1,560,000	1976 to 1980	3.25% to 3.35%
Series L—Second Circuit Transmission Line Project Term Bonds	4,285,000	2006	3.55%
Serial Bonds	2,790,000	1976 to 1984	3.25% and 3.30%
	<u>\$478,912,000</u>		

The bonds are subject to redemption prior to maturity in whole or in part in inverse order of the maturities on January 1, 1975 or any date thereafter at various redemption prices according to the date of redemption, together with accrued interest to the redemption date. None of the bonds of Series D or I has been or will be issued by the Authority.

The Revenue Bonds issued for the 1970 Project outstanding at December 31, 1974 bear interest payable semiannually on January 1, and July 1, with maturities and respective interest rates per annum shown below:

	Amount	Maturity January 1	Interest Rate
1970 Project			
Series A			
Term Bonds	\$120,000,000	2010	6.875%
Serial Bonds	20,000,000	1986 to 1993	6.50%
Series B			
Term Bonds	85,500,000	2010	5.625%
Serial Bonds	24,500,000	1986 to 1995	5.10% to 5.50%
Series D			
Term Bonds	98,000,000	2010	5.875%
Serial Bonds	22,000,000	1986 to 1995	5.10% to 5.60%
Series E			
Term Bonds	39,000,000	2010	5.50%
Serial Bonds	11,000,000	1986 to 1995	4.90% to 5.30%
Series F			
Term Bonds	95,000,000	2010	5.50%
Serial Bonds	29,000,000	1986 to 1995	4.75% to 5.30%
Series G			
Term Bonds	85,000,000	2010	5.375%
Serial Bonds	25,000,000	1986 to 1995	5.00% to 5.20%
	<u>\$654,000,000</u>		

None of the Bonds of Series C has been or will be issued by the Authority.

The bonds will be subject to redemption prior to maturity in whole or in part in inverse order of maturities beginning on January 1, 1981 at various redemption prices according to the date of redemption and the amount redeemed together with accrued interest to the redemption date.

Funds for the redemption of \$17,566,000 General Revenue Serial Bonds due January 1, 1975 plus interest on all bond indebtedness payable on that day had been deposited with the Trustees prior to December 31, 1974 and accordingly, there is no liability reflected in the accompanying statements for such interest or bonds.

#### Note E—Commitments and Claims

Estimated costs to be incurred on outstanding construction contracts at December 31, 1974 aggregated approximately \$20,000,000.

No provision has been made for land acquisition claims in excess of appraisal estimates deposited with the Comptroller of the State of New York. Such deposits are included in Construction Work in Progress.

At December 31, 1974 the Authority was obligated on trades for the purchases of \$2,592,000 principal amount Power Authority of the State of New York General Revenue Bonds for delivery subsequent to December 31, 1974 at a cost of \$2,282,719.

#### Note F—F.P.C. Annual Charges

Deposits include \$1,358,472 of annual charges for the years 1961 through 1973 representing amounts assessed by the Federal Power Commission for its cost of administering Part 1 of the Federal Power Act, from which charges the Authority contends its Niagara Project is at least partially exempt. All charges were paid under protest and are kept by the Commission in a special account subject to refund.

Main Lafrentz & Co.  
certified public accountants

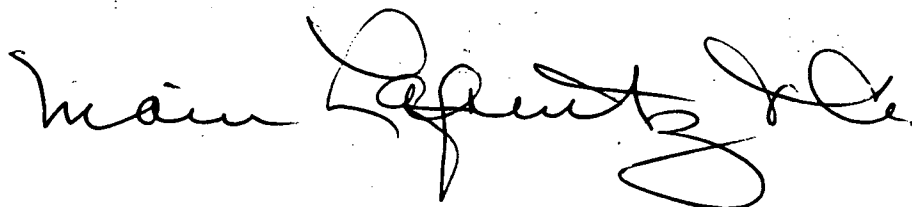
280 PARK AVENUE  
NEW YORK, NEW YORK 10017  
212 867 9100

Power Authority of the State of New York  
New York, New York

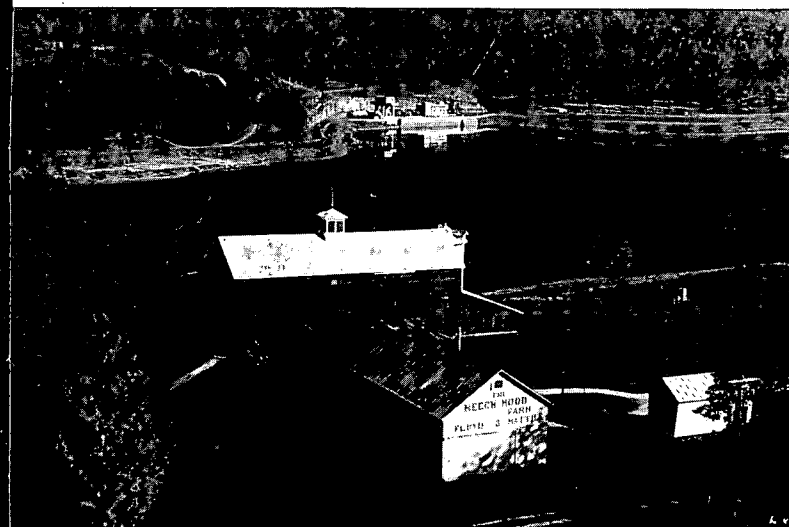
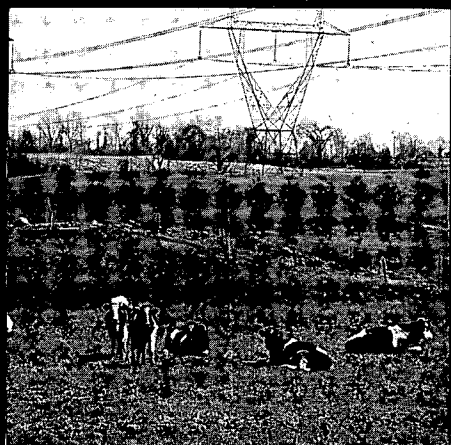
We have examined the statement of condition of the Power Authority of the State of New York as of December 31, 1974, and the statements of revenues, disposition of revenues, receipts and disbursements, and summary of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As indicated in the note on accounting policies, the Authority's Bond Resolutions provide that operating expenses shall not include any provision for depreciation, amortization or similar charges. Effective recovery of investment in facilities is accomplished through allocation of available revenues to funds for the retirement of bonds at cost.

In our opinion, such financial statements present fairly the financial position of the Power Authority of the State of New York at December 31, 1974, and revenues, disposition of revenues, cash and fund transactions for the year then ended, in conformity with generally accepted accounting principles adapted to the provisions of the Bond Resolutions, as being appropriate for the Authority, applied on a basis consistent with that of the preceding year.



New York, New York  
February 11, 1975



# 1974

## Power Authority of the State of New York

# Annual Report

TRUSTEES \*

<u>Name</u>	<u>Business Address</u>
JAMES A. FITZPATRICK Chairman	48 Court Street Plattsburgh, New York 12901
GEORGE L. INGALLS Vice Chairman	One Marine Midland Plaza Eighth Floor Binghamton, New York 13902
WILLIAM J. RONAN	Room 5600 30 Rockefeller Plaza New York, New York 10020
RAYMOND J. LEE	7137 Northledge Drive Lockport, New York 14094

\* There is presently one vacancy on the Board of Trustees.

PRINCIPAL STAFF

<u>Name</u>	<u>Business Address</u>
GEORGE T. BERRY General Manager and Chief Engineer	10 Columbus Circle New York, New York 10019
WILBUR L. GRONBERG Assistant General Manager - Engineering	10 Columbus Circle New York, New York 10019
SCOTT B. LILLY General Counsel	10 Columbus Circle New York, New York 10019
JOHN W. BOSTON Director of Power Operations	10 Columbus Circle New York, New York 10019
THOMAS F. MC CRANN, JR. Controller	10 Columbus Circle New York, New York 10019



LEGISLATION AUTHORIZING ACQUISITION  
OF CON EDISON FACILITIES

New York City—Generating, Transmission Facilities—  
Electric Service

*Memorandum relating to this chapter, see page 3002*

CHAPTER 369

An Act to amend the public authorities law and the public service law, in relation to the acquisition and completion of generating and transmission facilities by power authority of the state of New York in order to maintain an adequate and reliable supply of electricity in the metropolitan area of the city of New York and throughout the state.

Approved and effective May 17, 1974.

Passed on message of necessity. See Const. art. IX, § 2(b)(2), and McKinney's Legislative Law § 44.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows:*

Section 1. The third and fourth unnumbered paragraphs of section ten hundred one of the public authorities law, such third paragraph having been added and such fourth having been amended by chapter four hundred eighty-nine of the laws of nineteen hundred seventy-two, are hereby amended to read as follows:

It is further declared that there is a shortage of dependable power capacity in the southeastern part of the state and that the public interest requires that the authority assist in alleviating such shortage by providing such base load generating facilities as may be necessary or desirable to contribute to the maintenance of an adequate and dependable supply of electricity for the metropolitan transportation authority, its subsidiary corporations, ~~and~~ the New York city transit authority, the port authority of New York and New Jersey, the city of New York, the state of New York, the United States, other public corporations and electric companies within the metropolitan area of the city of New York within the state of New York.

It is further declared (i) that there should be full cooperation among private and public entities including the authority, municipal corporations and rural electric cooperatives engaged in power generation, transmission and distribution and in associated developmental and service activities, (ii) that it is desirable that the authority and the utilities which with the authority constitute the New York power pool exchange comparable cost, performance and operating data with respect to generation by nuclear means particularly reflecting the effect of the authority's tax-free status, (iii) that it is desirable and reasonable that the authority sell power and energy from its projects other than the Niagara and Saint Lawrence hydroelectric projects, not needed for its high load factor industrial, municipal, rural electric cooperative and public transportation customers to other members of the New York power pool for resale without discrimination under their respective tariffs and (iv) that it is desirable that the authority, in order to cooperate in New York state atomic and space development authority's program for maximum development and peaceful use of atomic energy, utilize nuclear fuel supplied by New York state atomic and space development authority provided it is available and its utilization is not to the significant economic disadvantage of the authority and not operationally infeasible to the extent deemed advisable by the trustees.

deletions by strikeouts

§ 2. Title one of article five of such law is hereby amended by adding thereto a new section, to be section ten hundred one-a, to read as follows:

§ 1001-a. Emergency provisions for the metropolitan area of the city of New York

The legislature hereby finds and declares that extraordinary circumstances, including excessive costs, shortages of supply, and the inflated price of fuel threaten the capacity to provide utility service essential to the continued safety, health, prosperity and well-being of the people of the metropolitan area of the city of New York and, by reason of the interconnection and interdependence of electric facilities, the reliability of such service throughout the state and require emergency action by the state and its agencies. It is therefore declared that:

1. To preserve reliability of electric service in the metropolitan area of the city of New York and throughout the state and to assist in deterring further extraordinary increases in rates for electric service the authority should provide such supplemental electricity for such use in the metropolitan area of the city of New York as is consistent with continuing and maintaining the exemption of interest on authority bonds from the income tax imposed by the Internal Revenue Code of the United States<sup>1</sup> and regulations and ruling thereunder.

2. It is essential that such electricity be provided at the earliest practicable time.

3. The authority should be authorized to acquire completed or partially completed generation, transmission and related facilities and fuel and fuel contracts.

4. Any cost savings realized in the production or delivery of electricity by reason of any such acquisition by the authority should be passed on to consumers.

<sup>1</sup> 26 U.S.C.A. (I.R.C.1954) § 1 et seq.

§ 3. The third unnumbered paragraph of section ten hundred five of such law as added by chapter four hundred eighty-nine of the laws of nineteen hundred seventy-two, is hereby amended to read as follows:

The authority is further authorized to construct and/or acquire and complete such base load generating, transmission and related facilities as it deems necessary or desirable to assist in maintaining an adequate and dependable supply of electricity by supplying power and energy for the metropolitan transportation authority, its subsidiary corporations, and the New York city transit authority, the port authority of New York and New Jersey, the city of New York, the state of New York, the United States, other public corporations and electric corporations within the metropolitan area of the city of New York within the state of New York; provided, however, that the acquisition of completed or partially completed facilities shall be limited to facilities located in New York city or Westchester county and the energy and power generated by such facilities shall be used, to the extent feasible, for the benefit of electric consumers in that area, and provided, further, that transmission facilities shall not be so acquired pursuant to this paragraph unless such acquisition is necessary to assure delivery of power and energy produced by any acquired generating facility.

§ 4. Paragraph g of subdivision five of section ten hundred five of such law, such subdivision having last been amended by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight, is hereby amended to read as follows:

g. That the rates, services and practices of the purchasing, transmitting and/or distributing public agencies or companies in respect to the power generated by such projects shall be governed by the provisions and principles established in the contract, and not by regulations of the public service commission or by general principles of public service law regulating rates, services and practices and that in the event any such public agencies or companies which purchase power from the authority shall sell any such power for resale, such sale for resale shall be made at rates no higher than those at which the power was purchased from the authority.

§ 5. Paragraph d of subdivision six of section ten hundred five of such law, such subdivision having been added by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight, is hereby amended to read as follows:

d. That the rates, services and practices of the purchasing, transmitting and/or distributing public agencies and rural electric cooperatives in respect to the power and energy from such projects shall be governed by the provisions and principles established in the contract, and not by regulations of the public service commission or by general principles of public service law regulating rates, services and practices and that in the event any such public agencies or cooperatives which purchase power from the authority shall sell any such power for resale, such sale for resale shall be made at rates no higher than those at which the power was purchased from the authority.

§ 6. Paragraph e of subdivision six of section ten hundred five of such law is hereby renumbered to be paragraph f and such subdivision is hereby amended by adding thereto a new paragraph to be paragraph e, to read as follows:

e. In the case of a contract with an electric corporation entered into on or after May first, nineteen hundred seventy-four (i) for assurances by the electric corporation of prompt and timely payment of all bills rendered by the authority and that failure to make such prompt and timely payment shall be grounds for immediate termination of the contract, and (ii) that in the event the contract is so terminated, the electric company will wheel to such purchasers as the authority may direct the power and energy that would have been sold to the electric company had the contract not been terminated.

§ 7. Subdivision seven of section ten hundred five of such law, as last amended by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight is hereby amended to read as follows:

7. To proceed with the physical construction or completion of any project authorized by this title, including the erection of the necessary dams, power houses and other facilities, instrumentalities and things necessary or convenient to that end, and including also the erection of such transmission lines as may be necessary to conduct electricity to ~~industrial~~ users located at or near the site; and including also the acquisition, by contract only with the owners thereof, of transmission lines or the use of such transmission lines, available or which may be made available, to conduct electricity to such point or points at which the electricity is sold by the authority to any person, corporation or

deletions by strikeouts

association, public or private, engaged in the business of distribution and sale of electricity to ultimate consumers or if the authority is unable to so acquire by contract the ownership or use of such transmission lines, including also the erection by the authority of transmission lines necessary for such purposes; and thereafter to maintain and operate the project in accordance with the provisions and policy of this title. The authority is specifically authorized to undertake the construction of any project in one or more steps as it may find economically desirable or advantageous, and as it may agree with the appropriate Canadian and/or United States authorities. Whenever in this title reference is made to "project", it shall be understood to refer to such part of any project authorized by this title as may from time to time be in existence or immediately projected.

§ 8. Paragraphs b and c of subdivision eight of section ten hundred five of such law, such subdivision having been added by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight, are hereby amended to read as follows:

b. With respect to construction, completion, acquisition, ownership and/or operation of baseload ~~nuclear~~ generating facilities, fuel, docks, sidings, loading or unloading equipment, storage facilities and other subsidiary facilities and disposition of the output of such generating facilities.

c. With respect to construction, acquisition, ownership, operation and/or use of transmission facilities.

§ 9. Subdivision ten of section ten hundred five of such law, as added by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight, is hereby amended to read as follows:

10. ~~To~~ When the trustees deem it advisable, to utilize nuclear fuel supplied and owned by New York state atomic and space development authority ~~unless such fuel is unavailable or unless the trustees determine that to utilize such fuel would result in a significant economic disadvantage to the authority or would not be operationally feasible.~~

§ 10. Subdivision one of section ten hundred nine of such law, such section having been amended by chapter two hundred ninety-four of the laws of nineteen hundred sixty-eight, is hereby amended to read as follows:

1. After agreement upon the terms of any such contracts shall have been reached by the authority and its co-party or co-parties, the authority shall promptly transmit a copy of such proposed contract to the governor and shall hold a public hearing or hearings upon the terms thereof. At least thirty days' notice of such hearing shall be given by publication once in each week during such period in each of six newspapers within the state to be selected by the authority. Copies of proposed contracts shall be available for public inspection during such period of thirty days at the office or offices of the authority and at such other places throughout the state as it may designate.

§ 11. The first unnumbered paragraph of section ten hundred twelve of such law, as last amended by chapter nine hundred eight of the laws of nineteen hundred seventy-two, is hereby amended to read as follows:

It is hereby found and declared that the projects authorized by this title are for the aid and improvement of commerce and navigation and that such aid and improvement of commerce and navigation and the development, sale and distribution of ~~hydro-electric~~ power is primarily for the benefit of the people of the state of New York, for the improvement of their health and welfare and material prosperity, and is a public purpose, and the authority shall be regarded as performing a



governmental function in undertaking such projects and in carrying out the provisions of this title, and shall be required to pay no taxes or assessments upon any of the property acquired by it for such projects or upon its activities in the operation and maintenance thereof, provided that nothing herein shall prevent the authority from entering into agreements to make payments in lieu of taxes with respect to property acquired for any project where such payments are based solely on the value of real property without regard to any improvement thereof by the authority and where no bonds to pay any costs of such project were issued prior to January first, nineteen hundred seventy-two.

§ 12. Subdivision twelve of section sixty-six of the public service law, as last amended by chapter two hundred seventy of the laws of nineteen hundred seventy, is hereby amended to read as follows:

12. Have power to require every gas corporation, electric corporation and municipality hereinafter in this subdivision called a utility to file with the commission and to print and keep open to public inspection schedules showing all rates and charges made, established or enforced or to be charged or enforced, all forms of contract or agreement and all rules and regulations relating to rates, charges or service used or to be used, and all general privileges and facilities granted or allowed by such utility; but this subdivision shall not apply to state, municipal or federal contracts, except to the extent such contracts relate to transportation of electricity. No change shall be made in any rate or charge, or in any form of contract or agreement or any rule or regulation relating to any rate, charge or service, or in any general privilege or facility, which shall have been filed by a utility in compliance with an order of the commission, except after thirty days' notice to the commission and to each county, city, town and village served by such utility which had filed with such utility, within the prior twelve months, a request for such notice and which shall be affected by such change and publication of a notice to the public of such proposed change once in each week for four successive weeks in a newspaper having general circulation in each county containing territory affected by the proposed change, which notice shall plainly state the changes proposed and when the change will go into effect. The commission for good cause shown may, except in the case of major changes, allow changes to take effect prior to the end of such thirty-day period and without publication of notice to the public under such conditions as it may prescribe. For the purpose of this subdivision, "major changes" shall mean an increase in the rates and charges which would increase the aggregate revenues of the applicant more than the greater of one hundred thousand dollars or two and one-half percent, but shall not include changes in rates, charges or rentals allowed to go into effect by the commission or made by the utility pursuant to an order of the commission after hearings held upon notice to the public. No utility shall charge, demand, collect or receive a greater or less or different compensation for any service rendered or to be rendered than the rates and charges specified in its schedule filed and in effect; nor shall any utility refund or remit in any manner or by any device any portion of the rates or charges so specified, nor extend to any person any form of contract or agreement, or any rule or regulation, or any privilege or facility, except such as are regularly and uniformly extended to all persons under like circumstances. The commission shall have power to prescribe the form of every such schedule, and from time to time prescribe by order such changes in the form thereof as may be deemed wise. The commission shall also have power to establish such rules and regulations to carry into effect this subdivision as it may deem necessary, and to modify or amend such rules or regulations from time to time. Nothing in this chapter shall be taken to prohibit a utility from

deletions by ~~strikeouts~~

establishing sliding scale upward rates, beginning at a fixed price per unit for a small consumption and then increasing the price per unit as the consumption is increased. Whenever there shall be filed with the commission by any utility any schedule stating a new rate or charge, or any change in any form of contract or agreement or any rule or regulation relating to any rate, charge or service, or in any general privilege or facility, the commission may, at any time within sixty days from the date when such schedule would or has become effective, either upon complaint or upon its own initiative, and, if it so orders, without answer or other formal pleading by the utility, but upon reasonable notice, hold a hearing concerning the propriety of such change, provided that if such change is a major change, the commission shall hold such a hearing; and pending such hearing and decision thereon, the commission, upon filing with such schedule and delivering to the utility, a statement in writing of its reasons therefor, may suspend the operation of such schedule, but not for a longer period than one hundred and twenty days beyond the time when it would otherwise go into effect; and after full hearing, whether completed before or after it goes into effect, the commission may make such order in reference thereto as would be proper in a proceeding begun after the rate, charge, form of contract or agreement, rule, regulation, service, general privilege or facility had become effective. Provided that, if any such hearing cannot be concluded within the period of suspension as above stated, the commission may extend the suspension for a further period, not exceeding six months. The commission may, as authorized by section seventy-two, establish temporary rates or charges for any period of suspension under this section. At any hearing involving a rate, the burden of proof to show that the change or proposed change if proposed by the utility, or that the existing rate, if it is proposed to reduce the rate, is just and reasonable shall be upon the utility; and the commission may give to the hearing and decision of such questions preference over all other questions pending before it. The schedule, rates, charges, form of contract or agreement, rule, regulation, service, general privilege or facility in force when the new schedule, rate, charge, form of contract, rule, regulation, service, general privilege or facility was filed shall continue in force during the period of the suspension unless the commission shall establish a temporary rate or charge as authorized by section seventy-two.

§ 13. Notwithstanding any provision of law to the contrary, the transfer of any complete or partially completed generation or related facility to the power authority of the state of New York pursuant to this act on or before December thirty-first, nineteen hundred seventy-five shall not require the approval of any department, agency, board or commission nor shall the completion and/or operation of any such facility transferred to such authority require any license, permit or approval which would not be required if such facility were not transferred to the authority.

§ 14. If for any of the purposes of this act, including temporary construction purposes and the making of additions or improvements, the authority shall find it necessary or convenient to acquire any property (including but not limited to contract rights and other intangible personal property, construction materials, parts, fuel, maintenance and repair equipment, and other tangible personal property), whether for immediate or future use, then the authority may find and determine that such property is required for public use, and upon such due determination, such property shall be and shall be deemed to be required for such public use until otherwise determined by the authority and such determination of fact shall not be affected by the fact that such property has theretofore been taken for, or is then devoted to, a public use; but

the public use in the hands or under the control of the authority shall be deemed superior to the public use in the hands of any other person, association or corporation. The authority may acquire such property by purchase or by exercise of the power of eminent domain under and pursuant to the provisions of section ten hundred seven of the public authorities law except that such provisions of section ten hundred seven of the public authorities law or of section thirty of the highway law or of the condemnation law as pertain to surveys, diagrams, maps, plans or profiles, assessed valuation, lis pendens, filing in the office of the clerk in which real property affected is situated and such other provisions as by their nature cannot be applicable to property other than real property shall not be applicable to the acquisition of such other property. In the event that property is acquired by exercise of the power of eminent domain under this section notice of such proceeding and all subsequent notices or court processes shall be served upon the owners of such property and upon the authority by personal service or by registered or certified mail, except as may be otherwise directed by the court.

Anything in this section to the contrary notwithstanding, any property to be acquired pursuant to this section, which property shall not have been used by its owner or owners or any of his or their predecessors in connection with or shall not have been acquired or manufactured by its owner or owners or any of his or their predecessors for use in connection with the construction of a base load generating facility in New York city or Westchester county prior to authority acquisition shall be acquired only by agreement with the owner or owners thereof.

§ 15. This act shall take effect immediately.

#### New York City—Generating, Transmission Facilities—Construction

*Memorandum relating to this chapter, see page 3002*

### CHAPTER 370

An Act to amend the public authorities law, and a chapter of the laws of nineteen hundred seventy-four, entitled "AN ACT to amend the public authorities law and the public service law, in relation to the acquisition and completion of generating and transmission facilities by power authority of the state of New York in order to maintain an adequate and reliable supply of electricity in the metropolitan area of the city of New York and throughout the state", in relation to the acquisition of certain facilities by the power authority, of the state of New York.

Approved and effective May 17, 1974.

Passed on message of necessity. See Const. art. IX, § 2(b)(2), and McKinney's Legislative Law § 44.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows:*

Section 1. The third unnumbered paragraph of section ten hundred five of the public authorities law, as amended by a chapter of the laws of nineteen hundred seventy-four, entitled "AN ACT to amend the public authorities law and the public service law, in relation to the acquisition and completion of generating and transmission facilities by power authority of the state of New York in order to maintain an adequate and reliable supply of electricity in the metropolitan area of the city of New York and throughout the state", is hereby amended to read as follows:

deletions by ~~strikes~~

## Ch. 370 LAWS OF NEW YORK 1974

The authority is further authorized to construct and/or acquire and complete such base load generating, transmission and related facilities as it deems necessary or desirable to assist in maintaining an adequate and dependable supply of electricity by supplying power and energy for the metropolitan transportation authority, its subsidiary corporations, the New York city transit authority, the port authority of New York and New Jersey, the city of New York, the state of New York, the United States, other public corporations and electric corporations within the metropolitan area of the city of New York within the state of New York; provided, however, that (i) the acquisition of completed or partially completed facilities shall be after public hearing and shall be limited to facilities located in New York city or Westchester county and the energy and power generated by such facilities shall be used, to the extent feasible, for the benefit of electric consumers in that area, (ii) not more than one such generating facility shall be acquired in each of New York city and Westchester county, (iii) the price to be paid pursuant to any agreement entered into with respect to the purchase, appropriation or condemnation of any such completed or partially completed facility, as the case may be, shall be subject to the approval of the state comptroller and provided, further, that (iv) transmission facilities shall not be so acquired pursuant to this paragraph unless such acquisition is necessary to assure delivery of power and energy produced by any acquired generating facility.

§ 2. Subdivision four of section ten hundred one-a of such law, as added by such chapter, is hereby amended to read as follows:

4. Any cost savings realized in the production or delivery of electricity by reason of any such acquisition by the authority ~~should~~ shall be passed on to consumers.

§ 3. Section fifteen of a chapter of the laws of nineteen hundred seventy-four entitled "An Act to amend the public authorities law and the public service law, in relation to the acquisition and completion of generating and transmission facilities by power authority of the state of New York in order to maintain an adequate and reliable supply of electricity in the metropolitan area of the city of New York and throughout the state" is hereby renumbered to be section sixteen and such chapter is hereby amended by adding thereto a new section to be section fifteen to read as follows:

§ 15. Notwithstanding anything to the contrary in the provisions of subdivision eleven of section ten hundred five of the public authorities law, the power authority of the state of New York shall have the power from time to time to sell all or part of any generating, transmission or related facility acquired pursuant to this act.

§ 4. This act shall take effect immediately.

POWER AUTHORITY OF THE  
STATE OF NEW YORK

GENERAL PURPOSE BOND RESOLUTION

NOVEMBER 26, 1974



---

---

POWER AUTHORITY OF THE STATE  
OF NEW YORK

General Purpose Bonds

---

GENERAL PURPOSE BOND RESOLUTION

Adopted on November 26, 1974

---

# POWER AUTHORITY OF THE STATE OF NEW YORK

## TABLE OF CONTENTS\*

### GENERAL PURPOSE BOND RESOLUTION

#### ARTICLE I.

##### DEFINITIONS AND STATUTORY AUTHORITY.

	PAGE
SECTION 101. Definitions .....	1
102. Authority for This Resolution .....	10
103. Resolution to Constitute Contract .....	11

#### ARTICLE II.

##### AUTHORIZATION AND ISSUANCE OF BONDS AND BOND ANTICIPATION NOTES.

SECTION 201. Authorization of Bonds .....	11
202. General Provisions for Issuance of Bonds .....	11
203. Special Provisions for Bonds Other than Re- funding Bonds .....	14
204. Special Provisions for Refunding Bonds .....	18
205. Bond Anticipation Notes .....	24

#### ARTICLE III.

##### GENERAL TERMS AND PROVISIONS OF BONDS.

SECTION 301. Medium of Payment; Form and Date .....	25
302. Legends .....	25
303. Execution and Authentication .....	26
304. Interchangeability of Bonds .....	27

\* This Table of Contents was not part of the Resolution as adopted.

	PAGE
SECTION 305. Negotiability, Transfer and Registry .....	27
306. Transfer of Coupon Bonds .....	28
307. Transfer of Registered Bonds .....	28
308. Regulations With Respect to Exchanges and Transfers .....	29
309. Bonds Mutilated, Destroyed, Stolen or Lost ...	29
310. Preparation of Definitive Bonds; Interim Re- ceipts and Temporary Bonds .....	30

#### ARTICLE IV.

##### REDEMPTION OF BONDS.

SECTION 401. Privilege of Redemption and Redemption Price	31
402. Redemption at the Election of the Authority ...	31
403. Redemption Otherwise Than at Authority's Election .....	32
404. Selection of Bonds to be Redeemed by Lot .....	32
405. Notice of Redemption .....	32
406. Payment of Redeemed Bonds .....	33

#### ARTICLE V.

##### ESTABLISHMENT OF FUNDS AND APPLICATION THEREOF.

SECTION 501. The Lien Created by the Resolution .....	34
502. Establishment of Funds .....	35
503. Construction Fund .....	35
504. Temporary Interest Fund .....	37
505. Revenue Fund .....	38
506. Operating Fund .....	38
507. Projects' Study Fund .....	40
508. General Fund—Certain Payments .....	41
509. General Fund—Allocation of Revenues .....	41
510. Bond Service Account .....	42
511. Bond Reserve Account .....	43
512. General Reserve Account .....	44

	PAGE
513. Investment of General Fund .....	45
514. Cancellation of Bonds and Coupons .....	45

## ARTICLE VI.

### PARTICULAR COVENANTS OF THE AUTHORITY.

SECTION 601.	Payment of Bonds .....	45
602.	Extension of Payment of Bonds and Coupons ..	45
603.	Offices for Servicing Bonds .....	46
604.	Further Assurance .....	46
605.	Power to Issue Bonds and Create a Lien .....	47
606.	Power to Undertake Projects and Collect Rates and Fees .....	47
607.	Creation of Liens and Issuance of Additional Obligations; Sale and Lease of Property ....	47
608.	Completion, Operation and Maintenance .....	49
609.	Rates and Fees .....	49
610.	Accounts and Reports .....	50
611.	Insurance .....	52
612.	General .....	53

## ARTICLE VII.

### CONCERNING THE TRUSTEE AND THE PAYING AGENTS.

SECTION 701.	Trustee; Appointment and Acceptance of Duties	53
702.	Paying Agents; Appointment and Acceptance of Duties .....	54
703.	Responsibilities of Fiduciaries .....	54
704.	Evidence on Which Fiduciaries May Act .....	55
705.	Compensation .....	55
706.	Certain Permitted Acts .....	56
707.	Resignation of Trustee .....	56
708.	Removal of Trustee .....	56
709.	Appointment of Successor Trustee .....	56
710.	Transfer of Rights and Property to Successor Trustee .....	57

	PAGE
711. Merger or Consolidation .....	58
712. Adoption of Authentication .....	58
713. Resignation or Removal of Paying Agent and Appointment of Successor .....	59

## ARTICLE VIII.

### SUPPLEMENTAL RESOLUTIONS.

SECTION	801. Supplemental Resolutions Effective Upon Filing with the Trustee .....	59
	802. Supplemental Resolutions Effective Upon Con- sent of Trustee .....	60
	803. Supplemental Resolutions Effective with Con- sent of Bondholders .....	61
	804. General Provisions .....	61

## ARTICLE IX.

### AMENDMENTS.

SECTION	901. Mailing and Publication .....	62
	902. Powers of Amendment .....	62
	903. Consent of Bondholders .....	63
	904. Modifications by Unanimous Consent .....	65
	905. Exclusion of Bonds .....	66
	906. Notation on Bonds .....	66

## ARTICLE X.

### REMEDIES ON DEFAULT.

SECTION	1001. Events of Default .....	66
	1002. Accounting and Examination of Records after Default .....	68
	1003. Application of Revenues and Other Moneys after Default .....	68
	1004. Proceedings Brought by Trustee .....	71
	1005. Restriction on Bondholders' Action .....	72



	PAGE
1006. Remedies not Exclusive .....	73
1007. Effect of Waiver and Other Circumstances ....	73

## ARTICLE XI.

### MISCELLANEOUS.

SECTION 1101.	Defeasance .....	73
1102.	Evidence of Signatures of Bondholders and Ownership of Bonds .....	76
1103.	Moneys Held for Particular Bonds and Coupons	77
1104.	General Regulations as to Moneys and Funds ..	77
1105.	Preservation and Inspection of Documents ....	78
1106.	Parties Interested Herein .....	78
1107.	No Recourse on the Bonds .....	79
1108.	Publication of Notices .....	79
1109.	Successors and Assigns .....	79
1110.	Severability of Invalid Provisions .....	79

## GENERAL PURPOSE BOND RESOLUTION

BE IT RESOLVED by the Trustees of the Power Authority of the State of New York as follows:

### ARTICLE I.

#### DEFINITIONS AND STATUTORY AUTHORITY.

101. *Definitions.* The following terms shall, for all purposes of the Resolution, have the following meanings:

*Accountant's Certificate* shall mean an opinion signed by an independent public accountant or firm of public accountants of recognized standing (who may be the public accountant or firm of public accountants who regularly audit the books and accounts of the Authority) selected by the Authority.

*Accrued Bond Service* shall mean, as of any date of calculation, an amount equal to the sum of the amounts of accrued Bond Service with respect to all Series, calculating the accrued Bond Service with respect to each Series at an amount equal to the sum of (i) interest on the Bonds of such Series and on Bond Anticipation Notes issued in anticipation of the Bonds of such Series accrued and unpaid and to accrue to the end of the then current calendar month, and (ii) that portion of the Principal Installment for such Series next due which would have accrued (if deemed to accrue in the manner set forth in the definition of *Bond Service*) to the end of such calendar month.

*Act* shall mean Power Authority Act, Title 1 of Article 5 of the Public Authorities Law, Chapter 43-A of the Consolidated Laws of the State of New York.

*Aggregate Bond Service* for any period shall mean, as of any date of calculation and with respect to all Bonds and Bond Anticipation Notes, the sum of the amounts of Bond Service for such period.

*Aggregate Interest* for any period shall mean, as of any date of calculation, an amount equal to interest accruing during such period on all Bonds and Bond Anticipation Notes. Such interest shall be calculated on the assumption that no Bonds or Bond Anticipation Notes Outstanding at the date of calculation will cease

to be Outstanding except by reason of the payment of each Principal Installment (or in the case of Bond Anticipation Notes, the payment of the principal amount of such Notes) on the due date thereof.

*Authority* shall mean Power Authority of the State of New York, the instrumentality organized and existing under the Act.

*Authorized Certificates of Deposit* shall mean negotiable or non-negotiable certificates of deposit issued by any bank, trust company or national banking association which is a member of the Federal Reserve System, including certificates of deposit issued by the Trustee and by a Paying Agent. Such certificates of deposit shall be purchased directly from such bank, trust company or national banking association, shall have a maturity of not exceeding the time within which the funds invested therein are required to be available and shall be continuously secured by the obligations included in paragraph (i) or (ii) of Investment Securities which obligations shall have a market value (exclusive of accrued interest) at all times at least equal to the principal amounts of such certificates of deposit. The bank, trust company or national banking association issuing each such certificate of deposit shall furnish the Trustee and the Authority with an undertaking satisfactory to the Trustee and the Authority as to the aggregate market value of all of such obligations securing each such certificate of deposit. The Trustee and the Authority shall be entitled to rely on each such undertaking.

*Authorized Newspaper* shall mean a newspaper customarily published at least once a day for at least five days (other than legal holidays) in each calendar week, printed in the English language and of general circulation in the Borough of Manhattan, City and State of New York.

*Authorized Officer* shall mean any Trustee of the Authority, its General Manager, its Controller, any Assistant Controller, its Secretary, any Assistant Secretary, and any other person authorized by resolution of the Authority to perform the act or sign the document in question.

*Bond or Bonds* shall mean any General Purpose Bond or Bonds, as the case may be, authenticated and delivered under the Resolution.

*1954 Bond or Bonds* shall mean any bond or bonds issued in one or more series to pay the cost of construction of the 1954 Project and authenticated and delivered under the 1954 Resolution.

*1970 Bond or Bonds* shall mean any bond or bonds issued in one or more series to pay the cost of construction of the 1970 Project and any 1970 Project Improvement, and authenticated and delivered under the 1970 Resolution.

*Bond Anticipation Notes* shall mean the notes of the Authority authorized in Section 205.

*Bond Reserve Account* shall mean the account by that name established in the General Fund pursuant to Section 509.

*Bond Reserve Requirement* shall mean as of any date of calculation, an amount equal to Aggregate Interest for one year from such date of calculation.

*Bond Service* for any period shall mean, as of any date of calculation and with respect to any Series, an amount equal to the sum of (i) interest, other than interest being paid from the Temporary Interest Fund, accruing during such period on Bonds of such Series or Bond Anticipation Notes issued in anticipation of the Bonds of such Series and (ii) that portion of each Principal Installment for such Series which would accrue during such period if such Principal Installment were deemed to accrue daily in equal amounts from the next preceding Principal Installment due date for such Series (or, if there shall be no such preceding Principal Installment due date, from a date one year preceding the due date of such Principal Installment). Such interest and Principal Installments for such Series shall be calculated on the assumption that no Bonds of such Series Outstanding at the date of calculation will cease to be Outstanding except by reason of the payment of each Principal Installment on the due date thereof, and such interest on such Notes shall be calculated on the assumption that all such Notes shall be retired upon the maturity date or dates thereof.

*Bond Service Account* shall mean the account by that name established in the General Fund pursuant to Section 509.

*Bondholder, or Holders of Bonds*, or any similar terms, shall mean any person who shall be the bearer of any coupon Bond or Bonds or the registered owner of any Bond or Bonds without coupons.

*Construction Fund* shall mean the fund by that name established in Section 502.

*Cost of Construction*, with respect to a Project, shall mean the Authority's costs of physical construction, costs of acquisition by or for the Authority of real or personal property or interests therein (including the acquisition of the rights of way included within a Project), and costs of the Authority incidental to such construction or acquisition, including legal, administrative, engineering, consulting and technical services and insurance costs, financing costs (other than of any Series of Refunding Bonds), amounts, if any, required by the Resolution to be paid into the Temporary Interest Fund or into the Operating Fund or the General Fund upon the issuance of any Series, payments when due (whether at the maturity of principal or the due date of interest or upon redemption) on any indebtedness of the Authority (other than the Bonds or Bond Anticipation Notes or notes issued in connection with Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study, but including advances from or indebtedness to the State of New York required to be paid by the Resolution) incurred for such Project, costs of equipment and supplies, costs of fuel, fuel assemblies and components, or interests therein, required by the Authority for the commencement of and initial operation of such Project, initial working capital and reserves deemed necessary or desirable by the Authority for the commencement of operation of such Project, and any other costs properly attributable to such construction or acquisition.

*Counsel's Opinion* shall mean an opinion signed by an attorney or firm of attorneys of nationally recognized standing in the field of law relating to municipal bonds selected by the Authority.

*Date of Completion*, with respect to a Project, shall mean the date upon which the designed capacity of such Project has been installed and is capable of generating, transmitting or otherwise performing its intended function as evidenced by an Engineer's Certificate filed with the Trustee; provided, however, that in the case of the acquisition of a Project the designed capacity of which is installed and capable of generating, transmitting or otherwise performing its intended functions as evidenced by an Engineer's Certificate filed with the Trustee, shall mean the date of such acquisition.

*Engineer's Certificate* shall mean an opinion or statement signed by an independent engineer or engineers or firm or firms of engineers of recognized standing (who may be an engineer or engineers or firm or firms of engineers retained by the Authority for other purposes) selected by the Authority.

*Fiduciary or Fiduciaries* shall mean the Trustee, any Paying Agent, or any or all of them, as may be appropriate.

*Fuel Reserve Account* shall mean the account by that name established in Section 506.

*General Fund* shall mean the fund by that name established in Section 502.

*General Reserve Account* shall mean the account by that name established in the General Fund pursuant to Section 509.

*Investment Securities* shall mean and include any of the following securities:

(i) Direct obligations of or obligations guaranteed by the United States of America or the State of New York;

(ii) Bonds, debentures or notes issued by any of the following: Banks for Cooperatives; Federal Intermediate Credit Banks; Federal Home Loan Bank System; Export-Import Bank of the United States; Federal Land Banks; the Government National Mortgage Association; Federal National Mortgage Association if such bonds, debentures or notes are guaranteed by the Government National Mortgage Association; or Federal Financing Bank or any other agency or instrumentality of the Federal Government established for the purposes of acquiring the obligations of any of the foregoing or otherwise providing financing therefor;

(iii) Public Housing Bonds issued by Public Housing Authorities and fully secured as to the payment of both principal and interest by a pledge of annual contributions under an Annual Contributions Contract or Contracts with the United States of America; or Project Notes issued by Local Public Agencies, in each case, fully secured as to the payment of both principal and interest by a requisition or payment agreement with the United States of America;

(iv) Direct and general obligations, to the payment of the principal of and interest on which the full faith and credit of the issuer is pledged, of any of the following: any state of the United States, or any political subdivision of any such state; provided that (a) all the taxable real property within such political subdivision shall be subject to taxation thereby to pay such obligations and the interest thereon, without limitation as to rate or amount, and (b) at the time of their purchase under the Resolution, such obligations of any such state or political subdivision are rated in either of the two highest rating categories by two nationally recognized bond rating agencies and are legal investments for fiduciaries in the State of New York.

*Operating Expenses* shall mean the Authority's expenses for operation, maintenance, repairs and ordinary replacements of a Project and on and after the Retirement Date of the 1954 Bonds and the Retirement Date of the 1970 Bonds, the payment of such expenses for the 1954 Project, the 1970 Project and any 1970 Project Improvement, and shall include, without limiting the generality of the foregoing: costs of fuel, fuel assemblies and components required by the Authority for the operation of a Project including payments into the Fuel Reserve Account, administrative expenses, insurance premiums, legal and engineering expenses, consulting and technical services, payments to pension, retirement, health and hospitalization funds, annual charges payable by the Authority pursuant to any licenses, orders or other authorizations from any agency or regulatory body having lawful jurisdiction, any payments in lieu of taxes agreed to be paid by the Authority and any taxes, governmental charges, and any other expenses required to be paid by the Authority, all to the extent properly and directly attributable to the operation of a Project; financing costs of any Series of Refunding Bonds if such costs are not paid or provided for from the proceeds derived from the sale of such Series of Refunding Bonds; and the expenses, liabilities and compensation of the Fiduciaries required to be paid under the Resolution. Operating Expenses shall not include any provision for depreciation, amortization or similar charges, or any costs or expenses for new construction or for reconstruction other than restoration of any part of a Project to the condition of serviceability thereof when new.



*Operating Fund* shall mean the fund by that name established in Section 502.

*Outstanding*, when used with reference to Bonds or Bonds of a Series, shall mean, as of any date, Bonds or Bonds of such Series theretofore or thereupon being authenticated and delivered under the Resolution except:

(i) any Bonds cancelled by the Trustee at or prior to such date,

(ii) Bonds for the payment or redemption of which moneys, equal to the principal amount or Redemption Price thereof, as the case may be, with interest to the date of maturity or redemption date, shall be held by one or more Fiduciaries in trust for such purpose (whether at or prior to the maturity or redemption date), provided that if such Bonds are to be redeemed, notice of such redemption shall have been given as in Article IV provided or provision satisfactory to the Trustee shall have been made for the giving of such notice,

(iii) Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered pursuant to Article III or Section 406 or Section 906, and

(iv) Bonds deemed to have been paid as provided in subsection 2 of Section 1101.

*Paying Agent* shall mean any paying agent for the Bonds of any Series, and its successor or successors and any other corporation which may at any time be substituted in its place pursuant to the Resolution.

*Principal Installment* shall mean, as of the date of calculation and with respect to any Series, so long as any Bonds thereof are Outstanding, (i) the principal amount of Bonds of such Series due on a future date for which no Sinking Fund Installments have been established, or (ii) the Sinking Fund Installment due on a future date for Bonds of such Series, or (iii) if such future dates coincide, the sum of such principal amount or Bonds and of such Sinking Fund Installment due on such future date; in each case in the amounts and on the dates as provided in the

**Supplemental Resolution** authorizing such Series regardless of any retirements of Bonds except pursuant to Section 510.

*principal office* when used in connection with the Trustee shall mean the corporate trust office of the Trustee.

*Proceeds Account* shall mean a separate account by that name for each Project established in the Construction Fund pursuant to Section 503.

*1954 Project* shall mean (i) the Saint Lawrence Project, (ii) the Niagara Project, and (iii) the Transmission Line Project as defined in the 1954 Resolution.

*1970 Project* shall mean:

(a) A project licensed by the Federal Power Commission known as the "Blenheim-Gilboa Pumped Storage Power Project" located on Schoharie Creek in the Towns of Blenheim and Gilboa, Schoharie County, New York.

(b) A project licensed by the United States Atomic Energy Commission known as the "James A. FitzPatrick Nuclear Power Plant" located on the shore of Lake Ontario at Nine Mile Point, Oswego County, New York.

(c) (i) A 400 foot transmission line right-of-way from the FitzPatrick switchyard to the Edic Substation near Utica, New York.

(ii) A single circuit 345,000 volt transmission line from the FitzPatrick switchyard to the Edic Substation together with preliminary engineering and site exploration necessary for second circuit facilities.

(iii) 250 foot transmission line rights-of-way from New Scotland to Blenheim-Gilboa, from Leeds to Blenheim-Gilboa and from Blenheim-Gilboa to Delhi together with preliminary engineering and site exploration necessary for high voltage transmission facilities on such rights-of-way.

(d) Any incidental buildings, structures, appurtenances and facilities necessary or appropriate thereto.

*1970 Project Improvement* shall mean any Project Improvement as defined and financed under the 1970 Resolution.

*Project* shall mean any project directly or indirectly related to power generation or transmission, whether owned jointly or

singly by the Authority, including any output in which the Authority has an interest, heretofore or hereafter authorized by the Act and hereafter specified in a Supplemental Resolution.

*Projects' Study* shall mean the preliminary efforts of the Authority to determine appropriate methods to fulfill the purposes of the Authority authorized by the Act.

*Projects' Study Fund* shall mean the fund by that name established in Section 502.

*Redemption Price* shall mean, with respect to any Bond, the principal amount thereof plus the applicable premium, if any, payable upon redemption thereof pursuant to the Resolution.

*Refunding Bonds* shall mean all Bonds, whether issued in one or more Series, authenticated and delivered on original issuance pursuant to Section 204.

*1954 Resolution* shall mean the General Revenue Bond Resolution adopted by the Authority on December 21, 1954, as amended by the Supplemental Resolution Amending General Revenue Bond Resolution adopted by the Authority on February 17, 1958, and as heretofore and hereafter supplemented in accordance with the terms thereof.

*1970 Resolution* shall mean the Revenue Bond Resolution adopted by the Authority as of June 15, 1970, and as heretofore and hereafter supplemented in accordance with the terms thereof.

*Resolution* shall mean this Resolution as from time to time amended or supplemented by Supplemental Resolutions.

*Retirement Date of the 1954 Bonds* shall mean the date on which all of the 1954 Bonds will be finally paid or provision for their payment made in accordance with the provisions of the 1954 Resolution.

*Retirement Date of the 1970 Bonds* shall mean the date on which all of the 1970 Bonds will be finally paid or provision for their payment made in accordance with the provisions of the 1970 Resolution.

*Revenue Fund* shall mean the fund by that name established in Section 502.

*Revenues* shall mean all revenues, rates, fees, charges, rents and other income and receipts, as derived in cash by or for the account of the Authority from the operation of any Project or any other project of the Authority heretofore or hereafter authorized pursuant to the Act, and interest received on any moneys or securities (other than moneys or securities in any construction fund or temporary interest fund) of the Authority. Revenues from the 1954 Project, the 1970 Project and any 1970 Project Improvement shall be subject and subordinate, however, in all respects to the charge or lien created by the 1954 Resolution and to the charge or lien created by the 1970 Resolution.

*Series* shall mean all of the Bonds authenticated and delivered on original issuance in a simultaneous transaction, and any Bonds thereafter authenticated and delivered in lieu of or in substitution therefor pursuant to Article III or Section 406 or Section 906, regardless of variations in maturity, interest rate, or other provisions.

*Sinking Fund Installment* shall mean an amount so designated which is established pursuant to paragraph (9) of subsection 1 of Section 202.

*Supplemental Resolution* shall mean any resolution supplemental to or amendatory of the Resolution, adopted by the Authority in accordance with Article VIII thereof.

*Temporary Interest Fund* shall mean the fund by that name established in Section 502.

*Trustee* shall mean the trustee appointed in accordance with Section 701, and its successor or successors and any other corporation which may at any time be substituted in its place pursuant to the Resolution.

Except where the context otherwise requires, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include firms, associations and corporations.

102. *Authority for This Resolution.* This Resolution is adopted pursuant to the provisions of the Act.

103. *Resolution to Constitute Contract.* In consideration of the purchase and acceptance of any and all of the Bonds authorized to be issued under the Resolution by those who shall hold the same from time to time, the Resolution shall be deemed to be and shall constitute a contract between the Authority and the Holders from time to time of the Bonds and coupons; and the pledge made in the Resolution and the covenants and agreements therein set forth to be performed by or on behalf of the Authority shall be for the equal benefit, protection and security of the Holders of any and all of the Bonds and coupons, all of which, regardless of the time or times of their issue or maturity, shall be of equal rank without preference, priority or distinction of any of the Bonds or coupons over any other thereof except as expressly provided in or permitted by this Resolution.

## ARTICLE II.

### AUTHORIZATION AND ISSUANCE OF BONDS AND BOND ANTICIPATION NOTES.

201. *Authorization of Bonds.* 1. The Resolution creates an issue of Bonds of the Authority to be designated as "General Purpose Bonds" and creates a continuing lien as hereinafter provided in Section 501 to secure the full and final payment of the principal and Redemption Price of and interest on all the Bonds. The Bonds shall be direct and general obligations of the Authority, and the full faith and credit of the Authority are hereby pledged for the payment of such principal, Redemption Price and interest. The aggregate principal amount of the Bonds which may be executed, authenticated and delivered under the Resolution is not limited except as provided in the Resolution or as limited by law.

2. The Bonds may, if and when authorized by the Authority pursuant to one or more Supplemental Resolutions, be issued in one or more Series, and the designation thereof, in addition to the name "General Purpose Bonds"; shall include such further appropriate particular designations added to or incorporated in such title for the Bonds of any particular Series, as the Authority may determine. Each Bond shall bear upon its face the designation so determined for the Series to which it belongs.

202. *General Provisions for Issuance of Bonds.* 1. Bonds of any Series shall be authorized by a Supplemental Resolution which shall specify:

(1) The Project or Projects, if any, being undertaken by the Authority and not previously specified in a Supplemental Resolution;

(2) The authorized principal amount, designation and Series of such Bonds;

(3) The purposes for which such Series of Bonds are being issued, which shall be (i) one or more of the purposes set forth in Section 203 or (ii) the redemption or payment of Bonds or 1954 Bonds or 1970 Bonds as provided in Section 204, specifying the Bonds to be redeemed or paid;

(4) The date or dates, and the maturity date or dates, of the Bonds of such Series, provided that each maturity date shall fall upon an interest payment date for such Bonds;

(5) The interest rate or rates of the Bonds of such Series, or the manner of determining such rate or rates, and the interest payment dates therefor, provided that (i) the interest rate shall be identical for all such Bonds of like maturity, and (ii) the interest payment dates shall be semi-annual and shall be identical for all Bonds of such Series; provided that the first such date may be less than, but shall be not more than one year following the actual date of authentication and delivery of such Bonds;

(6) The denominations of, and the manner of numbering and lettering, the Bonds of such Series, provided that such Bonds shall be in denominations of \$1,000 or \$5,000 or any integral multiple of \$5,000 as authorized by such Supplemental Resolution;

(7) The Paying Agent or Paying Agents and the place or places of payment of the principal and Redemption Price, if any, of, and interest on, the Bonds of such Series;

(8) The Redemption Price or Prices, if any, and, subject to Article IV, the redemption terms, if any, for the Bonds of such Series;

(9) The amount and due date of each Sinking Fund Installment, if any, for Bonds of such Series;

(10) If so determined by the Authority, provisions for the application of any part of moneys available therefor in the General

**Fund to the purchase or redemption of Bonds of such Series, and for the order of purchase or redemption of such Bonds;**

(11) If so determined by the Authority, restrictions or limitations on the terms and issuance of Refunding Bonds, in addition to the restrictions and limitations in the Resolution;

(12) If so determined by the Authority, provisions for the sale of the Bonds of such Series; and

(13) The forms of the Bonds of such Series, of the coupons to be attached to the coupon Bonds of such Series and of the Trustee's certificate of authentication.

The maturity dates and Sinking Fund Installment due dates specified pursuant to paragraphs (4) and (9), respectively, of this subsection 1 shall be such that the date of each Principal Installment for Bonds of such Series subsequent to the first Principal Installment for such Bonds shall be not more than one year from the date of the next preceding Principal Installment for Bonds of such Series. All the Bonds of such Series of like maturity shall be identical in all respects, except as to denominations, numbers and letters and except that they may be in either coupon or registered form.

**2. All (but not less than all) the Bonds of each Series shall be executed by the Authority for issuance under the Resolution and delivered to the Trustee and thereupon shall be authenticated by the Trustee and by it delivered to the Authority or upon its order, but only upon receipt by the Trustee of:**

(1) A Counsel's Opinion to the effect that (a) the Authority has the right and power under the Act as amended to the date of such Opinion to adopt the Resolution, and the Resolution has been duly and lawfully adopted by the Authority, is in full force and effect and is valid and binding upon the Authority and enforceable in accordance with its terms, and no other authorization for the Resolution is required; (b) the Resolution creates the valid pledge which it purports to create of the Revenues, moneys, securities and funds held or set aside under the Resolution in the manner and to the extent provided in Section 501 hereof; and (c) the Bonds of such Series are valid, binding, direct and general obligations of the Authority, enforceable in accordance with their terms and the terms of the Resolution and entitled to the benefits of the Act



as amended to the date of such Opinion, and such Bonds have been duly and validly authorized and issued in accordance with law and the Resolution;

(2) A written order of the Authority as to the delivery of the Bonds of such Series, signed by an Authorized Officer;

(3) A copy of the Supplemental Resolution authorizing such Series, certified by an Authorized Officer;

(4) An Engineer's Certificate setting forth the estimated Date or Dates of Completion of the Project or Projects, if any, being financed; and

(5) Such further documents and moneys as are required by the provisions of Sections 203 or 204 or Article VIII.

3. After the original issuance of the Bonds of any Series, no Bonds of such Series shall be issued except in lieu of or in substitution for other Bonds of such Series pursuant to Article III or Section 406 or Section 906.

*203. Special Provisions for Bonds Other than Refunding Bonds.*

1. One or more Series of Bonds other than Refunding Bonds may be authenticated and delivered upon original issuance pursuant to this subsection 1 in such principal amount or amounts for each such Series as may be determined from time to time by the Authority for the purpose of paying or providing for the payment of all or a portion of the Cost of Construction of one or more Projects in an amount that will provide the Authority with funds not in excess of the estimated Cost of Construction of such Project or Projects as set forth in the Engineer's Certificate furnished pursuant to paragraph (3) of subsection 3 of this Section upon the authentication and delivery of the first such Series of Bonds issued in respect of such Project or Projects or paying or providing for the payment of the principal of and interest on any Bond Anticipation Notes or making payments into the Projects' Study Fund.

Each Supplemental Resolution authorizing a Series of Bonds (including Bonds of each Series issued pursuant to subsection 2 of this Section) shall provide for Principal Installments sufficient to retire all Bonds of such Series not later than the last maturity date of such Series. Such Principal Installments shall be due commencing January

1, 1987 or if later, on a January 1 within 24 months after the latest estimated Date of Completion of the Project or Projects for which the proceeds of the Series of Bonds will be applied and shall be in amounts which result in either (i) Bond Service for Bonds of such Series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such Series, or (ii) Bond Service for all Outstanding Bonds, including such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds, including such Series, and for each 12-month period thereafter, which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such Series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such Series for any 12-month period after the latest maturity of any Series of any Outstanding Bonds previously issued may be in such amount as is specified in the Supplemental Resolution authorizing such Series of Bonds.

2. After the authentication and delivery upon original issuance pursuant to subsection 1 of this Section of one or more Series of Bonds in an aggregate principal amount that will provide the Authority with funds equal, as nearly as practicable, to the estimated Cost of Construction of a Project or Projects as set forth in the Engineer's Certificate furnished pursuant to paragraph (3) of subsection 3 of this Section, Bonds of one or more additional Series of Bonds may be authenticated and delivered upon original issuance, in each case so that the aggregate principal amount of such additional Series will provide the Authority with funds not in excess of the completion requirement set forth in the Engineer's Certificate furnished upon the authentication and delivery of such additional Bonds pursuant to paragraph (5) of subsection 3 of this Section, for the purpose of providing all or a portion of the additional funds necessary to complete payment of the Cost of Construction of such Project or Projects.

3. Each such Series of Bonds (other than a Series of Bonds issued solely for the purpose of making payments into the Projects' Study Fund in which event the requirements of paragraphs (1) (3) and (5) of this subsection need not be met) shall be authenticated and delivered by the Trustee only upon receipt by the Trustee (in addition to documents required by Section 202) of:

(1) A Counsel's Opinion to the effect that the Authority has good right and lawful authority under the Act to undertake the Project or Projects, if any, being financed with the proceeds of such Series of Bonds, subject to obtaining such licenses, orders or other authorizations, as are, at the date of such Opinion, required to be obtained from any agency or regulatory body having lawful jurisdiction in order to undertake such Project or Projects;

(2) The amounts (a) to be credited to the account established in the Temporary Interest Fund for such Project or Projects, which shall be specified in the Supplemental Resolution authorizing such Series of Bonds and (b) to be credited to the Bond Reserve Account in the General Fund which, together with amounts, if any, then in such Account, shall be necessary for such Account to equal the Bond Reserve Requirement immediately after the authentication and delivery of such Series of Bonds;

(3) In the case of the authentication and delivery of the Bonds of the first such Series issued in respect of such Project or Projects pursuant to subsection 1 of this Section, an Engineer's Certificate setting forth the estimated Cost of Construction of such Project or Projects;

(4) In the case of the authentication and delivery of the Bonds of each Series issued pursuant to this Section, a certificate of an Authorized Officer to the effect that, upon the authentication and delivery of the Bonds of such Series, the Authority will not be in default in the performance of the terms and provisions of the Resolution, the 1954 Resolution or the 1970 Resolution or of any of the Bonds, the 1954 Bonds or the 1970 Bonds;

(5) In the case of the authentication and delivery of the Bonds of each such Series issued pursuant to subsection 2 of this Section, an Engineer's Certificate setting forth the completion requirement—namely, the amount which, together with all other amounts available therefor (as determined by an Authorized Officer), is necessary and sufficient to complete the payment of the Cost of Construction of such Project or Projects being completed;

(6) A certificate of an Authorized Officer setting forth the Bond Service for the Bonds of such Series for each 12-month period referred to in subsection 1 of this Section and containing

such additional statements as may be reasonably necessary to show compliance with the requirements of this Section 203.

4. Each such Series of Bonds, any portion of the proceeds of which are to be applied to pay the Cost of Construction of any Project for which Bonds have not theretofore been issued, shall be authenticated and delivered by the Trustee only upon receipt by the Trustee (in addition to documents required by Section 202 and the foregoing subsections of this Section) of:

(1) An Engineer's Certificate or Engineers' Certificates which set forth the estimated Cost of Construction of each uncompleted Project, or, in the case of each completed Project a certificate of an Authorized Officer which sets forth the Cost of Construction thereof, including any Project specified in the Supplemental Resolution authorizing such Series of Bonds for which the proceeds of such Bonds will be applied;

(2) An Engineer's Certificate or Engineers' Certificates which set forth that there will be, at the estimated Date of Completion of any Project for which Bonds have not theretofore been issued, a market for the power or other output of such Project at the rates used by the Authority in computing the Revenues specified in paragraph (3) below;

(3) A certificate of an Authorized Officer setting forth for each of the five calendar years commencing in 1986, or if later, for the five calendar years commencing in the calendar year after the latest estimated Date of Completion of any Project, estimates for each such year of (i) the amount of Revenues free and clear of the lien and pledge created by the 1970 Resolution (calculated on the assumption that the 1970 Bonds will be retired prior to maturity by operation of the bond reserve account pursuant to the 1970 Resolution); and (ii) the amount of Operating Expenses;

(4) A certificate of an Authorized Officer setting forth the total principal amount of Bonds then estimated to be Outstanding upon completion of all Projects and the resulting amount of Aggregate Bond Service for each year referred to in paragraph (3) above and for each subsequent year to and including the year of estimated final retirement of all Outstanding Bonds previously issued; and

(5) A certificate of an Authorized Officer setting forth that the average of estimated Revenues less estimated Operating Expenses set forth pursuant to paragraph (3) above will be at least 1.20 times maximum Aggregate Bond Service set forth pursuant to paragraph (4) above.

5. The proceeds, including accrued interest, of each Series of Bonds shall be applied simultaneously with the delivery of such Bonds as follows:

(1) The sum, if any, specified in the Supplemental Resolution authorizing such Series of Bonds shall be paid (or provision for payment made) to the holders of the Authority's outstanding Bond Anticipation Notes and upon such payment such Notes shall be cancelled.

(2) There shall be deposited in the Temporary Interest Fund and in the Bond Reserve Account in the General Fund the amounts required pursuant to paragraph (2) of subsection 3 of this Section.

(3) There shall be deposited in the Fuel Reserve Account in the Operating Fund such amount, if any, as shall be specified in the Supplemental Resolution authorizing such Series of Bonds; provided that there shall have been deposited in such Account by the Date of Completion of each Project an aggregate amount at least sufficient to pay in cash the balance of the purchase price of the initial fuel requirements included in the Cost of Construction with respect to such Project.

(4) The remaining balance of the proceeds of such Bonds shall be deposited in the separate Proceeds Account for such Project established in the Construction Fund or in the Projects' Study Fund in the respective amounts specified in the Supplemental Resolution authorizing such Series of Bonds.

204. *Special Provisions for Refunding Bonds.* 1. One or more Series of Refunding Bonds may be authenticated and delivered upon original issuance to refund (i) all or part of the Outstanding Bonds, or (ii) all but not less than all outstanding 1954 Bonds, or (iii) all or part of the outstanding 1970 Bonds. Refunding Bonds shall be issued in a principal amount sufficient, together with other moneys available therefor, to accomplish such refunding and to make the de-

posits in the Bond Reserve Account required by the provisions of this Section and of the Supplemental Resolution authorizing said Bonds.

2. The Supplemental Resolution authorizing a Series of Refunding Bonds to refund all or part of the Outstanding Bonds shall provide for Principal Installments due in each calendar year, commencing on the later of (i) one year from the date of such Refunding Bonds or (ii) the year when the next succeeding Principal Installment is due on the Outstanding Bonds being refunded, and shall continue to the date of the last maturity of the Refunding Bonds of such Series, and shall be sufficient to retire all Refunding Bonds of such Series not later than such last maturity date. Such Principal Installments shall be in amounts which result in either (i) Bond Service for Bonds of such Series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such Series, or (ii) Bond Services for all Outstanding Bonds, including such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds including such Series, and for each 12-month period thereafter, which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such Series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such Series for any 12-month period after the latest maturity of any Series of any Outstanding Bonds previously issued may be in such amount as is specified in the Supplemental Resolution authorizing such Series of Bonds. Each Series of Refunding Bonds issued to refund one or more Series of Outstanding Bonds shall be authenticated and delivered by the Trustee only upon receipt by the Trustee (in addition to the documents required by Section 202) of:

(1) A certificate of an Authorized Officer setting forth (a) the Aggregate Bond Service for the current and each calendar year (i) with respect to all Series of Bonds Outstanding immediately prior to such authentication and delivery and (ii) with respect to all Series of Bonds to be Outstanding immediately thereafter, and (b) that the Aggregate Bond Service for each such year set forth pursuant to (a)(ii) of this paragraph (1) is no greater than the Aggregate Bond Service set forth pursuant to (a)(i) of this paragraph (1);

(2) Irrevocable instructions to the Trustee, satisfactory to it, to give due notice of redemption of all the Bonds to be refunded on the redemption date specified in such instructions;

(3) Irrevocable instructions to the Trustee, satisfactory to it, to make due publication of the notice provided for in Section 1101 to the Holders of the Bonds and coupons being refunded;

(4) Either (i) moneys in an amount sufficient to effect payment at the applicable Redemption Price of the Bonds to be refunded, together with accrued interest on such Bonds to the redemption date, which moneys shall be held by the Trustee or any one or more of the Paying Agents in a separate account irrevocably in trust for and assigned to the respective Holders of the Bonds to be refunded, or (ii) direct obligations of the United States of America or the State of New York or Authorized Certificates of Deposit fully secured by direct obligations of the United States of America in such principal amounts, of such maturities, bearing such interest, and otherwise having such terms and qualifications, as shall be necessary to comply with the provisions of subsection 2 of Section 1101 and any moneys required pursuant to said subsection 2, which direct obligations of the United States of America or the State of New York and moneys shall be held in trust and used only as provided in said subsection 2;

(5) A certificate of an Authorized Officer setting forth the Bond Service for the Bonds of such Series for each 12-month period referred to in this subsection 2 of this Section and containing such additional statements as may be reasonably necessary to show compliance with the requirements of this subsection 2 of this Section.

3. The Supplemental Resolution authorizing a Series of Refunding Bonds to refund 1954 Bonds shall provide for Principal Installments due in each calendar year, commencing one year from the date of such Refunding Bonds to the date of the last maturity of such Refunding Bonds, and shall be sufficient to retire all such Bonds not later than such last maturity date. Such Principal Installments shall be in amounts which result in either (i) Bond Service for Bonds of such Series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such Series, or (ii) Bond Service for all Outstanding Bonds, includ-



ing such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds, including such Series, and for each 12-month period thereafter, which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such Series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such Series for any 12-month period after the latest maturity of any Series of any Outstanding Bonds previously issued may be in such amount as is specified in the Supplemental Resolution authorizing such Series of Bonds. Refunding Bonds of a Series issued to refund 1954 Bonds shall be authenticated and delivered by the Trustee only upon receipt by it (in addition to the documents required by Section 202) of:

(a) A certificate of the trustee then duly appointed and acting under the 1954 Resolution that (i) it has received irrevocable instructions, satisfactory to it, to give due notice of redemption of all of the 1954 Bonds on a redemption date specified in such instructions and to make due publication in the manner provided in Section 1101 of the 1954 Resolution of a notice that the moneys payable upon such redemption are immediately available for payment to the holders of the 1954 Bonds and coupons entitled thereto, and (ii) the pledge of the revenues and other moneys, securities and funds pledged, and all other rights granted, by the 1954 Resolution have been discharged and satisfied;

(b) A Counsel's Opinion to the effect that the pledge of the revenues and other moneys, securities and funds pledged, and all other rights granted, by the 1954 Resolution have been discharged and satisfied and that such revenues, moneys, securities and funds and the revenues thereafter to be derived by or for the account of the Authority from the operation of the 1954 Project are pledged under, and subjected to the lien of, the Resolution free and clear of any pledge, lien, charge or encumbrance thereon or with respect thereto prior to, or of equal rank with, the pledge created by the Resolution, except to the extent of the pledge, lien, charge or encumbrance of the 1970 Resolution.

(c) Certificates of the paying agents for the 1954 Bonds so to be redeemed or paid to the effect that they hold in trust the moneys required to effect such redemption or payment and that such

moneys are immediately available for payment to the holders of the 1954 Bonds and coupons entitled thereto;

(d) The amount of money to be credited to the Bond Reserve Account in the General Fund which, together with amounts, if any, then in such Account shall be necessary for such Account to equal the Bond Reserve Requirement immediately after the authentication and delivery of such Series of Bonds; and

(e) A certificate of an Authorized Officer setting forth the Bond Service for the Bonds of such Series for each 12-month period referred to in this subsection 3 and containing such additional statements as may be reasonably necessary to show compliance with the requirements of subsection 1 and this subsection 3 of this Section 204.

4. The Supplemental Resolution authorizing a Series of Refunding Bonds to refund 1970 Bonds shall provide for Principal Installments due in each calendar year, commencing on the later of (i) one year from the date of such Refunding Bonds or (ii) in the year when the next succeeding principal installment is due on the 1970 Bonds being refunded, to the date of the last maturity of such Refunding Bonds, and shall be sufficient to retire all such Bonds not later than such last maturity date. Such Principal Installments shall be in amounts which result in either (i) Bond Service for Bonds of such Series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such Series, or (ii) Bond Service for all Outstanding Bonds, including such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds including such Series, and for each 12-month period thereafter, which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such Series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such Series for any 12-month period after the latest maturity of any Series of any Outstanding Bonds previously issued may be in such amount as is specified in the Supplemental Resolution authorizing such Series of Bonds. Refunding Bonds of a Series issued to refund 1970 Bonds shall be authenticated and delivered by the Trustee only upon receipt by it (in addition to the documents required by Section 202) of:

(a) A certificate of the trustee then duly appointed and acting under the 1970 Resolution that (i) it has received irrevocable instructions, satisfactory to it, to give due notice of redemption of the 1970 Bonds so to be redeemed on a redemption date specified in such instructions and to make due publication in the manner provided in Section 1101 of the 1970 Resolution of a notice that the moneys payable upon such redemption are immediately available for payment to the holders of the 1970 Bonds and coupons entitled thereto, and (ii) (only in the case of the refunding of all 1970 Bonds) the pledge of the revenues and other moneys, securities and funds pledged, and all other rights granted, by the 1970 Resolution have been discharged and satisfied;

(b) In the case of the refunding of all 1970 Bonds a Counsel's Opinion to the effect that the pledge of the revenues and other moneys, securities and funds pledged, and all other rights granted, by the 1970 Resolution have been discharged and satisfied and that such revenues, moneys, securities and funds and the revenues thereafter to be derived by or for the account of the Authority from the operation of the 1970 Project are pledged under, and subjected to the lien of, the Resolution free and clear of any pledge, lien, charge or encumbrance thereon or with respect thereto prior to, or of equal rank with, the pledge created by the Resolution;

(c) Certificates of the paying agents for the 1970 Bonds so to be redeemed or paid to the effect that they hold in trust the moneys required to effect such redemption or payment and that such moneys are immediately available for payment to the holders of the 1970 Bonds and coupons entitled thereto;

(d) The amount of money to be credited to the Bond Reserve Account in the General Fund which, together with amounts, if any, then in such Account shall be necessary for such Account to equal the Bond Reserve Requirement immediately after the authentication and delivery of such Series of Bonds; and

(e) A certificate of an Authorized Officer setting forth the Bond Service for the Bonds of such Series for each 12-month period referred to in this subsection 4 and containing such additional statements as may be reasonably necessary to show compliance with the requirements of subsection 1 and this subsection 4 of this Section 204.

205. *Bond Anticipation Notes.* Whenever the Authority shall by Supplemental Resolution, authorize the issuance of a Series of Bonds, the Authority may by resolution authorize the issuance of Bond Anticipation Notes in anticipation of the sale of such authorized Series of Bonds in a principal amount not exceeding the principal amount of such Series. The principal amount of such Series shall not exceed, together with the principal amount of Bonds previously authenticated and delivered to pay the Cost of Construction of such Project or Projects for which the proceeds of the Notes will be applied, such estimated Cost of Construction as set forth in the Engineer's Certificate furnished pursuant to paragraph (3) of subsection 3 of Section 203, or the amount of the completion requirement as set forth in an Engineer's Certificate filed with the Trustee upon the adoption of the Supplemental Resolution authorizing such Series of Bonds—namely, the amount which, together with all other amounts available therefor (as determined by an Authorized Officer), is necessary and sufficient to complete the payment of the Cost of Construction of such Project or Projects. The interest on such Notes may be payable out of the Temporary Interest Fund and the Bond Service Account to the extent provided in Section 504 and Section 510 (if so provided in the resolution of the Authority authorizing such Notes). The principal of and interest on such Notes and renewals thereof shall be payable from any moneys of the Authority available therefor or from the proceeds of the sale of the Series of Bonds in anticipation of which such Notes are issued. Such proceeds may be pledged for the payment of the principal of and interest on such Notes and any such pledge shall have priority over any other pledge created by the Resolution. The proceeds of sale of Bond Anticipation Notes shall be applied to the purposes for which the Bonds anticipated by such Notes are authorized and shall be deposited in the appropriate Fund or account established by the resolution for such purposes; provided, however, that the resolution or resolutions authorizing such Notes may provide for the payment of interest on such Notes from the proceeds of sale of such Notes and for the deposit, as may be appropriate, in the Temporary Interest Fund or the Bond Service Account. In the event that the Authority adopts a resolution authorizing the issuance of Bond Anticipation Notes, the Authority will promptly furnish to the Trustee a copy of such resolution, certified by an Authorized Officer, together with such information with respect to such Bond Anticipation Notes as the Trustee may reasonably request, including, without limitation, information as to the paying agent

or agents for such Notes. The Trustee shall have no duties or obligations to the holders of such Notes.

### ARTICLE III.

#### GENERAL TERMS AND PROVISIONS OF BONDS.

301. *Medium of Payment; Form and Date.* 1. The Bonds shall be payable, with respect to interest, principal and Redemption Price, in any coin or currency of the United States of America which at the time of payment is legal tender for the payment of public and private debts.

2. The Bonds of each Series shall be issued in the form of coupon Bonds and in the form of fully registered Bonds without coupons.

3. Coupon Bonds of each Series shall be dated as provided in the Supplemental Resolution authorizing the Bonds of such Series. Coupon Bonds of each Series shall bear interest from their date, payable, in the case of installments due on and prior to maturity, in accordance with, and upon surrender of, the appurtenant interest coupons as they severally mature. Registered Bonds of each Series shall be dated as of the date six months preceding the interest payment date next following the date of authentication thereof by the Trustee, unless such date of authentication shall be an interest payment date, in which case they shall be dated as of such date of authentication; provided, however, that if, as shown by the records of the Trustee, interest on the Bonds of any Series shall be in default, the registered Bonds of such Series issued in lieu of Bonds surrendered for transfer or exchange may be dated as of the date to which interest has been paid in full on the Bonds surrendered; provided, further, that if the date of authentication shall be prior to the first interest payment date for the Bonds of such Series, registered Bonds shall be dated as provided in the Supplemental Resolution authorizing the Bonds of such Series. Registered Bonds of each Series shall bear interest from their date.

302. *Legends.* The Bonds of each Series may contain or have endorsed thereon such provisions, specifications and descriptive words not inconsistent with the provisions of the Resolution as may be necessary or desirable to comply with custom, the rules of any securities exchange or commission or brokerage board, or otherwise, as may be determined by the Authority prior to the authentication and delivery thereof.

303. *Execution and Authentication.* 1. The Bonds shall be executed in the name of the Authority by the manual or facsimile signature of its Chairman or its Vice Chairman and its corporate seal (or a facsimile thereof) shall be thereunto affixed, imprinted, engraved or otherwise reproduced, and attested by the facsimile signature of its Secretary or an Assistant Secretary, or in such other manner as may be required by law. In case any one or more of the officers who shall have signed or sealed any of the Bonds shall cease to be such officer before the Bonds so signed and sealed shall have been actually authenticated and delivered by the Trustee, such Bonds may, nevertheless, be authenticated and delivered as herein provided, and may be issued as if the persons who signed or sealed such Bonds had not ceased to hold such offices. Any Bond of a Series may be signed and sealed on behalf of the Authority by such persons as at the actual time of the execution of such Bond shall be duly authorized or hold the proper office in the Authority, although at the date of the Bonds of such Series such persons may not have been so authorized or have held such office.

2. The coupons to be attached to the coupon Bonds of each Series shall be signed by the facsimile signature of the present or any future Chairman of the Authority, or in such other manner as may be required by law, and the Authority may adopt and use for that purpose the facsimile signature of any person or persons who shall have been Chairman of the Authority at any time on or after the date of the Bonds of such Series, notwithstanding that he may not have been such Chairman at the date of any such Bond or may have ceased to be such Chairman at the time when any such Bond shall be actually authenticated and delivered.

3. The Bonds of each Series shall bear thereon a certificate of authentication, in the form set forth in the Supplemental Resolution authorizing such Bonds, executed manually by the Trustee. Only such Bonds as shall bear thereon such certificate of authentication shall be entitled to any right or benefit under the Resolution and no Bond and no coupon thereunto appertaining shall be valid or obligatory for any purpose until such certificate of authentication shall have been duly executed by the Trustee. Such certificate of the Trustee upon any Bond executed on behalf of the Authority shall be conclusive evidence that the Bond so authenticated has been duly authenticated and delivered under the Resolution and that the Holder thereof is entitled to the benefits of the Resolution.

4. Except as otherwise provided in Section 309, the Trustee, before authenticating and delivering any coupon Bonds, shall cut off, cancel and destroy all matured coupons thereto attached, except matured coupons for which payment in full has not been provided; provided, however, that when coupon Bonds are issued in exchange for registered Bonds of any Series upon which interest is in default, as shown by the records of the Trustee, such coupon Bonds shall have attached thereto all coupons maturing after the date to which interest has been paid in full, as shown by the records of the Trustee, and in case any interest installments shall have been paid in part, appropriate notation shall be made on the coupons to evidence such fact.

304. *Interchangeability of Bonds.* 1. Coupon Bonds, upon surrender thereof at the principal office of the Trustee with all unmatured coupons attached, may, at the option of the Holder thereof, be exchanged for an equal aggregate principal amount of registered Bonds of the same Series and maturity of any of the authorized denominations.

2. Registered Bonds, upon surrender thereof at the principal office of the Trustee with a written instrument of transfer satisfactory to the Trustee, duly executed by the registered owner or his duly authorized attorney, may, at the option of the registered owner thereof, be exchanged for an equal aggregate principal amount of coupon Bonds of the same Series and maturity with appropriate coupons attached, or of registered Bonds of the same Series and maturity of any other authorized denomination.

305. *Negotiability, Transfer and Registry.* All the Bonds issued under the Resolution shall be negotiable, subject to the provisions for registration and transfer contained in the Resolution and in the Bonds. So long as any of the Bonds shall remain Outstanding, the Authority shall maintain and keep, at the principal office of the Trustee, books for the registration and transfer of Bonds; and, upon presentation thereof for such purpose at said office, the Authority shall register or cause to be registered therein, and permit to be transferred thereon, under such reasonable regulations as it or the Trustee may prescribe, any Bond entitled to registration or transfer. So long as any of the Bonds remain Outstanding, the Authority shall make all necessary provision to permit the exchange of Bonds at the principal office of the Trustee.



306. *Transfer of Coupon Bonds.* (1) Title to any coupon Bond, and to any coupons, shall pass by delivery as negotiable instruments payable to bearer.

(2) The Authority and any Fiduciary may treat the bearer of any coupon as the absolute owner thereof, whether such coupon shall be overdue or not, for the purpose of receiving payment thereof and for all other purposes whatsoever, and may treat the bearer of any coupon Bond which shall not at the time be registered as to principal other than to bearer, or the person in whose name any coupon Bond for the time being shall be registered upon the books of the Authority, as the absolute owner of such Bond, whether such Bond shall be overdue or not, for the purpose of receiving payment of the principal or Redemption Price thereof and for all other purposes whatsoever except for the purpose of receiving payment of coupons, and neither the Authority nor any Fiduciary shall be affected by any notice to the contrary. The Authority agrees to indemnify and save each Fiduciary harmless from and against any and all loss, cost, charge, expense, judgment or liability incurred by it, acting in good faith and without negligence under the Resolution, in so treating such bearer or registered owner.

307. *Transfer of Registered Bonds.* 1. Each registered Bond shall be transferable only upon the books of the Authority, which shall be kept for the purpose at the principal office of the Trustee, by the registered owner thereof in person or by his attorney duly authorized in writing, upon surrender thereof together with a written instrument of transfer satisfactory to the Trustee duly executed by the registered owner or his duly authorized attorney. Upon the transfer of any such registered Bond the Authority shall issue in the name of the transferee a new registered Bond or Bonds or, at the option of the transferee, coupon Bonds, with appropriate coupons attached, of the same aggregate principal amount and Series and maturity as the surrendered Bond.

2. The Authority and each Fiduciary may deem and treat the person in whose name any Outstanding registered Bond shall be registered upon the books of the Authority as the absolute owner of such Bond, whether such Bond shall be overdue or not, for the purpose of receiving payment of, or on account of, the principal and Redemption Price, if any, of and interest on such Bond and for all other purposes, and all such payments so made to any such registered owner or upon his

order shall be valid and effectual to satisfy and discharge the liability upon such Bond to the extent of the sum or sums so paid, and neither the Authority nor any Fiduciary shall be affected by any notice to the contrary. The Authority agrees to indemnify and save each Fiduciary harmless from and against any and all loss, cost, charge, expense, judgment or liability incurred by it, acting in good faith and without negligence under the Resolution, in so treating such registered owner.

308. *Regulations With Respect to Exchanges and Transfers.* In all cases in which the privilege of exchanging Bonds or transferring registered Bonds is exercised, the Authority shall execute and the Trustee shall authenticate and deliver Bonds in accordance with the provisions of the Resolution. All Bonds and coupons surrendered in any such exchanges or transfers shall forthwith be cancelled by the Trustee. For every such exchange or transfer of Bonds, whether temporary or definitive, the Authority or the Trustee may make a charge sufficient to reimburse it for any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer. The Authority shall not be obliged to make any such exchange or transfer of Bonds of any Series during the 20 days next preceding an interest payment date on the Bonds of such Series or, in the case of any proposed redemption of Bonds of such Series, next preceding the date of the first publication of notice of such redemption.

309. *Bonds Mutilated, Destroyed, Stolen or Lost.* In case any Bond shall become mutilated or be destroyed, stolen or lost, the Authority shall execute, and thereupon the Trustee shall authenticate and deliver, a new Bond (with appropriate coupons attached in the case of coupon Bonds) of like Series, maturity and principal amount as the Bond and attached coupons, if any, so mutilated, destroyed, stolen or lost, in exchange and substitution for such mutilated Bond, upon surrender and cancellation of such mutilated Bond and attached coupons, if any, or in lieu of and substitution for the Bond and coupons, if any, destroyed, stolen or lost, upon filing with the Trustee evidence satisfactory to the Authority and the Trustee that such Bond and attached coupons, if any, have been destroyed, stolen or lost and proof of ownership thereof, and upon furnishing the Authority and the Trustee with indemnity satisfactory to them and complying with such other reasonable regulations as the Authority and the Trustee may prescribe and paying such expenses as the Authority and Trustee

may incur. All Bonds and coupons so surrendered to the Trustee shall be cancelled by it. Any such new Bonds or coupons issued pursuant to this Section in substitution for Bonds or coupons alleged to be destroyed, stolen or lost shall constitute original additional contractual obligations on the part of the Authority, whether or not the Bonds and coupons so alleged to be destroyed, stolen or lost be at any time enforceable by anyone, and shall be equally secured by and entitled to equal and proportionate benefits with all other Bonds and coupons issued under the Resolution, in any moneys or securities held by the Authority or the Fiduciary for the benefit of the Bondholders.

310. *Preparation of Definitive Bonds; Interim Receipts and Temporary Bonds.* 1. The definitive Bonds of each Series shall be fully engraved (as that term is customarily used) or lithographed or printed on steel engraved borders. Until the definitive Bonds of any Series are prepared, the Authority may execute, in the same manner as is provided in Section 303, and, upon the request of the Authority, the Trustee shall authenticate and deliver, in lieu of definitive Bonds, to the extent authorized by law, one or more interim receipts, or one or more temporary Bonds subject to the same provisions, limitations and conditions as, and substantially of the tenor of, such definitive Bonds, provided, however, that such temporary Bonds may have attached thereto one or more or no coupons, may be in denominations of \$1,000 or \$5,000 or any multiples of \$5,000 authorized by the Authority, may provide for such rights of exchange or registration as may be stated therein, and may have such omissions, insertions and variations as may be appropriate for temporary Bonds. The installments of interest payable on such temporary Bonds in bearer form shall be payable only upon presentation and surrender of the coupons therefor attached thereto or, if no coupons for such interest are attached, then only upon presentation of such temporary Bonds for notation thereon of the payment of such interest. The Authority at its own expense shall prepare and execute and, upon the surrender at the principal office of the Trustee of such interim receipts and of such temporary Bonds, with all unmatured coupons, and all matured coupons for which no payment or only partial payment has been provided, attached, for exchange and the cancellation of such surrendered receipts and temporary Bonds and coupons, the Trustee shall authenticate and, without charge to the Holder thereof, deliver in exchange therefor, definitive coupon Bonds, with appropriate coupons attached, or, at the option of the Holder, definitive regis-

tered Bonds, of the same aggregate principal amount and Series and maturity as the temporary Bonds surrendered. Until so exchanged, the interim receipts and temporary Bonds shall in all respects be entitled to the same benefits and security as definitive Bonds authenticated and issued pursuant to the Resolution.

2. If the Authority shall authorize the issuance of temporary Bonds in more than one denomination, the Holder of any temporary Bond or Bonds may, at his option, surrender the same to the Trustee in exchange for another temporary Bond or Bonds of like aggregate principal amount and Series and maturity of any other authorized denomination or denominations, and thereupon the Authority shall execute and the Trustee shall authenticate and, in exchange for the temporary Bond or Bonds so surrendered and upon payment of the taxes, fees and charges provided for in Section 308, shall deliver a temporary Bond or Bonds of like aggregate principal amount, Series and maturity in such other authorized denomination or denominations as shall be requested by such Holder.

3. All interim receipts and all temporary Bonds surrendered in exchange either for another temporary Bond or Bonds (in the case of temporary Bonds) or for a definitive Bond or Bonds shall be forthwith cancelled by the Trustee.

#### ARTICLE IV.

##### REDEMPTION OF BONDS.

401. *Privilege of Redemption and Redemption Price.* Bonds subject to redemption prior to maturity pursuant to a Supplemental Resolution shall be redeemable, upon published notice as provided in this Article IV, at such times, at such Redemption Prices and upon such terms (in addition to and consistent with the terms contained in this Article IV) as may be specified in the Supplemental Resolution authorizing such Series.

402. *Redemption at the Election of the Authority.* In the case of any redemption of Bonds otherwise than as provided in Section 403, the Authority shall give written notice to the Trustee of its election so to redeem, of the redemption date, of the Series, of the principal amounts of the Bonds of each maturity of such Series to be redeemed (which Series, maturities and principal amounts thereof to

be redeemed shall be determined by the Authority in its sole discretion, subject to any limitations with respect thereto contained in any Supplemental Resolution). Such notice shall be given at least 45 days prior to the redemption date or such shorter period as shall be acceptable to the Trustee. In the event notice of redemption shall have been given as in Section 405 provided, the Trustee shall, at least one day prior to the redemption date, or such earlier date as the Authority may direct, pay out of moneys available therefor to the appropriate Paying Agent or Paying Agents an amount in cash which, in addition to other moneys, if any, available therefor held by such Paying Agent or Paying Agents, will be sufficient to redeem on the redemption date at the Redemption Price thereof, all of the Bonds to be redeemed.

*403. Redemption Otherwise Than at Authority's Election.* Whenever by the terms of the Resolution Bonds are required to be redeemed otherwise than at the election of the Authority, the Trustee shall select the Bonds to be redeemed, give the notice of redemption and pay out of moneys available therefor the Redemption Price to the appropriate Paying Agents in accordance with the terms of this Article IV and, to the extent applicable, subsection 2 of Section 510.

*404. Selection of Bonds to be Redeemed by Lot.* In the event of redemption of less than all the Outstanding Bonds of like Series and maturity, the Trustee shall select, in such manner in its discretion as it shall deem appropriate and fair, the numbers of the Bonds to be redeemed and portions of any thereof to be redeemed in part. Bonds of denominations of \$5,000 or less may be redeemed only as a whole. Bonds of denominations of more than \$5,000 may be redeemed either as a whole or in part (which part must be \$5,000 or an integral multiple thereof). For the purposes of this Section 404, Bonds, or portions thereof, which have theretofore been selected for redemption shall not be deemed Outstanding.

*405. Notice of Redemption.* When the Trustee shall receive notice from the Authority of its election to redeem Bonds pursuant to Section 402, and when redemption of Bonds is required by the Resolution pursuant to Section 403, the Trustee shall give notice, in the name of the Authority, of the redemption of such Bonds, which notice shall specify the Series and maturities of the Bonds to be redeemed, the redemption date and the place or places where amounts due upon such redemption will be payable and, if less than all of the Bonds of any

like Series and maturity are to be redeemed, the letters and numbers or other distinguishing marks of such Bonds so to be redeemed, and, in the case of registered Bonds to be redeemed in part only, such notice shall also specify the respective portions of the principal amount thereof to be redeemed. Such notice shall further state that on such date there shall become due and payable upon each Bond to be redeemed the Redemption Price thereof, or the Redemption Price of the specified portions of the principal thereof in the case of registered Bonds to be redeemed in part only, together with interest accrued to the redemption date, and that from and after such date interest thereon shall cease to accrue and be payable. Such notice shall be given by publication once a week for at least 2 successive weeks in an Authorized Newspaper, the first such publication to be not less than 30 days nor more than 60 days prior to the redemption date. The Trustee shall also mail a copy of such notice, postage prepaid, not less than 25 days before the redemption date, to the registered owners of any Bonds or portions of Bonds which are to be redeemed, at their last addresses, if any, appearing upon the registry books, but such mailing shall not be a condition precedent to such redemption and failure so to mail any such notice shall not affect the validity of the proceedings for the redemption of Bonds.

406. *Payment of Redeemed Bonds.* Notice having been given by publication in the manner provided in Section 405, the Bonds or portions thereof so called for redemption shall become due and payable on the redemption date so designated at the Redemption Price, plus interest accrued and unpaid to the redemption date, and, upon presentation and surrender thereof at the office specified in such notice, together with, in the case of coupon Bonds, all appurtenant coupons maturing subsequent to the redemption date, such Bonds, or portions thereof, shall be paid at the Redemption Price plus interest accrued and unpaid to the redemption date not represented by coupons for matured interest installments. All interest installments represented by coupons which shall have matured on or prior to the redemption date shall continue to be payable to the bearers of such coupons. If there shall be called for redemption less than all of a registered Bond, the Authority shall execute and the Trustee shall authenticate and the Paying Agents deliver, upon the surrender of such Bond, without charge to the owner thereof, for the unredeemed balance of the principal amount of the registered Bond so surrendered, at the option of the owner thereof, either coupon Bonds or registered Bonds of like Series and maturity in any of the

authorized denominations. If, on the redemption date, moneys for the redemption of all the Bonds or portions thereof of any like Series and maturity to be redeemed, together with interest to the redemption date, shall be held by the Paying Agents so as to be available therefor on said date and if notice of redemption shall have been published as aforesaid, then, from and after the redemption date interest on the Bonds or portions thereof of such Series and maturity so called for redemption shall cease to accrue and become payable, and the coupons for interest appertaining thereto maturing subsequent to the redemption date shall be void. If said moneys shall not be so available on the redemption date, such Bonds or portions thereof shall continue to bear interest until paid at the same rate as they would have borne had they not been called for redemption.

## ARTICLE V.

### ESTABLISHMENT OF FUNDS AND APPLICATION THEREOF.

501. *The Lien Created by the Resolution.* 1. The full faith and credit of the Authority are hereby pledged for the payment of the principal and Redemption Price of, interest on, and Sinking Fund Installment for, the Bonds in accordance with their terms and the provisions of the Resolution. In addition, there are hereby pledged for such payment, subject only to the provisions of the Resolution permitting the application thereof (and of any pledge of Bond proceeds pursuant to Section 205) for the purposes and on the terms and conditions set forth in the Resolution, (i) the proceeds of sale of the Bonds, (ii) subject to the charge or lien created by the 1970 Resolution (a) on and after the Retirement Date of the 1954 Bonds all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1954 Project and (b) all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1970 Project or any 1970 Project Improvement and (iii) all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of any Project or any other project of the Authority heretofore or hereafter authorized pursuant to the Act, all funds created in connection therewith, and interest received on any moneys and securities of the Authority, subject to the provisions of the Resolution permitting the application thereof for the purposes and on the terms and conditions set forth in the Resolution. The pledge of the revenues, rates, fees, charges,

rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1954 Project, the 1970 Project or any 1970 Project Improvement shall be subject and subordinate in all respects to the charge or lien created by the 1954 Resolution and to the charge or lien created by the 1970 Resolution.

2. The pledge shall be valid and binding from and after the date of adoption of the Resolution, and the proceeds of sale of the Bonds and all the Revenues, moneys, securities and funds as received by the Authority as set forth in paragraph 1 of this Section 501 shall immediately be subject to the lien of the pledge without any physical delivery thereof or further act, and the lien of the pledge shall be valid and binding as against all parties having claims of any kind in tort, contract or otherwise against the Authority irrespective of whether such parties have notice thereof.

502. *Establishment of Funds.* The following Funds are hereby established:

- (1) Construction Fund, to be held by the Authority,
- (2) Temporary Interest Fund, to be held by the Trustee,
- (3) Revenue Fund, to be held by the Authority,
- (4) Operating Fund, to be held by the Authority,
- (5) Projects' Study Fund, to be held by the Authority, and
- (6) General Fund, to be held by the Trustee.

503. *Construction Fund.* 1. The Authority shall establish within the Construction Fund a separate account (herein called "Proceeds Account") for each Project.

2. Upon the authentication and delivery of the first Series of Bonds all or a portion of the proceeds of which are to be deposited into the Proceeds Account established for such Project, or as promptly as practicable thereafter, the Authority shall pay into such Proceeds Account that portion of the balance, if any, then remaining of the proceeds of sale of any then outstanding notes of the Authority which were issued to pay a portion of the Cost of Construction of such Project including notes issued in whole or in part to repay indebtedness incurred to pay a portion of the Cost of Construction of such Project.

3. The Authority shall pay into the Proceeds Account established for such Project all Revenues derived from the operation of such Project



and received prior to (i) the Date of Completion of such Project or (ii) the latest estimated Date of Completion of such Project set forth in an Engineer's Certificate filed with the Trustee upon the issuance of a Series of Bonds pursuant to paragraph (4) of subsection 2 of Section 202, whichever is earlier.

4. The Authority shall pay into the Proceeds Account established for such Project, as promptly as practicable, the following amounts received by it:

(i) the proceeds of sale of Bonds to the extent not required for payment of Bond Anticipation Notes or for payment by the Authority into the Temporary Interest Fund, the Operating Fund, the Projects' Study Fund or the General Fund;

(ii) proceeds of Bond Anticipation Notes issued in anticipation of Bonds of such Series, to the extent provided in Section 205;

(iii) payments made to the Authority from the sale or other disposition of properties of such Project payable into such Proceeds Account pursuant to subsection 2 of Section 607;

(iv) the balance of insurance proceeds with respect to such Project not applied as provided in subsection 4 of Section 611; and

(v) such other amounts (not required by the Resolution to be otherwise deposited) as may be provided in the Supplemental Resolution authorizing Bonds of such Series.

Amounts in such Account shall be applied to the Cost of Construction of such Project provided, however, that prior to the Date of Completion of a Project the amounts in the Proceeds Account established for such Project may be transferred to any other Proceeds Account so long as such amounts are retransferred prior to or contemporaneously with the delivery of the next succeeding Series of Bonds of the Authority. Any amount remaining in such Account upon the Date of Completion of such Project, and not set aside or appropriated by the Authority to pay such Cost of Construction may be transferred by the Authority to another and separate Proceeds Account, and if not so set aside, appropriated or transferred, such amounts shall be applied to meet any deficiency then existing in the Bond Reserve Account and thereafter shall be applied to any purpose for which moneys in the Construction Fund may be

used or to the purchase or redemption of Bonds, as directed by the Authority, after apportionment of such amounts in the manner provided in subsection 3 of Section 511. Amounts in the Construction Fund may in the discretion of the Authority be invested in Investment Securities or in Authorized Certificates of Deposit. Interest on moneys and investments in the Construction Fund shall be held in such Fund. The Authority may, and to the extent required for payments from the Construction Fund shall, sell any such obligations at any time, and the proceeds of such sale, and of all payments at maturity and upon redemption of such investments, shall be held in the Construction Fund. In computing the amount of the Construction Fund, investments shall be valued at cost.

5. Notwithstanding the above provisions of this Section, to the extent that other moneys are not available therefor, amounts in such Proceeds Account shall be applied to the payment of principal of and interest on Bonds when due.

504. *Temporary Interest Fund.* The Trustee if directed by the Authority shall establish in the Temporary Interest Fund a separate account for each Project or for each Series of Bonds all in accordance with such direction. The Authority shall pay to the Trustee, to be held in the Temporary Interest Fund or in the appropriate account therein, the amount or amounts equal to interest required to be paid therein in order to comply with Sections 203 or 205, as the case may be. The Trustee shall pay from such Fund to the appropriate Paying Agent (or if required in the case of Bond Anticipation Notes to the paying agent or agents for such Notes) at least one day prior to the date or dates on which semi-annual interest on the Outstanding Bonds becomes due and payable, or such earlier date as the Authority may direct, an amount equal to such interest. Amounts in the Temporary Interest Fund shall be invested by the Trustee in Investment Securities or in Authorized Certificates of Deposit, in each case if and as the Authority may direct. The Trustee shall sell any such obligations as directed by the Authority and in any event to the extent required for payments from the Temporary Interest Fund. The proceeds of such sales, and of all payments at maturity or upon redemption of such investments (excluding amounts in excess of the amount required to be held in the Temporary Interest Fund, which, when received, shall be paid to the Authority for credit to the appropriate account in the Construction Fund), shall be held in the Temporary Interest Fund. In computing the amount of the Temporary Interest Fund, investments shall be valued at cost.

505. *Revenue Fund.* On and after the Date of Completion of each Project or the latest estimated Date of Completion of such Project set forth in an Engineer's Certificate filed with the Trustee upon the issuance of a Series of Bonds pursuant to paragraph (4) of subsection 2 of Section 202, whichever is earlier, the Authority shall pay into the Revenue Fund, all Revenues other than Revenues derived from the 1954 Project, the 1970 Project and any 1970 Project Improvement as received. The Authority shall also pay into the Revenue Fund the Revenues derived from the 1954 Project, the 1970 Project and any 1970 Project Improvement as received; provided, however, that payment of Revenues from the 1954 Project, the 1970 Project and any 1970 Project Improvement shall be subject and subordinate in all respects to the charge or lien created by the 1954 Resolution and to the charge or lien created by the 1970 Resolution. Amounts in the Revenue Fund not paid into the Operating Fund or the Project Study Fund shall, as promptly as practicable, and at least monthly, be paid to the Trustee to be deposited in the General Fund.

506. *Operating Fund.* 1. As soon as practicable in each month after making the payments into the Revenue Fund pursuant to Section 505, the Authority shall withdraw from the Revenue Fund and pay into the Operating Fund (i) the amounts that it shall determine to be required for reasonable and necessary Operating Expenses (other than on account of fuel), including reasonable and necessary reserves and working capital therefor, and (ii) the amounts that it shall determine to be necessary and sufficient, together with any amounts otherwise available (including fuel credits and the proceeds of sale of fuel elements), to pay in cash the purchase price on the due date therefor of any part of the fuel, fuel assemblies, services, fuel materials and components therefor which is required to replace fuel, fuel assemblies, services, fuel materials and components. Such amounts deposited in the Operating Fund on account of fuel or for fuel working capital shall be set aside in a separate account which shall be established within such Fund and designated as the "Fuel Reserve Account." There shall also be paid into the Fuel Reserve Account all amounts received from fuel credits, including the proceeds of sale of fuel elements, fuel, fuel assemblies, fuel materials, and components therefor, and all other amounts required under the Resolution to be deposited in such Account. For purposes of the foregoing determination it shall be assumed that all fuel, fuel assemblies, services, fuel materials and components

shall be acquired only by purchase notwithstanding that such fuel, fuel assemblies, services, fuel materials and components may be leased or acquired otherwise than by purchase. In the event that the Authority has entered into contracts for the purchase of such fuel, fuel assemblies, services, fuel materials and components, the due dates for purposes of the foregoing determination shall be the dates when payment in cash is required under such contracts. In the event that the Authority has not entered into such contracts, it shall be assumed that the purchase price would be the amount for which, in the opinion of the Authority, responsible vendors would offer to sell such fuel, fuel assemblies, services, fuel materials and components to the Authority under conditions as they exist at the time such determination is required, and that payment in cash of the entire purchase price therefor would be required on the applicable due dates not later than the dates on which such responsible vendors as the sellers of such fuel, fuel assemblies, services, fuel materials and components would be obligated to deliver the same to the Authority.

2. Amounts in the Operating Fund shall be paid out from time to time by the Authority for reasonable and necessary Operating Expenses or accumulated as a reserve for Operating Expenses the payment of which is not immediately required; provided, however, that amounts in the Fuel Reserve Account shall be applied only to the cost of acquisition, leasing, use, reprocessing, and replacement of fuel, fuel assemblies, fuel material, services and components. Notwithstanding anything in the Resolution to the contrary, if and to the extent that amounts in the Fuel Reserve Account are not sufficient to pay or provide for the payment of the cost of acquisition, leasing, use, reprocessing and replacement of fuel, fuel assemblies, fuel material, services and components, other amounts in the Operating Fund may be applied to such purpose.

3. Amounts in the Operating Fund (other than in the Fuel Reserve Account therein) which the Authority at any time determines to be in excess of the requirements of such Fund shall be applied to make up any deficiency in the Bond Service Account in the General Fund and, if and to the extent no such deficiency exists, shall be paid into the Bond Reserve Account in the General Fund.

4. Amounts in the Operating Fund accumulated as a reserve for Operating Expenses the payment of which is not immediately required may in the discretion of the Authority be invested in Investment

Securities or in Authorized Certificates of Deposit. The Authority may sell any such obligations at any time and the proceeds of such sale and of all payments of principal or interest received at maturity or upon redemption or otherwise of such obligations (excluding accrued interest which, when received, shall be credited to the Revenue Fund) shall be held in the Operating Fund.

507. *Projects' Study Fund.* 1. Upon the authentication and delivery of any Series of Bonds or as promptly as practicable thereafter, the Authority shall pay into the Projects' Study Fund the balance, if any, then remaining of the proceeds of sale of any notes of the Authority issued in connection with Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study.

2. Amounts in the Projects' Study Fund shall be applied to the payment when due of notes of the Authority issued in connection with Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study, or shall be paid out from time to time by the Authority in payment of reasonable and necessary expenses incurred in connection with Projects' Study or shall be accumulated as a reserve for Projects' Study the payment of which is not immediately required.

3. As soon as practicable in each month after making the payments into the Revenue Fund pursuant to Section 505 and after making the withdrawal for the Operating Fund pursuant to Section 506 the Authority shall withdraw from the Revenue Fund and pay to the Projects' Study Fund an amount, not to exceed two percent of Revenues of the Authority not pledged under the 1954 Resolution or the 1970 Resolution that it shall determine to be required for Projects' Study, including reasonable and necessary reserves; provided, however, there shall be no withdrawal and payment as aforesaid if at such time the amount in the Bond Service Account shall be less than the amount required to be in such account pursuant to paragraph *First* of Section 509.

4. Amounts in the Projects' Study Fund which the Authority at any time determines to be in excess of the requirements of such Fund shall be applied to make up any deficiency in the Bond Service Account in the General Fund and, if and to the extent no such deficiency exists, shall be paid into the Bond Reserve Account in the General Fund.

5. Amounts in the Projects' Study Fund accumulated as a reserve for Projects' Study, the payment of which is not immediately required, may in the discretion of the Authority be invested in Investment Securities or in Authorized Certificates of Deposit. The Authority may sell any such obligation at any time and the proceeds of such sale and all payments of principal or interest received at maturity or upon redemption or otherwise of such obligations (excluding accrued interest which, when received, shall be credited to the Revenue Fund) shall be held in the Projects' Study Fund.

508. *General Fund—Certain Payments.* On and after the Date of Completion of each Project the Authority shall also pay to the Trustee as promptly as practicable, for deposit in the Bond Reserve Account of the General Fund, the following amounts:

(1) payments made to the Authority from the sale or other disposition of properties of such Project payable into the Bond Reserve Account of the General Fund pursuant to subsection 2 of Section 607; and

(2) the balance of insurance proceeds with respect to such Project not applied as provided in subsection 4 of Section 611.

509. *General Fund—Allocation of Revenues.* The Trustee shall establish within the General Fund a Bond Service Account, a Bond Reserve Account, and a General Reserve Account. The Trustee shall, upon receipt of each payment from the Revenue Fund, allocate or apply such payment as follows and in the following order:

*First:* To the Bond Service Account, if and to the extent required so that the amount in said Account shall equal the sum of Accrued Bond Service to the extent not provided for out of the proceeds of sale of Bonds or Bond Anticipation Notes paid into the Temporary Interest Fund;

*Second:* To the Bond Reserve Account, as a reserve for the security of the Bonds, the sum of (i) an amount equal to fifteen percent of the amounts allocated to the Bond Service Account each month, (ii) such further amount, if any, to the extent required so that the amount in said Account shall equal the Bond Reserve Requirement and (iii) such further amount, if any, to the extent required so that the total amounts allocated to the Bond Reserve Account up to the time of the latest allocation shall equal fifteen

percent of the total amounts allocated to the Bond Service Account up to such time; and

*Third:* To the General Reserve Account, to the extent of any remaining balance of such payment from the Revenue Fund.

510. *Bond Service Account.* 1. The Trustee shall pay out of Bond Service Account to the respective Paying Agents (i) on or before each interest payment date for any of the Bonds the amount required for the interest payable on such date unless such interest is paid pursuant to Section 504; (ii) on or before each Principal Installment due date, the amount required for the Principal Installment payable on such date; and (iii) on or before the day preceding any redemption date for the Bonds, the amount required for the payment of interest on the Bonds then to be redeemed; provided that in each case the Authority may direct the Trustee to make such payments to the appropriate Paying Agents on such date prior to the due date as the Authority may determine. Such amounts shall be applied by the Paying Agents on and after the due dates thereof. If the amount accumulated in the Bond Service Account for any purpose set forth in clauses (i), (ii) or (iii) of this subsection 1, with respect to any Series, exceeds the amount required therefor, such excess shall be applied first to meet any deficiency in the Bond Service Account for any other Series Outstanding, if no other moneys are available in the Bond Reserve Account to meet such deficiency, and thereafter shall be applied to the redemption or purchase of Bonds of the Series for which such amount was accumulated; provided that if no Bonds of such Series are then Outstanding such excess shall be apportioned and applied to the redemption or purchase of Bonds in the manner set forth in subsection 3 of Section 511. The Trustee shall also pay to the appropriate paying agent or agents out of the Bond Service Account the interest on Bond Anticipation Notes when due and payable to the extent not provided for out of the proceeds of sale of such Notes, and accrued interest included in the purchase price of Bonds purchased for retirement.

2. Amounts accumulated in the Bond Service Account with respect to any Sinking Fund Installment (together with amounts accumulated therein with respect to interest on the Bonds for which such Sinking Fund Installment was established) may, and if so directed by the Authority shall, be applied by the Trustee prior to the 45th day preceding the due date of such Sinking Fund Installment, to (i) the

purchase of Bonds of the Series and maturity for which such Sinking Fund Installment was established, at prices not exceeding the applicable sinking fund Redemption Price plus interest on such Bonds to the first date on which such Bonds could be redeemed (or in the case of a Sinking Fund Installment due on the maturity date, the principal amount thereof plus interest to such date), such purchases to be made in such manner as the Trustee shall determine, or (ii) the redemption, pursuant to Article IV, of such Bonds, then redeemable by their terms. The applicable Redemption Price or principal amount of maturing Bonds of any Bonds so purchased or redeemed shall be deemed to constitute part of the Bond Service Account until such Sinking Fund Installment date, for the purpose of calculating the amount of such Account. As soon as practicable after the 45th day preceding the due date of any such Sinking Fund Installment, the Trustee shall proceed (by giving notice as provided in Section 405) to call for redemption on such due date Bonds of the Series and maturity for which such Sinking Fund Installment was established (except in the case of Bonds maturing on a Sinking Fund Installment date) in such amount as shall be necessary to complete the retirement of the principal amount of the Bonds of such Series and maturity, as specified for such Sinking Fund Installment in the Supplemental Resolution establishing the same. The Trustee shall pay out of the Bond Service Account to the appropriate Paying Agent, on or before the day preceding such redemption date or maturity date, the amount required for the redemption of the Bonds so called for redemption or for the payment of such Bonds then maturing, and such amount shall be applied by such Paying Agent to such redemption or payment.

511. *Bond Reserve Account.* 1. If on the final day of any month the amount in the Bond Service Account shall be less than the amount required to be in such Account pursuant to paragraph *First* of Section 509, the Trustee shall apply amounts from the Bond Reserve Account to the extent necessary to make good the deficiency.

2. Amounts in the Bond Reserve Account not immediately required to make good any deficiency referred to in paragraph 1 of this Section shall, upon direction of the Authority, be paid to the Authority, free and clear of the lien and pledge created by the Resolution, for costs of emergency repairs or replacements essential to restore or prevent physical damage to, and to prevent loss of Revenues from, any Project (i) to the extent that the proceeds of insurance and other



moneys reasonably expected to be available to pay such cost are insufficient therefor, and (ii) upon the filing with the Trustee of an Engineer's Certificate setting forth (a) in reasonable detail the repairs or replacements for which such expenditures are to be made, (b) the estimated cost thereof, (c) the amount of insurance proceeds and other moneys reasonably expected to be available therefor, (d) that such repairs or replacements are essential to restore or prevent physical damage to, and prevent loss of Revenues from, said Project, and (e) that, in the opinion of the signer, the payment to be made from such Account is reasonable and necessary and in the interest of the Holders of the Bonds.

3. Amounts in the Bond Reserve Account in excess of the Bond Reserve Requirement and not immediately required to make good any deficiency referred to in paragraph 1 of this Section or for such costs of emergency repairs and replacements referred to in paragraph 2 of this Section shall be apportioned by the Trustee at least monthly among all Series of Bonds then Outstanding so that the amount apportioned to each Series shall bear the same ratio to the total amount apportioned as the Bond Service for the current calendar year with respect to such Series bears to the Aggregate Bond Service for such year with respect to all Series Outstanding. If the Authority so directs, the amount so apportioned to each Series shall be applied to the redemption or purchase of Bonds of such Series at prices not exceeding the then applicable Redemption Price or the Redemption Price on the earliest date of redemption of such Bonds. Prior to January 1 of each year the Trustee shall pay to the appropriate Paying Agent for the redemption of Bonds of each Series the amount of moneys so apportioned for such Series remaining in such Account on the next preceding November 15; provided that such remaining moneys, if less than \$50,000 with respect to any Series, need not be then so applied. In the case of any purchase of Bonds out of the Bond Reserve Account, the Trustee shall pay all expenses of such purchase therewith out of such Account, and such Bonds shall forthwith be cancelled.

512. *General Reserve Account.* 1. If at any time the amount in the Bond Service Account shall be less than the amount required to be in such Account pursuant to paragraph *First* of Section 509, or the amount in the Bond Reserve Account shall be less than the Bond Reserve Requirement, the Trustee shall apply amounts from the Gen-

eral Reserve Account to the extent necessary to make good the deficiency.

2. Amounts in the General Reserve Account not immediately required to make good such deficiency shall, upon direction of the Authority, be paid to the Authority, free and clear of the lien and pledge created by the Resolution, for any lawful corporate purpose.

513. *Investment of General Fund.* Amounts in the General Fund shall be invested in Investment Securities or in Authorized Certificates of Deposit as the Authority may direct. The Trustee shall sell any such obligations as directed by the Authority and in any event to the extent required for payments from the General Fund. The proceeds of such sale, and of all payments at maturity or upon redemption of such obligations (excluding interest earned on such obligations which, when received, shall be paid to the Authority for credit to the Revenue Fund), shall be held in the General Fund. In computing the amount of the General Fund, investments shall be valued at cost.

514. *Cancellation of Bonds and Coupons.* All Bonds and appurtenant coupons purchased by the Trustee shall forthwith be cancelled by it, and all Bonds or coupons paid by a Paying Agent upon the maturity of such Bonds or coupons or the redemption thereof shall be delivered promptly to the Trustee for cancellation and retirement.

## ARTICLE VI.

### PARTICULAR COVENANTS OF THE AUTHORITY.

The Authority covenants and agrees as follows:

601. *Payment of Bonds.* The Authority shall duly and punctually pay or cause to be paid the principal or Redemption Price, if any, of every Bond and the interest thereon, at the dates and places and in the manner mentioned in the Bonds and in the coupons thereto appertaining, according to the true intent and meaning thereof, and shall duly and punctually satisfy all Sinking Fund Installments, if any, which may be established for any Series.

602. *Extension of Payment of Bonds and Coupons.* The Authority shall not directly or indirectly extend or assent to the extension of the maturity of any of the Bonds or the time of payment of any

of the coupons or claims for interest by the purchase or funding of such Bonds, coupons or claims for interest or by any other arrangement and in case the maturity of any of the Bonds or the time for payment of any such coupons or claims for interest shall be extended, such Bonds, coupons or claims for interest shall not be entitled in case of any default under the Resolution to the benefit of the Resolution or to any payment out of any assets of the Authority or the funds (except funds held in trust for the payment of particular Bonds, coupons or claims for interest pursuant to the Resolution) held by the Fiduciaries, except subject to the prior payment of the principal of all Bonds issued and Outstanding the maturity of which has not been extended and of such portion of the accrued interest on the Bonds as shall not be represented by such extended coupons or claims for interest. Nothing herein shall be deemed to limit the right of the Authority to issue Refunding Bonds as provided in Section 204 and such issuance shall not be deemed to constitute an extension of maturity of Bonds.

603. *Offices for Servicing Bonds.* The Authority shall at all times maintain one or more offices or agencies in the Borough of Manhattan, City and State of New York, where Bonds and coupons may be presented for payment, redemption, registration, transfer or exchange, and where notices, demands and other documents may be served upon the Authority in respect of the Bonds and coupons or of the Resolution. The Authority hereby appoints the Trustee as its agent to maintain such office or agency for the registration, transfer or exchange of Bonds, and for the service upon the Authority of such notices, demands and other documents. The Authority hereby appoints the Paying Agents in said Borough and City as its respective agents to maintain such officers or agencies for the payment or redemption of Bonds and coupons.

604. *Further Assurance.* At any and all times the Authority shall, so far as it may be authorized by law, pass, make, do, execute, acknowledge and deliver, all and every such further resolutions, acts, deeds, conveyances, assignments, transfers and assurances as may be necessary or desirable for the better assuring, conveying, granting, assigning and confirming all and singular the rights, revenues and other moneys, securities and funds hereby pledged or assigned, or intended so to be, or which the Authority may become bound to pledge or assign after the date of adoption of this Resolution.

605. *Power to Issue Bonds and Create a Lien.* The Authority is duly authorized under all applicable laws to create and issue the Bonds and to adopt the Resolution and to pledge its Revenues and other moneys, securities and funds in the manner and to the extent provided in the Resolution. Except to the extent otherwise provided in Section 501, such Revenues and other moneys, securities and funds of the Authority are and will be free and clear of any pledge, lien, charge or encumbrance thereon or with respect thereto prior to, or of equal rank with, the pledge created by the Resolution, and all corporate action on the part of the Authority to that end has been and will be duly and validly taken. The Bonds and the provisions of the Resolution are and will be the valid and legally enforceable obligations of the Authority in accordance with their terms and the terms of the Resolution. The Authority shall at all times, to the extent permitted by law, defend, preserve and protect the pledge created by this Resolution and all the rights of the Bondholders under the Resolution against all claims and demands of all persons whomsoever.

606. *Power to Undertake Projects and Collect Rates and Fees.* The Authority has, and will have so long as any Bonds are Outstanding, good right and lawful power (i) to undertake each Project, or it will take such action on its part required which it deems reasonable in order to obtain licenses, orders or other authorizations, if any, from any agency or regulatory body having lawful jurisdiction which must be obtained in order to undertake such Project and (ii) to fix and collect rates, fees and other charges in connection with the sale, transmission or distribution of power from the 1954 Project, the 1970 Project, any 1970 Project Improvements and each Project designed to be capable of generating or transmitting power.

607. *Creation of Liens and Issuance of Additional Obligations; Sale and Lease of Property.* 1. The Authority shall not issue any bonds or other evidences of indebtedness, other than the Bonds or Bond Anticipation Notes as provided herein, secured by a pledge of the Authority's Revenues and other moneys, securities and funds held or set aside by the Authority or by the Fiduciaries under the Resolution, and shall not create or cause to be created any lien or charge on such Revenues and other moneys, securities and funds except to the extent otherwise provided in Section 501; provided, however, that nothing contained in the Resolution shall prevent the Authority from issuing (i)

obligations payable out of moneys in the Construction Fund as part of the Cost of Construction of any Project, (ii) bonds, notes, or any other obligations under another and separate resolution so long as the charge or lien created by such resolution is not prior or equal to the charge or lien created by the Resolution, (iii) 1954 Bonds in lieu of or in substitution for other 1954 Bonds pursuant to Sections 307 through 310 or Sections 406 or 906 of the 1954 Resolution, (iv) 1970 Bonds issued in accordance with Article II of the 1970 Resolution, or (v) 1970 Bonds in lieu of or in substitution for other 1970 Bonds pursuant to Sections 307 through 310 or Sections 406 or 906 of the 1970 Resolution.

2. No Project or any part of a Project shall be sold, leased, mortgaged or otherwise disposed of, except as follows:

(i) The Authority may sell or exchange at any time and from time to time any property or facilities constituting all or a part of a Project only if (a) it shall determine that such property or facilities are not useful in the operation of the Authority's business, or (b) the proceeds of such sale are \$100,000 or less, or it shall file with the Trustee an Authorized Officer's certificate stating, in the opinion of the signer, that the market value of the property or facilities exchanged is \$100,000 or less, or (c) if such proceeds or market value exceeds \$100,000 it shall file with the Trustee an Authorized Officer's certificate stating, in the opinion of the signer, that the sale or exchange of such property or facilities will not impair the ability of the Authority to comply during the current or any future year with the provisions of paragraph 1 of Section 609; and

(ii) The Authority may lease or make contracts or grant licenses for the operation of, or make arrangements for the use of, or grant easements or other rights with respect to, any Project or part thereof, provided any such lease, contract, license, arrangement, easement or right (a) does not impede the operations of the Authority and (b) does not in any manner impair or adversely affect the rights or security of the Bondholders under the Resolution; and provided, further, that if the depreciated cost of the property to be covered by any such lease, contract, license, arrangement, easement or other right is in excess of \$500,000, the Authority shall file with the Trustee an Authorized Officer's certificate stating that the action of the Authority with respect thereto does not result in a breach of the conditions under this paragraph

(ii). Any payments received by the Authority under or in connection with any such lease, contract, license, arrangement, easement or right in respect of a Project or any part thereof shall constitute Revenues; and

(iii) Prior to the Date of Completion of such Project, any payments to the Authority under or in connection with any lease, contract, license, easement or right in respect of such Project or any part thereof, and any proceeds of sale or exchange thereof not used to replace property so sold or exchanged, shall be paid into the appropriate Proceeds Account in the Construction Fund. On and after such Date of Completion, any payments to the Authority under or in connection with any lease, contract, license, easement or right in respect of such Project or any part thereof, and any proceeds of sale or exchange thereof not used to replace property so sold or exchanged, shall be paid to the Trustee for deposit in the Bond Reserve Account.

3. Any proceeds of any sale, lease, mortgage or other disposition of any fuel, fuel assemblies, fuel materials or components therefor shall be paid into the Fuel Reserve Account.

608. *Completion, Operation and Maintenance.* 1. The Authority shall complete the construction of each uncompleted Project with all practical dispatch and in a sound and economical manner.

2. The Authority shall at all times operate or cause to be operated each Project, the 1954 Project, the 1970 Project and any 1970 Project Improvement properly and in a sound and economical manner and shall maintain, preserve and keep the same or cause the same to be maintained, preserved and kept, with the appurtenances and every part and parcel thereof, in good repair, working order and condition, and shall from time to time make, or cause to be made, all necessary and proper repairs, replacements and renewals so that at all times the operation thereof may be properly and advantageously conducted.

609. *Rates and Fees.* 1. The Authority shall at all times maintain rates, fees or charges, pursuant to contracts or general application tariffs established by the Authority for the sale, transmission or distribution of power or otherwise derived which will produce Revenues in each year sufficient, together with other moneys available therefor,

(i) to pay the costs of operation and maintenance of all projects of the Authority, (ii) to pay the bond service in each year on all 1954 Bonds and 1970 Bonds then outstanding and the Bond Service in each year on all Bonds Outstanding as the same respectively become due and payable, and (iii) to meet the requirements for reserves established by the 1954 Resolution, the 1970 Resolution and the Resolution.

2. On or before November 1 in each year, subsequent to the Date of Completion of the first Project completed hereunder, the Authority shall complete a review of its financial condition for the purpose of estimating whether the Revenues from the operation of the Authority's projects will be sufficient, together with other moneys available therefor, to provide all of the payments and meet all other requirements as specified in subsection 1 of this Section. Such review shall be evidenced by a certificate of an Authorized Officer which shall be filed with the Trustee on or before November 20 and shall set forth a reasonably detailed statement of the actual and estimated Revenues, Operating Expenses, operating expenses of the 1954 Project, the 1970 Project and the 1970 Project Improvements, if any and other pertinent information for such year upon which such determination was made. If any such statement shows that such Revenues, together with other moneys available therefor, may not be sufficient to provide the payments and meet the requirements specified in subsection 1 of this subsection, the Authority shall promptly fix and establish such rates, fees or charges and take such other action as shall be necessary and sufficient to comply with the covenants in subsection 1, as evidenced by a certificate filed with the Trustee.

**610. Accounts and Reports.** 1. The Authority shall keep proper books of record and account (separate from all other records and accounts) in which complete and correct entries shall be made of its transactions relating to the 1954 Project, the 1970 Project, each 1970 Project Improvement and each Project, and which, together with all contracts and tariffs for the sale or transmission of power and all other books and papers of the Authority, including insurance policies, relating to the 1954 Project, the 1970 Project, each 1970 Project Improvement and each Project, shall at all times be subject to the inspection of the Trustee or the Holders of an aggregate of not less than 5% in principal amount of the Bonds then Outstanding or their

representatives duly authorized in writing; provided, however, that the Trustee shall have no duty to make any such inspection unless requested to do so by the Holders of an aggregate of not less than 5% in principal amount of the Bonds then Outstanding.

2. The Authority shall annually, within 100 days after the close of each calendar year, file with the Trustee, and otherwise as provided by law, a copy of an annual report for such year, accompanied by an Accountant's Certificate, relating to the 1954 Project, the 1970 Project, each 1970 Project Improvement and each Project and including statements in reasonable detail of financial condition as of the end of such year and income and expenses for such year, all to the extent relating to the 1954 Project, the 1970 Project, each 1970 Project Improvement and each Project, and a summary, with respect to each fund and account established under the 1954 Resolution, the 1970 Resolution and the Resolution, of the receipts therein and disbursements therefrom during such year and the amounts held therein at the end of such year.

3. The Authority shall file with the Trustee annually, within 100 days after the close of each calendar year, a certificate of an Authorized Officer setting forth (i) a description in reasonable detail of the insurance then in effect pursuant to the requirements of Section 611 and that the Authority has complied in all respects with the requirements of said Section, (ii) whether during such year any material part of the 1954 Project, the 1970 Project, each 1970 Project Improvement and any Project has been damaged or destroyed and, if so, the amount of insurance proceeds covering such loss or damage and specifying the Authority's reasonable and necessary replacement costs, and (iii) whether or not to the knowledge of the signer, the Authority is in default with respect to any of the covenants, agreements or conditions on its part contained in the Resolution, and if so, the nature of such default.

4. The Authority shall file with the Trustee within 100 days after the close of the year in which each Project has been completed, and within 100 days after the close of 1981 and every fifth year thereafter, an Engineer's Certificate setting forth a statement of the physical condition of such Project, the necessity for repairs, renewals and replacements thereto, the necessity for capital improvements, and recommendations in connection therewith.



5. The reports, statements and other documents required to be furnished by the Authority to the Trustee pursuant to any provisions of the Resolution shall be available for the inspection of Bondholders at the office of the Trustee.

611. *Insurance.* 1. The Authority shall at all times keep the property which is a part of the 1954 Project, the 1970 Project, each 1970 Project Improvement and each Project and which is of an insurable nature and of the character usually insured by those operating properties similar to the properties of the Authority insured against loss or damage by fire and from other causes customarily insured against and in such relative amounts as are customary. The Authority will also at all times maintain adequate insurance or reserves against loss or damage from such hazards and risks to the persons and property of others as are usually insured or reserved against by those operating properties similar to the properties of the Authority.

2. Any such insurance may be in whole or in part in the form of policies or contracts for insurance or in the form of one or more insurance funds or accounts established and maintained by the Authority.

3. In the case of policies or contracts for insurance, such policies or contracts shall be carried with insurers of good standing and shall provide that the proceeds of such insurance shall be payable to the Authority. Any proceeds of insurance with respect to the 1954 Project, the 1970 Project and each 1970 Project Improvement shall be applied as provided in the 1954 Resolution and the 1970 Resolution. Upon retirement of the 1954 Bonds and the 1970 Bonds such proceeds shall be applied as provided in paragraph 4 of this Section. Prior to the Date of Completion of each Project, any balance of such proceeds of insurance with respect to such Project not applied as provided in subsection 4 of this Section shall be paid into the appropriate Proceeds Account in the Construction Fund. On and after such Date of Completion, any such balance not applied as provided in subsection 4 of this Section shall be paid to the Trustee for deposit in the Bond Reserve Account.

4. If any useful property of the Authority shall be damaged or destroyed, the Authority shall, as expeditiously as possible, continuously and diligently prosecute the replacement of such property so as to restore the same to use and to apply to such replacement, to the extent necessary, the proceeds of any insurance thereon or moneys in

any insurance fund or account established for the property damaged or destroyed.

612. *General.* 1. The Authority shall do and perform or cause to be done and performed all acts and things required to be done or performed by or on behalf of the Authority under law and the Resolution, in accordance with the terms of such provisions.

2. Upon the date of issuance of any of the Bonds, all conditions, acts and things required by law and the Resolution to exist, to have happened and to have been performed precedent to and in the issuance of such Bonds shall exist, have happened and have been performed and the issue of such Bonds, together with all other indebtedness of the Authority, shall be within every debt and other limit prescribed by the laws of the State of New York.

3. Subject to the rights of holders of obligations issued pursuant to the 1954 Resolution, the Authority shall not modify or amend the 1954 Resolution in any manner which would have a material adverse effect on the Bondholders.

4. Subject to the rights of holders of obligations issued pursuant to the 1970 Resolution, the Authority shall not modify or amend the 1970 Resolution in any manner which would have a material adverse effect on the Bondholders, provided, that nothing herein shall prevent the Authority from amending or supplementing the 1970 Resolution to provide for the issuance of 1970 Bonds as provided in the 1970 Resolution.

5. The Authority shall retire or cause to be retired all 1954 Bonds on or before January 1, 1985.

6. The Authority shall not take or omit to take or permit any person to take or omit to take any action which would cause interest on the Bonds to be included in the gross income of any Bondholder for Federal income tax purposes by reason of subsection (c) of section 103 of the Internal Revenue Code of 1954 [Title 26 of the United States Code] as now in effect.

## ARTICLE VII.

### CONCERNING THE TRUSTEE AND THE PAYING AGENTS.

701. *Trustee; Appointment and Acceptance of Duties.* Prior to the delivery of any Bonds, the Authority shall appoint a Trustee. The

Trustee shall signify its acceptance of the duties and obligations imposed upon it by the Resolution by executing the certificate of authentication endorsed upon the Bonds, and, by executing such certificate upon any Bond, the Trustee shall be deemed to have accepted such duties and obligations not only with respect to the Bond so authenticated, but with respect to all the Bonds thereafter to be issued, but only, however, upon the terms and conditions set forth in the Resolution.

**702. *Paying Agents; Appointment and Acceptance of Duties.***

1. The Authority shall appoint one or more Paying Agents for the Bonds of any Series in the Supplemental Resolution authorizing such Bonds, and may at any time or from time to time appoint one or more other Paying Agents in the manner and subject to the conditions set forth in Section 713 for the appointment of a successor Paying Agent. The Trustee may be appointed a Paying Agent.

2. Each Paying Agent shall signify its acceptance of the duties and obligations imposed upon it by the Resolution by executing and delivering to the Authority and to the Trustee a written acceptance thereof.

3. The principal offices of the Paying Agents are designated as the respective offices or agencies of the Authority for the payment of the interest on and principal or Redemption Price of the Bonds.

**703. *Responsibilities of Fiduciaries.*** The recitals of fact in this Resolution and in the Bonds contained shall be taken as the statements of the Authority and no Fiduciary assumes any responsibility for the correctness of the same. No Fiduciary makes any representations as to the validity or sufficiency of the Resolution or of any Bonds or coupons issued thereunder or in respect of the security afforded by the Resolution, and no Fiduciary shall incur any liability in respect thereof. The Trustee shall, however, be responsible for its representation contained in its certificate on the Bonds. No Fiduciary shall be under any responsibility or duty with respect to the issuance of the Bonds for value or the application of the proceeds thereof or the application of any moneys paid to the Authority or for any losses incurred upon the sale or redemption of any securities purchased for or held in any Fund under the Resolution. No Fiduciary shall be under any responsibility or duty with respect to the application of any moneys paid to any other Fiduciary. The Trustee shall be under no responsibility or duty with respect to the application of any moneys placed on time deposit, at the direction of the Authority,

with any other depository. No Fiduciary shall be liable in connection with the performance of its duties under the Resolution except for its own willful misconduct, negligence or default.

**704. Evidence on Which Fiduciaries May Act.** 1. Each Fiduciary shall be protected in acting upon any notice, resolution, request, consent, order, certificate, report, opinion, bond, or other paper or document believed by it to be genuine, and to have been signed or presented by the proper party or parties. Each Fiduciary may consult with counsel, who may or may not be of counsel to the Authority, and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it under the Resolution in good faith and in accordance therewith.

2. Whenever any Fiduciary shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action under the Resolution, such matter (unless other evidence in respect thereof be therein specifically prescribed) may be deemed to be conclusively proved and established by a certificate of an Authorized Officer, and such certificate shall be full warrant for any action taken or suffered in good faith under the provisions of the Resolution upon the faith thereof; but in its discretion the Fiduciary may in lieu thereof accept other evidence of such fact or matter or may require such further or additional evidence as to it may seem reasonable.

3. Except as otherwise expressly provided in the Resolution, any request, order, notice or other direction required or permitted to be furnished pursuant to any provision thereof by the Authority to any Fiduciary shall be sufficiently executed if executed in the name of the Authority by an Authorized Officer.

**705. Compensation.** The Authority shall pay to each Fiduciary from time to time reasonable compensation for all services rendered under the Resolution, and also all reasonable expenses, charges, counsel fees and other disbursements, including those of its attorneys, agents, and employees, incurred in and about the performance of their powers and duties under the Resolution. The Authority further agrees to indemnify and save each Fiduciary harmless against any liabilities which it may incur in the exercise and performance of its powers and duties hereunder and which are not due to its willful misconduct, negligence or bad faith.

706. *Certain Permitted Acts.* Any Fiduciary may become the owner of any Bonds and coupons or any other obligations of the Authority, with the same rights it would have if it were not a Fiduciary. To the extent permitted by law, any Fiduciary may act as depositary for, and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or the holders of any other obligations of the Authority or to effect or aid in any reorganization growing out of the enforcement of the Bonds or any other obligations of the Authority or the Resolution, whether or not any such committee shall represent the Holders of a majority in principal amount of the Bonds then Outstanding.

707. *Resignation of Trustee.* The Trustee may at any time resign and be discharged of the duties and obligations created by the Resolution by giving not less than 60 days' written notice to the Authority and publishing notice thereof, specifying the date when such resignation shall take effect, once in each week for two successive calendar weeks in an Authorized Newspaper, and such resignation shall take effect upon the day specified in such notice unless previously a successor shall have been appointed by the Authority or the Bondholders as provided in Section 709, in which event such resignation shall take effect immediately on the appointment of such successor.

708. *Removal of Trustee.* The Trustee may be removed at any time by an instrument or concurrent instruments in writing, filed with the Trustee, and signed by the Holders of a majority in principal amount of the Bonds then Outstanding or their attorneys-in-fact duly authorized, excluding any Bonds held by or for the account of the Authority.

709. *Appointment of Successor Trustee.* 1. In case at any time the Trustee shall resign or shall be removed or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or if a receiver, liquidator or conservator of the Trustee, or of its property, shall be appointed, or if any public officer shall take charge or control of the Trustee, or of its property or affairs, a successor may be appointed by the holders of a majority in principal amount of the Bonds then Outstanding, excluding any Bonds held by or for the account of the Authority, by an instrument or concurrent instruments in writing

signed and acknowledged by such Bondholders or by their attorneys-in-fact duly authorized and delivered to such successor Trustee, notification thereof being given to the Authority and the predecessor Trustee; provided, nevertheless, that unless a successor Trustee shall have been appointed by the Bondholders as aforesaid, the Authority by a duly executed written instrument signed by an Authorized Officer of the Authority shall forthwith appoint a Trustee to fill such vacancy until a successor Trustee shall be appointed by the Bondholders as authorized in this Section 709. The Authority shall publish notice of any such appointment made by it once in each week for 2 consecutive calendar weeks, in an Authorized Newspaper, the first publication to be made within 20 days after such appointment. Any successor Trustee appointed by the Authority shall, immediately and without further act, be superseded by a Trustee appointed by the Bondholders.

2. If in a proper case no appointment of a successor Trustee shall be made pursuant to the foregoing provisions of this Section within 45 days after the Trustee shall have given to the Authority written notice as provided in Section 707 or after a vacancy in the office of the Trustee shall have occurred by reason of its inability to act, the Trustee or the Holder of any Bond may apply to any court of competent jurisdiction to appoint a successor Trustee. Said court may thereupon, after such notice, if any, as such court may deem proper and prescribe, appoint a successor Trustee.

3. Any Trustee appointed under the provisions of this Section 709 in succession to the Trustee shall be a bank or trust company organized under the laws of the State of New York or a national banking association, doing business and having its principal office in the Borough of Manhattan, City and State of New York, and having a capital and surplus aggregating at least \$500,000,000, if there be such a bank or trust company or national banking association willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by the Resolution.

710. *Transfer of Rights and Property to Successor Trustee.* Any successor Trustee appointed under the Resolution shall execute, acknowledge and deliver to its predecessor Trustee, and also to the Authority, an instrument accepting such appointment, and thereupon such successor Trustee, without any further act, deed or conveyance, shall become fully vested with all moneys, estates, properties, rights,

powers, duties and obligations of such predecessor Trustee, with like effect as if originally named as Trustee; but the Trustee ceasing to act shall nevertheless, on the written request of the Authority, or of the successor Trustee, execute, acknowledge and deliver such instruments of conveyance and further assurance and do such other things as may reasonably be required for more fully and certainly vesting and confirming in such successor Trustee all the right, title and interest of the predecessor Trustee in and to any property held by it under the Resolution, and shall pay over, assign and deliver to the successor Trustee any money or other property subject to the trusts and conditions herein set forth. Should any deed, conveyance or instrument in writing from the Authority be required by such successor Trustee for more fully and certainly vesting in and confirming to such successor Trustee any such estates, rights, powers and duties, any and all such deeds, conveyances and instruments in writing shall, on request, and so far as may be authorized by law, be executed, acknowledged and delivered by the Authority. Any such successor Trustee shall promptly notify the Paying Agents of its appointment as Trustee.

711. *Merger or Consolidation.* Any company into which any Fiduciary may be merged or converted or with which it may be consolidated or any company resulting from any merger, conversion or consolidation to which it shall be a party or any company to which any Fiduciary may sell or transfer all or substantially all of its corporate trust business, provided such company shall be a bank or trust company organized under the laws of any state of the United States or a national banking association and, in the case of any successor Trustee, shall meet the requirements of paragraph 3 of Section 709, in the case of a successor Paying Agent, shall meet the requirements of paragraph 1 of Section 713, and shall be authorized by law to perform all the duties imposed upon it by the Resolution, shall be the successor to such Fiduciary without the execution or filing of any paper or the performance of any further act.

712. *Adoption of Authentication.* In case any of the Bonds contemplated to be issued under the Resolution shall have been authenticated but not delivered, any successor Trustee may adopt the certificate of authentication of any predecessor Trustee so authenticating such Bonds and deliver such Bonds so authenticated; and in case any of the said Bonds shall not have been authenticated, any successor Trustee

may authenticate such Bonds in the name of the predecessor Trustee, or in the name of the successor Trustee, and in all such cases such certificate shall have the full force which it is anywhere in said Bonds or in the Resolution provided that the certificate of the Trustee shall have.

**713. *Resignation or Removal of Paying Agent and Appointment of Successor.*** 1. Any Paying Agent may at any time resign and be discharged of the duties and obligations created by the Resolution by giving at least 60 days' written notice to the Authority, the Trustee, and the other Paying Agents. Any Paying Agent may be removed at any time by an instrument filed with such Paying Agent and the Trustee and signed by the Authority. Any successor Paying Agent shall be appointed by the Authority, with the approval of the Trustee, and (subject to the requirements of Section 603) shall be a bank or trust company organized under the laws of any state of the United States or a national banking association, having a capital and surplus aggregating at least \$10,000,000, and willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by the Resolution.

2. In the event of the resignation or removal of any Paying Agent, such Paying Agent shall pay over, assign and deliver any moneys held by it as Paying Agent to its successor, or if there be no successor, to the Trustee. In the event that for any reason there shall be a vacancy in the office of any Paying Agent, the Trustee shall act as such Paying Agent.

## ARTICLE VIII.

### SUPPLEMENTAL RESOLUTIONS.

**801. *Supplemental Resolutions Effective Upon Filing with the Trustee.*** For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted, which, upon the filing with the Trustee of a copy thereof certified by an Authorized Officer or, if adopted prior to the appointment of a Trustee pursuant to Section 701, upon its adoption, shall be fully effective in accordance with its terms:

(1) To close the Resolution against, or provide limitations and restrictions in addition to the limitations and restrictions contained in the Resolution on, the authentication and delivery



on original issuance of Bonds or the issuance of other evidences of indebtedness;

(2) To add to the covenants and agreements of the Authority in the Resolution other covenants and agreements to be observed by the Authority which are not contrary to or inconsistent with the Resolution as theretofore in effect;

(3) To add to the limitations and restrictions in the Resolution other limitations and restrictions to be observed by the Authority which are not contrary to or inconsistent with the Resolution as theretofore in effect;

(4) To surrender any right, power or privilege reserved to or conferred upon the Authority by the Resolution;

(5) To authorize Bonds of a Series and, in connection therewith, specify and determine the matters and things mentioned or referred to in Section 202, and also any other matters and things relative to such Bonds which are not contrary to or inconsistent with the Resolution as theretofore in effect or to amend, modify or rescind any such authorization, specification or determination at any time prior to the first authentication and delivery of such Bonds;

(6) To confirm, as further assurance, any pledge under, and the subjection to any lien or pledge created or to be created by, the Resolution, of the Revenues, or of any other moneys, securities or funds; or

(7) To modify any of the provisions of the Resolution in any other respect whatever, provided that (i) such modification shall be, and be expressed to be, effective only after all Bonds of any Series Outstanding at the date of the adoption of such Supplemental Resolution shall cease to be Outstanding and (ii) such Supplemental Resolution shall be specifically referred to in the text of all Bonds of any Series authenticated and delivered on original issuance after the date of the adoption of such Supplemental Resolution and of Bonds issued in exchange therefor or in place thereof.

802. *Supplemental Resolutions Effective Upon Consent of Trustee.* For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted, which, upon

(i) the filing with the Trustee of a copy thereof certified by an Authorized Officer and (ii) the filing with the Trustee and the Authority of an instrument in writing made by the Trustee consenting thereto, shall be fully effective in accordance with its terms:

(1) To cure any ambiguity, supply any omission, or cure or correct any defect or inconsistent provision in the Resolution; or

(2) To insert such provisions clarifying matters or questions arising under the Resolution as are necessary or desirable and are not contrary to or inconsistent with the Resolution as theretofore in effect.

803. *Supplemental Resolutions Effective with Consent of Bondholders.* At any time or from time to time, a Supplemental Resolution may be adopted subject to consent by Bondholders in accordance with and subject to the provisions of Article IX, which Supplemental Resolution, upon the filing with the Trustee of a copy thereof certified by an Authorized Officer and upon compliance with the provisions of said Article IX, shall become fully effective in accordance with its terms as provided in said Article IX.

804. *General Provisions.* 1. The Resolution shall not be modified or amended in any respect except as provided in and in accordance with and subject to the provisions of this Article VIII and Article IX. Nothing in this Article VIII or Article IX contained shall affect or limit the right or obligation of the Authority to adopt, make, do, execute, acknowledge or deliver any resolution, act or other instrument pursuant to the provisions of Section 604 or the right or obligation of the Authority to execute and deliver to any Fiduciary any instrument which elsewhere in the Resolution it is provided shall be delivered to said Fiduciary.

2. Any Supplemental Resolution referred to and permitted or authorized by Sections 801 and 802 may be adopted by the Authority without the consent of any of the Bondholders, but shall become effective only on the conditions, to the extent and at the time provided in said Sections, respectively. The copy of every Supplemental Resolution when filed with the Trustee shall be accompanied by a Counsel's Opinion stating that such Supplemental Resolution has been duly and lawfully adopted in accordance with the provisions of the Resolution,

is authorized or permitted by the Resolution, and is valid and binding upon the Authority and enforceable in accordance with its terms.

3. The Trustee is hereby authorized to accept the delivery of a certified copy of any Supplemental Resolution referred to and permitted or authorized by Sections 801, 802 or 803 and to make all further agreements and stipulations which may be therein contained, and the Trustee, in taking such action, shall be fully protected in relying on an opinion of counsel (which may be a Counsel's Opinion) that such Supplemental Resolution is authorized or permitted by the provisions of the Resolution.

4. No Supplemental Resolution shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto.

## ARTICLE IX.

### AMENDMENTS.

901. *Mailing and Publication.* 1. Any provision in this Article for the mailing of a notice or other paper to Bondholders shall be fully complied with if it is mailed postage prepaid only (i) to each registered owner of Bonds then Outstanding at his address, if any, appearing upon the registry books of the Authority, (ii) to each Holder of any Bond payable to bearer who shall have filed with the Trustee within two years preceding such mailing an address for notices, and (iii) to the Trustee.

2. Any provision in this Article for publication of a notice or other matter shall require the publication thereof only in an Authorized Newspaper.

902. *Powers of Amendment.* Any modification or amendment of the Resolution and of the rights and obligations of the Authority and of the Holders of the Bonds and coupons appertaining thereto, in any particular, may be made by a Supplemental Resolution, with the written consent given as provided in Section 903, (i) of the Holders of at least sixty percent (60%) in principal amount of the Bonds Outstanding at the time such consent is given, and (ii) in case less than all of the several Series of Bonds then Outstanding are affected by the modification or amendment, of the Holders of at least sixty percent (60%) in principal amount of the Bonds of each Series so affected and Outstanding at the time such consent is given, and (iii) in case the modifica-

tion or amendment changes the terms of any Sinking Fund Installment, of the Holders of at least sixty percent (60%) in principal amount of the Bonds of the particular Series and maturity entitled to such Sinking Fund Installment and Outstanding at the time such consent is given; provided, however, that if such modification or amendment will, by its terms, not take effect so long as any Bonds of any specified like Series and maturity remain Outstanding, the consent of the Holders of Bonds of such like Series shall not be required and Bonds of such like Series shall not be deemed to be Outstanding for the purpose of any calculation of Outstanding Bonds under this Section. No such modification or amendment shall permit a change in the terms of redemption or maturity of the principal of any Outstanding Bond or of any installment of interest thereon or a reduction in the principal amount or the Redemption Price thereof or in the rate of interest thereon without the consent of the Holder of such Bond, or shall reduce the percentages or otherwise affect the classes of Bonds the consent of the Holders of which is required to effect any such modification or amendment, or shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto. For the purposes of this Section, a Series shall be deemed to be affected by a modification or amendment of the Resolution if the same adversely affects or diminishes the rights of the Holders of Bonds of such Series. The Trustee may in its discretion determine whether or not in accordance with the foregoing powers of amendment Bonds of any particular Series or maturity would be affected by any modification or amendment of the Resolution and any such determination shall be binding and conclusive on the Authority and all Holders of Bonds.

903. *Consent of Bondholders.* The Authority may at any time adopt a Supplemental Resolution making a modification or amendment permitted by the provisions of Section 902, to take effect when and as provided in this Section. A copy of such Supplemental Resolution (or brief summary thereof or reference thereto in form approved by the Trustee) together with a request to Bondholders for their consent thereto in form satisfactory to the Trustee, shall be mailed by the Authority to Bondholders and shall be published at least once a week for two successive weeks (but failure to mail such copy and request shall not affect the validity of the Supplemental Resolution when consented to as in this Section provided). Such Supplemental Resolution shall not be effective unless and until (a) there shall have been filed

with the Trustee (i) the written consents of Holders of the percentages of Outstanding Bonds specified in Section 902 and (ii) a Counsel's Opinion stating that such Supplemental Resolution has been duly and lawfully adopted and filed by the Authority in accordance with the provisions of the Resolution, is authorized or permitted by the Resolution, and is valid and binding upon the Authority and enforceable in accordance with its terms, and (b) a notice shall have been published as hereinafter in this Section 903 provided. Each such consent shall be effective only if accompanied by proof of the holding, at the date of such consent, of the Bonds with respect to which such consent is given, which proof shall be such as is permitted by Section 1102. A certificate or certificates by the Trustee filed with the Trustee that it has examined such proof and that such proof is sufficient in accordance with Section 1102 shall be conclusive that the consents have been given by the Holders of the Bonds described in such certificate or certificates of the Trustee. Any such consent shall be binding upon the Holder of the Bonds and the coupons, if any, appertaining thereto giving such consent and, anything in Section 1102 to the contrary notwithstanding, upon any subsequent Holder of such Bonds and the coupons, if any, appertaining thereto and of any Bonds issued in exchange therefor (whether or not such subsequent Holder thereof has notice thereof), unless such consent is revoked in writing by the Holder of such Bonds giving such consent or a subsequent Holder thereof by filing such revocation with the Trustee prior to the time when the written statement of the Trustee hereinafter in this Section 903 provided for is filed, and, if such Bonds are transferable by delivery, proof that such Bonds are held by the signer of such revocation in the manner permitted by Section 1102. The fact that a consent has not been revoked may likewise be proved by a certificate of the Trustee filed with the Trustee to the effect that no revocation thereof is on file with the Trustee. At any time after the Holders of the required percentages of Bonds shall have filed their consents to the Supplemental Resolution, the Trustee shall make and file with the Authority and the Trustee a written statement that the Holders of such required percentages of Bonds have filed such consents. Such written statement shall be conclusive that such consents have been so filed. At any time thereafter notice, stating in substance that the Supplemental Resolution (which may be referred to as a Supplemental Resolution adopted by the Authority on a stated date, a copy of which is on file with the Trustee) has been consented to by the

holders of the required percentages of Bonds and will be effective as provided in this Section 903, may be given to Bondholders by the Authority by mailing such notice to Bondholders (but failure to mail such notice shall not prevent such Supplemental Resolution from becoming effective and binding as in this Section 903 provided) and by publishing the same at least once not more than 90 days after the Holders of the required percentages of Bonds shall have filed their consents to the Supplemental Resolution and the written statement of the Trustee hereinabove provided for is filed. The Authority shall file with the Trustee proof of the publication of such notice and, if the same shall have been mailed to Bondholders, of the mailing thereof. A record, consisting of the papers required or permitted by this Section 903 to be filed with the Trustee, shall be proof of the matters therein stated. Such Supplemental Resolution making such amendment or modification shall be deemed conclusively binding upon the Authority, the Fiduciaries and the Holders of all Bonds and the coupons, if any appertaining thereto at the expiration of 40 days after the filing with the Trustee of the proof of the first publication of such last mentioned notice, except in the event of a final decree of a court of competent jurisdiction setting aside such Supplemental Resolution in a legal action or equitable proceeding for such purpose commenced within such 40-day period; provided, however, that any Fiduciary and the Authority during such 40-day period and any such further period during which any such action or proceeding may be pending shall be entitled in their absolute discretion to take such action, or to refrain from taking such action, with respect to such Supplemental Resolution as they may deem expedient.

904. *Modifications by Unanimous Consent.* The terms and provisions of the Resolution and the rights and obligations of the Authority and of the Holders of the Bonds and coupons thereunder may be modified or amended in any respect upon the adoption and filing by the Authority of a Supplemental Resolution and the consent of the Holders of all of the Bonds then Outstanding, such consent to be given as provided in Section 903 except that no notice to Bondholders either by mailing or publication shall be required; provided, however, that no such modification or amendment shall change or modify any of the rights or obligations of any Fiduciary without the filing with the Trustee of the written assent thereto of such Fiduciary in addition to the consent of the Bondholders.

905. *Exclusion of Bonds.* Bonds owned or held by or for the account of the Authority shall not be deemed Outstanding for the purpose of consent or other action or any calculation of Outstanding Bonds provided for in this Article, and the Authority shall not be entitled with respect to such Bonds to give any consent or take any other action provided for in this Article. At the time of any consent or other action taken under this Article, the Authority shall furnish the Trustee a certificate of an Authorized Officer, upon which the Trustee may rely, describing all Bonds so to be excluded.

906. *Notation on Bonds.* Bonds authenticated and delivered after the effective date of any action taken as in Article VIII or this Article provided may, and, if the Trustee so determines, shall, bear a notation by endorsement or otherwise in form approved by the Authority and the Trustee as to such action, and in that case upon demand of the Holder of any Bond Outstanding at such effective date and presentation of his Bond for the purpose at the principal office of the Trustee suitable notation shall be made on such Bond by the Trustee as to any such action. If the Authority or the Trustee shall so determine, new Bonds so modified as in the opinion of the Trustee and the Authority to conform to such action shall be prepared, authenticated and delivered, and upon demand of the Holder of any Bond then Outstanding shall be exchanged, without cost to such Bondholder, for Bonds of the same Series and maturity then Outstanding, upon surrender of such Bonds with all unpaid coupons, if any, appertaining thereto.

## ARTICLE X.

### REMEDIES ON DEFAULT.

1001. *Events of Default.* If one or more of the following events (in the Resolution called "Events of Default") shall happen, that is to say,

(i) if default shall be made in the due and punctual payment of the principal or Redemption Price of any Bond when and as the same shall become due and payable, whether at maturity or by call for redemption, or otherwise,

(ii) if default shall be made in the due and punctual payment of any installment of interest on any Bond or any Sinking

Fund Installment therefor (except when such Installment is payable on the maturity date of such Bond), when and as such interest installment or Sinking Fund Installment shall become due and payable, and such default shall continue for a period of 30 days,

(iii) if default shall be made by the Authority in the performance or observance of the covenants, agreements and conditions on its part as provided in subsection 1 of Section 609 and further the Authority fails in the performance or observance of any of the covenants, agreements or conditions on its part as provided in subsection 2 of Section 609,

(iv) if default shall be made by the Authority in the performance or observance of any other of the covenants, agreements or conditions on its part in the Resolution or in the Bonds contained, and such default shall continue for a period of 60 days after written notice thereof to the Authority by the Trustee or to the Authority and to the Trustee by the Holders of a majority in principal amount of the Bonds Outstanding, or

(v) if the Authority shall file a petition seeking a composition of indebtedness under the Federal bankruptcy laws, or under any other applicable law or statute of the United States of America or of the State of New York,

then, and in each and every such case, so long as such Event of Default shall not have been remedied, unless the principal of all the Bonds shall have already become due and payable, either the Trustee (by notice in writing to the Authority), or the Holders of twenty five percent (25%) in principal amount of the Bonds Outstanding (by notice in writing to the Authority and the Trustee), may declare the principal of all the Bonds then Outstanding, and the interest accrued thereon, to be due and payable immediately, and upon any such declaration the same shall become and be immediately due and payable, anything in the Resolution or in any of the Bonds contained to the contrary notwithstanding. The right of the Trustee or of the Holders of twenty five percent (25%) in principal amount of the Bonds to make any such declaration as aforesaid, however, is subject to the condition that if, at any time after such declaration, but before the Bonds shall have matured by their terms, all overdue installments of interest upon the Bonds, together with the reasonable and proper charges, expenses and liabilities of the Trustee, and all other sums then payable by the Authority under the Resolution



(except the principal of, and interest accrued since the next preceding interest date on, the Bonds due and payable solely by virtue of such declaration) shall either be paid by or for the account of the Authority or provision satisfactory to the Trustee shall be made for such payment, and all defaults under the Bonds or under the Resolution (other than the payment of principal and interest due and payable solely by reason of such declaration) shall be made good or be secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, then and in every such case the Holders of a majority in principal amount of the Bonds Outstanding, by written notice to the Authority and to the Trustee, may rescind such declaration and annul such default in its entirety, or, if the Trustee shall have acted without a direction from the Holders of a majority in principal amount of the Bonds Outstanding at the time of such request, and if there shall not have been theretofore delivered to the Trustee written direction to the contrary by the Holders of a majority in principal amount of the Bonds then Outstanding, then any such declaration shall *ipso facto* be deemed to be rescinded and any such default and its consequences shall *ipso facto* be deemed to be annulled, but no such rescission and annulment shall extend to or affect any subsequent default or impair or exhaust any right or power consequent thereon.

1002. *Accounting and Examination of Records after Default.* 1.

The Authority covenants that if an Event of Default shall have happened and shall not have been remedied, the books of record and account of the Authority and all other records relating to all projects of the Authority shall at all times be subject to the inspection and use of the Trustee and of its agents and attorneys, including the engineer or firm of engineers appointed pursuant to Section 1003.

2. The Authority covenants that if an Event of Default shall happen and shall not have been remedied, the Authority, upon demand of the Trustee, will account, as if it were the trustee of an express trust, for all Revenues and other moneys, securities and funds pledged or held under the Resolution for such period as shall be stated in such demand.

1003. *Application of Revenues and Other Moneys after Default.*

1. The Authority covenants that if an Event of Default shall happen and shall not have been remedied, the Authority, upon demand of the Trustee shall pay over to the Trustee (i) forthwith, all moneys, securi-

ties and funds then held by the Authority in any fund or account under the Resolution, and (ii) as promptly as practicable after receipt thereof and subject to application pursuant to the 1954 Resolution and the 1970 Resolution, the Revenues.

2. During the continuance of an Event of Default, the Trustee shall apply such Revenues and the income therefrom as follows and in the following order:

(i) to the payment of the reasonable and proper charges, and expenses of the Trustee and of any engineer or firm of engineers selected by the Trustee pursuant to this Article;

(ii) to the payment of the amounts required for reasonable and necessary Operating Expenses, including reasonable and necessary reserves and working capital therefor, and for the reasonable repair and replacement of the Projects, and to the extent not provided for in the 1954 Resolution and the 1970 Resolution, for the 1954 Project, the 1970 Project and any 1970 Project Improvement, necessary to prevent loss of Revenues, as certified to the Trustee by an independent engineer or firm of engineers of recognized standing (who may be an engineer or firm of engineers retained by the Authority for other purposes) selected by the Trustee. For this purpose the books of record and account of the Authority relating to the projects of the Authority shall at all times be subject to the inspection of such engineer or firm of engineers during the continuance of such Event of Default;

(iii) to the payment of the interest and principal or Redemption Price then due on the Bonds, subject to the provisions of Section 602, as follows:

(a) unless the principal of all of the Bonds shall have become or have been declared due and payable,

First: To the payment to the persons entitled thereto of all installments of interest then due in the order of the maturity of such installments, and, if the amount available shall not be sufficient to pay in full any installment or installments maturing on the same date, then to the payment thereof ratably, according to the amounts due thereon, to the persons entitled thereto, without any discrimination or preference; and

Second: To the payment to the persons entitled thereto of the unpaid principal or Redemption Price of any Bonds which shall have become due, whether at maturity or by call for redemption, in the order of their due dates, and, if the amount available shall not be sufficient to pay in full all the Bonds due on any date, then to the payment thereof ratably, according to the amounts of principal or Redemption Price due on such date, to the persons entitled thereto, without any discrimination or preference.

(b) if the principal of all of the Bonds shall have become or have been declared due and payable, to the payment of the principal and interest then due and unpaid upon the Bonds without preference or priority of principal over interest or of interest over principal, or of any installment of interest over any other installment of interest, or of any Bond over any other Bond, ratably, according to the amounts due respectively for principal and interest, to the persons entitled thereto without any discrimination or preference.

3. If and whenever all overdue installments of interest on all Bonds, together with the reasonable and proper charges and expenses of the Trustee, and all other sums payable by the Authority under the Resolution, including the principal and Redemption Price of and accrued unpaid interest on all Bonds which shall then be payable by declaration or otherwise, shall either be paid by or for the account of the Authority, or provision satisfactory to the Trustee shall be made for such payment, and all defaults under the Resolution or the Bonds shall be made good or secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, the Trustee shall pay over to the Authority all such Revenues then remaining unexpended in the hands of the Trustee (except Revenues deposited or pledged, or required by the terms of the Resolution to be deposited or pledged, with the Trustee), and thereupon the Authority and the Trustee shall be restored, respectively, to their former positions and rights under the Resolution, and all Revenues shall thereafter be applied as provided in Article V. No such payment over to the Authority by the Trustee or resumption of the application of Revenues as provided in Article V shall extend to or affect any subsequent default under the Resolution or impair any right consequent thereon.

1004. *Proceedings Brought by Trustee.* 1. If an Event of Default shall happen and shall not have been remedied, then and in every such case, the Trustee, by its agents and attorneys, if the Trustee shall deem it advisable, may proceed to protect and enforce its rights and the rights of the Holders of the Bonds under the Resolution forthwith by a suit or suits in equity or at law, whether for the specific performance of any covenant herein contained, or in aid of the execution of any power herein granted, or for an accounting against the Authority as if the Authority were the trustee of an express trust, or in the enforcement of any other legal or equitable right as the Trustee, being advised by counsel, shall deem most effectual to enforce any of its rights or to perform any of its duties under the Resolution.

2. All rights of action under the Resolution may be enforced by the Trustee without the possession of any of the Bonds or coupons or the production thereof on the trial or other proceedings, and any such suit or proceedings instituted by the Trustee shall be brought in its name.

3. The Holders of a majority in principal amount of the Bonds at the time Outstanding, may direct by instrument in writing the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee, provided that the Trustee shall have the right to decline to follow any such direction if the Trustee shall be advised by counsel that the action or proceeding so directed may not lawfully be taken, or if the Trustee in good faith shall determine that the action or proceeding so directed would involve the Trustee in personal liability or be unjustly prejudicial to the Bondholders not parties to such direction.

4. Upon commencing a suit in equity or upon other commencement of judicial proceedings by the Trustee to enforce any right under the Resolution, the Trustee shall be entitled to exercise any and all rights and powers conferred in the Resolution and provided to be exercised by the Trustee upon the occurrence of an Event of Default; and, as a matter of right against the Authority, without notice or demand and without regard to the adequacy of the security for the Bonds, the Trustee shall, to the extent permitted by law, be entitled to the appointment of a receiver of the moneys, securities and funds then held by the Authority in any Fund or account under the Resolution and, subject to application pursuant to the 1954 Resolution and the 1970 Resolution, of the Revenues, with all such powers as the court or

courts making such appointment shall confer; but notwithstanding the appointment of any receiver, the Trustee shall be entitled to retain possession and control of and to collect and receive income from, any moneys, securities and funds deposited or pledged with it under the Resolution or agreed or provided to be delivered to or deposited or pledged with it under the Resolution.

5. Regardless of the happening of an Event of Default, the Trustee shall have power to, but unless requested in writing by the Holders of a majority in principal amount of the Bonds then Outstanding, and furnished with reasonable security and indemnity, shall be under no obligation to, institute and maintain such suits and proceedings as it may be advised shall be necessary or expedient to prevent any impairment of the security under the Resolution by any acts which may be unlawful or in violation of the Resolution, and such suits and proceedings as the Trustee may be advised shall be necessary or expedient to preserve or protect its interests and the interests of the Bondholders.

1005. *Restriction on Bondholders' Action.* 1. No Holder of any Bond or coupon shall have any right to institute any suit, action or proceeding at law or in equity for the enforcement of any provision of the Resolution or the execution of any trust under the Resolution or for any remedy under the Resolution, unless such Holder shall have previously given to the Trustee written notice of the happening of an Event of Default, as provided in this Article, and the Holders of at least twenty-five percent (25%) in principal amount of the Bonds then Outstanding shall have filed a written request with the Trustee, and shall have offered it reasonable opportunity, either to exercise the powers granted in this Section or to institute such action, suit or proceeding in its own name, and unless such Holders shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liabilities to be incurred therein or thereby, and the Trustee shall have refused to comply with such request within a reasonable time; it being understood and intended that no one or more Holders of Bonds or coupons shall have any right in any manner whatever by his or their action to affect, disturb or prejudice the pledge created by the Resolution, or to enforce any right under the Resolution, except in the manner therein provided; and that all proceedings at law or in equity to enforce any provision of the Resolution shall be instituted, had and maintained in the manner provided in the Resolution and for the equal benefit of all Holders of the Outstanding Bonds and coupons, subject only to the provisions of Section 602.

2. Nothing in the Resolution or in the Bonds or in the coupons contained shall affect or impair the obligation of the Authority, which is absolute and unconditional, to pay at the respective dates of maturity and places therein expressed the principal of and interest on the Bonds to the respective Holders thereof, or affect or impair the right of action, which is also absolute and unconditional, of any Holder to enforce such payment of his Bond.

1006. *Remedies not Exclusive.* No remedy by the terms of the Resolution conferred upon or reserved to the Trustee or the Bondholders is intended to be exclusive of any other remedy, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under the Resolution or existing at law or in equity or by statute on or after the date of adoption of this Resolution.

1007. *Effect of Waiver and Other Circumstances.* 1. No delay or omission of the Trustee or of any Bondholder to exercise any right or power arising upon the happening of an Event of Default shall impair any right or power or shall be construed to be a waiver of any such default or to be an acquiescence therein; and every power and remedy given by this Article to the Trustee or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee or by the Bondholders.

2. Prior to the declaration of maturity of the Bonds as provided in Section 1001, the Holders of a majority in principal amount of the Bonds at the time Outstanding, or their attorneys-in-fact duly authorized, may on behalf of the Holders of all of the Bonds waive any past default under the Resolution and its consequences, except a default in the payment of interest on or principal of or premium on any of the Bonds. No such waiver shall extend to any subsequent or other default or impair any right consequent thereon.

## ARTICLE XI.

### MISCELLANEOUS.

1101. *Defeasance.* 1. If the Authority shall pay or cause to be paid to the Holders of all Bonds and coupons then Outstanding, the principal and interest and Redemption Price, if any, to become due thereon, at the times and in the manner stipulated therein and in the

Resolution, then, at the option of the Authority, expressed in an instrument in writing signed by an Authorized Officer and delivered to the Trustee, the covenants, agreements and other obligations of the Authority to the Bondholders shall be discharged and satisfied. In such event, the Trustee shall, upon the request of the Authority, execute and deliver to the Authority all such instruments as may be desirable to evidence such discharge and satisfaction and the Fiduciaries shall pay over or deliver to the Authority all money, securities and funds held by them pursuant to the Resolution which are not required for the payment or redemption of Bonds or coupons not theretofore surrendered for such payment or redemption.

2. Bonds or coupons or interest installments for the payment or redemption of which moneys shall have been set aside and shall be held in trust by the Paying Agents (through deposit by the Authority of funds for such payment or redemption or otherwise) at the maturity or redemption date thereof shall be deemed to have been paid within the meaning and with the effect expressed in paragraph 1 of this Section. All Outstanding Bonds of any Series and all coupons appertaining to such Bonds shall prior to the maturity or redemption date thereof be deemed to have been paid within the meaning and with the effect expressed in paragraph 1 of this Section if (a) in case any of said Bonds are to be redeemed on any date prior to their maturity, the Authority shall have given to the Trustee in form satisfactory to it irrevocable instructions to publish as provided in Article IV of the Resolution notice of redemption on said date of such Bonds, (b) there shall have been deposited with the Trustee either moneys in an amount which shall be sufficient, or direct obligations of the United States of America or the State of New York or Authorized Certificates of Deposit fully secured by direct obligations of the United States of America the principal of and the interest on which when due will provide moneys which, together with the moneys, if any, deposited with the Trustee at the same time, shall be sufficient, to pay when due the principal or Redemption Price, if applicable, and interest due and to become due on said Bonds on and prior to the redemption date or maturity date thereof, as the case may be, and (c) in the event said Bonds are not by their terms subject to redemption within the next succeeding 60 days, the Authority shall have given the Trustee in form satisfactory to it irrevocable instructions to publish, as soon as practicable, at least twice, at an interval of not less than seven days between publications, in an Authorized Newspaper a notice to the Holders of such Bonds and coupons that the

deposit required by (b) above has been made with the Trustee and that said Bonds and coupons are deemed to have been paid in accordance with this Section and stating such maturity or redemption date upon which moneys are to be available for the payment of the principal or Redemption Price, if applicable, on said Bonds. Neither direct obligations of the United States of America or the State of New York or moneys deposited with the Trustee pursuant to this Section nor principal or interest payments on any such securities shall be withdrawn or used for any purpose other than, and shall be held in trust for, the payment of the principal or Redemption Price, if applicable, and interest on said Bonds; provided that any cash received from such principal or interest payments on such direct obligations of the United States of America or the State of New York deposited with the Trustee, if not then needed for such purpose, shall, to the extent practicable, be reinvested in direct obligations of the United States of America or the State of New York maturing at times and in amounts sufficient to pay when due the principal or Redemption Price, if applicable, and interest to become due on said Bonds on and prior to such redemption date or maturity date thereof, as the case may be.

3. Anything in the Resolution to the contrary notwithstanding, any moneys held by a Fiduciary in trust for the payment and discharge of any of the Bonds or coupons which remain unclaimed for 6 years after the date when such Bonds have become due and payable, either at their stated maturity dates or by call for earlier redemption, if such moneys were held by the Fiduciary at such date, or for 6 years after the date of deposit of such moneys if deposited with the Fiduciary after the said date when such Bonds became due and payable, shall, at the written request of the Authority, be repaid by the Fiduciary to the Authority, as its absolute property and free from trust, and the Fiduciary shall thereupon be released and discharged with respect thereto and the Bondholders shall look only to the Authority for the payment of such Bonds and coupons; provided, however, that before being required to make any such payment to the Authority, the Fiduciary shall, at the expense of the Authority, cause to be published at least twice, at an interval of not less than 7 days between publications, in an Authorized Newspaper, a notice that said moneys remain unclaimed and that, after a date named in said notice, which date shall be not less than 30 days after the date of the first publication of such notice, the balance of such moneys then unclaimed will be returned to the Authority.



1102. *Evidence of Signatures of Bondholders and Ownership of Bonds.* 1. Any request, consent, revocation of consent or other instrument which the Resolution may require or permit to be signed and executed by the Bondholders may be in one or more instruments of similar tenor, and shall be signed or executed by such Bondholders in person or by their attorneys-in-fact appointed in writing. Proof of (i) the execution of any such instrument, or of an instrument appointing any such attorney, or (ii) the holding by any person of the Bonds or coupons appertaining thereto, shall be sufficient for any purpose of the Resolution (except as otherwise therein expressly provided) if made in the following manner, or in any other manner satisfactory to the Trustee, which may nevertheless in its discretion require further or other proof in cases where it deems the same desirable:

(1) The fact and date of the execution by any Bondholder or his attorney-in-fact of such instrument may be proved by the certificate, which need not be acknowledged or verified, of an officer of a bank or trust company or of any notary public or other officer authorized to take acknowledgments of deeds, that the person signing such request or other instrument acknowledged to him the execution thereof, or by an affidavit of a witness of such execution, duly sworn to before such notary public or other officer. Where such execution is by an officer of a corporation or association or a member of a partnership, on behalf of such corporation, association or partnership such certificate or affidavit shall also constitute sufficient proof of his authority;

(2) The amount of Bonds transferable by delivery held by any person executing any instrument as a Bondholder, the date of his holding such Bonds, and the numbers and other identification thereof, may be proved by a certificate, which need not be acknowledged or verified, in form satisfactory to the Trustee, executed by the Trustee or by a member of a financial firm or by an officer of a bank, trust company, insurance company or financial corporation or other depository, showing at the date therein mentioned that such person exhibited to such member or officer or had on deposit with such depository the Bonds described in such certificate. Such certificate may be given by a member of a financial firm or by an officer of any bank, trust company, insurance company or financial corporation or other depository with respect to Bonds owned by it, if acceptable to the Trustee.

(3) The ownership of Bonds registered otherwise than to bearer and the amount, numbers and other identification, and date of holding the same shall be proved by the registry books.

2. Any request or consent by the owner of any Bond shall bind all future owners of such Bond in respect of anything done or suffered to be done by the Authority or any Fiduciary in accordance therewith.

1103. *Moneys Held for Particular Bonds and Coupons.* The amounts held by any Fiduciary for the payment of the interest, principal or Redemption Price due on any date with respect to particular Bonds or coupons shall, on and after such date and pending such payment, be set aside on its books and held in trust by it for the Holders of the Bonds and coupons entitled thereto.

1104. *General Regulations as to Moneys and Funds.* 1. Each of the Funds established by the Resolution shall be a trust fund for the purposes thereof.

2. All Revenues and other moneys of the Authority held or set aside under the Resolution shall, until paid over to the Fiduciaries or otherwise invested or applied as provided in the Resolution, be deposited by the Authority in its name, on demand or time deposit, in such banks or trust companies as shall be selected by the Authority. All Revenues and other moneys held by the Trustee under the Resolution shall be deposited in such banks or trust companies as the Authority may select. Any such deposit may be made in the commercial banking department of any Fiduciary which may honor checks and drafts on such deposit with the same force and effect as if it were not such Fiduciary, and without any duty to inquire into whether any withdrawals of such funds are in accordance with or might violate any of the provisions of the Resolutions. Such deposits shall be continuously secured by the obligations of the United States of America or of the State of New York which obligations shall have a market value (exclusive of accrued interest) at all times at least equal to the amount of such deposits, which obligations shall be segregated in trust for the account of the Authority, or shall be otherwise held as the Authority and the depository may agree. Securities deposited with the Federal Reserve Bank to secure all trust accounts of a depository shall be deemed to comply with the foregoing requirement.

3. All moneys held by any Fiduciary, as such, may be deposited by such Fiduciary in its banking department on demand or, if and to the extent directed by the Authority and acceptable to such Fiduciary, on time deposit, and all such deposits shall be continuously secured by the obligations of the United States of America or of the State of New York which obligations shall have a market value (exclusive of accrued interest) at all times at least equal to the amount of such deposits. Securities deposited with the Federal Reserve Bank to secure all trust accounts of the Fiduciary shall be deemed to comply with the foregoing requirement. Such Fiduciary shall allow and credit on such moneys such interest, if any, as it customarily allows upon similar funds of similar size and under similar conditions or as required by law.

4. No part of the proceeds of any Series of Bonds or any other funds of the Authority shall be used directly or indirectly to acquire any securities or obligations the acquisition of which would cause any Bond to be an "arbitrage bond" as defined in subsection (d)(2) of section 103 of the Internal Revenue Code of 1954 [Title 26 of the United States Code] as then in effect and to be subject to treatment under subsection (d)(1) of said section as an obligation not described in subsection (a) of said section.

1105. *Preservation and Inspection of Documents.* All documents received by any Fiduciary under the provisions of the Resolution shall be retained in its possession and shall be subject at all reasonable times to the inspection of the Authority, any other Fiduciary, and any Bondholder and their agents and their representatives, any of whom may make copies thereof.

1106. *Parties Interested Herein.* Nothing in the Resolution expressed or implied is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the Authority, the Fiduciaries, and the Holders of the Bonds and the coupons thereunto appertaining, any right, remedy or claim under or by reason of the Resolution or any covenant, condition or stipulation thereof; and all the covenants, stipulations, promises and agreements in the Resolution contained by and on behalf of the Authority shall be for the sole and exclusive benefit of the Authority, the Fiduciaries, and the Holders of the Bonds and the coupons thereunto appertaining.

1107. *No Recourse on the Bonds.* No recourse shall be had for the payment of the principal of or interest on the Bonds or for any claim based thereon or on the Resolution against any member or officer of the Authority or any person executing the Bonds.

1108. *Publication of Notices.* Any publication to be made under the provisions of the Resolution in successive weeks or on successive dates may be made in each instance upon any business day of the week and need not be made in the same Authorized Newspaper for any or all of the successive publications but may be made in different Authorized Newspapers.

1109. *Successors and Assigns.* Whenever in the Resolution the Authority is named or referred to, it shall be deemed to include its successors and assigns and all the covenants and agreements in the Resolution contained by or on behalf of the Authority shall bind and enure to the benefit of its successors and assigns whether so expressed or not.

1110. *Severability of Invalid Provisions.* If any one or more of the covenants or agreements provided in the Resolution on the part of the Authority or any Fiduciary to be performed should be contrary to law, then such covenant or covenants, agreement or agreements, shall be deemed severable from the remaining covenants and agreements, and shall in no way affect the validity of the other provisions of the Resolution.

POWER AUTHORITY OF THE  
STATE OF NEW YORK

OFFICIAL STATEMENT

\$150,000,000 BOND ISSUE

JANUARY 30, 1975

Interest on the Series A Bonds is exempt, in the opinion of bond counsel, under the existing statute and court decisions from Federal income taxes, and at all times shall be free from New York State and New York City personal income taxes.

**\$150,000,000**

# **Power Authority of the State of New York**

## **General Purpose Bonds, Series A**

**\$125,000,000 7 $\frac{7}{8}$ % Bonds, due January 1, 2010**

**\$25,000,000 Serial Bonds**

Principal amount	Due January 1	Interest rate	Principal amount	Due January 1	Interest rate
\$2,150,000	1987	6 $\frac{1}{4}$ %	\$3,015,000	1992	7.10%
2,300,000	1988	6.65	3,225,000	1993	7.20
2,460,000	1989	6.80	3,450,000	1994	7 $\frac{1}{4}$
2,635,000	1990	6.90	2,950,000	1995	7.30
2,815,000	1991	7			

**Prices 100%**

Plus accrued interest from February 1, 1975, payable on July 1, 1975  
and semi-annually thereafter on each January 1 and July 1.

The Series A Bonds are subject to redemption, as a whole or in part, at any time on and after January 1, 1985 as set forth in the Official Statement.

The Series A Bonds are offered for delivery when, as and if issued and delivered to the Underwriters, and subject to approval of legality by Hawkins, Delafield & Wood, bond counsel to the Authority. Certain legal matters will be passed upon for the Underwriters by their counsel, Sullivan & Cromwell. It is expected that the Series A Bonds in definitive form will be ready for delivery on or about February 11, 1975. The Underwriters include:

**Dillon, Read & Co. Inc.**

**W. H. Morton & Co.**  
DIVISION OF AMERICAN EXPRESS COMPANY

**Goldman, Sachs & Co.**

**Salomon Brothers**

**Smith, Barney & Co.**

**Kuhn, Loeb & Co.**

Incorporated

**Hornblower & Weeks - Hemphill, Noyes**

Incorporated

The Date of this Official Statement is January 30, 1975.

*This does not constitute an offer to sell the Series A Bonds in any State to any person to whom it is unlawful to make such an offer in such State. No dealer, salesman or any other person has been authorized to give any information or to make any representations, other than those contained herein in connection with the offering of the Series A Bonds, and if given or made, such information or representations must not be relied upon.*

## TABLE OF CONTENTS

	<u>Page</u>
Summary Statement .....	i
The Authority .....	1
Future Projects .....	2
Astoria 6 .....	4
Transfer of Ownership .....	5
Operations and Sales .....	6
Application of Series A Bond Proceeds .....	6
Outstanding 1954 Bonds and 1970 Bonds .....	6
Security for General Purpose Bonds .....	7
Flow of Funds from Authority Projects After Retirement of 1954 Bonds .....	8
Estimated Retirement of 1954 Bonds Pursuant to 1970 Resolution .....	9
Estimated Revenues and Operating Expenses of 1970 Project .....	10
Estimated Net Revenues and Bond Service Applicable to 1970 Project .....	11
Estimated Revenues and Operating Expenses of Astoria 6 .....	12
Estimated Net Revenues and Bond Service Applicable to Bonds Issued for Astoria 6 .....	13
Statement of Condition—December 31, 1974 .....	14
1954 Project .....	15
Bond Service Coverage on 1954 Bonds 1969-1974 .....	18
1970 Project .....	18
Description of General Purpose Bonds and Summary of Certain Provisions of the Resolution	
Definitions .....	20
Pledge of Revenues and Funds .....	21
Trustee .....	22
Paying Agent .....	22
Series A Bonds Being Issued .....	22
Conditions for Issuance of Bonds .....	23
Rate Covenant .....	26
Establishment of Funds .....	27
Construction Fund .....	27
Temporary Interest Fund .....	27
Allocation of Revenues .....	28
Application of General Fund .....	29
Insurance .....	29
Supplemental Resolutions .....	29
Remedies .....	30
Defeasance .....	30
Tax Exemption .....	31
Legality for Investment .....	31
Litigation .....	31
Approval of Legal Proceedings .....	31
Appendix A .....	A-1
Appendix B .....	B-1

## SUMMARY STATEMENT

(Subject in all respects to more complete information contained  
in this Official Statement)

*Purpose of Issue*—The Series A Bonds are being issued to pay a portion of the Cost of Construction of a partially completed 826,575 kw fossil-fuel generating plant and related facilities, known as Astoria 6, and previously owned by Con Edison and the first of the Authority's future projects to be financed under the new Resolution. Astoria 6 is designed to burn low sulfur No. 2 or No. 6 oil as the primary fuel and has an alternative provision to burn natural gas. While there is no present intention to burn coal and provision to do so would be costly, such conversion is feasible. The estimated capital requirement of Astoria 6, including financing costs and the establishment of reserves, is \$460,000,000. Title to Astoria 6 was transferred to the Authority upon the payment by the Authority to Con Edison of \$100,000,000 on December 13, 1974 which was derived from the proceeds of \$150,000,000 principal amount of notes bearing interest at 6¼% and payable on June 16, 1975. On December 30, 1974 the Authority issued \$125,000,000 principal amount of Bond Anticipation Notes bearing interest at 7¼% and payable on December 15, 1975. The proceeds of the Bond Anticipation Notes were applied to pay an additional portion of the Cost of Construction of Astoria 6, including \$89,540,077 paid to Con Edison as a further payment of the purchase price required to be paid by the Authority pursuant to the purchase agreement. The estimated completion date of Astoria 6 is August 31, 1976.

*Facilities of the Authority*—The Authority has previously issued bonds under prior bond resolutions in the aggregate principal amount of approximately \$1.8 billion to finance four electric power generating plants, transmission lines and related facilities. The combined name plate generating capacity of these four facilities is 4,923,000 kilowatts.

The 1954 Project consists of two hydro-electric power projects located on the St. Lawrence and Niagara Rivers, together with related transmission lines. The St. Lawrence Project includes two major dams and a power plant with a name plate rating of 912,000 kw installed on the United States side of the border. The Niagara Project includes a conventional generating plant and a pump-generating plant with storage reservoir, together having a total name plate rating of 2,190,000 kw. In addition to these two major power projects, the Authority has financed and constructed certain related transmission facilities. The average rate for power and energy at these projects is approximately 4 mills per kilowatt-hour.

The 1970 Project consists of a nuclear baseload generating facility, a pumped storage peaking facility, and certain related transmission facilities. The James A. FitzPatrick Nuclear Power Plant, located on the south shore of Lake Ontario, is a single-unit electric power generating facility using a nuclear reactor of the boiling water type. It will have a net output of approximately 821,000 kilowatts. The Authority received an operating license from the Atomic Energy Commission and is conducting start-up and power ascension tests. Commercial operation is expected by May 1975. The average rate for power and energy from this plant delivered to the state-wide grid will be approximately 7 mills per kilowatt-hour.

The Blenheim-Gilboa Pumped Storage Power Project, located in Schoharie County, consists of a power plant, upper and lower storage reservoirs and certain transmission lines. The power plant contains four pump generating units each with a capability as a generator of 250,000 kilowatts. The rate for this peaking capacity is \$1.35 per kilowatt-month.

*Outstanding 1954 Bonds and 1970 Bonds*—The Authority has issued an aggregate principal amount of \$1,102,050,000 of 1954 Bonds to finance the St. Lawrence and Niagara Projects and related facilities. As of January 1, 1975, \$478,912,000 principal amount of 1954 Bonds were outstanding. Until retired, the 1954 Bonds and the interest thereon will continue to be payable from the net revenues of the 1954 Project. The Authority has covenanted not to issue any additional 1954 Bonds and to retire all 1954 Bonds by January 1, 1985.



The Authority has issued an aggregate principal amount of \$654,000,000 of 1970 Bonds to finance the Blenheim-Gilboa Project and the FitzPatrick plant, transmission lines and related facilities. All the 1970 Bonds are presently outstanding. The Authority presently estimates that it will complete the 1970 Project with the proceeds of the 1970 Bonds previously issued. Although the Authority has no present intention to do so, it has the right to issue additional bonds on a parity with the 1970 Bonds (a) to complete the 1970 Project, (b) to refund one or more series of bonds outstanding under the 1970 Resolution or all of the 1954 Bonds then outstanding, and (c) to finance major repairs, replacements, improvements, betterments or additions to the 1970 Project.

*Future Projects*—The Authority contemplates that all of its future projects will be financed by the issuance of Bonds pursuant to the Resolution including the following:

- (1) Astoria 6 (in New York City) and a partially completed nuclear generating plant of Con Edison known as Indian Point 3 (in Westchester County).
- (2) a 134 mile 765,000 volt transmission line from a new substation at Massena, New York, to a new substation near Utica, New York, and related transmission facilities.
- (3) a 1,000,000 kilowatt pumped storage power project located at Breakabeen, Schoharie County, New York.
- (4) to further serve the needs of the Metropolitan Transportation Authority
  - (i) a 1,200,000 kilowatt nuclear power plant to be located at either Cementon or Athens, both in Greene County, New York.
  - (ii) a 700,000 kilowatt fossil-fuel power plant at a location to be determined.
- (5) other transmission facilities as may be necessary to connect the above projects with the regional grid system.

The Authority is authorized to acquire not more than one completed or partially completed base-load generating facility in each of New York City and Westchester County.

The Authority presently estimates that it will issue approximately \$2.5 billion Bonds over the next ten years to finance the future projects listed above.

*Security for the General Purpose Bonds*—Pertinent factors regarding the security for the Bonds include the following:

- (1) The Bonds will be secured by a pledge of (i) the net revenues of future projects, whether or not financed under the Resolution, (ii) on and after the retirement of the Authority's presently outstanding 1954 Bonds, that portion of the net revenues of the 1954 Project in excess of the amount required to assure that the aggregate amount of net revenues from the 1970 Project and the 1954 Project available for the 1970 Bonds shall at least equal 1.25 times aggregate bond service on the 1970 Bonds on a cumulative basis and (iii) that portion of the net revenues, if any, from the 1970 Project which shall be in excess of 1.25 times aggregate bond service on the 1970 Bonds on a cumulative basis.
- (2) Interest on the Series A Bonds through August 31, 1976 will be payable from and secured by a portion of bond proceeds deposited in the Temporary Interest Fund. A bond reserve equal to one year's interest on the Bonds will also be provided out of the bond proceeds.
- (3) While the Authority is not prevented from issuing bonds, notes or other obligations under a new resolution, no charge or lien created by such resolution on revenues from future projects of the Authority can be equal or prior to the charge or lien created by the Resolution.

The Resolution permits the issuance of Bonds to finance future projects of the Authority directly or indirectly related to power generation or transmission and, in addition, to pay the principal of and

interest on any Bond Anticipation Notes or for the purpose of making payments into the Projects' Study Fund or to refund outstanding Bonds issued under the Resolution, 1954 Bonds and 1970 Bonds.

*Projected Bond Service Coverage and Accelerated Retirement*—During the period prior to final retirement of the 1954 Bonds, projected coverage of interest on the \$460 million Bonds issued to finance Astoria 6 by net revenues from the operation of Astoria 6 ranges from a low of 1.16 times in 1976 to a high of 1.22 times in 1984. After the retirement of the 1954 Bonds, projected coverage of bond service on Bonds issued for Astoria 6 by available revenues of the Authority ranges from a low of 1.22 times in 1985, increasing to 2.35 times in 1986 and to a high of 4.94 times in 2004. In each case, however, effect has not been given to bond service on Bonds issued for future projects or to net revenues from such projects.

The Resolution provides that an amount equal to 15 percent of bond service on a cumulative annual basis after completion will be paid into the bond reserve account and, unless required for emergency repairs and replacements, will be applied to additional Bond retirements.

*Rate Covenant*—The Authority covenants in the Resolution to maintain rates, fees or charges pursuant to contracts or general application tariffs sufficient, together with other moneys available therefor, to pay in each year (i) the costs of operation and maintenance of all projects of the Authority, (ii) bond service on all outstanding 1954 Bonds, 1970 Bonds and the Bonds, and (iii) reserve requirements established by the 1954 Resolution, the 1970 Resolution and the Resolution.

*Test for Issuance of General Purpose Bonds*—In addition to the estimated \$460,000,000 Bonds to finance Astoria 6, the Authority reserves the right to issue (a) Bonds for future Projects for which Bonds have not theretofore been issued provided that a certificate of an Authorized Officer of the Authority states that the average of estimated Revenues less estimated Operating Expenses for the five calendar years commencing in 1986, or if later, for the five calendar years commencing in the calendar year after the latest estimated Date of Completion of any Project, will be at least 1.20 times maximum Aggregate Bond Service for all Bonds then estimated to be outstanding; and further provided that an Engineer's Certificate states that there will be a market for the power or other output of such Project at the rates used by the Authority in computing such estimated Revenues; (b) additional Bonds, without an earnings test, to complete a Project or for Projects' Study; or (c) Bonds to refund (i) all or part of the outstanding Bonds of one or more series, (ii) all of the 1954 Bonds or (iii) all or part of the outstanding 1970 Bonds.

*Consultants for Astoria 6*—The consultants to the Authority for an engineering evaluation of Astoria 6, the status of its construction and in connection with establishing power rates therefore are Stone & Webster Engineering Corporation, who have submitted reports to the Authority in connection therewith. Arthur Young & Company, certified public accountants, have acted as consultants to the Authority with respect to certain accounting matters relating to Astoria 6 and have conducted audits of construction costs and submitted reports to the Authority in connection therewith.

*Operations and Sales*—The Authority will operate Astoria 6 independent of Con Edison's five existing generating units at Astoria. Contracts for the sale of power produced by Astoria 6 have not been negotiated. It is the Authority's intention to initially offer such power to the City of New York, the Port Authority of New York and New Jersey and other public agencies now being served in whole or in part by Con Edison, with the remainder, if any, being offered to Con Edison and then to other utilities. The cost of power and energy from Astoria 6 is estimated to be approximately 31.2 mills per kilowatt hour delivered to the load center at the 15th Street substation. Power from Astoria 6 is essential to carry the projected load of the public agencies in the New York City area and in the opinion of Stone & Webster the cost of such power will be economically attractive. Indian Point 3, for which the consultants have also furnished reports to the Authority, is expected to be completed prior to Astoria 6. If Indian Point 3 is acquired, the Authority intends to market Astoria 6 power on a combined basis with Indian Point 3 at an average rate of approximately 22.1 mills per kilowatt-hour. The rates for power sold by the Authority are not subject to the provisions of the New York Public Service Law nor to regulations by or the jurisdiction of the New York Department of Public Service.

# POWER AUTHORITY OF THE STATE OF NEW YORK

## OFFICIAL STATEMENT

Relating to

### \$150,000,000 General Purpose Bonds, Series A

New York, New York  
January 30, 1975

The purpose of this Official Statement, which includes the cover page, summary statement and appendices hereto, is to set forth information concerning Power Authority of the State of New York (the "Authority"), its General Purpose Bonds (the "Bonds"), and particularly its proposed \$150,000,000 General Purpose Bonds, Series A (the "Series A Bonds"), in connection with the sale of the Series A Bonds.

The Series A Bonds are to be issued pursuant to the Power Authority Act of the State of New York, Title 1 of Article 5 of the Public Authorities Law, Chapter 43-A of the Consolidated Laws of the State of New York (the "Act"), the General Purpose Bond Resolution of the Authority, adopted on November 26, 1974 and the Second Supplemental General Purpose Bond Resolution of the Authority adopted on January 30, 1975 (such General Purpose Bond Resolution as from time to time amended or supplemented by supplemental resolutions being herein, except as the context otherwise indicates, called the "Resolution.")

The Series A Bonds are being issued to pay a portion of the Cost of Construction (as defined in the Resolution) of a partially completed fossil-fuel generating plant previously owned by Consolidated Edison Company of New York, Inc. ("Con Edison") known as Astoria Unit No. 6 and related facilities and property interests ("Astoria 6"), the first of the Authority's projects to be financed under the Resolution.

On November 27, 1974 the Authority issued \$150,000,000 principal amount of notes bearing interest at  $6\frac{1}{4}\%$  and payable on June 16, 1975. The proceeds of the notes were applied to (1) the repayment of \$35,000,000 borrowed by the Authority pursuant to a loan agreement to finance preliminary expenditures for Project Studies of the Authority (as defined in the Resolution) and (2) pay a portion of the Cost of Construction of Astoria 6, including \$100,000,000 paid to Con Edison on December 13, 1974 to acquire ownership and possession of Astoria 6. On December 30, 1974 the Authority issued \$125,000,000 principal amount of Bond Anticipation Notes bearing interest at  $7\frac{1}{4}\%$  and payable on December 15, 1975. The proceeds of the Bond Anticipation Notes were applied to pay an additional portion of the Cost of Construction of Astoria 6, including \$89,540,077 paid to Con Edison as a further payment of the purchase price required to be paid by the Authority pursuant to the purchase agreement. See TRANSFER OF OWNERSHIP.

## THE AUTHORITY

The Authority is a body corporate and politic constituting a public corporation and a political subdivision of the State of New York created in 1931 by the Act. Pursuant to the Act, it financed and constructed and now operates a hydro-electric power project in the International Rapids section of the Saint Lawrence River (the "St. Lawrence Project"), a hydro-electric power project in the Niagara River (the "Niagara Project") and certain related transmission lines (the "Transmission Line Project"). The St. Lawrence Project, the Niagara Project and the Transmission Line Project (the "1954 Project") are more particularly described under 1954 PROJECT. The bonds of the Authority which were issued to finance the 1954 Project and are now outstanding are described under OUTSTANDING 1954 BONDS AND 1970 BONDS.

By amendment of the Act in 1968, the Authority was authorized to build nuclear and pumped storage generating plants in order to assure optimum use of the St. Lawrence and Niagara Projects, to attract and retain high load factor industry, to supply the needs of the Authority's existing municipal and rural electric cooperative customers, and to assist in maintaining an adequate, dependable power supply in the State of New York. Pursuant to the 1968 amendment the Authority has financed and is operating the Blenheim-Gilboa Pumped Storage Power Project ("Blenheim-Gilboa project") and has financed and is completing the James A. FitzPatrick Nuclear Power Plant ("Fitzpatrick plant") together with certain transmission lines (the "1970 Project") and more particularly described under 1970 PROJECT. The bonds of the Authority which were issued to finance the 1970 Project and are now outstanding are described under OUTSTANDING 1954 BONDS AND 1970 BONDS.

The Act was amended in 1972 and further amended in 1974 to authorize the Authority to construct, acquire and complete baseload generating facilities to maintain an adequate and dependable supply of electricity for the Metropolitan Transportation Authority, its subsidiary corporations, the New York City Transit Authority, the Port Authority of New York and New Jersey, the City of New York, the State of New York, the United States of America, other public corporations and electric corporations within the metropolitan area of the City of New York within the State of New York. The Authority is authorized to acquire not more than one completed or partially completed baseload generating facility in each of New York City and Westchester County and to acquire necessary transmission facilities.

The rates for power sold by the Authority are not subject to the provisions of the New York Public Service Law nor to regulations by or the jurisdiction of the New York Department of Public Service.

The Authority consists of five trustees appointed by the Governor of the State of New York, with the advice and consent of the Senate of the State, to serve for terms of five years each. The present trustees are: James A. FitzPatrick, Chairman, whose term expires in 1979, and George L. Ingalls, Vice-Chairman, William J. Ronan, and Raymond J. Lee, whose terms expire in 1978, 1977, and 1976, respectively. Daniel J. Reidy's term expired in January, 1975, and a successor has yet to be appointed by the Governor.

George T. Berry is General Manager and Chief Engineer of the Authority, Scott B. Lilly is General Counsel, Wilbur L. Gronberg is Assistant General Manager-Engineering, John W. Boston is Director of Power Operations, Thomas F. McCrann, Jr. is Controller, and John C. Bruel is Secretary.

The Consulting Engineers to the Authority for Astoria 6 and in connection with establishing power rates therefor are Stone & Webster Engineering Corporation ("Stone & Webster"), who have submitted reports to the Authority in connection therewith. Arthur Young & Company, certified public accountants, have acted as Consultants to the Authority with respect to certain financial matters relating to Astoria 6 and have conducted audits of construction costs and submitted reports to the Authority in connection therewith. Reports of Stone & Webster are appended to this Official Statement as Appendix A and Appendix B hereto.

Title to the real property utilized by the Authority is or will be vested either in the Authority or in the State of New York, but the Authority has the right, so long as its corporate existence shall continue, to possess and use all real property and rights therein acquired by it or acquired on its behalf by the State.

The Authority has no taxing power and its obligations are not a debt of the State of New York.

### **FUTURE PROJECTS**

The Authority contemplates that all future projects of the Authority to the extent not paid for from any available funds in the General Fund will be financed by the issuance of Bonds pursuant to the Resolution. The Authority is not prevented from issuing bonds, notes or other obligations under a new resolution; however no charge or lien created by such resolution on revenues from future projects of the Authority can be equal or prior to the charge or lien created by the Resolution.

The Authority presently intends to finance the following projects under the Resolution :

(1) Astoria 6 and a partially completed nuclear generating plant of Con Edison known as Indian Point Nuclear Generating Unit No. 3 ("Indian Point 3").

(2) a 134 mile 765,000 volt transmission line from a new substation at Massena, New York, to a new substation near Utica, New York, and related transmission facilities. An application to the New York Public Service Commission for a certificate of environmental compatibility was filed on September 21, 1973.

(3) a 1,000,000 kilowatt (kw) pumped storage power project located at Breakabeen, Schoharie County, New York. The project is similar to and is located about five miles north of the Blenheim-Gilboa project which is now in operation. An application was filed with the Federal Power Commission on March 30, 1973 to construct and operate the project.

(4) to further serve the needs of the Metropolitan Transportation Authority and its subsidiaries

(i) a 1,200,000 kw nuclear power plant to be located at either Cementon or Athens, both in Greene County, New York. An application to the New York Public Service Commission for a certificate of environmental compatibility is expected to be filed in the spring of 1975 and an application to the Atomic Energy Commission for a construction permit is expected to be filed in September, 1975.

(ii) a 700,000 kw fossil-fuel power plant at a location to be finally determined from four under consideration. An application to the New York Public Service Commission for a certificate of environmental compatibility was filed on December 26, 1974.

(5) other transmission facilities as may be necessary to connect the above projects with the regional grid system.

The Authority presently estimates that it will issue approximately \$2.5 billion Bonds over the next ten years to finance the foregoing projects. In connection with Projects' Study, the Authority has expended \$18,500,000 to December 31, 1974 from funds available for such purposes to conduct preliminary investigations, prepare applications to the appropriate regulatory agencies, acquire enrichment services for nuclear fuel and other efforts necessary or desirable for its future projects.

The 1974 amendment of the Act declared that in order to preserve reliability of electric service in the metropolitan area of the City of New York and throughout the State and to assist in deterring further extraordinary increases in rates for electric service, the Authority should provide such supplemental electricity for such use in the metropolitan area of the City of New York as is consistent with continuing and maintaining the exemption of interest on the Authority's bonds from the income tax imposed by the Internal Revenue Code of the United States of America and regulations and ruling thereunder. The amendment also declared it to be essential that such electricity be provided at the earliest practicable time and specifically authorized the Authority to acquire in each of New York City and Westchester County not more than one completed or partially completed baseload generation facility and related transmission lines and facilities and fuel and fuel contracts. Any cost savings realized by any such acquisition are to be passed on to consumers. Pursuant to such statutory authorization the Authority has determined that the plant to be acquired in New York City is Astoria 6 and ownership and possession of Astoria 6 has been acquired by the Authority.

The Authority and its Consultants are developing plans for, and completing studies with respect to, the acquisition of Indian Point 3 as authorized by the Act. It is expected that Indian Point 3, if acquired by the Authority, will be completed prior to completion of Astoria 6 and will generate power at a cost of approximately 14 mills per kilowatt hour at the plant site. That acquisition is being deferred because of the time required to obtain the necessary Atomic Energy Commission approval and the necessity of proceeding promptly with the additional construction required to complete Astoria 6. Stone & Webster has projected that Indian Point No. 3 will be ready to load fuel in July 1975 and will reach commercial operation in December 1975 and on that basis has estimated that the cost of acquiring the plant and completing construction is approximately \$550 million.

## ASTORIA 6

### *Plant Description*

Astoria 6 is located in the Borough of Queens in the City of New York on a site of approximately 43 acres adjacent to a 242 acre tract owned by Con Edison and occupied by Con Edison's five existing generating units and other related facilities. Astoria 6 is on the East River which is the source and point of discharge of cooling water for all Astoria units.

The turbine, supplied by Westinghouse Electric Corporation, at rated conditions of throttle and condenser pressure and of steam and reheat temperature, is designed to produce 826,575 kw. The electric generator, also supplied by Westinghouse, has a rated capacity of 980,800 kilovolts-amperes (kva) with 0.9 power factor.

The source of steam is a balanced draft boiler manufactured by Foster Wheeler Corporation, with a 6,600,000 lb. per hour maximum continuous capacity. It is designed to burn low sulfur No. 2 or No. 6 oil as the primary fuel and has an alternative provision to burn natural gas. While there is no present intention to burn coal and provision to do so would be costly, such conversion is feasible.

Ancillary facilities include cooling water screenwell intake structures, discharge structures, makeup water demineralization plant, fire protection system, ash collection and disposal system, chemical cleaning water disposal system, access roads and parking areas, storm drains and sanitary sewage system, gas supply piping, oil piping and minimal off-site oil storage tankage.

The electric generator is connected through three main step-up transformers, each rated at 300,000 kva to two underground 345 kv cable circuits. These lines, acquired and to be completed as part of Astoria 6, will extend approximately 7½ miles to a substation located at 15th Street in Manhattan.

In order to achieve maximum independence of operation of Astoria 6, the Authority will require supplementary facilities including a fuel oil tank farm (affording a minimum storage of 30 days supply for Astoria 6), an oil unloading wharf, warehouse building, administration building, maintenance building, modifications to the control room, electric metering, and fire protection system improvements.

### *Engineering Evaluation*

Stone & Webster has conducted an engineering evaluation of the status of engineering and field erection of Astoria 6. They have concluded that the engineering and design of Astoria 6 meet all the requirements of good engineering practices and that the design of the plant systems is sufficient to ensure satisfactory operation. They are of the view that the physical erection of the facility, which is now approximately 58 percent complete, has suffered considerably from and is hampered by inadequate storage practices, lack of cleanliness during assembly, and certain unsatisfactory construction practices. They have concluded that through improved construction procedures, proper corrective action to existing conditions, and thorough flushing and cleaning during the initial operations phase, Astoria 6 can attain a degree of plant availability and efficiency consistent with that prevalent in the industry. The estimated date of completion of Astoria 6 is August 31, 1976. For a description of the permits required to be obtained in connection with the operation of Astoria 6 see pp. A-15 to A-17 of Appendix A to the Official Statement.

In the opinion of Stone & Webster, the total estimated capital cost for design and construction of Astoria 6 is consistent with industry cost for generating stations of similar size constructed during this period.

#### Capital Requirements

The capital requirements related to Astoria 6 are estimated as follows(1) :

Audited costs through May 31, 1974 (rounded) .....	\$202,653,000
Estimated cost of remaining contract work .....	90,310,000
Con Edison administrative costs and allowance for funds used during construction from June 1 to November 30, 1974 .....	4,600,000
Training and operating expenses including working capital and spare parts .....	7,175,000
Additional facilities required for independent operation of Astoria 6 ...	32,600,000
Fuel costs for initial operating period (90 day supply) .....	25,000,000
Escalation and contingencies including claims .....	19,500,000
<b>Total estimated capital costs before interest during construction, financing cost and bond reserve requirement (rounded) .....</b>	<b>\$382,000,000(2)</b>
Net interest during construction .....	36,600,000(3)
Financing cost .....	9,200,000
Bond reserve requirement .....	32,200,000(3)
<b>Total capital requirements .....</b>	<b><u>\$460,000,000</u></b>

#### NOTES :

(1) Audited costs through May 31, 1974 (subject to limited adjustments to be determined) have been examined by Arthur Young & Company, certified public accountants. A relatively small portion of these costs may be found not to be properly includable in the costs to be borne by the Authority. The remaining items comprising total estimated capital costs before interest during construction, financing cost and bond reserve requirement have been estimated by Stone & Webster. Net interest during construction, financing cost and bond reserve requirement have been estimated by the Authority.

(2) Does not include provision for construction of a cooling tower which may be required and which is estimated to cost about \$70,000,000.

(3) Based on an assumed average interest rate of 7%.

### TRANSFER OF OWNERSHIP

In accordance with the Act a public hearing was held on November 22, 1974 and on December 10, 1974 the Comptroller of the State of New York approved \$189,203,088 of the purchase price to be paid by the Authority, being the amount of Con Edison's expenditures to May 31, 1974 approved by the Authority. Upon the payment by the Authority to Con Edison of \$100,000,000, constituting part of the proceeds of the \$150,000,000 notes referred to on page one above, and release of the lien under the mortgage indenture securing Con Edison's mortgage bonds, ownership and possession of Astoria 6 was transferred to the Authority on December 13, 1974. On December 30, 1974, the Authority paid \$89,540,077 to Con Edison as the balance then due under the purchase agreement relating to the acquisition of Astoria 6. The Authority shall make additional payments for Con Edison's expenditures including contractor's claims and inventory items for the period June 1, 1974 through November 30, 1974 pursuant to the purchase agreement.

The Authority purchased the land and facilities forming Astoria 6 at their cost to Con Edison as audited by Arthur Young & Company. Only such expenditures are included in the cost as, in the judgment of the Authority, based in part upon advice from Stone & Webster and Arthur Young & Company, may justifiably be charged to Astoria 6. In addition to the reimbursement of Con Edison for its actual approved expenditures on the plant prior to the passage of title, the Authority will reimburse Con Edison for the actual cost of disposing of claims made by contractors and others in the process of the work prior to the passage of title up to a specified maximum. The Authority has and will continue to approve settlement amounts. The purchase agreement provides that a sum equal to the maximum the Authority will pay Con Edison to cover claims is placed in escrow pending resolution of the claims until that amount is used up. If all claims are settled for less than the amount in escrow the remainder will be repaid to the

Authority. Escrow money in addition to that advanced on account of unresolved claims includes some further amounts which will not be turned over to Con Edison until an inventory of materials and final inspection have been completed.

### **OPERATIONS AND SALES**

The Authority will operate Astoria 6 independently of Con Edison's five existing generating units at Astoria in accordance with the Authority's standards applied at the 1954 Project and the 1970 Project. It will transmit the power over its own lines to a substation at 15th Street in Manhattan. Delivery from there to the Authority's customers will be made through Con Edison's distribution system under a delivery service agreement.

Like other generating stations in the State, Astoria 6 will operate as part of the New York Power Pool. In order to meet the demands of the State in the most efficient possible manner, generating stations in the Power Pool are generally called upon to produce power in the order of the next lowest delivered cost of power, subject to transmission capabilities. The Authority expects that Astoria 6 will be among the more efficient stations in the Power Pool and that, accordingly, it will operate substantially as a baseload plant.

Contracts for the sale of power produced by Astoria 6 have not been negotiated. It is the Authority's intention to initially offer such power to the City of New York, the Port Authority of New York and New Jersey and other public agencies now being served in whole or in part by Con Edison, with the remainder, if any, not exceeding 25% of nameplate capacity over the term of the Series A Bonds, being offered to Con Edison and then to other utilities. The contracts will provide for rate adjustments by the Authority from time to time and additional charges for late payment.

The cost of power and energy from Astoria 6 is estimated to be approximately 31.2 mills per kilowatt hour delivered to the load center at the 15th Street substation. This cost is based on an assumed 65% plant factor and is estimated to cover operating and maintenance expenses and fuel costs (at an assumed cost of \$13.50 per barrel) and, together with other available revenues of the Authority, to cover bond service on the estimated \$460 million Bonds to be issued to finance Astoria 6 (see tables on pp. 12 and 13). Power from Astoria 6 is essential to carry the projected load of the public agencies in the New York City area and in the opinion of Stone & Webster the cost of such power will be economically attractive if marketed independently. Moreover, if the Authority acquires Indian Point 3, it intends to combine power from Astoria 6 and Indian Point 3. The average cost of Astoria 6 power at 15th Street and Indian Point 3 power at the plant site is estimated to be approximately 22.1 mills. The Authority intends to contract with Con Edison to distribute power from each plant at a charge no greater than the cost to Con Edison of distributing its own power to similar customers, resulting in an overall cost to the Authority's customers which is expected to be economically attractive.

It is expected that the meters of the Authority's customers will be read by Con Edison personnel under the general supervision of the Authority. Billing and collection will be handled by the Authority through its own personnel and facilities.

### **APPLICATION OF SERIES A BOND PROCEEDS**

The net proceeds to the Authority from the sale of the Series A Bonds will be used to pay a part of the Cost of Construction of Astoria 6. In addition, there shall be paid into the Temporary Interest Fund \$18,357,697, representing interest on the Series A Bonds through August 31, 1976. There shall also be paid into the Bond Reserve Account \$11,594,335, representing one year's interest on the Series A Bonds.

Subject to market conditions, the Authority expects to undertake additional financing for Astoria 6 and other future projects in the second quarter of 1975.

### **OUTSTANDING 1954 BONDS AND 1970 BONDS**

The Authority issued its General Revenue Bonds (the "1954 Bonds") in the aggregate principal amount of \$1,102,050,000 pursuant to its General Revenue Bond Resolution adopted December 21, 1954 and resolutions supplemental thereto (the "1954 Resolution"). There were outstanding as of January 1,



1975, \$478,912,000 principal amount of 1954 Bonds. Until retired, the 1954 Bonds and the interest thereon will continue to be payable from the net revenues of the 1954 Project in accordance with the terms of the 1954 Resolution. The Authority has covenanted not to issue any additional 1954 Bonds and to retire all 1954 Bonds by January 1, 1985.

The Authority has issued to date its Revenue Bonds (the "1970 Bonds") in the aggregate principal amount of \$654,000,000 pursuant to its Revenue Bond Resolution adopted as of June 15, 1970 and resolutions supplemental thereto (the "1970 Resolution"). All of such 1970 Bonds are presently outstanding. In addition to the \$654,000,000 of 1970 Bonds presently outstanding, the Authority has the right to issue additional bonds on a parity with the 1970 Bonds (a) to complete the 1970 Project, (b) to refund one or more series of bonds outstanding under the 1970 Resolution or all of the 1954 Bonds then outstanding, and (c) to finance major repairs, replacements, improvements, betterments or additions to the 1970 Project. The Authority presently estimates that it will complete the 1970 Project with the proceeds of the 1970 Bonds previously issued. The Authority does not contemplate any such expenditures as referred to under (c) above with respect to the 1970 Project which would require the issuance of 1970 Bonds, nor is the Authority presently aware of any such expenditures that are likely to be required by any governmental agency having jurisdiction. However, to the extent that additional funds may be required to complete the 1970 Project or to the extent that additional requirements may subsequently be imposed by any such agency, the Authority may issue additional 1970 Bonds.

Until retired, the 1970 Bonds and the interest thereon (a) prior to the retirement of the 1954 Bonds, will continue to be payable from the net revenues of the 1970 Project, together with available amounts in the bond reserve account and the general reserve account of the 1970 Resolution and (b) on and after the retirement of the 1954 Bonds, will be payable from net revenues of the 1970 Project and that portion of the net revenues of the 1954 Project which shall be sufficient and necessary in each year during the term of any outstanding 1970 Bonds to assure that net revenues from the 1970 Project and net revenues from the 1954 Project available for such 1970 Bonds shall at least equal 1.25 times aggregate bond service computed on all such 1970 Bonds on a cumulative basis.

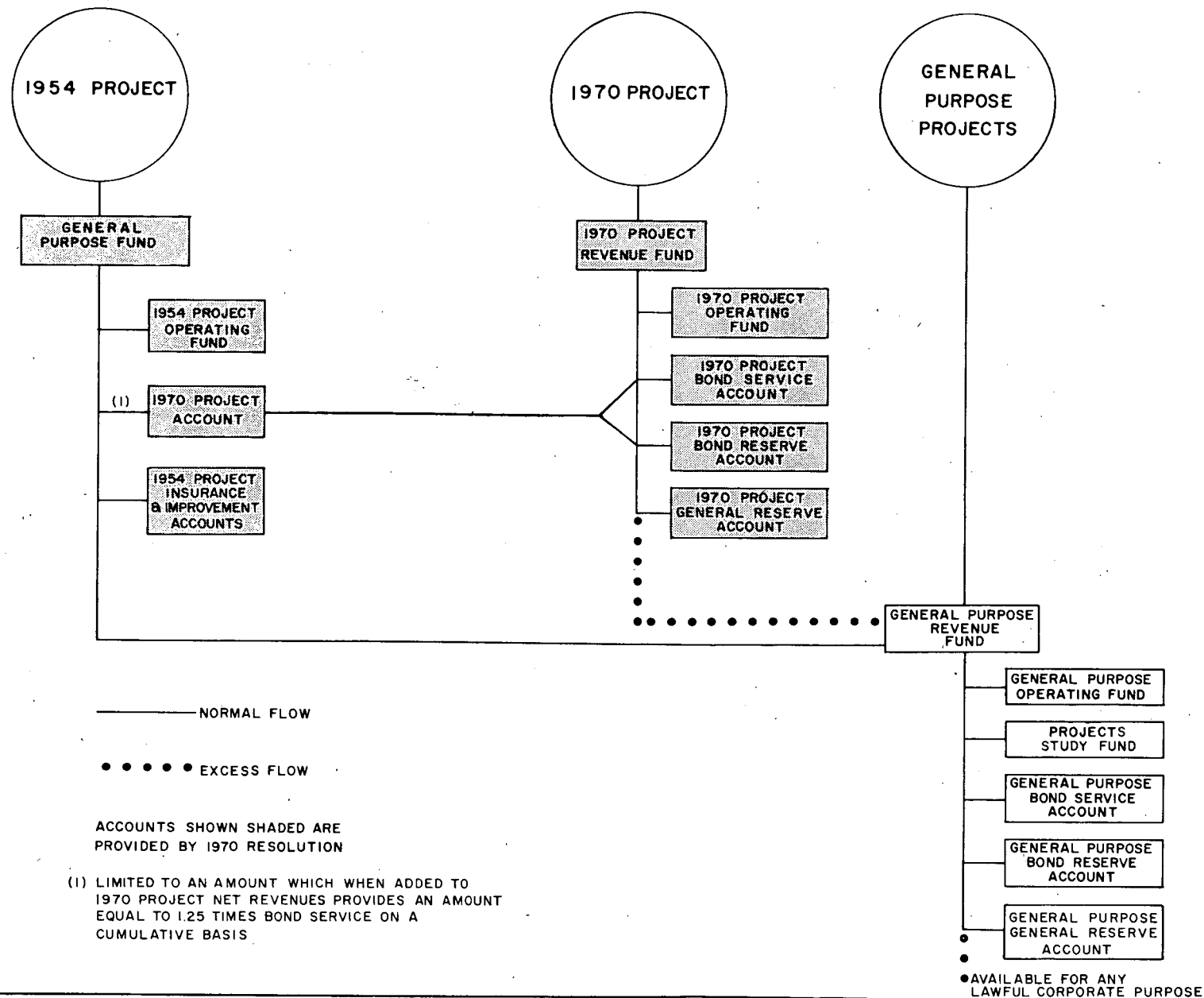
To provide assurance that the 1970 Bonds will have access to the net revenues of the 1954 Project not later than the estimated retirement date of the 1954 Bonds, the Authority covenanted in the 1970 Resolution to retire all 1954 Bonds on or before January 1, 1985 pursuant to a schedule set forth in the 1970 Resolution. Such schedule requires that not more than \$633,441,000 principal amount of 1954 Bonds be outstanding on January 1, 1975. On such date \$478,912,000 principal amount of 1954 Bonds were outstanding.

### **SECURITY FOR GENERAL PURPOSE BONDS**

The General Purpose Bonds will be secured by a pledge of (i) the net revenues of future projects whether or not financed under the Resolution, (ii) on and after the retirement of the Authority's presently outstanding 1954 Bonds, that portion of the net revenues of the 1954 Project in excess of the amount required to assure that the aggregate amount of net revenues from the 1970 Project and the 1954 Project available for the 1970 Bonds shall at least equal 1.25 times aggregate bond service on such 1970 Bonds on a cumulative basis and (iii) that portion of the net revenues, if any, from the 1970 Project which shall be in excess of 1.25 times aggregate bond service on such 1970 Bonds on a cumulative basis. While the Authority is not prevented from issuing bonds, notes or other obligations under a new resolution, except as specifically provided in the 1970 Resolution, the charge or lien created by such resolution shall not be equal or prior to the charge or lien created by the Resolution.

The Resolution permits the issuance of Bonds to finance future projects of the Authority directly or indirectly related to power generation or transmission and, in addition, to pay the principal of and interest on any Bond Anticipation Notes or for the purpose of making payments into the Projects' Study Fund or to refund outstanding Bonds issued under the Resolution, 1954 Bonds and 1970 Bonds. All Bonds issued under the Resolution will be on a parity and will be entitled to the equal benefit, protection and security of the provisions, covenants and agreements of the Resolution.

# FLOW OF FUNDS FROM AUTHORITY PROJECTS AFTER RETIREMENT OF 1954 BONDS



# ESTIMATED RETIREMENT OF 1954 BONDS PURSUANT TO 1970 RESOLUTION

The following calculation was made by the Authority in 1970 to demonstrate its ability to meet a covenant in the 1970 Resolution that the Authority would maintain rates at a level sufficient to retire the 1954 Bonds in accordance with an annual schedule set forth in the 1970 Resolution resulting in the retirement of all 1954 Bonds by January 1, 1985. Reference is made to BOND SERVICE COVERAGE ON 1954 BONDS 1968-1973 for actual revenues, provision for operating expenses and 1954 Bond retirements since 1970. At January 1, 1975, \$478,912,000 principal amount of 1954 Bonds were outstanding, compared to the 1970 Resolution requirement that not more than \$633,441,000 of 1954 Bonds be outstanding at such date.

The amount of power revenues from the 1954 Project is dependent upon the flows of the Niagara and St. Lawrence rivers. Based upon the flows of the lowest consecutive 15 year period of record since 1860 annual power revenues were estimated by the Authority, as follows:

Energy—16,500,000,000 kwh at 2.67 mills/kwh .....	\$44,000,000
Capacity—2,975,000 kw at \$1.00/kw/month .....	35,700,000
Transmission rental .....	4,300,000
Miscellaneous power .....	1,000,000
<b>Total power revenues .....</b>	<b>\$85,000,000</b>

Interest earned on investment of reserve and operating funds applicable to the 1954 Bonds was estimated to average \$2,500,000 annually, resulting on the above basis in total annual revenues of \$87,500,000. Total annual revenues based on average river flows for the period 1900 to 1968 would be approximately \$93,500,000, including interest earned of \$2,500,000.

The following table, adapted from the official statements relating to the 1970 Bonds, showed that total annual revenues of \$87,500,000 from the 1954 Project, beginning in 1970 and with the debt outstanding on January 1, 1970, would be sufficient (together with withdrawals from the bond reserve account) to retire the 1954 Bonds by January 1, 1985, in accordance with the schedule referred to above.

"Present Facilities [1954 Project]"				"(000's omitted)"							
"Calendar year	Estimated gross revenues	Estimated operating and maintenance expenses	Estimated net revenues	Original Bonds [1954 Bonds]			Balance of estimated net revenues	Withdrawal from bond reserve account	Additional bond retirements	At end of year	
				Interest	Mandatory principal installments	Total bond service				Original [1954] Bonds outstanding	Bond reserve requirement
		(a)			(b)				(b)		(c)
1970	\$87,500	\$ 9,360	\$78,140	\$33,345	\$17,289	\$50,634	\$27,506	\$ 3,106	\$30,612	\$830,963	\$49,604
1971	87,500	9,734	77,766	31,611	17,993	49,604	28,162	1,352	29,514	783,456	48,252
1972	87,500	10,123	77,377	29,889	18,363	48,252	29,125	872	29,997	735,096	47,380
1973	87,500	10,528	76,972	28,134	19,246	47,380	29,592	1,073	30,665	685,185	46,307
1974	87,500	10,949	76,551	26,320	19,987	46,307	30,244	1,513	31,757	633,441	44,794
1975	87,500	11,387	76,113	24,435	20,359	44,794	31,319	990	32,309	580,773	43,804
1976	87,500	11,842	75,658	22,514	21,290	43,804	31,854	1,151	33,005	526,478	42,653
1977	87,500	12,316	75,184	20,507	22,146	42,653	32,531	1,986	34,517	469,815	40,667
1978	87,500	12,809	74,691	18,399	22,268	40,667	34,024	1,861	35,885	411,662	38,806
1979	87,500	13,321	74,179	16,228	22,578	38,806	35,373	1,131	36,504	352,580	37,675
1980	87,500	13,854	73,646	13,995	23,680	37,675	35,971	1,223	37,194	291,706	36,452
1981	87,500	14,408	73,092	11,682	24,770	36,452	36,640	2,471	39,111	227,825	33,981
1982	87,500	14,984	72,516	9,266	24,715	33,981	38,535	12,530	51,065	152,045	21,451
1983	87,500	15,583	71,917	6,267	15,184	21,451	50,466	2,194	52,660	84,201	19,257
1984	87,500	16,206	71,294	3,466	15,791	19,257	52,037	19,257	68,410	—	—

## NOTES:

(a) Actual operating and maintenance expenses of \$9,000,000 in 1969 have been estimated by the Authority for the purpose of this table to increase by 4% annually.

(b) Calculated without inclusion of redemption premiums or deduction of possible discounts on purchases as permitted by the 1954 bond resolution. Such resolution requires that an amount equal to 40% of current bond service requirements be applied to retire additional bonds of each series in the proportion that bond service for each series bears to aggregate bond service. For the purpose of this table the Authority has assumed that amounts in excess of such requirement are applied to retire additional bonds in the same manner.

(c) Equals ensuing year's bond service."

## ESTIMATED REVENUES AND OPERATING EXPENSES OF 1970 PROJECT

The following table shows the Authority's projection of estimated revenues and operating expenses of the 1970 Project for the period January 1, 1975 through December 31, 1984 and the actual revenues and operating expenses for the period August 1, 1974 through December 31, 1974. Revenues from the FitzPatrick plant have been projected on the basis that capacity will be sold at the rate of \$1.90 per kilowatt of monthly demand on sales of 700,000 kilowatts and energy will be sold at 3.4 mills per kilowatt-hour, with the plant operating at 70% of capacity, resulting in an average rate of 6.57 mills per kilowatt-hour. Revenues from the Blenheim-Gilboa project have been projected on the basis that peaking capacity will be sold at the rate of \$1.35 per kilowatt of monthly demand on sales of 1,000,000 kilowatts. Blenheim-Gilboa energy will be flexibly priced to recover the full cost of pumping energy and no net revenue from such energy sales is reflected herein.

		(000's omitted)							
		Estimated revenues				Estimated operating expenses			
Calendar Year		Fitz-Patrick plant	Blenheim-Gilboa project	Interest earnings	Total	Nuclear fuel expense	Fitz-Patrick plant	Blenheim-Gilboa project	Estimated net revenues
10 1974 (Actual 8/1-12/31) .....			\$ 7,611(a)	\$1,101	\$ 8,712			\$1,627(a)	\$ 7,085
1975 .....		\$25,941(b)	16,200	5,000	47,141	\$5,695	\$2,961(b)	1,813	36,672
1976 .....		33,076	16,200	5,000	54,276	9,500	3,695	1,886	39,195
1977 .....		33,076	16,200	5,100	54,376	8,500	3,843	1,961	40,072
1978 .....		33,076	16,200	5,100	54,376	8,500	3,996	2,040	39,840
1979 .....		33,076	16,200	5,100	54,376	8,500	4,156	2,121	39,599
1980 .....		33,076	16,200	5,100	54,376	8,500	4,322	2,206	39,348
1981 .....		33,076	16,200	5,100	54,376	8,500	4,495	2,294	39,087
1982 .....		33,076	16,200	5,100	54,376	8,500	4,675	2,386	38,815
1983 .....		33,076	16,200	5,100	54,376	8,250	4,862	2,481	38,783
1984 .....		33,076	16,200	5,100	54,376	8,000	5,056	2,581	38,739

Notes:

(a) Includes reimbursement for energy purchased for pumping.

(b) 1975 FitzPatrick revenues are based on the assumption that, since fuel loading began on November 1, 1974 and initial generation is expected in February, 1975, commercial operation will be attained by May 1, 1975. 1975 FitzPatrick operating expenses have been estimated in accordance with this schedule.

# ESTIMATED NET REVENUES AND BOND SERVICE APPLICABLE TO 1970 PROJECT

The following table shows the Authority's estimates of net revenues applicable to the 1970 Project and the use of such revenues to pay bond service and make accelerated retirements of the 1970 Bonds. Prior to the final retirement of the 1954 Bonds, which the Authority has covenanted to accomplish on or before January 1, 1985, net revenues of the 1970 Project are available for the 1970 Bonds. After such final retirement, net revenues of the 1954 Project are also available for the 1970 Bonds to the extent necessary to meet the 1.25 to 1.00 ratio between net revenues and bond service on the 1970 Bonds required by the 1970 Resolution on a cumulative annual basis after such retirement. Net revenues of the 1954 Project in excess of such requirement will be available for the General Purpose Bonds as shown under ESTIMATED NET REVENUES AND BOND SERVICE APPLICABLE TO BONDS ISSUED FOR ASTORIA 6.

BONDS ISSUED FOR ASTORIA O.

(000's omitted)												
	Estimated net revenues of 1970 Project	Estimated net revenues of 1954 Project applied to 1970 Bonds	Total estimated net revenues applied to 1970 Bonds	1970 Bonds			Ratio of estimated net revenues to bond service	Balance of estimated net revenues	Applied to (withdrawn from) bond reserve account	Applied to accelerated 1970 Bond retirements	At end of year	
				Interest	Principal Installments	Total Bond service					1970 Bonds out- standing	1970 Bond reserve account
					(a)			(b)	(b)	(a)	(a)	(b)
1974 (Actual 8/1-12/31)	\$ 7,085		\$ 7,085	\$15,791		\$15,791		(\$ 8,706)	(\$ 8,706)		\$654,000	\$66,968
1975	36,672		36,672	37,899		37,899		(1,227)	(1,227)		654,000	65,741
1976	39,195		39,195	37,899		37,899	1.03	1,296	1,296		654,000	67,037
1977	40,072		40,072	37,899		37,899	1.06	2,173	2,173		654,000	69,210
1978	39,840		39,840	37,899		37,899	1.05	1,941	1,941		654,000	71,151
1979	39,599		39,599	37,899		37,899	1.04	1,700	1,700		654,000	72,851
1980	39,348		39,348	37,899		37,889	1.04	1,449	1,449		654,000	74,300
1981	39,087		39,087	37,899		37,899	1.03	1,188	1,188		654,000	75,488
1982	38,815		38,815	37,899		37,899	1.02	916	230	\$ 686	653,314	75,718
1983	38,783		38,783	37,859		37,859	1.02	924	(122)	1,046	652,268	75,596
1984	38,739		38,739	37,798		37,798	1.02	941	(125)	1,066	651,202	75,471
1985	38,000	\$70,000	108,000(c)	37,735	\$11,145	48,880	(c)	59,120	(44,431)	103,551	536,506	31,040
1986	38,000	18,624	56,624(c)	31,040	11,870	42,910	(c)	13,714	(1,545)	15,259	509,377	29,495
1987	38,000	14,656	52,656	29,495	12,630	42,125	1.25	10,531	(1,393)	11,924	484,823	28,102
1988	38,000	13,940	51,940	28,102	13,450	41,552	1.25	10,388	(1,439)	11,827	459,546	26,663
1989	38,000	13,235	51,235	26,663	14,325	40,988	1.25	10,247	(1,477)	11,724	433,497	25,186
1990	38,000	12,539	50,539	25,186	15,245	40,431	1.25	10,108	(1,528)	11,636	406,616	23,658
1991	38,000	11,860	49,860	23,658	16,230	39,888	1.25	9,972	(1,584)	11,556	378,830	22,074
1992	38,000	11,205	49,205	22,074	17,290	39,364	1.25	9,841	(1,643)	11,484	350,056	20,431
1993	38,000	10,545	48,545	20,431	18,405	38,836	1.25	9,709	(1,716)	11,425	320,226	18,715
1994	38,000	9,894	47,894	18,715	19,600	38,315	1.25	9,579	(1,788)	11,367	289,259	16,927
1995	38,000	9,240	47,240	16,927	20,865	37,792	1.25	9,448	(1,887)	11,335	257,059	15,040
1996	38,000	8,569	46,569	15,040	22,215	37,255	1.25	9,314	(1,968)	11,282	223,562	13,072
1997	38,000	7,909	45,909	13,072	23,655	36,727	1.25	9,182	(2,048)	11,230	188,677	11,024
1998	38,000	7,255	45,255	11,024	25,180	36,204	1.25	9,051	(2,133)	11,184	152,313	8,891
1999	38,000	6,633	44,633	8,891	26,815	35,706	1.25	8,927	(2,228)	11,155	114,343	6,663
2000	38,000	6,016	44,016	6,663	28,550	35,213	1.25	8,803	(2,328)	11,131	74,662	4,335
2001	38,000	5,431	43,431	4,335	30,410	34,745	1.25	8,686	(2,437)	11,123	33,129	1,898
2002	38,000	3,411	41,411	1,898	31,231(d)	33,129	1.25	8,282	(1,898)	1,898	—	—
2003					(34,475)							
2004					(36,725)							
2005					(39,095)							
2006					(41,640)							
2007					(44,350)							
2008					(47,220)							
2009					(50,235)							

## NOTES:

- Principal installments and accelerated 1970 Bond retirements are made on January 1 of the year immediately following the year shown and are calculated without inclusion of redemption premiums or deduction of possible discounts on purchases as permitted by the 1970 Resolution. Funds for such installments and retirements are considered to have been deposited with the paying agents prior to December 31 in the year indicated and accordingly the principal amount of 1970 Bonds outstanding at year-end reflects such deposits.
- Because of delays in completion of the FitzPatrick plant, revenues in 1974 are inadequate to cover bond service, requiring application of a portion of the bond reserve account for that purpose. For the period 1975-1979, the balance of net revenues is paid into the bond reserve account. Commencing in 1980, the balance of net revenues and amounts in the bond reserve account in excess of the bond service requirement (two years' interest on the 1970 Bonds prior to final retirement of the 1954 Bonds and one year's interest thereafter) are applied to accelerated 1970 Bond retirements.
- The 1.25 ratio between net revenues and bond service is a cumulative annual requirement which must be met after the final retirement of the 1954 Bonds. Estimated 1985 and 1986 net revenues and the withdrawal from the bond reserve account in 1985 reflecting the reduction in the bond reserve account to one year's interest are sufficient to make up the cumulative requirement of the 1.25 ratio for the period 1974-1984 during which the Authority will not be in default if the 1970 Project net revenues, together with available amounts in the bond reserve account, are at least equal to bond service on the 1970 Bonds. Under the 1970 Resolution the Authority may apply such withdrawal from the bond reserve account to retirement of 1970 Bonds over the three years following the final retirement of the 1954 Bonds.
- On the basis indicated above and assuming the estimated net revenues as shown are realized, the 1970 Bonds would be retired in 2002. Without the accelerated retirements as shown, the principal installment for 2002 would be \$32,380,000.

## ESTIMATED REVENUES AND OPERATING EXPENSES OF ASTORIA 6

The following table shows the Authority's projection of estimated Revenues and Operating Expenses of Astoria 6 for the period September 1, 1976 through December 31, 1986. Revenues from power sales have been projected on the basis that power and energy will be sold at 31.2 mills per kilowatt-hour with the plant operating at 65% of capacity. Delivery service charges are excluded from estimated Revenues and Operating Expenses of Astoria 6. Interest earnings on the Bond Reserve Account have been projected at 8% in each year.

Calendar Year	Estimated Revenues (000's omitted)			Estimated Operating Expenses (a)			Estimated Net Revenues
	Power Sales	Interest Earnings	Total	Fuel Oil	Operating and Maintenance	Total	
1976 (9/1-12/31) ...	\$ 46,602	\$ 268	\$ 46,870	\$ 32,477	\$ 1,967	\$ 34,444	\$ 12,426
1977 .....	139,807	2,500	142,307	97,430	6,195	103,625	38,682
1978 .....	139,807	2,500	142,307	97,430	6,505	103,935	38,372
1979 .....	139,807	2,500	142,307	97,430	6,830	104,260	38,047
1980 .....	139,807	2,500	142,307	97,430	7,171	104,601	37,706
1981 .....	139,807	2,500	142,307	97,430	7,530	104,960	37,347
1982 .....	139,807	2,500	142,307	97,430	7,906	105,336	36,971
1983 .....	139,807	2,500	142,307	97,430	8,302	105,732	36,575
1984 .....	139,807	2,500	142,307	97,430	8,717	106,147	36,160
1985 .....	139,807	2,500	142,307	97,430	9,153	106,583	35,724
1986 .....	139,807	2,500	142,307	97,430	9,611	107,041	35,266

**NOTE:**

(a) Fuel oil is assumed to cost \$13.50 a barrel. Such figure does not include any increases which may result from actions presently being discussed to conserve energy. However, since fuel costs will be passed on to consumers, any increase or decrease in fuel oil costs will not result in any change in Net Revenues. Operating and maintenance expenses are escalated at 5% compounded annually from 1977 to 1986 for purposes hereof.

# ESTIMATED NET REVENUES AND BOND SERVICE APPLICABLE TO BONDS ISSUED FOR ASTORIA 6

The following table shows the Authority's estimates of net revenues applicable to the \$460,000,000 principal amount of Bonds assumed to be issued for Astoria 6 and the use of such revenues to pay bond service and make accelerated retirements of the Bonds. Prior to the final retirement of the 1954 Bonds, net revenues of Astoria 6 are available for the Bonds. After such final retirement, which the Authority has covenanted to accomplish on or before January 1, 1985, net revenues of the 1954 Project are available for the Bonds to the extent not first required, together with net revenues of the 1970 Project, to equal 1.25 times bond service on the 1970 Bonds on a cumulative basis. Net revenues of the 1970 Project in excess of 1.25 times bond service on the 1970 Bonds, if any, on a cumulative basis are also available for the Bonds. The table assumes annual net revenues from the 1954 Project and the 1970 Project of \$70,000,000 and \$38,000,000, respectively, commencing in 1985 and shows, for that year and for each year thereafter, the amount of estimated 1954 net revenues available for the Bonds after meeting the requirement for the 1970 Bonds explained above. The table assumes that the Bonds will be issued at an average rate of 7% with principal installments calculated on the basis of level bond service for 24 years commencing in 1987. The Authority intends to issue additional parity Bonds subject to the test for issuance of Bonds described under DESCRIPTION OF GENERAL PURPOSE BONDS.

Calendar Year	Estimated net revenues applicable to General Purpose Bonds			(\$460,000,000 General Purpose Bonds			Ratio of estimated net revenues to Bond service	Balance of estimated net revenues	Applied to accelerated Bond retirements	Estimated net revenues available for future Bonds and Projects	Withdrawal from Bond Reserve Account	Total acceler- ated Bond retire- ments	At end of year		
	Astoria 6	1954 Project	1970 Project	Total	Interest at 7 %	Principal instalments							Total Bond service	Bonds Out- standing	Bond Reserve Account
(a)							(b)		(a) (b)		(a)	(c)			
1976 (9/1-12/31)	\$12,426			\$ 12,426	\$10,733		\$10,733	1.16	\$ 1,693	\$1,610	\$ 83	\$ 121	\$1,731	\$458,269	\$32,079
1977	38,682			38,682	32,079		32,079	1.21	6,603	4,812	1,791	362	5,174	453,095	31,717
1978	38,372			38,372	31,717		31,717	1.21	6,655	4,758	1,897	358	5,116	447,979	31,359
1979	38,047			38,047	31,359		31,359	1.22	6,688	4,704	1,984	355	5,059	442,920	31,004
1980	37,706			37,706	31,004		31,004	1.22	6,702	4,651	2,051	350	5,001	437,919	30,654
1981	37,347			37,347	30,654		30,654	1.22	6,693	4,598	2,095	346	4,944	432,975	30,308
1982	36,971			36,971	30,308		30,308	1.22	6,663	4,546	2,117	342	4,888	428,087	29,966
1983	36,575			36,575	29,966		29,966	1.22	6,609	4,495	2,114	338	4,833	423,254	29,628
1984	36,160			36,160	29,628		29,628	1.22	6,532	4,444	2,088	335	4,779	418,475	29,293
1985	35,724			35,724	29,293		29,293	1.22	6,431	4,394	2,037	331	4,725	413,750	28,962
1986	35,266	\$51,376		86,642	28,962	\$ 7,905	36,867	2.35	49,775	5,530	44,245	1,011	6,541	399,304	27,951
1987	34,000	55,344		89,344	27,951	8,460	36,411	2.45	52,933	5,462	47,471	1,048	6,510	384,334	26,903
1988	34,000	56,060		90,060	26,903	9,055	35,958	2.50	54,102	5,394	48,708	1,087	6,481	368,798	25,816
1989	34,000	56,765		90,765	25,816	9,685	35,501	2.56	55,264	5,325	49,939	1,130	6,455	352,658	24,686
1990	34,000	57,461		91,461	24,686	10,365	35,051	2.61	56,410	5,258	51,152	1,176	6,434	335,859	23,510
1991	34,000	58,140		92,140	23,510	11,090	34,600	2.66	57,540	5,190	52,350	1,225	6,415	318,354	22,285
1992	34,000	58,795		92,795	22,285	11,865	34,150	2.72	58,645	5,123	53,522	1,279	6,402	300,087	21,006
1993	34,000	59,455		93,455	21,006	12,695	33,701	2.77	59,754	5,055	54,699	1,336	6,391	281,001	19,670
1994	34,000	60,106		94,106	19,670	13,585	33,255	2.83	60,851	4,988	55,863	1,398	6,386	261,030	18,272
1995	34,000	60,760		94,760	18,272	14,535	32,807	2.89	61,953	4,921	57,032	1,464	6,385	240,110	16,808
1996	34,000	61,431		95,431	16,808	15,555	32,363	2.94	63,068	4,854	58,214	1,537	6,391	218,164	15,271
1997	34,000	62,091		96,091	15,271	16,645	31,916	3.01	64,175	4,787	59,388	1,613	6,400	195,119	13,658
1998	34,000	62,745		96,745	13,658	17,810	31,468	3.07	65,277	4,720	60,557	1,696	6,416	170,893	11,962
1999	34,000	63,367		97,367	11,962	19,055	31,017	3.14	66,350	4,653	61,697	1,784	6,437	145,401	10,178
2000	34,000	63,984		97,984	10,178	20,390	30,568	3.21	67,416	4,585	62,831	1,880	6,465	118,546	8,298
2001	34,000	64,569		98,569	8,298	21,815	30,113	3.27	68,456	4,517	63,939	1,982	6,499	90,232	6,316
2002	34,000	66,589	\$ 8,282	108,871	6,316	23,345	29,661	3.67	79,210	4,449	74,761	2,092	6,541	60,346	4,224
2003	34,000	70,000	38,000	142,000	4,224	24,975	29,199	4.86	112,801	4,380	108,421	2,209	6,589	28,782	2,015
2004	34,000	70,000	38,000	142,000	2,015	26,725(d)	28,740	4.94	113,260	42	113,218	2,015	2,057	—	—
2005						(28,595)									
2006						(30,595)									
2007						(32,740)									
2008						(35,030)									
2009						(37,485)									

- NOTES:
- Principal installments and accelerated Bond retirements are made on January 1 of the year immediately following the year shown and are calculated without inclusion of redemption premiums or deduction of possible discounts on purchases as permitted by the Resolution. Funds for such installments and retirements are considered to have been deposited with the paying agents prior to December 31 in the year indicated and accordingly the principal amount of Bonds outstanding at year-end reflects such deposits.
  - The balance of estimated net revenues equal to 15% of bond service is paid into the bond reserve account and, for the purpose of this table such balance, together with the reduction in the bond reserve account, is applied to accelerated Bond retirements at the end of each year.
  - Equals next year's interest.
  - On the basis indicated above and assuming the estimated net revenues as shown are realized, the Bonds would be retired in 2004.

STATEMENT OF CONDITION—December 31, 1974

ASSETS

	1954 Project	1970 Project	General Purpose Project	Total
	(In Thousands)			
Expenditures for Electric Plant:				
In Service .....	\$1,092,265	\$188,188		\$1,280,453
Construction Work in Progress .....	4,915	371,302	\$221,772	597,989
Cash (includes Time Deposits) .....	53,347	29,549	15,200	98,096
Investment in U.S. Government Securities at Cost (Principal \$130,522,000) .....	52,442	58,405	17,176	128,023
U.S. Government Securities purchased under agreement to resell, at cost .....			35,000	35,000
Interest Receivable on Investments and Time Deposits .....	2,871	3,960	338	7,169
Receivables—Power Sales, etc. ....	10,122	1,668		11,790
Deposits .....	1,359			1,359
Materials and Supplies (at average cost) ..	3,383	136		3,519
Prepayments and Other Assets .....	950	138		1,088
Preliminary Investigations .....			19,267	19,267
Intra Authority Balances .....	288	(286)	(2)	
	<u>\$1,221,942</u>	<u>\$653,060</u>	<u>\$308,751</u>	<u>\$2,183,753</u>

LIABILITIES AND OTHER CREDITS

Bonds Outstanding .....	\$ 478,912	\$654,000		\$1,132,912
Promissory Notes Payable .....			\$150,000	150,000
Bond Anticipation Notes Payable .....			125,000	125,000
Retained on Contracts .....	280	1,966		2,246
Accounts Payable and Accrued Liabilities ..	4,858	1,415	33,751	40,024
Total Liabilities .....	<u>484,050</u>	<u>657,381</u>	<u>308,751</u>	<u>1,450,182</u>

Bonds Retired From:

Bond Service .....	196,067			196,067
Bond Reserve .....	231,848			231,848
General Reserve .....	195,223			195,223
	<u>623,138</u>			<u>623,138</u>

Revenues Allocated To:

Bond Service .....	7,480	1,036		8,516
Bond Reserve .....	30,693	(5,585)		25,108
General Reserve .....	18,293			18,293
Insurance and Improvement Fund ....	27,611			27,611
Working Capital .....	23,136	201		23,337
Additions to Electric Plant .....	7,541	27		7,568
	<u>114,754</u>	<u>(4,321)</u>		<u>110,433</u>
	<u>\$1,221,942</u>	<u>\$653,060</u>	<u>\$308,751</u>	<u>\$2,183,753</u>



## 1954 PROJECT

### *St. Lawrence Project*

The construction and operation of the United States portion of the St. Lawrence Project was authorized by a 50-year license issued to the Authority by the Federal Power Commission effective as of November 1, 1953. It was financed by the sale of the \$335,000,000 1954 Bonds of the Authority in 1955.

The St. Lawrence Project begins about 67 miles downstream from Lake Ontario, in the International Rapids section of the St. Lawrence River and continues for about 40 miles further downstream. It consists of two major dams, the Iroquois Dam and the Long Sault Dam, Barnhart Island power plant (which is also a dam, the United States half of which has been designated the Robert Moses Power Dam), power generating and transforming facilities, extensive channel works, and dikes and wing dams. All power is generated at the Barnhart Island power plant, the United States half of which is located in the Town of Massena, approximately 300 miles north of New York City and 240 miles northeast of Buffalo.

The power plant contains thirty-two 57,000 kw generators, for a rated capacity of 1,824,000 kw, half of which, or 912,000 kw, is installed on the United States side of the border. Power is sold in three categories: firm capacity and energy, marketed at a load factor averaging approximately 85%; interruptible capacity and energy, available for substantial periods of time at 100% load factor but subject to interruption; and secondary energy, available intermittently during times of very high stream flow. At present 800,000 kw of the St. Lawrence Project capacity are considered firm.

Commercial production of power started in July, 1958. The last of the 16 generating units on the United States side was installed in July, 1959.

### *Niagara Project*

The Niagara Project is the hydro-electric power project constructed by the Authority at Niagara Falls, New York, to develop and utilize the full United States share of the waters of the Niagara River available for power pursuant to a treaty in 1950 between the United States and Canada. First power was generated in January, 1961 and the final generator went into commercial operation in October, 1962.

The Niagara Project consists of a water intake, waterways, a pump-generating plant (the Lewiston Pump-Generating Plant) with storage reservoir, a generating plant (the Robert Moses Niagara Power Plant), and power transformation and transmission facilities.

Drainage from four of the Great Lakes—Superior, Michigan, Huron and Erie—flows through the Niagara River into Lake Ontario. This large flow, coupled with the abrupt change in elevation between Lake Erie and Lake Ontario which forms Niagara Falls, makes possible this major hydro-electric development.

The Moses Plant houses thirteen 150,000 kw generators totalling 1,950,000 kw; the pump-generating plant houses twelve 20,000 kw units totalling 240,000 kw. The entire name plate capacity is 2,190,000 kw but the plants have been found capable of producing 2,400,000 kw of firm and peaking capacity and can produce over 2,600,000 kw under favorable conditions.

In 1958 the Federal Power Commission issued to the Authority a license for a period of 50 years, effective as of September 1, 1957, for the construction, operation and maintenance of the Niagara Project.

The Niagara Project was financed by the sale of a total of \$737,000,000 1954 Bonds of the Authority issued between 1959 and 1963.

### *Transmission Lines*

The St. Lawrence and Niagara transmission lines, which were financed by 1954 Bonds in the aggregate principal amount of \$30,050,000, comprise:

(a) one 230 kv transmission line from the St. Lawrence Project switchyard to Plattsburgh, N. Y., a substation at that point and short extensions to Vermont, the Plattsburgh Air Force Base and a connection with New York State Electric & Gas Corporation near Saranac, N. Y.;

(b) extensions and improvements to two St. Lawrence Project 230 kv lines between Massena and Taylorville, N. Y., including a switching substation at Adirondack, N. Y.;

(c) three 115 kv lines, each about four miles long, to supply Reynolds Metals Company at Massena, a substation at its plant and a further short extension at 13,800-volts to supply General Motors Corporation; and

(d) one 345 kv line from Rochester to Utica with related facilities in the Niagara Project switchyard.

Two 345 kv circuits extending from the Niagara Project switchyard to Rochester and one 345 kv circuit between Rochester and Utica were financed and built by the Authority as part of the Niagara Project.

#### *Power Sales*

The Authority's rates for St. Lawrence and Niagara Project power and energy apply to power and energy at the power plant switchyards. The rate for wholesale firm power established in 1955 is \$1.00 per month per kilowatt of capacity plus 2.67 mills per kilowatt-hour of energy, resulting in an average rate for power and energy of 4 mills per kilowatt-hour. It applies to both the St. Lawrence and Niagara Projects. Peaking power and energy from the Niagara Project are sold at the same rates as firm power and energy. Peaking power differs from firm power only in that the amount of energy supplied with the power is limited to 12½ percent load factor, i.e., only enough energy is supplied to permit use of the power during a few hours per day when the purchasing utility's loads are at peak levels. Interruptible energy is sold by the St. Lawrence Project at 2.67 mills per kilowatt-hour, with no capacity charge. This is energy that can be supplied continuously for substantial periods in good water years but may not be available at all in some of the drier years. There is also a rate of 2.0 mills per kilowatt-hour for "secondary energy", i.e., energy of intermittent availability which because of its irregularity and the unfavorable periods of its availability commands only a minimum price. Authority sales at this rate have been negligible.

All power and energy from both the St. Lawrence and Niagara Projects is sold under contracts with three New York utility companies, 42 municipally and cooperatively owned electric systems in New York State, three industrial plants at Massena, the Plattsburgh Air Force Base, the State of Vermont and a rural cooperative with members in the states of Pennsylvania and New Jersey.

The power contracts generally terminate June 30, 1985. Exceptions are Allegheny Electric Cooperative, Inc. (1978); U. S. Air Force (1976); the 50,000 kw Niagara Project contract with the Public Service Board of the State of Vermont (1979); the utility companies' Niagara Project contracts (1990 except 2006 for the 445,000 kw of replacement power sold to Niagara Mohawk if it so elects); General Motors Corporation and Reynolds Metals Company (1992); and Aluminum Company of America (1996) with half withdrawable at the option of the Authority in 1986.

The Niagara Project contracts with Niagara Mohawk Power Corporation, New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation provide that certain amounts designated as withdrawable firm power are subject to withdrawal on suitable notice when needed by the Authority to meet the growing requirements of the electric systems of public bodies and cooperatives. Public Law 85-159 mandated that there be sales subject to such withdrawal as a means of providing for the reasonably foreseeable needs of such systems. The total amount of such withdrawable power for all three companies was initially 430,000 kilowatts. Withdrawal of 215,000 kilowatts has since reduced the withdrawable total to 215,000 kilowatts.

Rates under all contracts are subject to periodic modification by the Authority. In the event of a rate increase the purchaser is given the right to terminate the contract subject to the following:

1. New York municipalities and cooperatives, Reynolds Metals Company, and the Public Service Board of the State of Vermont may not terminate their contracts because of a change in rates until the costs of any transmission facilities which the Authority may acquire or construct for the purpose of delivering power and energy to the purchaser have been completely amortized, unless the Authority determines that adequate use can be made of such facilities for the transmission

of power to others; in addition the St. Lawrence Project contracts with the Public Service Board of the State of Vermont and the City of Plattsburgh, N. Y., bar termination until the Authority has effected a termination of any agreements with others for wheeling power to the purchaser and the purchaser has paid the Authority any costs incurred by it in effecting termination.

2. Allegheny Electric Cooperative and the New York State cooperatives may terminate their contracts if the costs of transmission are increased.

3. Neither Aluminum Company of America nor Reynolds Metals Company may terminate its contract unless the capacity charge for firm power rises to more than \$1.10 per month per kilowatt or the energy charge for either firm or interruptible energy is increased above 2.67 mills per kilowatt-hour, and then either may do so in whole or in part. Each has a further option to increase its purchase of interruptible power and energy and correspondingly reduce its purchase of firm power and energy if at the time the Authority has the additional interruptible available and not under contract to others.

4. A purchaser terminating its contract because of a rate change may select the date of termination within a period not less than 6 months or more than 3 years (4 years in Niagara Project contracts) from date of notice, in which event the rate change will not become effective for that purchaser for the remaining term or two years, whichever is lesser.

Each contract contains various limitations on the obligations of the parties under particular circumstances including, among other things, provisions for adjustment of charges in case of interruption or reduction in the supply of power and for suspension of obligations when the Authority is unable to deliver power or in certain cases when the purchaser is unable to accept it because of forces beyond the control of the parties.

The Authority's enabling legislation gives it full authority to establish and modify its rates as necessary for the financial requirements of the projects.

#### *Power Sales and Revenues*

The following table shows power sales and operating revenues (exclusive of interest) of the St. Lawrence and Niagara Projects by years from initial operation to December 31, 1974.

Year	Energy Sales*		Revenues*		
	KWH (1000's)	From Power	From Use of Transmission Lines	From Wheeling Charges	Total
1958 .....	1,285,560	\$ 4,345,696	\$ 307,950	\$ 17,901	\$ 4,671,547
1959 .....	5,547,343	20,495,739	1,937,529	290,612	22,723,880
1960** .....	6,194,552	24,509,004	1,746,763	297,569	26,553,336
1961 .....	12,830,254	45,613,516	1,703,314	403,779	47,720,609
1962 .....	15,783,266	59,045,185	2,821,491	660,835	62,527,511
1963*** .....	16,483,579	64,757,453	2,420,908	802,318	67,980,679
1964 .....	16,306,466	69,040,117	2,552,395	798,858	72,391,370
1965 .....	17,891,473	78,163,168	3,330,981	817,354	82,311,503
1966 .....	19,251,242	84,954,912	4,198,128	1,037,934	90,190,974
1967 .....	19,753,704	88,330,631	4,125,577	1,331,119	93,787,327
1968 .....	20,796,780	91,595,592	4,338,799	1,453,096	97,387,487
1969 .....	22,234,733	96,508,443	4,339,810	1,739,241	102,587,494
1970 .....	20,882,750	93,208,530	4,375,523	1,877,987	99,462,040
1971 .....	21,130,429	93,950,742	4,414,332	2,014,484	100,379,558
1972 .....	22,705,862	98,582,787	4,509,747	2,233,729	105,326,263
1973 .....	24,803,717	106,627,339	4,611,265	2,481,194	113,719,798
1974 .....	24,597,450	105,994,911	4,632,214	2,619,917	113,247,042

\* Inter-project sales and revenues are included in years 1958-1966.

\*\* First full year with full capacity at St. Lawrence Project.

\*\*\* First full year with full capacity at Niagara Project.

## BOND SERVICE COVERAGE ON 1954 BONDS 1969-1974

The following table shows the ratio of net revenues to bond service on the 1954 Bonds for the years 1969 through 1974, calculated as required by the 1954 Resolution. The table shows cash operating revenues for each year and the transfer of such revenues to various accounts in the order of priority established under the 1954 Resolution.

	(000's omitted)					
	1969	1970	1971	1972	1973	1974
Operating Revenues						
Sales of power .....	\$102,088	\$ 99,289	\$100,780	\$104,308	\$114,269	\$113,281
Earnings on investments and other income .....	5,546	7,134	5,374	5,286	7,135	8,318
Total Revenues .....	107,634	106,423	106,154	109,594	121,404	121,599
Transfer of revenues to Operating Fund (1) .....	11,600	14,075	12,500	13,000	17,750	19,350
Net Revenues .....	<u>\$ 96,034</u>	<u>\$ 92,348</u>	<u>\$ 93,654</u>	<u>\$ 96,594</u>	<u>\$103,654</u>	<u>\$102,249</u>
Transfer of Net Revenues to:						
Bond Service Account(2) .....	\$ 50,526	\$ 48,331	\$ 46,440	\$ 44,206	\$ 41,949	\$ 39,429
Bond Reserve Account(3) .....	20,210	19,332	18,576	17,683	16,779	15,772
Insurance and Improvement Fund(4) .	16,676	—	—	1,000	—	1,200
General Reserve Account(5) .....	8,622	24,685	28,638	33,705	44,926	45,848
	<u>\$ 96,034</u>	<u>\$ 92,348</u>	<u>\$ 93,654</u>	<u>\$ 96,594</u>	<u>\$103,654</u>	<u>\$102,249</u>
Ratio of Net Revenues to Bond Service ..	1.90	1.91	2.02	2.19	2.47	2.59

### NOTES:

(1) Amounts in addition to current requirements for operating expenses were paid into the operating fund until a working fund reserve of approximately \$20,000,000 was reached in 1968. Since 1968 amounts sufficient to pay current operating expenses, certain plant additions and modifications and to maintain such a reserve were paid into the operating fund.

(2) Aggregate bond service on 1954 Bonds.

(3) Net revenues remaining after payment of aggregate bond service are paid into the bond reserve account in an amount equal to 40% of current bond service requirements and such further amount as required to equal aggregate bond service for the ensuing year. Amounts in such account in excess of this requirement were applied to retire the following principal amounts of 1954 Bonds: 1969—\$27,727,000; 1970—\$29,732,000; 1971—\$25,370,000; 1972—\$21,511,000; 1973—\$20,561,000; 1974—\$21,812,000.

(4) Since 1967 the Authority has built up an insurance and improvement fund for the 1954 Project of \$30,531,000 from which \$3,220,100 were disbursed during 1971, 1972 and 1974.

(5) Amounts in the general reserve account may, at the Authority's option, be used to retire 1954 Bonds. In 1969, \$7,148,000 principal amount of 1954 Bonds were retired at a cost of \$4,807,000; in 1970 \$32,349,000 at a cost of \$24,713,000; in 1971 \$33,409,000 at a cost of \$29,635,000; in 1972 \$34,932,000 at a cost of \$32,207,000; in 1973 \$46,851,000 at a cost of \$44,455,000; in 1974 \$40,654,000 at a cost of \$37,312,350.

## 1970 PROJECT

### *James A. FitzPatrick Nuclear Power Plant*

The FitzPatrick plant is a single-unit electric power generating facility using a nuclear reactor of the boiling water type. The plant is located on the south shore of Lake Ontario, seven miles northeast of Oswego, in the Town of Scriba, New York. It will have a net output of approximately 821,000 kw. Its principal elements are a nuclear steam generating system, a turbine-generator unit, 345 kv and 115 kv switchyards, lake water pumping facilities complete with intake and discharge structures, plant auxiliary equipment, instrumentation, controls and other associated accessories. The Authority has received an operating license from the Atomic Energy Commission and is conducting start-up and power ascension tests. Commercial operation is expected by May 1975.

A 345 kv transmission line will transmit power from the plant. The line is located in Oswego and Oneida Counties, New York, and runs in a southeasterly direction connecting with the existing cross-state 345 kv transmission system near Utica, New York. The line is part of a strong network serving the New York State power market area with connections to Pennsylvania, New England and Ontario. The system connects existing large plants of the Authority and upstate utilities, and has the capability of delivering power for pumping to the Blenheim-Gilboa project through bulk power transmission facilities owned by the Authority and others.

### *Blenheim-Gilboa Pumped Storage Power Project*

The Blenheim-Gilboa project is located in the towns of Blenheim and Gilboa, Schoharie County, New York. The power plant contains four pump generating units each with a capability as generators of 250,000 kw and is located on Schoharie Creek, about 4.5 miles downstream from Gilboa Dam which impounds Schoharie Reservoir, a portion of the New York City water supply system.

The project consists of a lower reservoir on Schoharie Creek, formed by a dam about 1.1 miles downstream from the power plant site; the 1,000,000 kw pump generating power plant; an upper reservoir; water conduits connecting the pump generating units with the upper reservoir; power transformation and transmission facilities; certain recreation and visitor facilities and access roads. The power transformer for each unit transforms the voltage to 345 kv for transmission. The power house also includes administration offices, erection bay, shop and storage areas.

The project as licensed includes three 345 kv transmission lines which constitute important links in the inter-connected transmission grid in the State, connecting the project to three substations of the existing 345 kv transmission system of the State, which connects to systems in surrounding states. The project and two of the lines have been completed and are in service. These transmission lines are transmitting pumping power from available energy sources to the project and delivering power generated at the project into the 345 kv system under all situations of system stability and load conditions. The design and location of the third line have been approved by an Administrative Law Judge of the Federal Power Commission subject to review by the Commission.

### *Power Sales Rates*

The Authority has completed contracts terminating June 30, 2002 for the sale of firm capacity of the Blenheim-Gilboa Project (which capacity is withdrawable at the option of the Authority) as follows:

Niagara Mohawk Power Corporation .....	550,000 kw
New York State Electric & Gas Corporation .....	200,000
Rochester Gas & Electric Corporation .....	150,000
Central Hudson Gas & Electric Corporation .....	100,000
Total .....	1,000,000 kw

The rate for this firm service has been established at (i) \$1.35 per month per kilowatt of contract demand plus (ii) the cost to the Authority of energy required to pump the water into storage for subsequent use in power generation as this will vary from time to time. Energy from the Authority's other projects used for pumping will be priced at established rates of those projects. The Blenheim-Gilboa Project has some additional nonfirm capacity which the Authority will market under terms appropriate to its varying availability.

As of December 31, 1974, twelve contracts have been negotiated for the sale of a total of 314,600 kw of power from the FitzPatrick plant to industrial establishments qualifying as high load factor manufacturers. The remaining 385,400 kw of firm power is not now required by municipal systems or cooperatives and thus will be sold to seven major New York State utility systems subject to withdrawal as needed to meet the future requirements of municipal and cooperative systems and other public bodies. In addition, 186,600 kw of power to be sold to the industrial establishments will not initially be needed by them and have been allocated to the utility systems.

The rate for the sale of firm power from the FitzPatrick plant has been established at \$1.90 per month per kilowatt of demand plus 3.4 mills per kilowatt-hour of energy resulting in an average rate of 6.57 mills per kilowatt-hour. Such rates are based on an annual output of 5.034 billion kwh which is equivalent to rated output of 821,000 kw for 70% of the time. If the plant should be required to operate normally at less than full rated power pending further studies, as some boiling water reactor plants have recently been required to do, the rates would be adjusted accordingly to produce substantially the same amount of revenue.

The rates for power from both plants have been fixed at levels which the Authority estimates will be sufficient to comply with the rate covenant in the 1970 Resolution. The contracts for the sale of the power provide for rate adjustments by the Authority from time to time.

## **DESCRIPTION OF GENERAL PURPOSE BONDS AND SUMMARY OF CERTAIN PROVISIONS OF THE RESOLUTION**

### **Definitions**

The following are definitions in summary form of certain terms contained in the Resolution and used hereinafter:

*Accrued Bond Service:* The sum of the amounts of accrued Bond Service for all series of Bonds, calculating accrued Bond Service for each series as the sum of interest unpaid and accruing on the Bonds of such series or on Bond Anticipation Notes issued in anticipation thereof and of that portion of the next Principal Installment for such series which would accrue (if deemed to accrue in the same manner as interest) to the end of the then current calendar month.

*Aggregate Bond Service:* The sum of the amounts of Bond Service for any period with respect to all Bonds and Bond Anticipation Notes.

*Authorized Certificates of Deposit:* Certificates of deposit issued by any bank, trust company or national banking association which is a member of the Federal Reserve System and which shall be continuously secured by the obligations included in (i) and (ii) of *Investment Securities*.

*Bond Anticipation Notes:* Notes of the Authority issued in anticipation of Bonds and payable out of the proceeds thereof or from moneys available therefor and not pledged under the Resolution.

*Bond Reserve Requirement:* An amount equal to one year's interest on all Bonds and Bond Anticipation Notes.

*Bond Service:* For any period, and with respect to Bonds of any series, the sum of interest, other than interest being paid from the Temporary Interest Fund, accruing thereon or on Bond Anticipation Notes issued in anticipation of such Bonds, and that portion of each Principal Installment for such series which would accrue (if deemed to accrue in the same manner as interest), during such period.

*Cost of Construction:* With respect to a Project, the Authority's costs of physical construction and acquisition, and incidental costs of the Authority, including legal, administrative, engineering, consulting and technical services, financing and insurance costs, amounts required by the Resolution or any supplemental resolution to be paid into the Temporary Interest Fund, the Operating Fund or the General Fund, payments on any indebtedness of the Authority (other than Bonds or Bond Anticipation Notes or notes issued for Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study) incurred for such Project, costs of equipment and supplies, costs of fuel, fuel assemblies and components, or interests therein, required for commencement of and initial operation of such Project, initial working capital and reserves, and other costs properly attributable to such construction or acquisition.

*Investment Securities:* Any of the following: (i) direct obligations of or obligations guaranteed by the United States or the State of New York; (ii) bonds, debentures or notes issued by any of the following federal agencies: Banks For Cooperatives; Federal Intermediate Credit Banks; Federal Home Loan Bank System; Export-Import Bank of the United States; Federal Land Banks; the Government National Mortgage Association; Federal National Mortgage Association if guaranteed by the Government National Mortgage Association or Federal Financing Bank or any other agency or instrumentality of the Federal Government established to acquire obligations of the foregoing or provide financing therefore; (iii) Public Housing Bonds or Project Notes, fully secured by contracts with the United States; or (iv) full faith and credit general obligations of any State or political subdivision, provided that at the time of purchase such obligations are rated in either of the two highest rating categories by two nationally recognized bond rating agencies and are legal investments for fiduciaries in New York.

*Operating Expenses:* The Authority's expenses for operation, maintenance, repairs and ordinary replacement of a Project and on and after the Retirement Date of the 1954 Bonds and the Retirement Date of the 1970 Bonds, the payment of such expenses for the 1954 Project, the 1970 Project and any 1970 Project Improvement, including costs of fuel, fuel assemblies and components required for the operation of a Project including payments into the Fuel Reserve Account, applicable administrative expenses, insurance premiums, legal and engineering expenses, consulting and technical services, payments to pension or employees' welfare funds, any payments in lieu of taxes agreed to by the Authority or any taxes, or any governmental charges, and any other applicable expenses required to be paid by the Authority, together with the expenses, liabilities and compensation of the Trustee and paying agents for the bonds and financing costs of refunding Bonds.

*1954 Bonds:* General Revenue Bonds of the Authority heretofore issued pursuant to the 1954 Resolution.

*1970 Bonds:* Revenue Bonds of the Authority heretofore or hereafter issued pursuant to the 1970 Resolution.

*Projects' Study:* Preliminary efforts of the Authority to determine appropriate methods to fulfill its purposes authorized by the Act.

*Principal Installment:* (i) The principal amount of Bonds of like series for which no sinking fund installments shall have been established, (ii) any sinking fund installment established for Bonds of such series, or (iii) the sum of such principal amount and of such sinking fund installment if due on the same date; in each case in the amounts and on the dates as provided in the supplemental resolution authorizing such series.

*Project:* Any project directly or indirectly related to power generation or transmission whether owned jointly or singly by the Authority, including any output in which the Authority has an interest, heretofore or hereafter authorized by the Act and hereafter specified in a Supplemental Resolution.

*1954 Project:* The Authority's existing St. Lawrence Project, Niagara Project, and Transmission Line Project financed under the 1954 Resolution.

*1970 Project:* The Authority's existing Blenheim-Gilboa Pumped Storage Power Project, the James A. FitzPatrick Nuclear Power Plant Project and transmission lines financed under the 1970 Resolution.

*1970 Project Improvement:* Any Project Improvement as defined and financed under the 1970 Resolution.

*Retirement Date of the 1954 Bonds:* The date on which all of the 1954 Bonds will be finally paid or provision for their payment made in accordance with the provisions of the 1954 Resolution.

*Retirement Date of the 1970 Bonds:* The date on which all of the 1970 Bonds will be finally paid or provision for their payment made in accordance with the provisions of the 1970 Resolution.

*Revenues:* All revenues, rates, fees, charges and other income and receipts derived from the operation of any Project or any other project of the Authority heretofore or hereafter authorized by the Act, together with interest on any moneys or securities of the Authority (other than moneys or securities in any construction fund or temporary interest fund. Application of the revenues from the 1954 and 1970 Projects is subject and subordinate in all respects to the charge or lien of the 1954 Resolution and the charge or lien of the 1970 Resolution, respectively.

*(General Purpose Bond Resolution, Section 101)*

## **Pledge of Revenues and Funds**

The full faith and credit of the Authority are pledged for the payment of the principal and redemption price of, interest on, and sinking fund installments for, the Bonds in accordance with

their terms and the provisions of the Resolution. In addition, there are pledged for such payment subject only to the provisions of the Resolution permitting the application thereof (and of any pledge of Bond Proceeds under the Resolution regarding Bond Anticipation Notes), for the purposes and on the terms and conditions set forth in the Resolution, (i) the proceeds of sale of the Bonds, (ii) subject to the charge or lien created by the 1970 Resolution (a) on and after the Retirement Date of the 1954 Bonds all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1954 Project, (b) all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1970 Project or any 1970 Project Improvement, and (iii) all revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of any Project or any other project of the Authority heretofore or hereafter authorized pursuant to the Act, all funds created in connection therewith, and interest received on any moneys and securities of the Authority, subject to the provisions of the Resolution permitting the application thereof for the purposes and on the terms and conditions set forth in the Resolution. The pledge of the revenues, rates, fees, charges, rents and other income and receipts as derived in cash by or for the account of the Authority from the operation of the 1954 Project, the 1970 Project or any 1970 Project Improvement shall be subject and subordinate in all respects to the charge or lien created by the 1954 Resolution and to the charge or lien created by the 1970 Resolution.

(Bond Res., Sec. 501)

#### Trustee

The Chase Manhattan Bank, N.A. is the Trustee under the Resolution.

#### Paying Agent

The Morgan Guaranty Trust Company of New York is the Paying Agent for the Series A Bonds.

#### Series A Bonds, Being Issued

*Principal Amount, Date, Interest and Maturities:* The Series A Bonds are to be issued in the principal amount of \$150,000,000, and will be dated and will bear interest from February 1, 1975. They will mature on January 1, in the years and in the principal amounts, and bear interest (payable on July 1, 1975 and semiannually thereafter on each January 1 and July 1) at the respective rates, shown as follows:

<u>January 1</u>	<u>Amount Maturing</u>	<u>Interest Rate</u>	<u>January 1</u>	<u>Amount Maturing</u>	<u>Interest Rate</u>
1987 .....	\$2,150,000	6½%	1992 .....	\$3,015,000	7.10%
1988 .....	2,300,000	6.65	1993 .....	3,225,000	7.20
1989 .....	2,460,000	6.80	1994 .....	3,450,000	7¼
1990 .....	2,635,000	6.90	1995 .....	2,950,000	7.30
1991 .....	2,815,000	7	2010 .....	125,000,000	7⅞

(Second Supplemental General Purpose Bond Resolution, Section 203)

*Sinking Fund Installments:* The Series A Bonds due January 1, 2010 will be entitled to sinking fund installments, due on the dates shown below, in amounts sufficient to redeem at the applicable redemption price (or to pay at maturity) the respective principal amounts shown below:

<u>January 1</u>	<u>Principal Amount</u>	<u>January 1</u>	<u>Principal Amount</u>	<u>January 1</u>	<u>Principal Amount</u>
1987 .....	\$430,000	1995 .....	\$1,480,000	2003 .....	\$7,610,000
1988 .....	460,000	1996 .....	4,740,000	2004 .....	8,145,000
1989 .....	490,000	1997 .....	5,070,000	2005 .....	8,715,000
1990 .....	525,000	1998 .....	5,425,000	2006 .....	9,325,000
1991 .....	565,000	1999 .....	5,805,000	2007 .....	9,975,000
1992 .....	605,000	2000 .....	6,215,000	2008 .....	10,675,000
1993 .....	645,000	2001 .....	6,650,000	2009 .....	11,425,000
1994 .....	690,000	2002 .....	7,115,000	2010 .....	12,220,000

(Second Supp. Res., Sec. 207)



**Redemption:** The Series A Bonds will be subject to redemption prior to maturity, on 30 days' published notice, in whole, or in part, in inverse order of maturities, on January 1, 1985, or any date thereafter, at the respective redemption prices (expressed as percentages of the principal amount) set forth below, together with accrued interest to the redemption date:

Period During Which Redeemed (both dates inclusive)	Redemption Prices	
	In whole	In part
January 1, 1985 to December 31, 1987 .....	104%	100%
January 1, 1988 to December 31, 1990 .....	103	100
January 1, 1991 to December 31, 1993 .....	102	100
January 1, 1994 to December 31, 1994 .....	101	100
January 1, 1995 and thereafter .....	100	100

(*Second Supp. Res., Sec. 206*)

**Order of Redemption or Purchase:** If less than all the Series A Bonds are to be redeemed or purchased, the Series A Bonds due January 1, 2010 will first be redeemed or purchased. The other Series A Bonds will be retired only after or simultaneously with the retirement of the Series A Bonds due January 1, 2010 and will be redeemed in inverse order of maturities (commencing with the redemption of the last maturity). If less than all of the Bonds of any maturity are to be redeemed, the particular Bonds of such maturity will be selected by the Trustee by lot. (*Second Supp. Res., Sec. 206*)

**Form, Denominations and Interchangeability:** The Series A Bonds are to be issued as definitive Bonds in either coupon form or fully registered form, in the denominations of \$5,000 or any multiples of \$5,000 in the case of registered Bonds. Coupon and registered Bonds are interchangeable at the office of the Trustee upon payment of any charge made by the Authority or the Trustee to reimburse either of them for any tax, fee or other governmental charge required to be paid by them with respect to such exchange. (*Bond Res., Secs. 202, 301, 304, 308, Second Supp. Res., Sec. 204*)

#### Conditions for Issuance of Bonds

**Bonds for a Project:** One or more series of Bonds may be issued from time to time for the purpose of paying all or a portion of the Cost of Construction of one or more Projects in such principal amount as determined by the Authority as will provide the Authority with funds which, together with other available funds of the Authority, are substantially equal to such Cost of Construction as estimated by the Authority's consulting engineers at the time of issuance of the first series of Bonds for any such Project or Projects or, paying or providing for the payment of the principal of and interest on any Bond Anticipation Notes or for the purpose of making payments into the Projects' Study Fund. After the issuance of Bonds in such aggregate principal amount for a Project, one or more series of completion Bonds may be issued for such Project, only in such amounts as will provide the Authority with funds which, together with other available funds, are not in excess of the amount then estimated by such consulting engineers to be necessary and sufficient to complete payment of the Cost of Construction of such Project.

Each supplemental resolution authorizing a series of Bonds shall provide for Principal Installments sufficient to retire all Bonds of such series not later than the last maturity date of such series. Such Principal Installments shall be due commencing January 1, 1987 or if later, on a January 1 within 24 months after the latest estimated Date of Completion of the Project or Projects for which the proceeds of the series of Bonds will be applied and shall be in amounts which result in either (i) Bond Service for Bonds of such series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such series, or (ii) Bond Service for all Outstanding Bonds, including such series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of outstanding Bonds, including such Series, and for each 12-month period thereafter which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such Series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such series for any 12-month period after the latest

maturity of any series of any Outstanding Bonds previously issued may be in such amount as is specified in the supplemental resolution authorizing such series of Bonds.

Upon the issuance of each series of such additional Bonds there shall be deposited (i) in the Temporary Interest Fund the amount which is specified in the supplemental resolution authorizing such Bonds, and (ii) in the Bond Reserve Account the amount required so that such Account shall equal the Bond Reserve Requirement.

Each series of Bonds, any portion of the proceeds of which are to be applied to pay the Cost of Construction of any Project for which Bonds have not theretofore been issued shall be authenticated and delivered only upon receipt of, among other certificates, an Engineer's Certificate or Engineers' Certificates which set forth the estimated Cost of Construction of each uncompleted Project, or, in the case of each completed Project a certificate of an Authorized Officer which sets forth the Cost of Construction thereof, including any Project specified in the Supplemental Resolution authorizing such Series of Bonds for which the proceeds of such Bonds will be applied, an Engineer's Certificate or Engineers' Certificates which sets forth that there will be, at the estimated Date of Completion of any Project for which Bonds have not theretofore been issued, a market for the power or other output of such Project at the rates used by the Authority in computing the estimated Revenues of such Project, and a certificate of an authorized officer of the Authority stating that the average of estimated Revenues less estimated Operating Expenses for the five calendar years commencing in the year 1986, or if later, for the five calendar years commencing in the calendar year after the latest estimated Date of Completion of any Project will be at least 1.20 times maximum Aggregate Bond Service for all Bonds then estimated to be outstanding.

*(Bond Res., Sec. 203)*

*Refunding Bonds:* One or more series of Bonds may be issued to refund (i) all or part of the outstanding Bonds of one or more series, (ii) all of the 1954 Bonds, or (iii) all or part of the outstanding 1970 Bonds. Such series of Refunding Bonds shall be in a principal amount sufficient, with other available moneys, to accomplish the refunding and make the required deposit in the Bond Reserve Account. Refunding Bonds of each series may not mature earlier than the date of the latest maturity of the outstanding Bonds or 1954 Bonds to be refunded.

The supplemental resolution authorizing a series of Refunding Bonds to refund all or part of the Outstanding Bonds shall provide for Principal Installments due in each calendar year, commencing on the later of (i) one year from the date of such Refunding Bonds or (ii) the year when the next succeeding Principal Installment is due on the Outstanding Bonds being refunded, and shall continue to the date of the last maturity of the Refunding Bonds of such series, and shall be sufficient to retire all Refunding Bonds of such series not later than such last maturity date. Such Principal Installments shall be in amounts which result in either (i) Bond Service for Bonds of such series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such series, or (ii) Bond Service for all Outstanding Bonds, including such series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds, including such Series, and for each 12-month period thereafter which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such series as estimated by the Authority). Notwithstanding the foregoing Bond Service for such series for any 12-month period after the latest maturity of any series of any Outstanding Bonds previously issued may be in such amount as is specified in the supplemental resolution authorizing such series of Bonds. The issuance of such Refunding Bonds is also subject to the condition that the aggregate Bond Service for the then current and each future year is not increased by such refunding.

The supplemental resolution authorizing Refunding Bonds to refund 1954 Bonds must provide for Principal Installments commencing one year from the date of such Refunding Bonds sufficient to retire all such Bonds by their last maturity date. Such Principal Installments shall be in amounts which

result in either (i) Bond Service for Bonds of such series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such series, or (ii) Bond Service for all Outstanding Bonds, including such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds, including such Series for each 12-month period thereafter which shall not substantially exceed the amount of the Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such series for any 12-month period after the latest maturity of any series of any Outstanding Bonds previously issued may be in such amount as is specified in the supplemental resolution authorizing such series of Bonds. The issuance of such Refunding Bonds is also subject to receipt by the Trustee of evidence of the redemption of 1954 Bonds and the discharge and satisfaction of the pledge and other rights granted under the 1954 Resolution.

The supplemental resolution authorizing Refunding Bonds to refund 1970 Bonds must provide for annual Principal Installments commencing one year from the date of such Refunding Bonds or the year when the next Principal Installment is due on 1970 Bonds, whichever is later, and sufficient to retire such Refunding Bonds by their last maturity date. Such Principal Installments shall be in amounts which result in either (i) Bond Service for Bonds of such series on a substantially level annual basis for the 12-month period immediately preceding the due date of the first such Principal Installment and each 12-month period thereafter to and including the last maturity date of such series, or (ii) Bond Service for all Outstanding Bonds, including such Series, for the 12-month period immediately succeeding the due date of the latest initial Principal Installment of any Series of Outstanding Bonds, including such Series and for each 12-month period thereafter which shall not substantially exceed the amount of Bond Service for the preceding 12-month period (using in each case an average interest rate for the Bonds of such series as estimated by the Authority). Notwithstanding the foregoing, Bond Service for such series for any 12-month period after the latest maturity of any series of any Outstanding Bonds previously issued may be in such amount as is specified in the supplemental resolution authorizing such series of Bonds. The issuance of such Refunding Bonds is also subject to receipt by the Trustee of evidence of the redemption of 1970 Bonds and the discharge and satisfaction of the pledge and other rights granted under the 1970 Resolution.

*(Bond Res., Sec. 204)*

*Bond Anticipation Notes:* In anticipation of the issuance of any Bonds, Bond Anticipation Notes may be issued at any time. Proceeds of such Bonds may be pledged for the payment of the principal of and interest on such Notes and any such pledge will have priority over any other pledge under the Resolution. Note proceeds will be applied to the purposes for which the Bonds anticipated thereby are authorized and will be deposited, as provided in the Resolution, in the Fund or account established by the Resolution for such purposes. Interest on the Notes will be payable out of the Temporary Interest Fund or the Bond Service Account if and to the extent provided in the resolution authorizing such Notes.

*(Bond Res., Sec. 205)*

*Creation of Liens and Issuance of Additional Obligations; Sale and Lease of Property.* The Authority shall not issue any bonds or other evidences of indebtedness, other than the Bonds or Bond Anticipation Notes, secured by a pledge of the Authority's Revenues and other moneys, securities and funds held or set aside by the Authority or by the Fiduciaries under the Resolution, and shall not create or cause to be created any lien or charge on such Revenues and other moneys, securities and funds except to the extent otherwise provided in Section 501 of the Resolution; provided, however, that nothing contained in the Resolution shall prevent the Authority from issuing (i) obligations payable out of moneys in the Construction Fund as part of the Cost of Construction of any Project, (ii) bonds, notes, or any other obligations under another and separate resolution so long as the charge or lien created by such resolution is not prior or equal to the charge or lien created by this Resolution, (iii) 1954 Bonds in lieu of or in substitution for other 1954 Bonds pursuant to the 1954 Resolution, (iv)

1970 Bonds issued in accordance with the 1970 Resolution, or (v) 1970 Bonds in lieu of or in substitution for other 1970 Bonds pursuant to the 1970 Resolution.

No Project or any part of a Project shall be sold, leased, mortgaged or otherwise disposed of, except as follows:

(i) The Authority may sell or exchange at any time and from time to time any property or facilities constituting all or a part of a Project only if (a) it shall determine that such property or facilities are not useful in the operation of the Authority's business, or (b) the proceeds of such sale are \$100,000 or less, or it shall file with the Trustee an Authorized Officer's certificate stating, in the opinion of the signer, that the market value of the property or facilities exchanged is \$100,000 or less, or (c) if such proceeds or market value exceeds \$100,000 it shall file with the Trustee an Authorized Officer's certificate stating, in the opinion of the signer, that the sale or exchange of such property or facilities will not impair the ability of the Authority to comply during the current or any future year with the rate covenant in the Resolution; and

(ii) The Authority may lease or make contracts or grant licenses for the operation of, or make arrangements for the use of, or grant easements or other rights with respect to, any Project or part thereof, provided any such lease, contract, license, arrangement, easement or right (a) does not impede the operations of the Authority and (b) does not in any manner impair or adversely affect the rights or security of the Bondholders under the Resolution; and provided, further, that if the depreciated cost of the property to be covered by any such lease, contract, license, arrangement, easement or other right is in excess of \$500,000, the Authority shall file with the Trustee an Authorized Officer's certificate stating that the action of the Authority with respect thereto does not result in a breach of the conditions described in the Resolution. Any payments received by the Authority under or in connection with any such lease, contract, license, arrangement, easement or right in respect of a Project or any part thereof shall constitute Revenues; and

(iii) Prior to the Date of Completion of such Project, any payments to the Authority under or in connection with any lease, contract, license, easement or right in respect of such Project or any part thereof, and any proceeds of sale or exchange thereof not used to replace property so sold or exchanged, shall be paid into the appropriate Proceeds Account in the Construction Fund. On and after such Date of Completion, any payments to the Authority under or in connection with any lease, contract, license, easement or right in respect of such Project or any part thereof, and any proceeds of sale or exchange thereof not used to replace property so sold or exchanged, shall be paid to the Trustee for deposit in the Bond Reserve Account.

Any proceeds of any sale, lease, mortgage or other disposition of any fuel, fuel assemblies, fuel materials or components thereof shall be paid into the Fuel Reserve Account.

*(Bond Res., Sec. 607)*

#### **Rate Covenant**

The Authority covenants in the Resolution that:

(a) It will at all times maintain rates, fees, or charges, pursuant to contracts or general application tariffs established by the Authority for the sale, transmission or distribution of power which will produce Revenues in each year sufficient, together with other moneys available therefor, to pay (i) the costs of operation and maintenance of all projects of the Authority, (ii) bond service on all outstanding 1954 Bonds, 1970 Bonds and Bonds, and (iii) reserve requirements established by the 1954 Resolution, the 1970 Resolution and the Resolution.

(b) On or before November 1 in each year subsequent to the Date of Completion of the first Project completed under the Resolution it will review its financial condition in order to estimate whether the Revenues from its projects will be sufficient, together with other moneys available therefor, to comply with the foregoing rate covenant. The Authority is required to file with the

Trustee a certificate setting forth a reasonably detailed statement of the actual and estimated revenues and operating expenses of all projects of the Authority and other pertinent information for such year upon which such determination was made. If any such statement shows that such Revenues, together with other moneys available therefor, may not be sufficient to comply with the foregoing rate covenant, the Authority shall promptly adjust its rates and take such other action as is necessary to assure such compliance.

*(Bond Res., Sec. 609)*

### **Establishment of Funds**

The Resolution establishes the following Funds:

- (1) Construction Fund, to be held by the Authority,
- (2) Temporary Interest Fund, to be held by the Trustee,
- (3) Revenue Fund, to be held by the Authority,
- (4) Operating Fund, to be held by the Authority,
- (5) Projects' Study Fund, to be held by the Authority, and
- (6) General Fund, to be held by the Trustee.

*(Bond Res., Sec. 502)*

### **Construction Fund**

The Resolution provides that the Authority shall establish within the Construction Fund a "Proceeds Account" for each Project. Upon the issuance of each series of Bonds the proceeds shall be paid into the appropriate account except amounts required to be paid into other Funds or to pay Bond Anticipation Notes. Amounts in each account shall be applied to the cost of construction of the project for which such account was established. Pending such application, such amounts may be invested in Investment Securities or in Authorized Certificates of Deposit.

Prior to the date of completion of a Project or the latest estimated date of completion set forth in an engineer's certificate filed upon the issuance of a series of Bonds, whichever is earlier, Revenues (including income from investments of the Construction Fund and the Temporary Interest Fund) are to be paid into the Proceeds Account established in the Construction Fund for such Project.

After the date of completion of a project any amounts in the applicable Proceeds Account not set aside, appropriated or transferred to another Proceeds Account will be applied to any deficiency in the Bond Reserve Account and then will be used either to retire Bonds or for any purpose for which moneys in the Construction Fund may be used.

*(Bond Res., Sec. 503)*

### **Temporary Interest Fund**

The Resolution provides that the Trustee if directed by the Authority shall establish within the Temporary Interest Fund a separate account for each Project or for each series of Bonds. Upon the issuance of each series of Bonds, the Authority shall pay into the appropriate account an amount equal to the interest on such Bonds to the date specified in the supplemental resolution authorizing such series or to the date specified in the resolution authorizing a series of Bond Anticipation Notes. The Temporary Interest Fund shall be applied by the Trustee to the payment of interest when due on the Bonds or Bond Anticipation Notes. Amounts in such Fund will be invested by the Trustee in Investment Securities or in Authorized Certificates of Deposit, in each case if and as directed by the Authority.

*(Bond Res., Sec. 504)*

## Allocation of Revenues

*Revenue Fund:* On and after completion or the latest estimated completion date of each Project, whichever is earlier, the Authority is required to pay into the Revenue Fund, all Revenues other than Revenues derived from the 1954 Project, the 1970 Project and any 1970 Project Improvement as received. Payment into the Revenue Fund of Revenues derived from the 1954 Project, the 1970 Project and any 1970 Project Improvement are subject and subordinate to the charge or lien created by the 1954 Resolution and to the charge or lien created by 1970 Resolution.

*Operating Fund:* The Authority will pay at least monthly from the Revenue Fund into the Operating Fund (i) amounts required for reasonable and necessary Operating Expenses (other than on account of fuel) including reserves and working capital therefor, and (ii) amounts determined to be necessary and sufficient, together with any amounts otherwise available (including fuel credits and the proceeds of sale of fuel elements), to pay in cash when due any part of fuel replacements. Such amounts for fuel or fuel working capital will be set aside in a special Fuel Reserve Account in the Operating Fund together with amounts received from fuel credits and all other amounts required by the Resolution to be deposited in such Account.

Amounts in the Operating Fund (other than in the Fuel Reserve Account) shall be applied to the payment of reasonable and necessary Operating Expenses, or accumulated as a reserve for Operating Expenses, the payment of which is not immediately required. Amounts in the Fuel Reserve Account will be applied only to the cost of acquisition, leasing, use, reprocessing and replacement of fuel, fuel assemblies, fuel material, services and components and, to the extent amounts in such Account are inadequate for such purpose, other amounts in the Operating Fund may be applied thereto. Amounts in the Operating Fund (other than in the Fuel Reserve Account) in excess of requirements will be used to make up any deficiency in the Bond Service Account in the General Fund. Any balance not so applied will be deposited in the Bond Reserve Account in the General Fund.

*Projects' Study Fund:* The Authority is required to pay into the Projects' Study Fund (i) upon the issuance of any series of Bonds any balance remaining of the proceeds of any notes of the Authority issued for Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study, and (ii) at least monthly from the Revenue Fund after withdrawal therefrom for the Operating Fund, as long as the amount in the Bond Service Account is not less than the amount required to be in such Account, an amount, not to exceed two percent of Revenues not pledged under the 1954 Resolution and the 1970 Resolution that it determines to be required for Projects' Study, including reasonable and necessary reserves.

Amounts in the Projects' Study Fund shall be applied (i) to payment of notes issued for Projects' Study, including notes issued in whole or in part to repay indebtedness incurred in connection with Projects' Study, (ii) to pay reasonable and necessary expenses for Projects' Study including accumulation of a reserve for Projects' Study the payment of which is not immediately required and (iii) if determined by the Authority to be in excess of the above requirements, to make up a deficiency, if any, in the Bond Service Account in the General Fund, and if none, to pay into the Bond Reserve Account in the General Fund.

*General Fund:* The Authority will pay at least monthly all remaining amounts in the Revenue Fund to the Trustee for allocation to the following accounts established in the General Fund:

*First:* To the Bond Service Account, if and to the extent required for such Account to equal Accrued Bond Service (to the extent not provided for out of Bond or Bond Anticipation Note proceeds);

*Second:* To the Bond Reserve Account, the sum of (i) an amount equal to 15% of the amounts allocated to the Bond Service Account each month, (ii) such further amount, if any, required so that the amount in said Account shall equal the Bond Reserve Requirement and (iii) such further amount, if any, to the extent required so that the total amounts allocated to the Bond Reserve Account up to the time of the latest allocation shall equal 15% of the total amounts allocated to the Bond Service Account up to such time; and

*Third:* To the General Reserve Account, to the extent of any remaining balance of such payment from the Revenue Fund.

On and after the date of completion of a Project, the Authority will also pay to the Trustee for deposit in the Bond Reserve Account payments received from the sale or other disposition of properties of such Project or from proceeds of insurance thereon not applied to replacement.

(*Bond Res., Secs. 505-508*)

#### **Application of General Fund**

The General Fund will be applied as follows:

(1) *Bond Service Account:* The Trustee shall pay out of this Account the amounts required for the payment of interest on Bonds and Bond Anticipation Notes and Principal Installments for the Bonds when due. Amounts accumulated in this Account with respect to any sinking fund installments for Bonds of like series and maturity will be applied to retire such Bonds by purchase or redemption.

(2) *Bond Reserve Account:* This Account is to be used, first, to meet any deficiency in the Bond Service Account. Amounts in the Bond Reserve Account in excess of the Bond Reserve Requirement and not immediately required for any such deficiency or for emergency repairs or replacements (mentioned below) will be apportioned by the Trustee at least monthly among all series of Bonds then outstanding so that the amount apportioned to each series will bear the same ratio to the total amount apportioned as the Bond Service for the current calendar year with respect to such series bears to the Aggregate Bond Service for such year with respect to all series outstanding. The Authority may, from time to time, direct the Trustee to apply the amounts so apportioned to each series of Bonds to the purchase or redemption of such Bonds. The Trustee will pay amounts in excess of \$50,000 remaining in this Account on November 15 of each year to the appropriate paying agent for the redemption of such Bonds on the next succeeding January 1.

If required for emergency repairs or replacements of a Project, amounts in the Bond Reserve Account may be used to pay the cost thereof, but only: (i) to the extent that other moneys are not available therefor and (ii) if, in the opinion of the Authority's consulting engineers, such emergency repairs or replacements are essential to restore or prevent physical damage to, and to prevent loss of Revenues from such Project, and if, in such opinion, such payment is reasonable and necessary and in the interest of the bondholders.

(3) *General Reserve Account:* Amounts paid into the General Reserve Account shall be used, first, to meet deficiencies in the Bond Service Account and the Bond Reserve Account. Remaining amounts not so required will, upon direction of the Authority, be paid to the Authority for any lawful corporate purpose, free and clear of the lien and pledge created by the Resolution.

Amounts in the General Fund will be invested by the Trustee in Investment Securities or in Authorized Certificates of Deposit, in each case if and as directed by the Authority.

(*Bond Res., Secs., 509-513*)

#### **Insurance**

The Authority will at all times keep its property which is a part of the 1954 Project, 1970 Project, each 1970 Project Improvement and each Project and which is of an insurable nature and of the character usually insured by those operating properties similar to the properties of the Authority insured against loss or damage by fire and other causes customarily insured against and in such relative amounts as are customary. Such insurance may be in whole or in part in the form of policies or contracts carried with insurers of good standing or insurance funds or accounts maintained by the Authority.

(*Bond Res., Sec. 611*)

#### **Supplemental Resolutions**

Any of the provisions of the Resolution may be amended by the Authority, by a supplemental resolution, upon the consent of the holders of at least sixty percent in principal amount in each case of

(i) all Bonds then outstanding, and (ii) if less than all of the several series of Bonds then outstanding are affected, the Bonds of each affected series, and (iii) if the amendment changes the terms of any sinking fund installment, the Bonds of the Series and maturity for which such sinking fund installment was established; excluding, in each case, from such consent, and from the outstanding Bonds, (a) the Bonds of any specified series and maturity, if such amendment by its term will not take effect so long as any of such Bonds remain outstanding; provided that any such amendment shall not change any due date of principal or interest or make any reduction in principal, redemption price or interest without the consent of the affected holder, or reduce the percentages of consents required for a further amendment.

The Authority may adopt (without the consent of any holders of the Bonds) supplemental resolutions to authorize additional Bonds; to add to the restrictions contained in the Resolution upon the issuance of additional indebtedness; to add to the covenants of the Authority contained in, or surrender any rights reserved to or conferred upon it by, the Resolution; to confirm any pledge under the Resolution of Revenues or other moneys' otherwise to modify any of the provisions of the Resolution (but no such other modification may be effective while any of the Bonds of any series theretofore issued are outstanding); or to cure any ambiguity or to correct any defect in the Resolution (provided that the Trustee shall consent thereto).

*(Bond Res., Arts. VIII and IX)*

### **Remedies**

Under the Resolution, in substance, if the Authority defaults (i) in the payment of principal and redemption premium, if any, of any Bond, or (ii) in the payment of interest thereon or any sinking fund installment therefor and such default continues for 30 days, or (iii) in the performance or observance of the rate covenants of the Resolution, or (iv) in the performance or observance of any other covenant or condition in the Resolution or Bonds and such default continues for 60 days after written notice thereof, or if the Authority files a petition seeking a composition of indebtedness under the Federal bankruptcy laws or any other applicable statute, the Trustee or the holders of 25% in principal amount of the Bonds then outstanding may declare the principal and accrued interest on the Bonds then outstanding due and payable immediately, subject however, to rescission of such declaration and annulment of the default upon the remedying thereof.

Under the Resolution the Authority covenants that upon a default its books of record of the Authority and all other records relating to all projects of the Authority will be subject to inspection by the Trustee, and that the Authority will, upon demand by the Trustee, account for all Revenues and other moneys pledged under the Resolution as if the Authority were the trustee of an express trust. Upon a default the Trustee may protect and enforce its and the bondholders' rights under the Resolution by a suit in equity or at law, whether for the specific performance of any covenants contained in the Resolution, or in aid of execution of any power granted therein or for an accounting against the Authority as if it were the trustee of an express trust, or in the enforcement of any other legal or equitable right as the Trustee deems most effectual to enforce its rights or perform its duties under the Resolution. No bondholder has any right to institute suit to enforce any provision of the Resolution or the execution of any trust thereunder or for any remedy thereunder, unless the Trustee has been requested by at least 25% of the bondholders and has failed to commence such suit in the manner provided in the Resolution.

*(Bond Res., Art. X)*

### **Defeasance**

All outstanding Bonds of a series shall prior to the maturity or redemption date thereof be deemed to have been paid and shall cease to be entitled to any lien, benefit or security under the Resolution if the following conditions are met: (i) in the case of Bonds to be redeemed, the Authority shall have given to the Trustee irrevocable instructions to publish the notice of redemption therefor, (ii) there shall have been deposited with the Trustee in trust either moneys in an amount which shall be sufficient, or direct obligations of the United States or the State of New York the principal of and the interest on which, when due, will provide moneys which, together with any moneys also deposited, shall be sufficient, to pay



when due the principal or redemption price, if applicable, and interest due or to become due on such Bonds, and (iii) in the event such Bonds are not subject to redemption within the next succeeding 60 days, the Authority shall have given the Trustee irrevocable instructions to publish, as soon as practicable, a notice to the holders of such Bonds that the above deposit has been made with the Trustee and that such Bonds are deemed to be paid and stating the maturity or redemption date upon which moneys are to be available to pay the principal or redemption price, if applicable, of such Bonds.

*(Bond Res., Sec. 1101)*

### **TAX EXEMPTION**

Interest on the Series A Bonds is exempt, in the opinion of bond counsel to the Authority, under the existing statute and court decisions from Federal income taxes, and at all times is exempt from personal income taxes imposed by the State of New York or any political subdivision thereof (including the City of New York), and the Series A Bonds are exempt from all taxation directly imposed thereon by or under the authority of said State and from transfer taxes except estate or gift taxes. The Internal Revenue Service has ruled that interest on the Series A Bonds is excludible from gross income of the recipient thereof under Section 103(a)(i) of the Internal Revenue Code of 1954, as amended.

### **LEGALITY FOR INVESTMENT**

The Series A Bonds will be legal investments, in the opinion of such counsel, under present provisions of New York law for public officers and bodies of the State of New York and municipalities and municipal subdivisions, insurance companies and associations and other persons carrying on an insurance business, banks, bankers and trust companies, savings banks and savings associations, including savings and loan associations, building and loan associations, investment companies, and other persons carrying on a banking business, and all other persons whatsoever who are now or may hereafter be authorized to invest in bonds of the State of New York but the Series A Bonds will not be eligible for the investment of funds, including capital, of trusts, estates or guardianships under the control of individual administrators, guardians, executors, trustees and other individual fiduciaries, except when such individual fiduciary shall be acting with a corporate co-fiduciary; and will be eligible, in the opinion of such counsel, for deposit with all public officers and bodies of the State of New York for any purpose for which the deposit of the State's obligations is or may be authorized.

### **LITIGATION**

There is no litigation pending in any court (either State or Federal) or, to the knowledge of the General Counsel of the Authority, threatened against the Authority, in any way questioning or affecting the validity of or the security for the Series A Bonds.

### **APPROVAL OF LEGAL PROCEEDINGS**

All legal matters incident to the authorization and issuance of the Series A Bonds are subject to the approval of Hawkins, Delafield & Wood, bond counsel to the Authority. Certain legal matters will be passed upon for the Underwriters by their counsel, Sullivan & Cromwell. The approving opinion of bond counsel will be delivered with such Bonds.

The references herein to the Resolution, the 1954 Resolution, the 1970 Resolution, the Act, Public Law 85-159, the Federal Power Act, the licenses and permits, and certain power contracts are brief outlines of certain provisions thereof. Such outlines do not purport to be complete, and reference is made to such documents, laws, licenses and contracts for full and complete statements of such provisions. Copies of such documents are on file at the offices of the Authority and the Trustee.

The delivery of the Official Statement has been duly authorized by the Authority.

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK

*Chairman*

# STONE & WEBSTER ENGINEERING CORPORATION



225 FRANKLIN STREET, BOSTON, MASSACHUSETTS

ADDRESS ALL CORRESPONDENCE TO P.O. BOX 2325, BOSTON, MASS. 02107

NEW YORK  
BOSTON  
CHICAGO  
GARDEN CITY  
HOUSTON  
LOS ANGELES  
SAN FRANCISCO

DESIGN  
CONSTRUCTION  
REPORTS  
APPRAISALS  
EXAMINATIONS  
CONSULTING  
ENGINEERING

September 10, 1974

Mr. George T. Berry  
General Manager and Chief Engineer  
Power Authority of the State of New York  
10 Columbus Circle  
New York, N. Y. 10019

Dear Mr. Berry:

## ENGINEERING EVALUATION REPORT ASTORIA GENERATING STATION—UNIT NO. 6 POWER AUTHORITY OF THE STATE OF NEW YORK

We are pleased to submit herewith the results of our independent engineering evaluation on the current status of Astoria Generating Station—Unit No. 6. The report is presented in two parts, namely the summary document which states our findings in concise form and an appendix which contains supporting documentation.

We have identified several problem areas, some of which will require corrective action. In those cases, we have made appropriate recommendations. We believe all of these problems can be satisfactorily resolved for obtaining permits and successful operation of the unit.

We have collaborated with Arthur Young & Company in assessing the expenditures made by Con Edison for the design and construction of the plant prior to May 31, 1974. We have made an independent estimate of the work to be completed after that date and the cost thereof. These costs were combined to arrive at an estimate for the total cost to the Authority for obtaining a complete and operable plant. We estimate the cost including the generator leads from the plant to Con Edison East 13th Street Substation, the demineralized water treatment equipment, the fuel oil receiving and storage facility, the initial supply of fuel oil, administration, overhead, interest during construction, insurance and financing charges at \$420,000,000. This cost does not include an allowance for a cooling tower. The cooling tower may be required by regulatory agencies.

In preparing the cost estimate, we have made a separate analysis of the cost of facilities that would be required to provide a completed plant that would operate essentially independent of adjacent Con Edison facilities. The cost of these facilities is included in the above quoted figure.

We have analyzed the additional construction still remaining to be completed, the scheduled preliminary operation period, and we estimate that the plant can be brought to commercial operation by May 15, 1976 if no unforeseen conditions arise.

We would be pleased to offer any further assistance which you may require in this matter.

Very truly yours,

W. F. ALLEN, JR.  
President

[THIS PAGE LEFT INTENTIONALLY BLANK]

**ENGINEERING EVALUATION REPORT**

**ON**

**ASTORIA GENERATING STATION – UNIT No. 6**

**FOR**

**POWER AUTHORITY OF THE STATE OF NEW YORK**

**SUMMARY**

**SEPTEMBER 1974**



**STONE & WEBSTER ENGINEERING CORPORATION**

## TABLE OF CONTENTS

	<u>Page</u>
List of Abbreviations .....	A5
Summary and Conclusions .....	A6
Introduction .....	A6
Scope of the Report .....	A6
Plant Description .....	A7
Transfer of Ownership .....	A8
Evaluation of Plant Design and Construction .....	A8
Cost and Schedule .....	A8
Capital Requirements .....	A8
Cost of Generation .....	A12
Schedule for Completion .....	A13
Items Requiring Resolution .....	A14
Licensing .....	A15
Licenses and Permits .....	A15
Environmental Considerations .....	A16
Common Facilities with Existing Units .....	A17
Shared and Independent Facilities .....	A17
Spare Parts .....	A18
Contracts .....	A18
Adequacy and Application of Labor Force and Supervision .....	A18
Fuel Sources and Arrangement .....	A19
Quality Assurance .....	A20
Operations .....	A21
Personnel Staffing .....	A21
Training Program .....	A21
Plant Manuals and Operating Procedures .....	A21

## LIST OF ABBREVIATIONS

Con Edison	—Consolidated Edison Company
DAR	—New York City Department of Air Resources
DECON	—New York State Department of Environmental Conservation
Ebasco	—Ebasco Services Incorporated
EIS	—Environmental Impact Statement
EPA	—U. S. Environmental Protection Agency
FWPCA	—Federal Water Pollution Control Act
NYC-EPA	—New York City Environmental Protection Administration
NEPCO	—New England Petroleum Company
NO <sub>x</sub>	—Nitric oxides
NPDES	—National Pollution Discharge Elimination System
OSHA	—Occupational Safety and Health Act
PASNY	—Power Authority of the State of New York
QA	—Quality Assurance
S&W	—Stone & Webster Engineering Corporation
SO <sub>2</sub>	—Sulfur dioxide
SPDES	—New York State Pollutant Discharge Elimination System
Unit 6	—Astoria Generating Station, Unit No. 6
USCE	—U. S. Army Corps of Engineers

## SUMMARY AND CONCLUSIONS

This report was authorized by the Power Authority of the State of New York (PASNY). It appraises the present status of engineering and field erection of the Consolidated Edison Company (Con Edison) fossil fuel generating plant known as Astoria Unit 6, which was under construction when the work was curtailed in May, 1974.

In summarizing this investigation as to the adequacy, status, and reliability of the Astoria Generating Plant Unit 6, it is our conclusion that the engineering and design of this unit meet all the requirements of good engineering practices. It is our impression that the design of the plant systems is sufficient in application to ensure satisfactory operation of the unit.

On the other hand, we believe that the physical erection of the facility, which is now approximately 55 percent complete, has suffered considerably and is hampered by inadequate storage practices, lack of cleanliness during assembly, and unsatisfactory construction practices.

We do believe, however, that through improved construction procedures, proper corrective action to existing conditions, and thorough flushing and cleaning during the initial operations phase this unit can attain a degree of plant availability consistent with that prevalent in the industry. The projected commercial operation date of May 15, 1976 can be attained. However, we believe a substantial buildup of construction forces by September 1, 1974 would be necessary if the projected commercial operation date is to be attained.

Further, it is our opinion that the total estimated capital cost for design and construction of Astoria Unit 6 is consistent with industry cost for generating stations of about this size and constructed during this time. We have considered the factors affecting cost in New York City in our estimate of reasonableness of cost.

## INTRODUCTION

### Scope of the Report

Stone & Webster undertook this assignment on May 28, 1974 at the request of PASNY and in investigating the engineering, design, construction, permits, operations, quality assurance, scheduling, and environmental considerations employed 54 engineers and construction personnel. The findings in this report are considered to be of sufficient depth to warrant the conclusions reached.

Using the parameters set forth in the Con Edison contract documents and the Environmental Impact Statement (EIS) and relying on our judgment of engineering, construction, and management practices, we have commented on the following items:

1. The physical plant—including opinions as to percent completion, operability, anticipated reliability, and overall quality of work.
2. The ultimate successful operability of the facility, with particular consideration of such areas as permits and licenses required by government agencies; possible future retrofitted hardware; operator training, availability and qualifications; interdependence with existing units at the Astoria site; compliance with applicable codes; initial start-up schedules; and external sources of power.
3. Estimated dates for initial operation, supported by our observations of current progress, manpower requirements, logistics, and construction completion.
4. Adequacy of the quality assurance program and evaluation of its provisions.
5. Facilities commonly shared with Astoria Units 1 through 5 and an opinion on the degree and approximate costs of possible separation.

6. In making our estimate of the cost to complete the total facility, we have utilized supporting data from Arthur Young & Company and from PASNY.

Drawings, diagrams, specifications and other data were assembled and examined but we found it most expedient for the purposes of the report to concentrate our major effort at the plant site.

System reporting forms were developed for each mechanical system to facilitate gathering of data in an orderly manner. These forms provided for the recording of significant items, which included verification of compliance with specifications and drawings as well as acceptability of engineering, design, quality of construction, and convenience for operation and maintenance. We have also researched public documents and interviewed various Con Edison personnel both at the site and in the New York City offices in connection with acquisition of data to determine the status of Astoria Unit 6.

The results of our review are summarized in this report. System reporting worksheets are included in the Appendix.

### **Plant Description**

The Astoria Generating Plant is situated in the southwest area of a site of approximately 285 acres in Queens County, Astoria, New York City. The U. S. pier and bulkhead line of the East River, the source of cooling water for all Astoria units, forms the site boundary west and north. The south property line parallels 20th Avenue, and the east property line is adjacent to Luyster Creek and an oil storage and supply terminal. Normal access to the site is through Gate 5 located at 31st Street and 20th Avenue. The switchyard for existing units is to the east and a battery of gas turbines is positioned north and east from the plant. An existing unused coal handling system is located west of the generating plant.

Unit 6 is located to the north of and adjacent to existing Unit 5. The back of the boiler area faces the East River to the west and the turbine-generator hall is located to the east of the boiler area. The turbine-generator longitudinal axis is positioned in a north-south orientation, with the exciter-generator to the south. This arrangement differs from the orientation of existing Units 1 through 5, in which the boilers are to the east and the turbine units are on the west or river side. The reversed position of Unit 6 is due to the location of the existing coal handling system originally employed with earlier units and which Con Edison has elected to retain. Twin stacks, rising approximately 300 ft, are on the same centerline as those of the earlier units. This arrangement provides for a turbine-generator hall completely isolated north and south from the earlier structure.

A plot plan of the Astoria Generating Station is appended at the rear of this text.

The turbine, supplied by Westinghouse, at rated conditions is guaranteed to produce 826,575 kW when the turbine is supplied with 2,400 psig throttle pressure, 1,000°F steam and 1,000°F reheat at 2.0 in. Hg Abs condenser pressure. The turbine is a four flow, 3,600 rpm machine with 31 in. last stage blades. The generator is 980,800 kVA, 3,600 rpm, 0.90 power factor, 26,000 V, 3-phase, 60 Hz with a direct connected exciter. The generator rotor is hydrogen cooled and the stator is water cooled.

The steam generator, manufactured by Foster Wheeler Corporation, is a balanced draft boiler having a 6,600,000 lb per hr maximum continuous capacity with feedwater at 511°F. It is designed to burn low sulfur No. 2 or No. 6 oil as the primary fuel and has a provision to burn natural gas. Air and gas flow paths utilize two forced draft fans, two air preheaters, three induced draft fans and two air dilution fans provided for NOx control.

Other major mechanical equipment includes two half capacity turbine driven boiler feed pumps; twin shell, single pass, divided water box design deaerating condensers; two half capacity vertical circulating water pumps; two half capacity vertical condensate pumps; two trains of half capacity (split stream) closed type feedwater heaters (totaling 14 heater shells) arranged in two high pressure stages and five low pressure stages; an auxiliary boiler; reboiler; and a diesel engine generator. Electrical equipment includes two start-up transformers; one unit auxiliary transformer; three single phase main step-up transformers, with an installed spare, each rated at 300 MVA.



Unit 6 was engineered and designed by Ebasco Services, Inc. under the overall direction of Con Edison. Construction management was also performed by Ebasco from inception until May 17, 1974, when Con Edison assumed this function. Major equipment was supplied by reputable manufacturers whose products have performed reliably over many service years at numerous installations. The boiler is one of a series of several similar Foster Wheeler units. None of these is in service at this time, but considerable effort has been devoted to their development and it is expected that operation will be satisfactory.

### **Transfer of Ownership**

The formal transfer of Unit 6 ownership from Con Edison to PASNY involves consideration of which facilities are to be transferred, their state of completion, the degree of subsequent involvement of Con Edison, and the monetary compensation required. When PASNY becomes owner, it must consider the problems of completing construction, acquiring a staff, securing the necessary permits to operate the unit, and undertaking commercial operation of the unit.

A careful inventory of all material and equipment to be transferred to PASNY is being undertaken.

## **EVALUATION OF PLANT DESIGN AND CONSTRUCTION**

System Evaluation Reports have been prepared for the principal operating systems, for various structures and for major equipment items at Unit 6. Data, collected in the areas of mechanical, electrical, controls, facilities, structural, and environmental design are presented on specially prepared "raw data presented" worksheets, including references for substantiation and clarifying comments where required.

These data enabled Stone & Webster to perform a systematic physical inspection of the Unit 6 systems and equipment. Much of the data were obtained from Con Edison and were used by Stone & Webster as inputs to our evaluation.

The result of this evaluation shows the design and engineering of Unit 6 to be consistent with modern concepts of plant arrangement. The design has generally been implemented by the selection of quality equipment. The problems which have been discovered and reported in construction procedures, in housekeeping, and in other general areas can be satisfactorily resolved.

To reach commercial production of electric power by May 15, 1976 will require careful adherence to the scheduling described in the details, charts and project network supplied in the Appendix to this report. Early initiation of a program to employ the requisite manpower, especially with respect to boiler erection, will be required.

## **COST AND SCHEDULE**

### **Capital Requirements**

#### *Summary*

All components of total capital requirement which have been identified are tabulated at the end of this section. Many of the components are included as allowances without detailed supporting data.

The tabulation summarizes the expenditures by Con Edison. An estimate of the additional requirements to complete the plant and place it in operation is provided. Financing is not included.

Interest costs incurred by Con Edison and PASNY are determined on the basis of transfer of ownership November 1, 1974 and commercial operation July 1, 1976.

#### *Expenditures to May 31, 1974*

The expenditures as of May 31, 1974 for the plant proper, based on preliminary data from Arthur Young & Company, not including items listed under Related Facilities are shown in the following tabulation.

### *Audited Costs*

Con Edison Contract with Ebasco .....	\$132,797,428
Costs Recorded by Con Edison .....	34,424,109
Subtotal .....	\$167,221,537
Less Charges not Identified Specifically as Unit 6 Costs .....	3,563,582
Subtotal .....	\$163,657,955

### *Related Facilities*

Expenditures to May 31, 1974 for the following items have not been audited:

Generator Leads (Transmission from Astoria) .....	\$ 15,952,138
Package Boilers and Demineralization Plant .....	9,476,474
Pressurizing and Cooling Plant .....	1,355,542
Astoria Unit 6 Switchyard .....	1,874,595
Common Facilities and Site Beautification .....	1,058,000
Existing Facilities .....	836,126
Land Grant .....	33,419
Research .....	1,096
Subtotal .....	\$ 30,587,390
Total Expenditures to May 31, 1974 .....	\$194,245,345
Say .....	194,245,000

### *Estimated Cost of Work Remaining as of May 31, 1974*

The estimate to complete is based on a detailed evaluation of cost of work yet to be done, and is supported also by our judgment of the probable total cost of plant less expenditures to date. Our judgment of probable total cost is, of course, based on our experience with similar plants, adjusted for geographical differences in labor rates and productivity.

### *Other Contracts*

In addition to costs related to the plant proper, this item includes estimated cost *to complete* (or allocated portion of estimated cost for a shared facility) of the following ancillary and shared facilities.

Generator Leads from Astoria 6 Potheads to Property Line .....	
Generator Leads from Astoria Station to 13th St. Substation .....	
480 V Feeder for Demineralizer Plant .....	
Demineralizer Plant and Auxiliary Boilers .....	
Fuel Gas Supply System .....	
Proportioned Cost of Pressurizing .....	
Plant at 15th St. Substation .....	
Cost of Shop and Laboratory Equipment .....	
Miscellaneous Services .....	
Cost of Interface with PASNY .....	
Total .....	\$25,500,000

### *Escalation*

Escalation from May 31, 1974 to assumed completion date of construction (i.e. two months prior to assumed commercial operating date of May 15, 1976), is based on expenditures yet to be made which are subject to escalation. Firm price orders for equipment and materials were excluded, and escalation was based on the remainder and is calculated to be .....

\$ 9,000,000

### Contingency

The costs estimated above do not include a contingency to cover protracted labor stoppages, or other items of a force majeure nature, premium pay to attract sufficient labor to maintain schedule or offset delays in schedule, effect of OSHA regulations not yet realized, etc. The contingency is assumed to cover possible claims by Contractors, including claims not yet submitted or not yet resolved. For a station partially completed, we suggest a smaller contingency than would be appropriate for a plant not yet started. We have assumed .....

\$ 12,000,000

### Recapitulation

Expenditure to May 31, 1974 .....	\$194,245,000
Estimate to complete .....	\$122,540,000
Total plant cost .....	<u>\$316,785,000</u>

### Additional PASNY Costs

The following costs are not included in the total plant cost shown above, but should be considered in PASNY determination of total financing requirements.

Interest during construction (IDC) to be incurred by PASNY between date of ownership (assumed November 1, 1974) and commercial operation (assumed May 15, 1976) on payment to Con Edison on November 1, 1974 and on other progress payments made after November 1, 1974 at 6½ percent assumed cost of money .....

\$ 29,000,000

Engineering, legal and administrative costs by PASNY after transfer of ownership .....

\$ 775,000

Allowance for spare parts and working capital .....

\$ 4,500,000

Allowance for operator training (principally salaries and overhead for staff prior to commercial operation) .....

\$ 900,000

Taxes incurred by Con Edison prior to May 31, 1974 are shown under "Expenditures prior to May 31, 1974"; additional taxes between May 31, 1974 and November 1, 1974 are assumed to be included in the contingency.

Insurance during construction and one year thereafter .....

\$ 1,000,000

Subtotal .....

\$ 36,175,000

### Allowance for Independent Facilities

Certain facilities are to be added to permit fueling and operation of Astoria 6 independent of other units as listed below. (Such facilities as are shared are included in "Total Plant Cost" above.)

Fuel Oil Tank Farm .....	\$20,000,000
Oil Unloading Wharf—Allowance Location to be Determined Later .....	10,000,000
Nitrogen System .....	10,000
Service Air System .....	5,000
Warehouse Building .....	150,000
Administration Building .....	545,000
Maintenance Building .....	180,000
Block Up Control Room Wall and Miscellaneous Doorways .....	15,000
Control Room Modifications .....	665,000
345 kV Metering—Lo Side .....	45,000
27 kV Metering—Lo Side .....	15,000
Revise Control Room Lighting .....	60,000
480 V Metering .....	5,000
Future Foam System .....	530,000
City Water System Extension .....	277,000
Fire Pump Installation .....	85,000

Total .....

\$32,587,000

Say .....

\$32,600,000

### *Cooling Towers*

An allowance of \$70,000,000 could be considered to represent a probable cost of converting the present once-through cooling system to a closed loop cooling tower system, as may be required later by the EPA. A cost evaluation would require an engineering study beyond the scope of this report to determine a feasible method of accommodating some type of tower to this site, and how to place the tower in service at minimum penalty in capital cost and lost production during construction. (Note that, in addition to capital cost penalty, cooling towers reduce plant output and increase fuel cost because of increase in net station heat rate.)

### **CAPITAL REQUIREMENT SUMMARY ASTORIA 6**

#### *Expenditures through May 31, 1974*

Audited Costs .....	\$163,657,955
Costs Subject to Audit .....	30,587,390
Total Expenditures to Date .....	\$194,245,345
Say .....	194,245,000

#### *Estimate to Complete*

1) Consolidated Edison contract with EBASCO .....	\$ 71,440,000
2) Other contracts .....	25,500,000
3) Other Consolidated Edison costs (G&A, I. D. C.) from June 1, to October 31, 1974 .....	4,600,000
4) Escalation to completion .....	9,000,000
5) Contingency including claims .....	12,000,000
Total Estimate to Complete .....	\$122,540,000
Total Plant Cost .....	\$316,785,000

#### *Additional PASNY Costs*

1) I. D. C. from November 1, 1974, to July 1, 1976 .....	\$ 29,000,000
2) PASNY administration costs .....	775,000
3) Operator training allowance .....	900,000
4) Spare parts allowance and working capital .....	4,500,000
5) Insurance during construction and one year thereafter .....	1,000,000
Subtotal .....	\$ 36,175,000

<i>Allowance for Independent Facilities</i> .....	\$ 32,600,000
---	---------------

Total Estimated Capital Requirements, Excluding Fuel and Financing Costs	\$385,560,000
Say .....	\$386,000,000

<i>Fuel Cost—3 Months at 65 percent Load Factor</i> .....	25,000,000
---	------------

Total, Including Fuel .....	\$411,000,000
-----------------------------	---------------

<i>Debt Financing Charge</i> .....	\$ 9,000,000
------------------------------------	--------------

Total Capital Requirements .....	\$420,000,000
----------------------------------	---------------

#### **NOTES:**

(1) The preceding costs do not include an allowance for replacement or rework of missing or damaged equipment and materials.

(2) Estimated additional cost for cooling tower if required is \$70,000,000.

## *Cost of Generation*

### *Need for Power*

The costs of generation computed in this section are approximate values and are presented primarily so as to permit a comparison with the cost of power from other units to be completed on or after the date when Unit 6 becomes operational. Construction of Unit 6 was started several years ago and, as of May 31, 1974, the physical erection was approximately 55 percent complete. The output from this unit is clearly needed to help supply the total electric power requirement of metropolitan New York.

### *Annual Fixed Costs*

Acquisition by PASNY will unquestionably reduce the cost of power to be produced by this unit provided, as expected, PASNY is able to obtain the necessary funds for acquisition and completion of the unit through the sale of tax exempt bonds. We estimate that a total of approximately \$420,000,000 of such bonds will have to be sold to reimburse Con Edison for its costs and to complete construction of the plant and ancillary facilities. The annual cost to the Authority of interest and capital recovery including an allowance for debt service coverage will be approximately \$37,000,000.

If Con Edison retained ownership of the plant, its total annual fixed charges, comprised of a combination of return on investment, interest, depreciation, and taxes, assuming financing costs similar to those of other utilities in the area, would be approximately \$70,000,000. We understand that because of present financial problems Con Edison would find it very difficult to obtain the necessary funds to complete the plant from any known source, regardless of rate.

### *Operating Costs*

Contracts for the sale of power produced by Unit 6 have not been negotiated. It is the Authority's intention to offer such power first to public agencies, with the remainder, if any, being offered next to Con Edison and then to other utilities. Since the public agencies in New York are expected to have a noncoincident peak load of 1,800 mW by 1977, nearly all of the power to be produced from both Unit 6 and Indian Point Unit 3, which the Authority may also acquire, would be sold to such agencies.

In the absence of definitive contractual provisions, a full description of all of the intricate transmission and other operational limitations within the Con Edison transmission and distribution system, and a means for accurately predicting future relative fuel prices, it is not possible to develop a detailed assessment of the weekly operational schedule of generation for this unit.

Con Edison's 1973 annual system load factor was 53.1 percent. We calculate that Unit 6 will have a net heat rate of 9,747 Btu per kW hr, which is substantially better than much of Con Edison's generation. Con Edison is still operating some generators which use nearly twice as much fuel to produce a kilowatt hour. We therefore believe that Unit 6 may be operating at an annual plant factor of 65 percent or more.

At today's prices for low sulphur oil, fuel is by far the largest component of generating cost. Using the present price of about \$13.50 per barrel (6,052,000 Btu/barrel), operating the plant at its 787,000 kW net rating, which is conservative, for 65 percent of the time for a year would require 7,220,000 barrels costing \$97,430,000. In the process, a net of 4,481,000,000 kW hr of electric energy would be supplied. The fuel cost would, therefore, be 21.7 mills per kW hr.

### *Average Energy Cost*

Addition of the annual charge for capital and operation and maintenance costs would add about 9.5 mills, for a total of about 31.2 mills.

The capital cost estimate includes the cost of transmission from the plant to Con Edison's E. 15th Street substation. Accordingly, the 31.2 mills would be the cost of Unit 6 power delivered to that central point in the Con Edison area load. Given the present price of low sulphur fuel oil, the average heat rate

of Con Edison generation, and fixed annual charges associated with the method used to acquire capital, we believe that Con Edison's average generation cost delivered to its load center will be substantially higher than 31.2 mills. The Authority is considering the acquisition of Indian Point Unit 3 plant. Since this is a nuclear plant, its fuel costs are expected to be about 2.5 mills per kW hr. The total cost of power from the plant is expected to be about 13.3 mills. The combined cost for both Astoria 6 and Indian Point 3 would average about 21.8 mills per kW hr. Accordingly, it should be possible for the Power Authority to arrange for delivery of power to public agencies over facilities owned by Con Edison at prices that are substantially lower than Con Edison could provide.

The Authority has applied to the Federal Power Commission for a license to construct a 1,000,000 kW pump-storage plant in Schoharie County. Integrating the operation of such a plant with Astoria Unit 6 and Indian Point Unit 3 would make it possible to store energy not needed during off-peak periods for release during high load periods, thus enhancing the value of the output.

As discussed in Section IV of the Appendix, there is a possibility that a closed cycle cooling system might be required for Astoria 6. If this actually materializes, since all of the Astoria steam generating units discharge heat to the East River, it would seem equitable to distribute the cost of such additional cooling system over the cost of Astoria Units 1 through 6, which would increase the cost of energy generated from all of these units by about 1 mill/kW hr.

#### *Schedule For Completion*

In order to achieve commercial operation of Astoria Unit 6 by May 15, 1976, which Stone & Webster believes to be the earliest practical date, certain critical events will have to occur by the dates tabulated below:

Hydrostatic Testing (Integrity of Pressure Parts) .....	November 15, 1975
Boilout of Steam Generator (Chemical Cleaning) .....	February 15, 1976
Steam to Turbine (Commence Trial Operation) .....	March 15, 1976

In arriving at the commercial operating date, pertinent data were investigated and evaluated, leading to the following considerations which determine the schedule:

1. The present construction completion status of the unit.
2. That portion of construction work that still remains to be completed.
3. The productivity of the work force, as demonstrated to the time of this reporting and which is expected through completion of construction.
4. The time interval from the earliest date (September 1, 1974) by which construction forces can be mobilized to perform the work in an orderly manner to start-up operations.
5. The maximum size of the construction force for each craft as considered practical for efficiently completing the work, including two-shift work for boiler erection.

The major activities requiring staffing have been charted to show manpower as a function of time between September 1, 1974 to commercial operation on May 15, 1976. These charts appear in the Appendix and are tabulated as follows:

Project Summary Network (in envelope at rear of Appendix)  
Total Manual and Nonmanual Manloading  
Boiler Erection Manloading  
Piping Installation Manloading

Piping Thermal Insulation Manloading  
Electrical Installation Manloading  
Screenwell, Discharge, and Miscellaneous Structure Manloading  
Turbine Generator Erection and All Other Manloading  
Nonmanual Manloading (Site Office and Headquarters)  
Chart of Total Project Manual and Nonmanual Manloading by Manhours and Man Months

We estimate that the work remaining for completion of Unit 6 will require a total of 2,946,000 manhours.

### ITEMS REQUIRING RESOLUTION

While conducting this review, it has been determined that several matters require immediate consideration. Following is a listing of these major concerns:

1. The size of current construction forces must be increased, with special emphasis on boiler erection.
2. Thermal piping insulation and lagging should be ordered at once.
3. The two electrical work contracts on the site should be combined into one contract.
4. Rapid resolution of the turbine generator blading problem should be pursued with Westinghouse.
5. Procurement of spare parts purchase should commence immediately to prevent delays during the unit start-up.
6. Computer delivery should be expedited in order to prevent delays during start-up and unnecessary outages during operation.
7. Strong emphasis must be exerted on screenwell construction to prevent delay of unit start-up.
8. A more complete and thorough boiler weld radiography program must be pursued.
9. A thorough review of all required permits and licenses must be undertaken.
10. Rearrangement of the control room must be completed in a timely fashion so as not to impair cable pulling and termination.
11. The line of boiler control equipment being installed in the unit has been discontinued. Availability of replacement components should be closely investigated.
12. A hiring and training program for the unit staff must be established so that qualified personnel will be available for initial equipment operation.
13. Design and construction of certain common facilities must be pursued immediately to permit independent operation of Unit 6.
14. A design review of the presently installed induced draft fans should be made to insure operational reliability.
15. The adequacy of the presently designed furnace pressure control system should be investigated to ensure protection against boiler implosion.
16. The presently designed fire protection system should be expanded to include areas not presently covered.
17. Further noise attenuation measures will be required in the vicinity of forced draft fans.
18. A thorough and continuing building cleanup program is required.

19. Equipment stored at the site must be adequately cleaned and protected.
20. A program must be developed, implemented, and controlled to lubricate and rotate the shafts of equipment at regular intervals to prevent bearing and shaft damage from dirt and corrosion.
21. A study should be initiated to develop adequate 345kV switching and protection in addition to automatic unit runback.
22. Design and construction of new fuel oil storage facilities should be carried out immediately to ensure adequate supplies of fuel for Unit 6.

## LICENSING

### *Licenses and Permits*

Numerous licenses, permits, and certifications are necessary for the construction and operation of a steam generating unit. These documents are issued by various agencies such as the New York State Department of Environmental Conservation (DECON), U. S. Army Corps of Engineers (USCE), U. S. Environmental Protection Agency (EPA), and others.

The important permits yet to be received, of which we are aware, that are required for the operation of Unit 6 are as follows:

1. *Discharge Permit* of EPA (Section 402, 1972 amendment to the Federal Water Pollution Control Act—FWPCA). Application was filed in October 1970 by Con Edison. On July 5, 1974, EPA issued a public notice with an attached draft Discharge Permit. Pursuant to the statute, the plant will not be permitted to discharge any effluent into the East River after December 31, 1974, without this permit. The conditions of the draft permit impose effluent discharge restrictions which would require replacing the once-through cooling system with a closed-cycle cooling tower system by July 1, 1978 and would also require significant additional waste treatment facilities.

On August 5, 1974, Con Edison responded to the public notice by (a) requesting that the notice and determinations be withdrawn until final regulations are issued, (b) commenting on the draft permit conditions, (c) requesting a hearing on the draft permit conditions, and (d) requesting alternative thermal effluent limitations pursuant to Section 316(a) of the Act.

It is our opinion that additional ecological monitoring will be required before the EPA will change its requirements and allow alternative thermal effluent limitations.

The permit when issued, will be of five years duration.

2. *Preoperational Chemical Cleaning Preboiler and Boiler System Permit* of EPA. This discharge permit will be required before chemical cleaning wastes can be discharged at sea. Application is scheduled to be filed on December 1, 1974.

3. *Intake and Discharge Structure* of USCE. This permit is required for construction of the Intake and Discharge Structures under Section 10 of the Rivers and Harbors Act of 1899. A permit was issued on April 20, 1972. However, this permit was invalidated by the U. S. District Court because the Corps failed to prepare an Environmental Impact Statement. The Court refused to enjoin construction of the structures in the interim and construction has continued. The Corps filed with the Court an Environmental Impact Statement on June 18, 1974. Con Edison is awaiting issuance of the permit.

4. *Water Quality Certification* of New York State DEC (Section 401 of FWPCA). This certifies that the effluent discharged will meet the water quality standards established by the EPA and the State in accordance with Sections 301, 302, 306 and 307 of FWPCA. This certification supplants the Section 21(b) certification under the Water Quality Improvement Act of 1970 which



Con Edison had obtained. Certification is a pre-requisite to the issuance of a Section 402 discharge permit.

On July 5, 1974, in conjunction with the notice issued by EPA of its intent to issue a 402 discharge permit described above, Con Edison was notified of DEC's intent to issue a Section 401 certification. On August 5, 1974, Con Edison commented on the conditions attached to the proposed certification and requested a public hearing.

This hearing may be held by DEC alone unless EPA also grants a hearing pursuant to a Con Edison request for a Section 402 hearings in which case a joint hearing will be held. However, issuance of the certification may be stayed pending a determination by the EPA on the request for alternative thermal effluent limitations under Section 316(a) of FWPCA.

5. *Discharge Canal* permit by DEC, for operation of a discharge canal must be obtained before operation. In addition, the water quality permit issued by DEC to permit dredging for construction of the intake and discharge structure expires on December 31, 1974. This will have to be renewed since construction will not be complete at that time.

A tabulation of these and other permits has been prepared to indicate the present status of licensing. This tabulation appears in the Appendix.

#### *Environmental Considerations*

We reviewed the available reports on environmental considerations concerned with air quality, waste treatment facilities, hydrothermal discharges, ecological effects, noise and water treatment. Each of the items investigated is included in the Appendix and can be summarized as follows.

##### *Air Quality*

The low sulfur oil described in Con Edison reports has little ash and produces a low level of particulate matter and sulfur dioxide. Using such fuel, operation of the plant will meet present emission standards for these contaminants. If the boiler operates as expected by the manufacturer, NO<sub>x</sub> emission standards will be met. The manufacturer's guaranteed performance will meet State and Federal standards. However, the guarantee will fall short of City standards, which are more stringent than State and Federal standards. In addition to these controls required to comply with specific emission standards, automatic control of viscosity and flue gas monitoring for control of air flow should be added to provide better combustion.

##### *Waste Treatment Facilities*

In this area of the environmental review, we considered makeup water treatment, floor and equipment drainage, equipment washings, sanitary systems, yard and roof drainage, boiler blowdown, and the chlorination system. The status and content of various permits and reports were also examined. It is our opinion that additional treatment of demineralizing pretreatment clarifiers and filters may be required. Floor equipment drains may require separation equipment. Air preheater washings may require treatment for solids removal, neutralizing, treatment for removal of heavy metals, and sludge dewatering. Boiler blowdown may require a phosphorous removal system. Yard and roof drains may require oil, grease and solids removal. The chlorination system may require modification of procedures to limit the residual chlorine concentrations.

##### *Hydrothermal Discharges*

The proposed Effluent Guidelines and Standards for Steam Electric Power Generating Plants presently being considered by the EPA may require that the once-through cooling be replaced by a closed cooling system. However, there is a statutory provision under which Con Edison has filed which would allow an exemption for use of a once through cooling system. Con Edison is following a reasonable

course of action in seeking this exemption on the basis that the heat discharges will cause "no appreciable harm".

#### *Ecological Effects*

In the Appendix we have listed the studies which have been performed to estimate the effects of structures and of thermal and chemical discharges on migratory and resident fish populations. From these studies it appears that thermal and chemical discharges should not present major ecological problems for Unit 6.

#### *Noise*

Interior noise and exterior noise sources have been considered. The forced draft fan and duct system may require attenuation to satisfy internal noise requirements. Noise reduction treatment will be required to meet acceptable levels in office areas. Exterior noise control is adequate and it appears there will be no perceptible impact at the property line.

#### *Water Treatment*

The chlorination equipment for the circulating water supply appears to be acceptable. In order to meet discharge standards for residual chlorine, careful operational procedures will be required.

The pretreatment and demineralization system was sized to provide the water requirements of Units 1 through 6 and is included as a part of Unit 6 construction.

### **COMMON FACILITIES WITH EXISTING UNITS**

#### *Shared and Independent Facilities*

Although present-day large electric generating units are designed to operate on a unit basis there are several subsystems that, through choice of design or by necessity, may be common to several units. This is the normal planning that was followed in the addition of Unit 6 to the Astoria complex. Common or shared systems involve buildings and structures with common interfaces; for example, the electrical switchyard, fuel receiving and storage, compressed air supply, fire protection facilities, city water supply and treatment, waste treatment systems, turbine room crane, administration building, maintenance facilities, and many others.

Several systems and features of Unit 6 are shared with those of the other units, principally Unit 5. Our investigation indicated that certain common facilities should be retained while others should become independent. Stone & Webster has identified the major common features and has evaluated the desirability and cost of providing separation. Some relatively minor items may merit reconsideration at a later time. A unit of this size should be independent of other units if it is to be operated by a separate entity. We are informed by PASNY that this is its intention for the operation of Unit 6. Accordingly, we have evaluated separation as follows:

- Fuel oil system to be independent of Astoria Plant facilities
- Power transmission to the Edison system to be provided, through acquisition of the generator leads from the Astoria Plant to the Con Edison substation at East 13th street in Manhattan
- Control room to be independent of Unit 5
- Warehouse structures to be provided for maintenance and administration
- City water supply—for potable water, makeup water to replace unit losses, and fire protection systems to be independent

There are several other shared facilities less extensive in scope and probably less important in the achievement of a high degree of independent operation. A descriptive and detailed discussion of each

common feature is presented in the Appendix. Following is a listing of additional areas of commonality with our suggested disposition of each :

<u>Item</u>	<u>Suggested Disposition</u>
Auxiliary Steam Supply	—Provide separation
Service Air Supply	—Provide separation
Nitrogen Gas Supply	—Provide separation
Control Room Air Conditioning and Lighting	—Provide separation
Battery Room Ventilation	—Provide separation
Load Frequency Control	—Provide separation
Telephone and Communication System	—Leave conduits in present position and arrange for independent switching
Grounding System	—Retain shared grid
Below Ground Items Except City Water Supply	—Retain shared facilities
Sanitary Sewage, Storm Drainage, and Miscellaneous Wastes	—Retain shared facilities
345 kV Feeder Trip	—Retain shared facilities

#### *Spare Parts*

Normal maintenance of a steam generating unit requires that replacements be available for parts susceptible to failure. Availability of a system can be reduced if replacement cannot be effected quickly. Thus, a proper supply of spare parts for specific usage is necessary for operating units.

Our investigation into this area indicates that a completely inadequate amount of spare parts is now on order. We have further established that there is little possibility of interchanging parts with those of other units at the Astoria site. This deficiency is considered critical and is included in Section V of this report under those items requiring resolution.

Much of the equipment and material will require a lengthy lead time for delivery. Although there are about 18 months from September 1974 until the preliminary operation date, we recommend that spare parts be ordered now to ensure their availability. The type of spares to be ordered can be determined from manufacturers' suggested listings, and the quantities can be estimated by experienced operating engineers.

The cost of developing a minimum acceptable spare parts inventory at Unit 6 is estimated to be approximately \$1,000,000.

### **CONTRACTS**

The current status of regional contracts for construction labor crafts, contracts for construction erection labor and materials, and also those for supplying fuel oil are tabulated and described in Section VIII of the Appendix.

#### *Adequacy and Application of Labor Force and Supervision*

##### *Labor Force*

The labor forces necessary to adequately staff the work will be available, based on the following factors:

1. General construction conditions are currently depressed in the New York metropolitan area. This situation is not expected to change significantly during the remainder of the Astoria Unit 6 construction.

2. Recent widespread construction slowdowns and cancellations in power plant construction will improve availability of certain specified skills such as welders.

3. Recent utility stretch-outs of engineering and licensing efforts on certain large nuclear units will make available the necessary qualified engineering headquarters home office and field personnel.

4. By combining better selection of individuals with better supervisory and technical support, increased productivity should be expected.

5. If the present separate electrical power wiring and control wiring contracts could be combined into a single contract, efficiency would be improved.

### *Supervision*

For the same reasons as outlined for the manual labor forces, the availability of adequate qualified supervisory people in the contractor organizations should not be a problem. Our experience indicates the need for strong supervision and technical support.

We find the best results are obtained when authoritative supervision/management is provided by the owner. While the specifics of any such arrangement are not within the scope of this report, the importance of this control cannot be overemphasized.

Close engineering support is essential to resolve technical problems or discrepancies, to minimize lost time and extra cost.

### *Fuel Sources and Arrangement*

The total fuel oil storage capacity at the Astoria site is about 13 million gallons. The present Astoria Units 1 through 5 have used about 1.8 million gallons per day, while Unit 6 will be capable of burning 1.2 million gallons per day at rated load. The combined daily requirement would exhaust oil storage in 3 days if all tanks were full and if no transfer of oil to Ravenswood or 74th Street Station was permitted. All of the tanks are seldom full at the same time, and it is not unusual to draw down to half the total storage capacity during normal operation. This reduces the on-site firm storage to less than 2 days.

The present fuel oil is contained in eight storage tanks which are arranged with a complicated piping and pumping system. New England Petroleum Company (NEPCO) fuel oil storage facility has a 29 million gallon reserve storage. This storage is used predominantly for supply to Ravenswood but is connected by pipeline to Astoria via Ravenswood.

The Greater New York Terminal at Astoria has 42,000,000 gallons of storage used by NEPCO and Asiatic for general supply of their customers. This storage is not dedicated to Con Edison, but Con Edison does receive oil from this source.

Con Edison relies on contracted storage of 116,000,000 gallons of tankage at Bayonne, New Jersey, and Northville, New York, for its reserve. Most of the oil used at Astoria is delivered by barge.

The present wharf facilities can accommodate two barges of 800,000 gallons each. By this means, access to the contracted storage or delivery from suppliers is achieved.

Con Edison has plans to use the present wharf for unloading both liquified natural gas, as well as fuel oil. Only one or the other would be unloaded at any one time for safety purposes. In addition, the wharf size would only permit an either/or unloading to occur. This may result in a reduction of the oil delivery capability.

If gas is used, it will be supplied from an underground 26 in. pipe line.

Since the existing oil supply system is complex and has relatively small load storage capacity, the feasibility of installing independent facilities for Unit 6 has been considered. Details concerning the proposed separation are described in the Appendix.

## QUALITY ASSURANCE

As part of this evaluation, a review of the quality assurance program for Unit 6 was made to ascertain the adequacy of the program. Physical audits were conducted in the following areas:

1. Selected areas of construction—electrical, mechanical, and piping
2. Shop inspection records
3. Receipt inspection
4. Storage areas
5. Welder's qualifications to applicable codes
6. Completed welds (visual)
7. Radiography to applicable codes

A more detailed discussion of our findings appears in the Appendix. It is our opinion, based upon the results of this quality assurance review that the quality assurance program and its implementation are generally satisfactory and that installation procedures are generally normal for this type of construction. There are five major areas of concern:

### 1. *Storage*

Because of delays in construction, equipment and material were delivered far ahead of their incorporation in the plant. Much of this equipment and material should have been better protected. This has led to a general deterioration.

Boiler sections will require careful cleaning and flushing. Pumps and valves will require inspection and, in many cases, reworking. We recommend that existing storage conditions be corrected as soon as possible.

### 2. *Boiler Construction*

We generally observed that there were heavy concentrations of rust and dirt in many pipe and boiler components with open ends. Lack of good housekeeping is evident in the entire boiler area.

### 3. *Welder Qualification for Boiler Welding—Treadwell Construction Company. (Subcontractor)*

A sample review of radiographs of four Treadwell welder qualification tests for small diameter pipe were found unacceptable due to incomplete coverage. As there is reason to believe that the sample reviewed was indicative of all small diameter pipe qualification radiographs, we recommend a thorough review of existing qualifications. To prevent recurrence of this problem, corrective action should include an upgrading of all procedures governing this type of welding. Con Edison is aware of this problem and is taking action where necessary.

### 4. *Radiography of Boiler Welds*

Findings in this area indicate that all boiler production welds radiographed should be reviewed for possible corrective action prior to acceptance by the authorized inspector. The basis for this recommendation will be found in the Appendix.

### 5. *Large Diameter Piping*

We observed several spools of large diameter and heavy wall pipe in the erected position with only tack welding performed or with only the root pass weld completed. Other spools have uncapped ends and open connecting fittings. The general deterioration due to rusting and dirt accumulation will require reworking and careful inspection to assure acceptable condition for unit operation.

## OPERATIONS

### *Personnel Staffing*

A station staffing organization schedule totaling 94 personnel, for independent operation of Unit 6, is included in the Appendix. This provides for the following personnel:

Station Manager .....	1
Supporting Service .....	7
Engineering Superintendent .....	1
Engineering .....	15
Operation and Maintenance Superintendent .....	1
Operations .....	33
Maintenance .....	36
Total .....	<hr/> 94

The staff is considered adequate for operating and maintaining an oil and gas fired unit of this size.

### *Training Program*

Con Edison has not implemented a program for the hiring or training of operators or maintenance personnel for Astoria Unit 6.

Hiring experienced operators should commence 18 months prior to commercial operation. Candidates for operating positions preferably should have previous power plant or marine experience. Actual training for operators for this specific unit should begin about 12 months prior to commercial operation. Adherence to this timetable will result in competent operators who possess a good understanding of the plant. When preliminary operation begins, two months prior to commercial operation, the operators will handle the equipment and acquire an intimate knowledge of plant operation.

The fulfillment of licensing and certification requirements is an important consideration. The "Synopsis of Boiler and Pressure Vessel Laws, Rules, and Regulations" indicates that a New York City license is required for foremen, senior operators, and assistant operators. In addition, certain maintenance staff members, such as welders, must receive licensing or certification, or both.

### *Plant Manuals and Operating Procedures*

The following three documents prepared by Ebasco summarize the description of the plant and operational features of Unit 6:

1. Blue Book Presentation of Contract Appendices including:

Design Criteria	Project Schedule
Description of Project	List of Bidders
Equipment List	Estimated Project Cost
Description of Services	Estimating and Cost Procedure

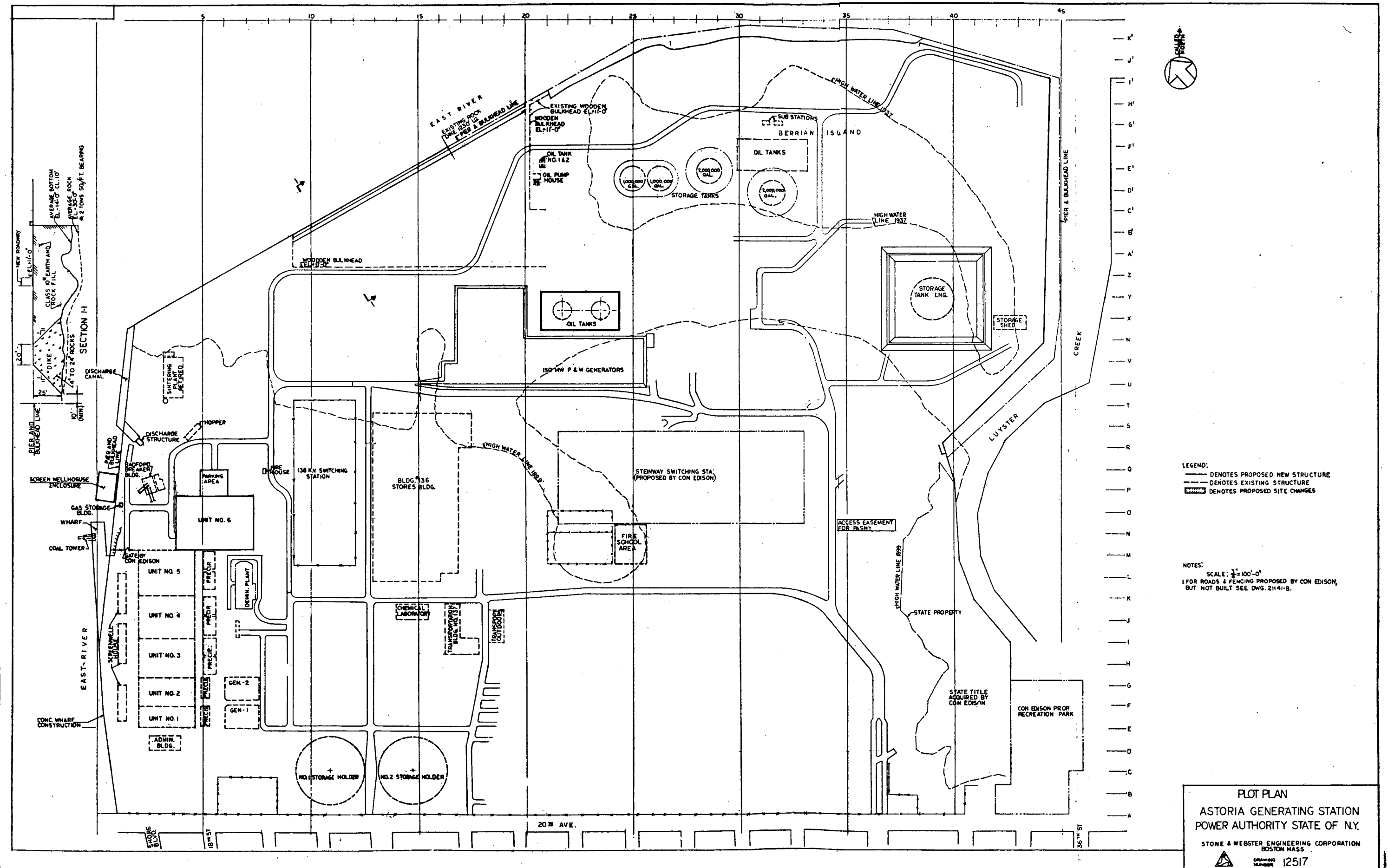
### *Drawings*

2. Engineers Manual—This will be formally published by Ebasco at a later date. An advance copy of Volume One is now available and is approaching final form as Con Edison has completed a second review which they consider final. When published, it is expected to include a general plant description; details of site conditions and plant arrangement; descriptions of mechanical, electrical, instrumentation and other systems; and appendices containing sample purchase orders, list of bidders, a log of design drawings, an equipment list, and a specification list.

3. Draft Environmental Statement dated July 28, 1972—This constitutes the basis for the application by Con Edison for a discharge permit, pursuant to Section 13 of the River and Harbor Act of 1899, to operate inlet and outlet facilities in the East River for Unit 6.

The detailed operating instructions for machinery being installed will be furnished by the manufacturer of the specific equipment.

We have prepared a "Register of Documents Received" which has been prepared specifically for this report. Each document from which data were extracted in preparing this report is included in the Register. Entries include drawings, contracts, specifications, correspondence, and miscellaneous data. This register, consisting of over 240 entries, is included in the Appendix to this report.





## STONE & WEBSTER ENGINEERING CORPORATION



225 FRANKLIN STREET, BOSTON, MASSACHUSETTS

ADDRESS ALL CORRESPONDENCE TO P.O. BOX 2325, BOSTON, MASS. 02107

NEW YORK  
BOSTON  
CHICAGO  
GARDEN CITY  
HOUSTON  
LOS ANGELES  
SAN FRANCISCO

DESIGN  
CONSTRUCTION  
REPORTS  
APPRAISALS  
EXAMINATIONS  
CONSULTING  
ENGINEERING

January 30, 1975

Mr. George T. Berry  
General Manager and Chief Engineer  
Power Authority of the State of New York  
10 Columbus Circle  
New York, New York 10019

Dear Mr. Berry:

STATEMENT SUPPLEMENTING  
ENGINEERING EVALUATION REPORT  
ASTORIA GENERATING STATION—UNIT NO. 6  
POWER AUTHORITY OF THE STATE OF NEW YORK

At your request we have examined our Report submitted September 10, 1974 and have the following additional comments:

We call your attention to the fact that in the Summary and Conclusions we had projected a commercial operation date of May 15, 1976 on the assumption construction forces would begin building up by September 1, 1974. The Authority took possession of Astoria No. 6 on December 13, 1974 and at the present time is preparing to build up the construction forces. On this basis we project that commercial operation of the unit will occur by August 31, 1976. Construction at the end of December 1974 was about 58 percent complete.

We developed the total cost of the project in the Report on the premise that interest costs would average  $6\frac{1}{2}\%$  for all financing. You have asked us to recalculate the total estimated cost on the basis that interest costs average 7%. In view of the extended construction period now assumed and the increased applicable interest rate now employed, we have recalculated the total capital requirement for Astoria No. 6. We now calculate the total capital requirements as \$460,000,000 of which \$32,200,000 is bond reserve not previously included.

In the interim since our initial report, additional information has become available which makes it desirable to reclassify the costs into categories somewhat different from those in the original Report without substantially affecting the established total cost of the construction.

The following tabulation provides an updated capital requirement summary:

# CAPITAL REQUIREMENTS SUMMARY

## ASTORIA No. 6

### UPDATED

Summary of audited costs through May 31, 1974 .....	\$202,652,903(1)
Say	202,653,000
Estimated cost of remaining contract work .....	90,310,000
Consolidated Edison costs (G&A I. D. C.)	
From June 1 to November 30, 1974 .....	\$ 4,600,000
PASNY administrative costs .....	\$ 775,000
Operator training allowance .....	900,000
Spare parts allowance and working capital .....	4,500,000
Insurance during construction and one year thereafter .....	1,000,000
Additional facilities required for independent operation .....	32,600,000
Fuel costs—3 months at 65 percent Load Factor .....	25,000,000
Escalation and contingencies, including claims .....	19,500,000
Total Estimated Capital Requirements Including Fuel and Excluding Financing and Interest Costs .....	\$381,838,000
Say	\$382,000,000
Net interest during construction .....	\$ 36,600,000(2)
Financing cost .....	9,200,000(2)
Bond Reserve Requirement .....	32,200,000(2)
Total Capital Requirement .....	\$460,000,000

(1) Con Edison's adjusted costs per Arthur Young & Company Report dated September 24, 1974 including retention of \$6,732,918.

(2) Calculated by the Authority.

We understand the Authority intends to finance the construction of Astoria No. 6 under a slightly different basis than was assumed in our initial calculation, in that no principal payments will be required until 1986. We have examined the estimates of net revenue presented in the table entitled Estimated Revenues and Expenses of Astoria 6 and are of the opinion that 31.2 mills per kilowatt hour average revenue will produce at least the net revenues shown thereon.

The cost of power from Indian Point 3 will be increased slightly from the cost shown in our Report entitled Engineering Evaluation Report on Astoria Generating Station—Unit No. 6 for Power Authority of the State of New York dated September 1974, because average interest is now assumed to be 7%. We compute that the cost would increase from 13.3 mills to 13.8 mills per kwhr.

The average cost of power from Astoria 6 and Indian Point 3 combined would be about 22.1 mills per kwhr.

These minor increases, in our opinion, do not affect the marketability of power.

Very truly yours,

W. F. ALLEN, JR.  
President