



**SEVENTH ANNUAL REPORT**  
**Year Ended 31 March 1969**

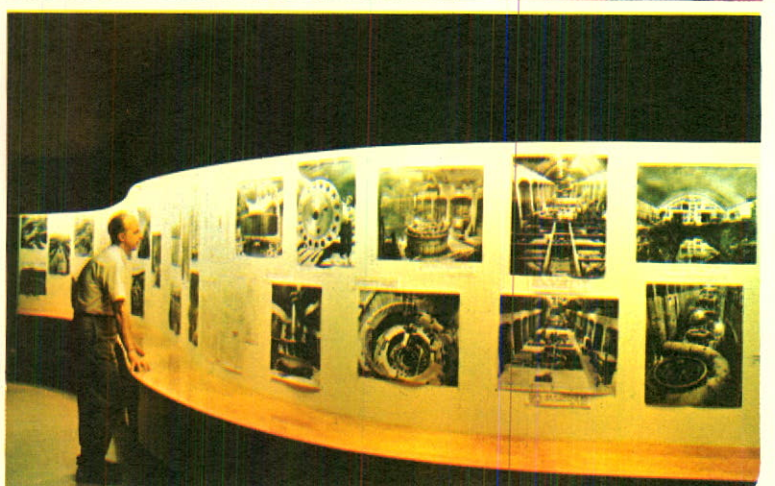
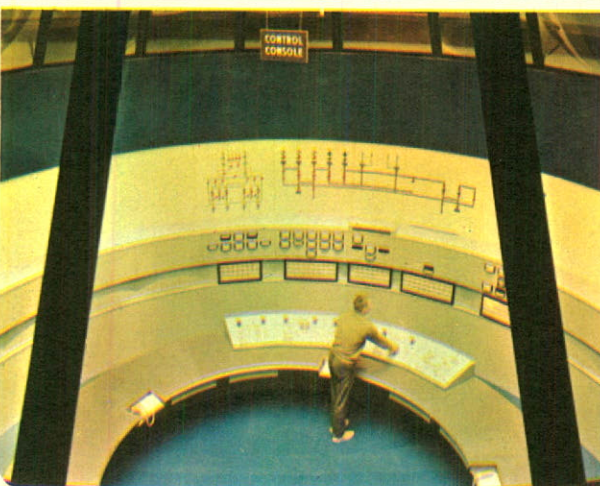
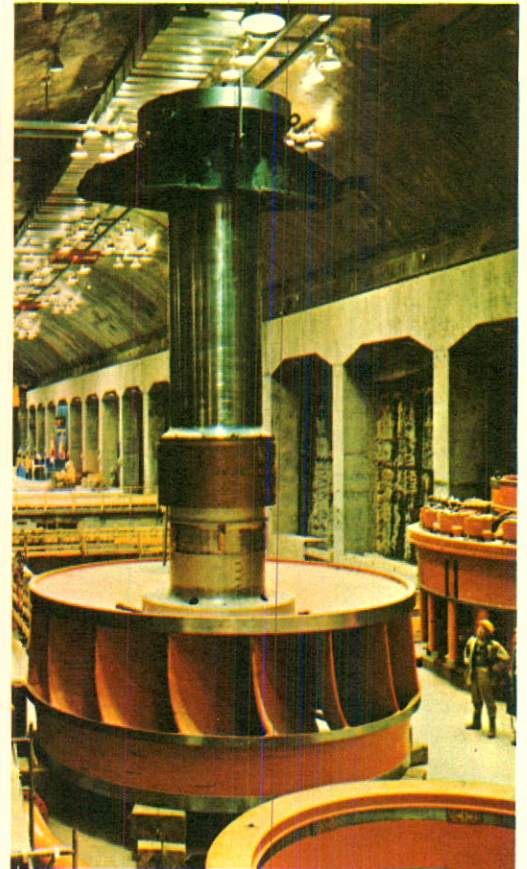
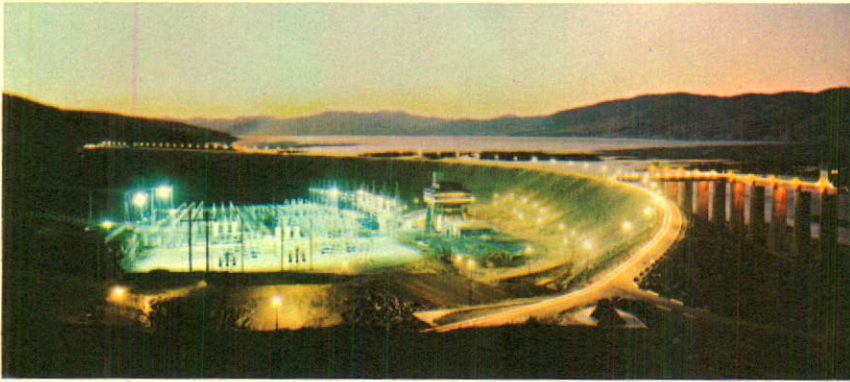
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**BRITISH COLUMBIA HYDRO AND POWER AUTHORITY**



## PEACE RIVER PROJECT

British Columbia Prime Minister W. A. C. Bennett presided as power from the Peace River Project was turned on, 28 September 1968, with the placing in service of the first three 227,000 kw generating units at Gordon M. Shrum Generating Station. Control building, reception centre and spillway were also completed during the year, and work was started on installation of the next two generating units.

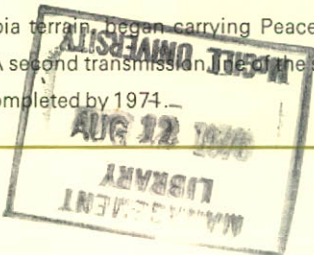




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Map of Electric Transmission System	- - Inside Back Cover	

**COVER:** Towers like those in the front cover picture, painted by Robert J. Banks, support the 500 kv, 575-mile-long transmission line from Gordon M. Shrum Generating Station to the Lower Mainland. This line, which traverses typical rugged British Columbia terrain, began carrying Peace power in the autumn of 1968. A second transmission line of the same voltage is scheduled to be completed by 1974.





PRIME MINISTER  
VICTORIA

1 9 6 9

June 13th

Colonel the Honourable John R. Nicholson, P.C.,  
O.B.E., Q.C., LL.D., Lieutenant-Governor  
of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present the  
Annual Report of British Columbia Hydro and Power Authority  
for the year ended 31 March 1969.

W. A. C. Bennett



## BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Head Office: 970 Burrard Street, Vancouver 1, British Columbia, Canada

### DIRECTORS AND OFFICERS

JOHN DUNSMUIR

\*EINAR M. GUNDERSON

\*HUGH L. KEENLEYSIDE *Chairman*

THE HONOURABLE W. KENNETH KIERNAN

FRED D. MATHERS

\*WILLIAM C. MEARNS

\*GORDON M. SHRUM *Chairman*

FREDERICK A. SMITH

\*JOHN H. STEEDE *Chief Engineer*

THE HONOURABLE RAY G. WILLISTON

\**Member of Executive Management Committee*

SIGURDUR SIGMUNDSON *General Manager*

GEOFFREY G. WOODWARD *Secretary*

MRS. P. ROSS KIDD *Assistant Secretary*

*Auditors:* PRICE WATERHOUSE & CO.

*Bankers:* CANADIAN IMPERIAL BANK OF COMMERCE

*Securities issued by British Columbia Hydro and Power Authority:*

*Registrar, Canadian issues:* THE AUTHORITY

*Registrar, United States issues:* THE CANADIAN BANK OF COMMERCE TRUST COMPANY, New York

*Securities issued by the former British Columbia Electric Company Limited:*

*Registrar, Perpetual Callable Bonds and 25-year Bonds:* MONTREAL TRUST COMPANY

*Registrar and Trustee, First Mortgage Bonds:* MONTREAL TRUST COMPANY

*Registrar and Trustee, Debentures:* THE ROYAL TRUST COMPANY

*Securities issued by the former British Columbia Power Commission:*

*Registrar:* THE AUTHORITY

### THE BUSINESS OF THE AUTHORITY AND THE AREAS SERVED (See map, inside back cover)

#### Electric Service

Generation and transmission of electricity.

Distribution of electricity throughout areas of British Columbia containing more than 90% of the population of the Province.

#### Gas Service

Distribution of natural gas in Greater Vancouver and in the Fraser Valley eastward to Hope.

Distribution of liquefied petroleum gas-air in Greater Victoria.

#### Passenger Transportation Service

Urban passenger transportation in Greater Vancouver and Greater Victoria.

Interurban passenger transportation in Greater Vancouver, in the Fraser Valley eastward to Hope, between Vancouver and Victoria and between Vancouver and Nanaimo.

#### Rail Freight Service

Rail freight operations in Greater Vancouver and the Fraser Valley.



# BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

OFFICE OF THE CHAIRMAN

970 BURRARD STREET

VANCOUVER 1, B.C.

11 June 1969

The Honourable W. A. C. Bennett, P.C., LL.D., D.Pol.Sc.,  
Prime Minister of British Columbia,  
Parliament Buildings,  
Victoria, B.C.

Dear Sir:

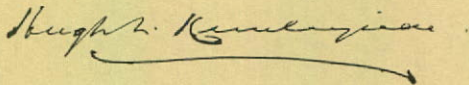
On behalf of the Board of Directors, we present, for transmittal to the Lieutenant-Governor in Council, the Annual Report of British Columbia Hydro and Power Authority for the year ended 31 March 1969.

Overshadowing all other achievements during the year was the flow of initial power from the Peace River Project, climaxing seven years of intensive construction activity. On 28 September 1968, the first three 227,000 kw generating units at Portage Mountain were officially placed in service. Paralleling this significant increase in generating capacity, more than 700 miles of transmission lines were added to the integrated electric system during the year to deliver power to existing and new load centres.

The development of the Columbia River reached another important stage when Arrow Dam was declared operational on 10 October 1968, nearly six months ahead of schedule. This was the second storage project to be completed by the Authority, leaving Mica Dam as the final project in British Columbia to be completed under terms of the Columbia River Treaty.

In May 1968, the Board of Directors approved a number of major changes in the Authority's corporate structure which were designed to improve efficiency and provide better service to customers. Many of these changes have now been implemented, and it is the objective of all levels of management to continue to develop and maintain an organization that will effectively meet the growing demand for the Authority's services throughout British Columbia.

Yours truly,



CHAIRMAN



CHAIRMAN



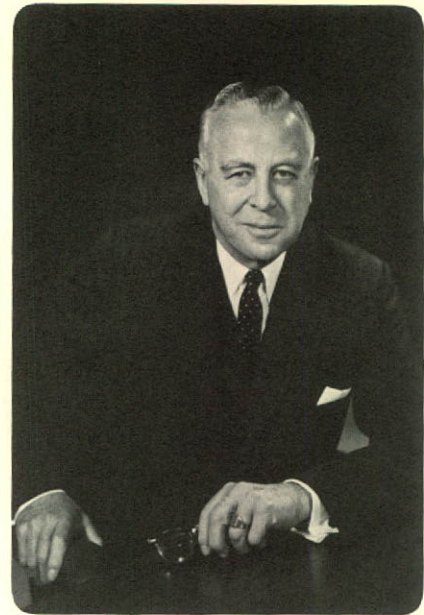
## DR. KEENLEYSIDE RETIRES

On 25 February 1969, Dr. H. L. Keenleyside announced his resignation as Chairman and a Director of the Authority, to take effect on 11 June 1969. Dr. Keenleyside had informed Prime Minister W. A. C. Bennett last year of his intention to resign following completion of Arrow Dam.

During the course of his career, Dr. Keenleyside spent several years in the External Affairs Department in Ottawa and later as Deputy Minister of Mines and Resources. In 1950, he was appointed Director General of the United Nations Technical Assistance Administration and held the post for nine years before returning to British Columbia. In 1959, Dr. Keenleyside was appointed Chairman of British Columbia Power Commission, and became Chairman of British Columbia Hydro and Power Authority when it was formed in 1962.

The negotiation and implementation of the Columbia River Treaty were among Dr. Keenleyside's important responsibilities. Under his guidance, Duncan and Arrow projects were completed months ahead of schedule and Mica project, which is now under construction, is expected to be completed on or ahead of schedule. Methods and principles for operating the Treaty projects have been approved by the Canadian and United States Entities, and the groundwork has thus been laid for the complete implementation in British Columbia of the Columbia River Treaty.

The Directors wish to express their appreciation for the outstanding contribution Dr. Keenleyside has made to the Authority from its inception. His sympathetic concern for his fellow employees, his advice and his leadership will be greatly missed.



## THE YEAR IN BRIEF

- First power from the Peace River Project was delivered to customers on 28 September 1968, when three units at Gordon M. Shrum Generating Station were officially placed in service.
- Arrow Dam, second of the Columbia River Treaty storage projects to be completed, was declared operational on 10 October 1968, nearly six months ahead of schedule. Good progress was made during the year on Mica storage project.
- Expenditures on new plant amounted to \$227,274,238 during the year. This was a substantial decrease from last year when expenditures on new plant amounted to \$341,170,731.
- Total generating capacity was increased to 3,056 megawatts, up 37.3% from last year.
- Net income for the year was \$9,283,868 compared with \$12,890,635 last year.
- Kilowatt-hours of electricity sold were 10.4% higher than last year.
- Therms of gas sold were 20.2% higher than last year.
- Number of passengers carried on the urban transportation services increased 3.8% over last year.
- In May 1968, the Board of Directors approved a number of major changes in the Authority's corporate structure designed to improve the effectiveness of the organization.



# ANNUAL REPORT OF BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

for the year ended 31 March 1969

*Record expansion of electric generation and transmission facilities enabled the Authority to make more power available to more people throughout British Columbia.*

## RESULTS OF OPERATIONS

Gross revenues for the year ended 31 March 1969 amounted to \$221,108,026, an increase of \$19,638,128 or 9.7% over the previous year. The unusually severe winter weather conditions caused an increase in demand for the Authority's services and thereby contributed to the higher gross revenues.

Net income, after providing for all expenses, was \$9,283,868 compared with \$12,890,635 for the previous year. The net income was added to the Authority's reserves, and the corresponding funds have been used for plant renewals and expansion to meet load growth.

The following table shows the principal sources of revenue and how this revenue was used in the operations of the Authority:

<b>Where the revenue came from</b>	<b>Year Ended 31 March 1969</b>	Year Ended 31 March 1968
Sale of electricity to residential customers.....	<b>\$ 57,682,739</b>	\$ 51,441,920
Sale of electricity to other customers.....	<b>91,677,011</b>	86,230,163
Sale of gas.....	<b>40,575,251</b>	34,346,670
Transportation of urban and interurban passengers.....	<b>19,509,572</b>	18,131,364
Rail freight operations.....	<b>7,462,538</b>	6,992,305
Miscellaneous.....	<b>4,200,915</b>	4,327,476
	<b><u>\$221,108,026</u></b>	<b><u>\$201,469,898</u></b>

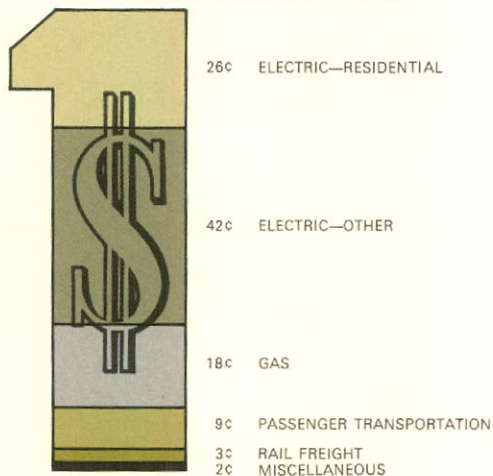
## How the revenue was used

Salaries, wages and employee benefits.....	<b>\$ 49,611,424</b>	\$ 43,999,168
Materials and services.....	<b>44,932,909</b>	43,340,818
Grants, school taxes, etc.....	<b>14,953,333</b>	13,265,734
Interest on debt, less interest charged to construction.....	<b>63,695,856</b>	53,233,932
Depreciation of plant.....	<b>38,630,636</b>	34,739,611
Balance employed in the business.....	<b>9,283,868</b>	12,890,635
	<b><u>\$221,108,026</u></b>	<b><u>\$201,469,898</u></b>

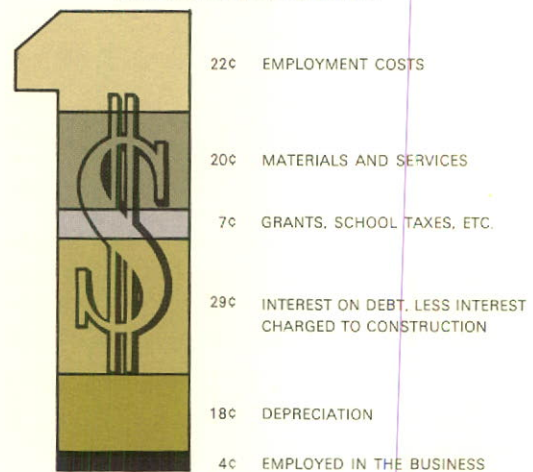
### THE AUTHORITY'S REVENUE DOLLAR

for the year ended 31 March 1969

#### WHERE THE REVENUE CAME FROM



#### HOW THE REVENUE WAS USED





## ELECTRIC SERVICE

### Sale of Electricity

Gross revenues from the electric service were \$149,359,750, an increase of 8.5% over the previous year. Kilowatt-hours of electricity sold by the Authority continued to increase significantly, with a gain of 10.4% over the previous year—just slightly below the average annual increase of 10.7% during the past decade.

The following table shows kilowatt-hour sales and percentage increases over the previous year, by categories:

	Year Ended 31 March 1969 Kwh in Millions	% Increase Over Previous Year
Residential .....	3,489	13.8
Commercial .....	2,599	11.2
Industrial .....	5,964	10.1
Other .....	185	—
Total .....	<u>12,237</u>	<u>10.4</u>

At 31 March 1969, there were 605,188 customers receiving electric service from the Authority, an increase of 22,055 during the year. Average annual consumption by residential customers rose from 6,222 kwh to 6,779 kwh.

Electric space heating for houses and apartments in the Authority's service area continued to make substantial gains. During the year, the number of residential electric heating accounts increased 20%, with most of the increase resulting from new construction. The use of electric space heating in motels, churches, schools and commercial premises also showed a marked increase. Air-conditioning units for houses and small commercial premises are gaining in popularity, particularly in the interior of the Province where high summer temperatures are common.

Some new and interesting uses for electricity were introduced in the Authority's service area during the year. Infrared and microwave ovens are finding use in quick-catering services by making it possible to bring frozen foods to serving temperatures quickly; hot water dispensers for the kitchen provide hot water instantly; and electric toilets are gaining acceptance where sewers are not available and where septic tanks are impractical.

### Metropolitan Region

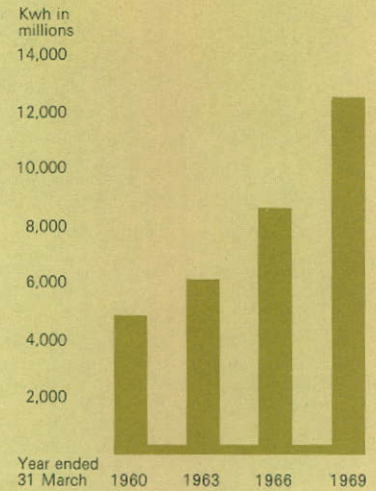
Economic expansion in the Metropolitan Region continued at a good pace during the year. Shortage of mortgage money had an adverse effect on the building of new houses, but this was offset by a high level of activity in the construction of apartment blocks, town houses and garden apartments; during the year, electric service was extended to 9,479 residential accounts in the Metropolitan Region. In the commercial and industrial fields, negotiations were commenced for the supply of electric power to several large projects, including:

- Project 200, a commercial-industrial complex planned for an area covering some twenty-three acres on the Vancouver waterfront.
- Pacific Centre, a commercial development to be located in downtown Vancouver.
- New maintenance base of Canadian Pacific Airlines, Limited on Sea Island.
- Additional facilities at University of British Columbia.

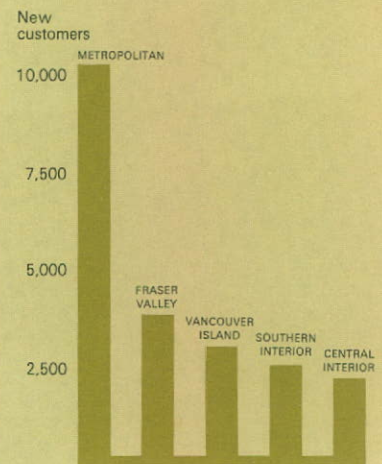
Consumption of electricity in Greater Vancouver is heavy, and this concentrated load has to be supplied over a distribution system that will ensure a high standard of continuity of service to customers. To this end, a 230 kv ring, most of which is located underground, serves major substations in the Vancouver area. During the year, work commenced on an eleven-mile underground extension of the ring to make a large additional block of power available at Camosun Substation to serve the growing load in the western part of Vancouver City. Work on this extension will be completed in 1969.

The community of Birken, in Pemberton Valley, and the communities of Sandy Hook, Tillicum Bay and Tuwanek, near Sechelt, were served by the Authority for the first time.

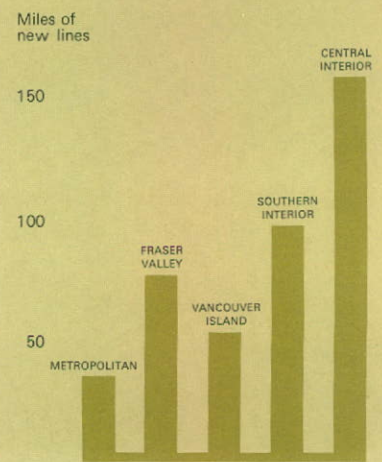
SALES OF ELECTRICITY



INCREASE IN ELECTRIC CUSTOMERS BY REGION DURING YEAR ENDED 31 MARCH 1969



INCREASE IN DISTRIBUTION LINES BY REGION DURING YEAR ENDED 31 MARCH 1969







*Modern exterior electric lighting adds visibly to the attractiveness of the home, provides a courteous convenience for guests and discourages night-time prowlers.*



*Installation of individual electric room-cooling units assures comfort in hot summer weather.*



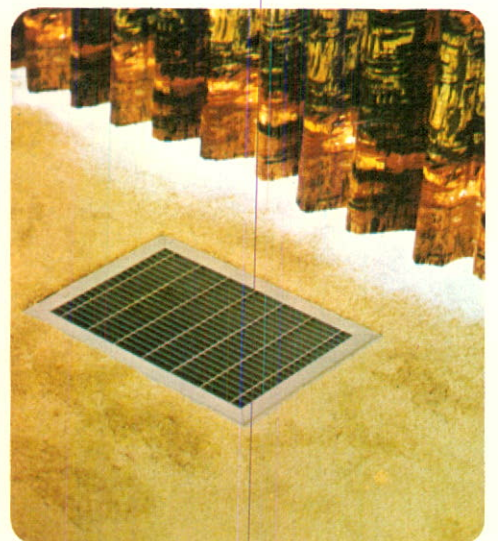
*Planned quality lighting creates a comfortable visual environment and brightens the appearance of dining facilities and paneling in this attractive hospitality room.*



*Automatic laundering equipment eliminates the homemaker's dependence on warm, dry weather.*



*The beauty of rugs, draperies and other interior furnishings is enhanced when living-room lighting is correctly designed, as it was for this handsome North Shore home.*



*Drop-in electric heating units are ideal where large glass areas extend from floor to ceiling.*



## Fraser Valley Region

The rate of construction in the Fraser Valley Region continues to accelerate, with no indication of a letdown. The value of building permits issued during 1968 increased 40% over the previous year.

Dairy farming experienced a 6% increase in production in 1968 compared with the previous record year of 1967. The poultry industry continues to expand, with an increase in production of 40% forecast for the next five years.

The seaport being constructed at Roberts Bank, which is scheduled to be in operation by 1970, will have a significant impact on the economy of this region. Negotiations are being concluded for the supply of electricity to sites on the new Roberts Bank causeway; the first tenant will be Resources Terminals Ltd., the operator of the loading and shipping terminal for Kaiser Resources Ltd. Pressure on port facilities and the need for space by industry in the Lower Mainland are expected to result in diversified developments at Roberts Bank during the next few years.

## Vancouver Island Region

Construction continued at a good rate in all major centres of the Vancouver Island Region. Greater Victoria showed a remarkable increase in construction activity during 1968; single-dwelling units started were 29% and multiple-dwelling units 138% higher than in the previous year. The Authority constructed underground extensions to serve eight new residential subdivisions in the Victoria area.

Prospects are bright for the economy of the Vancouver Island Region in the immediate future. New developments planned include large residential, commercial and civic projects in Greater Victoria; expansion of Nanaimo Regional General Hospital and the Fisheries Research Board of Canada biological station near Nanaimo; construction of tourist facilities at Long Beach and in the Parksville-Qualicum Beach area; and the opening of new subdivisions of seashore property in the vicinity of Duncan and on the Gulf Islands. Economic growth in northern Vancouver Island is expected to accelerate when the Authority completes the transmission line from Gold River to Port Hardy.

In November 1968, Mesachie Lake was added to the list of communities served by the Authority.

## Southern Interior Region

Major demands for power will result from expansion of coal mining in the East Kootenay area initiated by a long-term contract between Kaiser Resources Ltd. and Mitsubishi Shoji Kaisha, Ltd. for the shipment of coal to Japan, scheduled to commence in 1970. Arrangements are being made for the Authority to supply electricity to serve the first stage of the Kaiser coal development. Studies are under way relating to the supply of power for the second stage of the Kaiser development, the Fording River coal mining development of Canadian Pacific Investments Limited and Cominco Ltd., and other prospective loads.

A pulp mill completed by Crestbrook Pulp and Paper Ltd. at Skookumchuck went into production in late 1968, and new sawmills at Cranbrook and Elko are among other major developments planned for this region.

The electric distribution systems serving the communities of Sparwood and Natal were purchased from Crows Nest Industries Limited on 31 December 1968. This acquisition added 449 customers to the Authority's system; these customers are receiving the benefit of reduced electric rates.

During the year, there were 2,164 services installed in the Southern Interior Region, and work was carried out on underground distribution systems in nine new subdivisions. The Peachland-Westbank district is experiencing a boom in residential construction; more than 300 new residences were connected during the last twelve months, of which 55% had electric space heating installed.

Preliminary discussions were held during the year with representatives of the cities of Cranbrook, Fernie and Kimberley concerning the Authority's offer to acquire the electric distribution systems of these three cities.

## Central Interior Region

The Central Interior Region, which has experienced unusually heavy growth rates in sales of electricity for a number of years, continued to make important gains during the year ended 31 March 1969. Residential sales were up 19% and commercial 8%, partly because of the extremely cold weather which persisted throughout the region during the latter part of December and most of January. Sales to industrial customers showed a remarkable increase of 36%, reflecting the completion in 1968 of new industrial projects, including a pulp mill built by Intercontinental Pulp Company Ltd. at Prince George, a new mine

brought into operation by Granisle Copper Limited at Babine Lake and the reopened mercury mine of Cominco Ltd. at Pinchi Lake.

The outlook for industrial growth in the Central Interior Region is favourable. A new pulp mill is under construction at Mackenzie, which is advantageously located on Williston Lake reservoir. Other pulp mills are being planned to meet the increasing demand for pulp in world markets. New sawmills are being built at Houston and Fort St. James, and other lumber manufacturing facilities are being planned to take advantage of the strong lumber market. Negotiations are being concluded to supply Western Pacific Products & Crude Oil Pipelines Ltd. with power to operate four oil transmission line pumping stations. The completion by Pacific Great Eastern Railway of an extension from Prince George to Fort St. James and other extensions of that railway currently under construction are expected to encourage additional expansion in the mining and lumbering industries, which will have long-term implications for the supply of electricity by the Authority. A new office and service building was opened by the Authority at 100 Mile House in the autumn of 1968, to provide facilities to meet the needs of the rapidly expanding Cariboo district.

Steady growth was experienced in the North Coast Area during the year under review. Although the economy of Prince Rupert is influenced by the fishing industry, other industries, including the pulp mill of Columbia Cellulose Company, Limited, are broadening the economic base of this area. Continuing expansion by Eurocan Pulp & Paper Co. Ltd. is providing a stimulus to the economy of Kitimat.

On 1 August 1968, the Authority commenced supplying electric energy to the community of Port Clements on Queen Charlotte Islands; on 1 October 1968, the Authority purchased from C. Martin Utilities Ltd. the generation and distribution facilities at Masset on Queen Charlotte Islands. The first phase of an economic boom was evident when plans were announced during the year for expansion of the Canadian Armed Forces station at Masset. Customers in both Port Clements and Masset have benefited from the introduction of the Authority's electric rates.

Other communities added to the Authority's system in the Central Interior Region included Cedarvale, Cottonwood, Kitwancool and Moberly Lake.

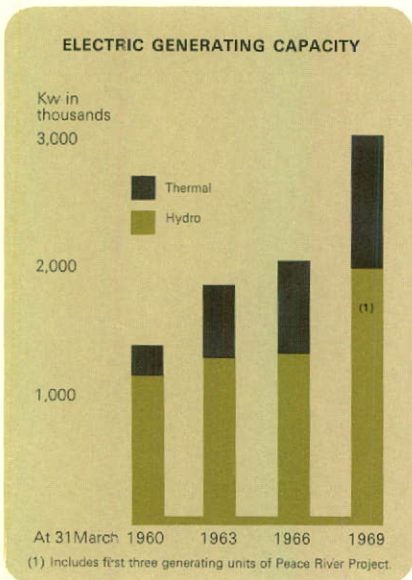




Work started on 11-mile underground extension of 230 kv ring serving Vancouver.



Electric line crews continue on the job despite snow and sub-zero temperatures.



## Rural Electrification

During the year, the Government of British Columbia made a grant of \$1,000,000 to the Authority to provide financial assistance for the electrification of rural areas in British Columbia. As a result of this grant, commitments were made to extend financial assistance to 118 projects serving 497 customers in all regions of the Authority's service area. These projects include the acquisition and rebuilding of the electric system at Anahim Lake, and construction of a 42-mile extension (of which 2.4 miles is under water) to initially serve 148 customers on Cortes Island.

For the coming year, the Provincial Government has increased the amount of its grant to the Authority for rural electrification to \$2,000,000. To utilize this additional grant, the Authority introduced a new cost-sharing formula that will bring the benefits of electricity to hundreds of rural residential customers for whom extensions would not otherwise be economically feasible.

## Generation and Supply of Electricity

The Authority's generating capacity was increased during the year by a record 37.3%, with the placing in service of the first three 227,000 kw units at Gordon M. Shrum Generating Station, the addition of a fifth 150,000 kw unit at Burrard Thermal Generating Plant and the doubling of hydro capacity at Strathcona Generating Station. Total installed nameplate generating capacity at 31 March 1969 was 3,055,842 kw compared with 2,225,672 kw at 31 March 1968.

Paralleling the significant increase in generating capacity was the corresponding expansion of the transmission network required to deliver power to existing and new load centres throughout the Province. During the year, 713 miles of new transmission lines—ranging from 60 kv to 500 kv—were brought into service. Transmission lines in service at 31 March 1969 totalled 6,263 miles.

The highest one-hour demand ever recorded on the Authority's integrated system, 2,357,000 kw, occurred on 27 January 1969. This record demand represented an increase of 9.5% over the previous year's peak.

Requirements for electric energy during the year totalled 13,750 million kwh compared with 12,361 million kwh in the previous year. The following table shows how the requirements were met during the year compared with the previous year:

	Year Ended 31 March 1969 Kwh in Millions	Increase (Decrease) From Previous Year Kwh in Millions
Hydro generation—excluding Peace River Project . . .	7,766	(529)
Hydro generation—Peace River Project . . . . .	1,590	1,590
Thermal generation . . . . .	3,013	218
Duncan and Arrow storage downstream benefits . . . .	839	(13)
Purchases . . . . .	542	123
	<u>13,750</u>	<u>1,389</u>

During the winter period of high demand, power was available from the Peace River Project; also, because of the early completion of Arrow Dam, the Authority received electricity from downstream generating plants. Notwithstanding the availability of this additional power, more energy was required from Burrard Thermal Generating Plant than last year, because freezing weather curtailed production at some hydro plants by reducing the flow of water into reservoirs.

Snow, wind and freezing temperatures in December and January cut distribution lines carrying power to customers, thereby causing widespread service outages throughout the Province. Emergency plans for restoring service were set in motion, but the task of repairing damaged lines was impeded by drifting snow which made some roads impassable. Despite the severe conditions, service to customers was restored expeditiously.





*Natural gas, the modern fuel, can serve many purposes in the home. Gas fireplaces give cheery warmth without work or dirt. Indoor swimming pools heated by gas can be enjoyed in comfort at any season of the year. Gas barbecues bring out the fine flavours of meat and poultry. Displays feature these and many other uses of this versatile fuel.*



## GAS SERVICE

Gross revenues from the sale of gas to the public were \$40,575,251, up 18.1% from the previous year, while therms of gas sold rose by 20.2%. Weather conditions, which have a marked influence on sales of gas for heating, were unusually cold during the prime heating months of December and January and were largely responsible for the spectacular increase in gas sales. The coldest day in the 32 years that meteorological records have been kept at Vancouver International Airport occurred on 29 December 1968, when the mercury registered  $-3$  degrees. The number of degree days recorded at the Airport during December and January totalled 2,125, an increase of 28.9% over normal, and snowfall measured 49 inches compared with a normal total of 11 inches.

Apart from the effect of abnormal weather conditions, the trend of growth in sales of

gas during the past several years was sustained. This continued growth was particularly noticeable in the heating categories and can be attributed, in large part, to more homes and apartment blocks using gas for heating. Gas heating is selected for more than 90% of new residential construction within the Authority's natural gas service area. Successful promotional programs, conducted in cooperation with Westcoast Transmission Company Limited, resulted in the conversion to gas of heating systems in more than 3,300 houses and 4,000 apartment suites during the year; while the conversion of heating systems in a number of office buildings, including Vancouver City Hall, resulted from promotions commenced in the previous year. At 31 March 1969, there were 185,842 customers receiving gas service from the Authority, an increase of 7,763 during the year.

Cold winter weather caused a number of unusual maintenance problems and contributed to a major fracture in the 20-inch main serving customers on the North Shore. Although this line was temporarily inoperative, service to customers was maintained by diverting gas through other lines. The number of service calls to customers' premises increased 5,000 over normal for December and January.

The peak one-day output of gas on the Lower Mainland during the year, including gas delivered to Burrard Thermal Generating Plant, was 294 million cubic feet on 27 December 1968, exceeding the previous record peak of 252 million cubic feet established in October 1966.

In Greater Victoria, sales of liquefied petroleum gas-air for the year totalled 3,798,705 therms, an increase of 6.1% over the previous record. Nearly a mile of 4-inch high-



pressure main was installed during the year to supply gas to Victoria's new Hillside shopping centre and adjacent area.

The net increase in gas mains laid during the year totalled 140 miles, including nearly 19 miles of high-pressure mains installed to replace old, low-pressure pipe. These extensions and reinforcements are part of the Authority's continuing program to improve the reliability of supply and to meet the growing demand for gas by all categories of customers.

Westcoast Transmission Company Limited supplies natural gas to the Authority on the Lower Mainland. In accordance with terms of a purchase agreement with that company, the daily billing demand for firm gas was 166.9 million cubic feet at the beginning of the year, but because of the cold

winter weather on the Lower Mainland, the billing demand was increased to 252.9 million cubic feet commencing with December 1968. This higher billing demand will continue in force until 31 October 1969, when a new purchase agreement with Westcoast Transmission Company Limited becomes effective.

A contract for \$3,997,000 was awarded in March 1969 to Canadian Liquid Air Ltd. for construction of a liquefied natural gas plant capable of liquefying and storing 625 million cubic feet of gas. The new plant will be constructed near Vancouver and is scheduled to be in operation by September 1970. This additional storage capacity will reduce the demand for gas on the pipeline during periods of peak loads and thereby minimize the cost of gas to the Authority.

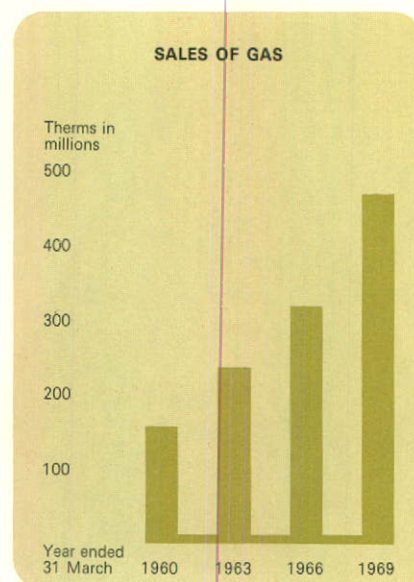
## TRANSPORTATION SERVICES

### Urban Transportation

For the third successive year, there was an upward trend in the use of transit services in the Vancouver metropolitan area. To meet this improved trend in passenger riding on the Vancouver metropolitan system, increases in service were introduced, with 233,879 additional miles being operated during the year. Gross revenues from urban transportation services totalled \$16,135,576, including a grant of \$1,000,000 received by the Authority from the Government of British Columbia; excluding the subsidy received from the Government, urban transportation revenues increased 1.4% over the previous year. A contributing factor to this increase was the additional patronage attributable to the severe weather experienced in the latter part of December and throughout January. It is noteworthy that, despite the strain imposed on the urban transportation

systems in Greater Vancouver and Greater Victoria by adverse weather conditions during this period, service was maintained on all routes, and approximately 800,000 more passengers were carried than in the same period a year ago.

Although the Vancouver metropolitan transit service has shown improved patronage, operating losses of this service and the Greater Victoria system continue to be substantial. To help alleviate these losses and maintain an adequate standard of service in the metropolitan areas, the Government of British Columbia is increasing its grant to the Authority from \$1,000,000 for the year ended 31 March 1969 to a total of \$2,000,000 for the coming year. Associated with the grant, the Government also provided that, effective 1 April 1968, any person in receipt of supplementary social assistance could obtain a restricted transit pass at a price of \$5.00 for each six-month period. During the year under review,



18,821 six-month passes were issued on behalf of the Authority by the Provincial Government Department of Social Welfare; the Authority is using a portion of the metropolitan transit subsidy to absorb the cost of providing service to holders of these passes.

Twenty-five new buses were purchased in March 1969 for use in the Greater Vancouver area; of these, sixteen replaced older buses, and nine were required to meet the gradually increasing demand for service. Ten new buses were purchased for use in Greater Victoria to replace twelve older and smaller vehicles; two of the new buses were designed for sightseeing and long-distance charter service.

### Interurban Transportation

Gross revenues from interurban transportation services rose 5.3% to \$3,373,996 during the year. The trend of increasing patronage on Greater Vancouver and Fraser Valley routes and the severe winter weather conditions resulted in revenues increasing 4.1% over the previous year. Revenues from the services operated between Vancouver and Victoria and between Vancouver and Nanaimo (via ships of the British Columbia Ferry Authority) also increased 4.1% over last year. Sightseeing revenues recorded a significant increase, despite growing competition from other operators.

Six new buses were received in March 1969, and four older buses will be retired from service. The new buses were acquired for use on regular interurban routes and also for sightseeing and charter operations.



Ten new diesel buses were added to the Authority's Victoria transit fleet during the year.



## Rail Freight

Gross revenues from rail freight operations amounted to \$7,462,538 for the year, an increase of 6.7% over the previous year.

The Authority has had marked success in attracting new industries to industrial sites adjacent to its railway lines in Greater Vancouver and the Fraser Valley. New freight customers commenced construction of twelve plants during the year, and thirteen private railway spurs were built. It is anticipated that, with the high level of industrial expansion predicted for the Lower Mainland, the active development of sites along the Authority's railway lines will continue.

A new railway bridge, constructed by Canadian Pacific Railway Company to provide rail access to freight customers on Lulu Island, was scheduled to be placed in service shortly after the year-end. This structure replaces the old Marpole Bridge, which was severely damaged during the previous year by river traffic. The new bridge will allow the handling of the heaviest railway cars and will provide improved channel openings for water traffic.

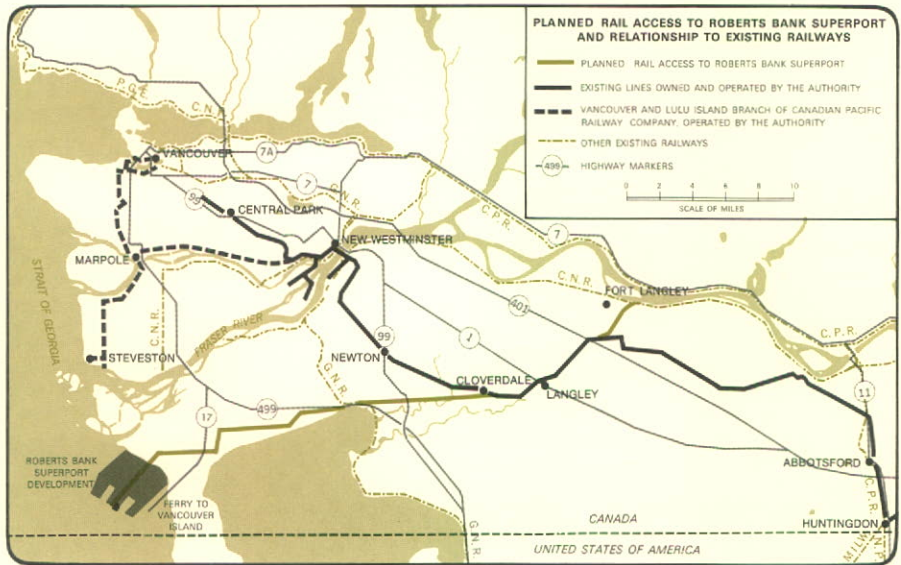
One new 1,000-horsepower diesel locomotive was placed in service during the year, bringing to sixteen the total number of diesel locomotives owned by the Authority.

After considerable public discussion, the route for the railway to Roberts Bank Superport was generally settled, the roadbed designed and initial contracts for construction of the line awarded before the year-end. The planned rail access from a point east of Fort Langley to the end of the causeway at Roberts Bank will consist of twenty-three miles of new main track, six miles of new track for passing, seven miles of existing Authority track and nearly a mile of existing Great Northern main line. The new rail line, which is scheduled for completion in October 1969, will provide a com-

mon rail access to Roberts Bank Superport for trains of Canadian National Railway, Canadian Pacific Railway, Great Northern Railway and the Authority's railway.

Two major contracts for construction of the roadbed and associated works for the rail line to Roberts Bank Superport were awarded during the year to:

Fownes Construction Co. Ltd. . . . . .	\$2,715,082
The Cattermole-Trethewey Contractors Ltd. . . . .	1,861,400



## COST OF PROVIDING SERVICES

The total cost of providing all services during the year was \$211,824,158, an increase of \$23,244,895 or 12.3% over the previous year.

Interest and other costs on debt charged to operations were \$63,695,856, up \$10,461,924 or 19.7% from last year. The main factors which contributed to this increase were:

(a) The transfer to property in service during the year of amounts totalling \$225,735,324, representing the cost of the first three generating units at Gordon M. Shrum Generating Station, a proportion of the costs of W. A. C. Bennett Dam, powerhouse and other common property associated with the Peace River Project and the cost of the first transmission line to the Lower Mainland.

(b) The completion and transfer to active

service during the year of other new plant facilities.

(c) A continuing rise in interest rates.

Provision for depreciation of plant was \$38,630,636 compared with \$34,739,611 last year, an increase of 11.2%. Increases in provision for depreciation are directly related to the completion and transfer to active service of new plant. The Authority's rates of depreciation are comparable to those used by other utilities.

Salaries, wages and employee benefits charged to operations amounted to \$49,611,424, an increase of \$5,612,256 or 12.8% over the previous year. This increase was caused mainly by higher rates of pay. An increase in the number of regular employees and increased pensions for certain retired employees or their beneficiaries were also contributing factors.

Purchases of natural gas from Westcoast

Transmission Company Limited totalled \$21,959,450, of which \$17,214,263 was for gas sold to the public, an increase of 21.4% over last year. The remainder of the gas purchased was used principally at Burrard Thermal Generating Plant. The increase in the cost of gas purchased from the pipeline company for sale to the public reflects continued growth in consumption of gas by customers and record demand charges arising from the cold winter weather.

Grants, school taxes, water rentals and franchise payments charged to operating expenses during the year totalled \$14,953,333, an increase of \$1,687,599 or 12.7% over last year. Water licence fees for operating Gordon M. Shrum Generating Station were \$316,890; the remainder of the increase was caused by growth in the Authority's assessable property, higher mill rates for school taxes and generally higher assessments on property.



## FINANCING

The following 25-year sinking fund bonds were sold in Canada during the year under review: \$19,800,000 7% Series Z, \$5,500,000 7¼% Series Z, \$10,000,000 7¼% Series AS, \$10,000,000 7% Series AU, \$10,000,000 7% Series AV and \$10,000,000 7½% Series AW.

Eleven issues of Series V sinking fund bonds totalling \$66,154,000 were sold during the year to the Canada Pension Plan Investment Fund, at an average interest cost of 6.78%. By comparison, bonds totalling \$96,601,000 were sold during the previous year to the Canada Pension Plan Investment Fund, at an average interest cost of 5.84%.

The average effective annual interest cost of all long-term bonds issued by the Authority during the year was 7.01% compared with an average of 6.24% in the previous year, reflecting the continuing general increase in cost of money.

On 3 August 1968, \$50,505,000 6½% Parity Development Bonds Series AT, due 3 August 1973, were sold. The net proceeds of this issue were applied to the repayment of \$50,505,000 5½% Parity Development Bonds Series K, which matured on 3 August 1968. At the same time, the interest rate of the other three outstanding issues of parity development bonds of the Authority was increased from 5½% to 6½%.

During the year, \$12,074,000 3¾% Series "C" bonds and \$11,995,000 3¾% Series "D" bonds, issued by the former British Columbia Electric Company Limited, and \$6,000,000 3% Series B bonds, issued by the former British Columbia Power Commission, reached maturity and were redeemed.

The amount of \$17,264,348 was paid to Trustees during the year to meet sinking fund requirements of the Authority's long-term debt. All sinking fund obligations have been met.

Bonds and other securities issued by the Authority and its predecessors are unconditionally guaranteed as to principal and interest by the Province of British Columbia.

### Columbia River Treaty Funds

On 16 September 1964, Canada and the United States exchanged ratifications of the Columbia River Treaty. Funds accruing to the Authority under the Treaty amounted to \$418,722,167 at 31 March 1969, derived from the following sources:

Amount received from sale of Canada's entitlement to downstream power benefits . . . . .	\$273,291,661
Amounts received for flood control provided by Duncan and Arrow storage projects . . . . .	67,838,844
Additional downstream power benefits received as a result of Duncan and Arrow storage projects becoming operational ahead of schedule (net) . . . . .	6,445,999
Interest (including \$31,042,869 charged to construction of storage projects) . . . . .	71,145,663
	<u>\$418,722,167</u>

### STATEMENT OF SOURCE AND APPLICATION OF FUNDS FOR THE YEAR ENDED 31 MARCH 1969

(with corresponding figures for the year ended 31 March 1968)

	1969	1968
<b>Funds provided:</b>		
Operations—		
Net income . . . . .	\$ 9,283,868	\$ 12,890,635
Provision for depreciation . . . . .	38,630,636	34,739,611
Other . . . . .	1,801,920	1,820,216
	<u>49,716,424</u>	<u>49,450,462</u>
Contributions in aid of construction . . . . .	3,749,797	3,461,543
Proceeds from sales of bonds . . . . .	180,407,451	282,850,970
Columbia River Treaty—		
Benefits received during year . . . . .	58,347,280	15,937,563
Interest . . . . .	15,746,634	16,783,960
Decrease (increase) in working capital exclusive of changes in current portion of long-term debt—		
Columbia River Treaty investments . . . . .	33,553,494	49,609,060
Other . . . . .	(17,356,915)	9,182,536
	<u>\$324,164,165</u>	<u>\$427,276,094</u>
<b>Funds expended:</b>		
Plant additions—		
Peace River Project . . . . .	\$ 92,687,087	\$166,155,067
Columbia River Treaty storage projects . . . . .	60,890,516	85,115,368
Other . . . . .	73,696,635	89,900,296
	<u>227,274,238</u>	<u>341,170,731</u>
Sinking fund purposes . . . . .	17,264,348	16,706,618
Redemption of bonds matured . . . . .	78,390,680	62,186,373
Decrease in notes payable to Provincial Government . . . . .	—	7,500,000
Increase (decrease) in sundry assets, etc. . . . .	1,234,899	(287,628)
	<u>\$324,164,165</u>	<u>\$427,276,094</u>

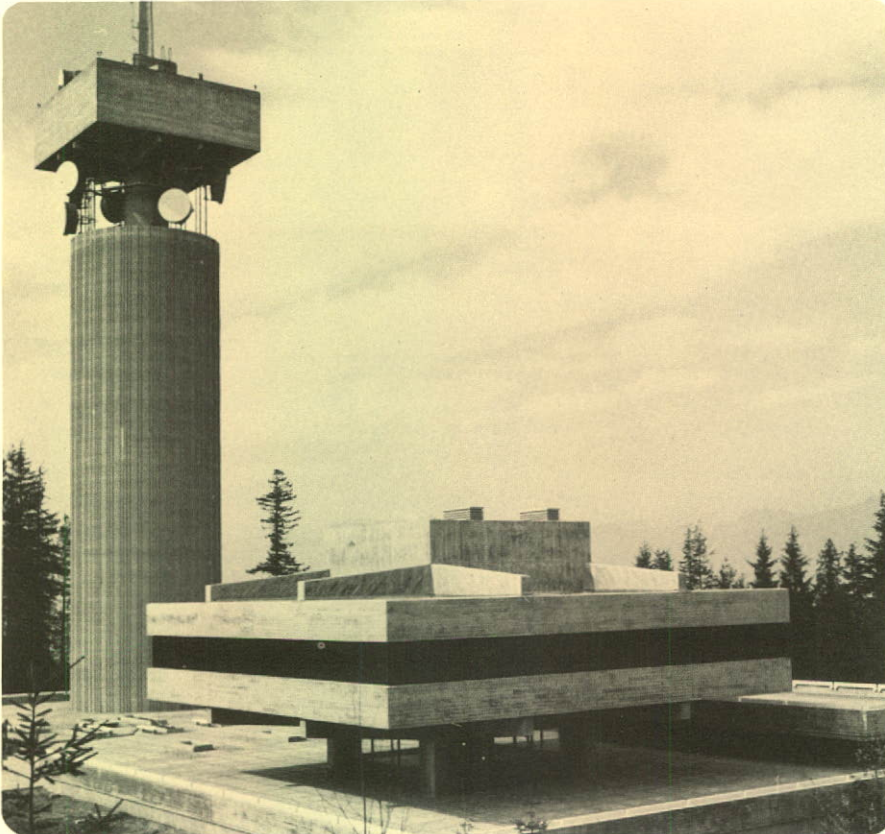


## CONSTRUCTION PROGRAM

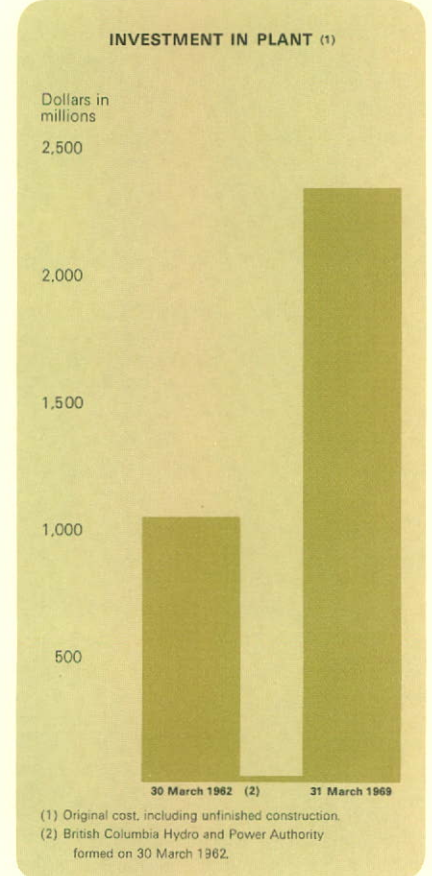
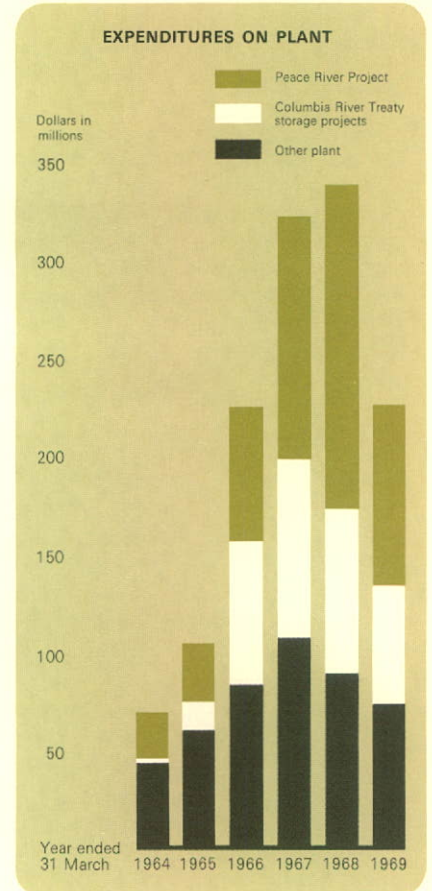
Expenditures on plant additions, land and improvements totalled \$227,274,238 compared with \$341,170,731 in the previous year. Net property additions amounted to \$220,383,365, after deducting plant retirements of \$6,890,873. Major expenditures for the year by projects or broad classifications included the following:

Peace River Project, including transmission lines . . . . .	\$92,687,087
Columbia River Treaty storage projects . . . . .	60,890,516
Burrard Thermal Generating Plant . . . . .	3,763,551
Strathcona Generating Station . . . . .	2,592,175
Mica Creek Diesel Generating Station . . . . .	2,414,848
Lower Mainland to Vancouver Island electric transmission system— 260 kv D.C. . . . .	11,117,015
Other major electric transmission lines . . . . .	4,558,825
Substations, associated distribution facilities and local transmission systems—electric . . . . .	17,518,041
Electric extensions to serve new customers . . . . .	15,127,313
Electric system control centre on Burnaby Mountain . . . . .	1,837,313
Gas extensions to serve new customers . . . . .	5,285,399
Gas system renewals and alterations . . . . .	1,875,647
Buses for urban and interurban transit systems . . . . .	1,801,558
Diesel locomotive, rail access to Roberts Bank and other rail freight plant additions . . . . .	1,255,016

Design and construction engineering on many of the Authority's major construction projects is carried out by International Power and Engineering Consultants, Limited, a wholly owned subsidiary of the Authority.



*New centre on Burnaby Mountain will control major generation and transmission facilities.*





## PEACE RIVER PROJECT

First power from the Peace River Project flowed into the Authority's integrated transmission system on 28 September 1968, as the first three 227,000 kw generating units were set in motion, barely in time to meet peak winter loads but ahead of the schedule established nearly seven years earlier. The occasion was marked by a ceremony at which the Honourable W. A. C. Bennett, Prime Minister of British Columbia, named the power plant "Gordon M. Shrum Generating Station", in honour of the Chairman of the Authority, and named the reservoir behind W. A. C. Bennett Dam "Williston Lake", in honour of the Honourable Ray G. Williston, Minister of Lands, Forests and Water Resources for the Province of British Columbia. Considering the size of the undertaking and the coordination required to achieve the many and complex objectives, production of power at this project ahead of schedule was an administrative and engineering triumph.

The 2,800-foot-long spillway channel in the right abutment of the dam was completed during the year. Construction of the central control building, which houses the controls for both the generating station and the 500 kv and 138 kv switchyards, was also completed and the building occupied by the Authority's operating and maintenance staff. The control equipment is sufficiently automated to permit one-man operation. Since start-up of the first three generating units in September 1968, power has been generated daily, and a peak of 560,000 kw was reached; with anticipated increases in the level of the reservoir during May and June 1969, production of the rated output of 227,000 kw per unit will be achieved.

The first of two 500 kv transmission lines was completed during the year from Gordon M. Shrum Generating Station to the Lower Mainland, a distance of 575 miles. Construction of Williston Substation at Prince George and Kelly Lake Substation near Clinton, and alterations and additions to Ingledow Substation in Surrey, had to be completed concurrently with the generation and transmission facilities.

Total expenditures on the Peace River Project to 31 March 1969 were \$530,816,274, of which \$92,687,087 was spent during the year under review. The work force for the entire project in 1968 reached a high of 2,393 men, which was 2,457 less than the record peak in 1967; this downward trend will continue with a maximum labour force of about 600 estimated for 1969.

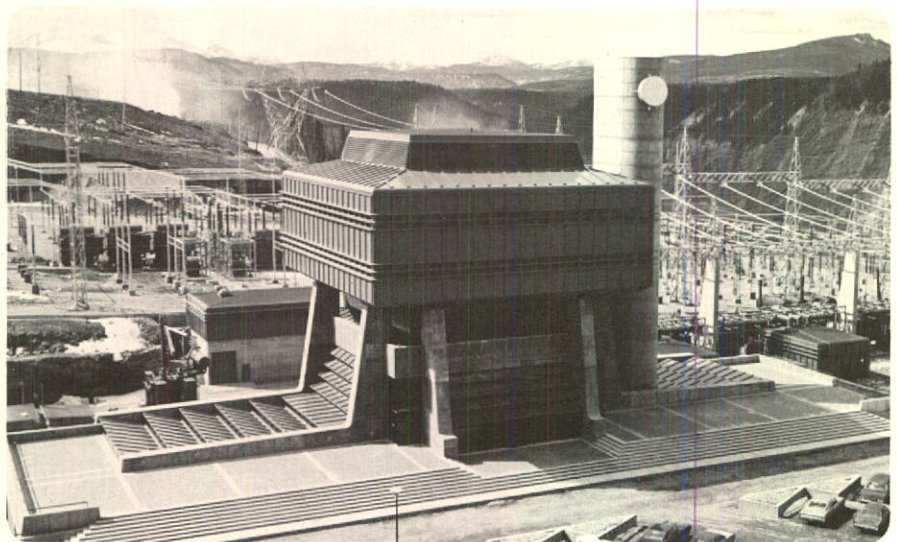
During 1969, Gordon M. Shrum Generating Station will be expanded with the placing in service of a fourth and a fifth generating unit, at which time this under-

ground power plant will have reached half its ultimate capacity of 2.3 million kw. Manufacture of turbines, generators and other major equipment for a further three units is under way, and a contract for installation of these three units will be awarded during the coming year, with one unit to be placed in service in 1971 and two units in 1972. Two more units will be installed later, as needed. A second 500 kv transmission line from Gordon M. Shrum Generating Station is under construction and will be completed as far south as Kelly Lake in 1969; this line is scheduled to be completed to the Lower Mainland by 1971.

No trial date has been set for the lawsuit commenced on 17 July 1967 by Northern Powerplant Builders against the Authority for additional remuneration, damages and declarations as to the contractor's rights, with respect to the contract for construction of the underground powerhouse and associated works.

Major contracts awarded during the year included:

Oy Nokia Ab	
Installation of 500 kv series capacitors . . . . .	\$6,440,000
Tyee Construction Co.	
Installation of foundations and erection of towers for transmission lines . . . . .	3,994,432
Fischbach and Moore of Canada, Ltd.	
Stringing conductor for transmission lines . . . . .	2,284,500
Pioneer Electric Manitoba Limited	
Supply of 500 kv transformers . . . . .	1,267,625



Central control building and switchyard at Gordon M. Shrum Generating Station.

### W. A. C. BENNETT DAM

Height: 600 feet. Length: 1¼ miles. Thickness: ½ mile at base. Volume: 57.2 million cubic yards of gravel, sand and rock.

### GORDON M. SHRUM GENERATING STATION

Located underground on the left bank of the Peace River. Installed rated capacity at 31 March 1969: 681,000 kw; ultimate rated capacity: 2,300,000 kw.

### WILLISTON LAKE RESERVOIR

225 miles long, covering 640 square miles. Total storage capacity: 57 million acre-feet of water.

### TRANSMISSION

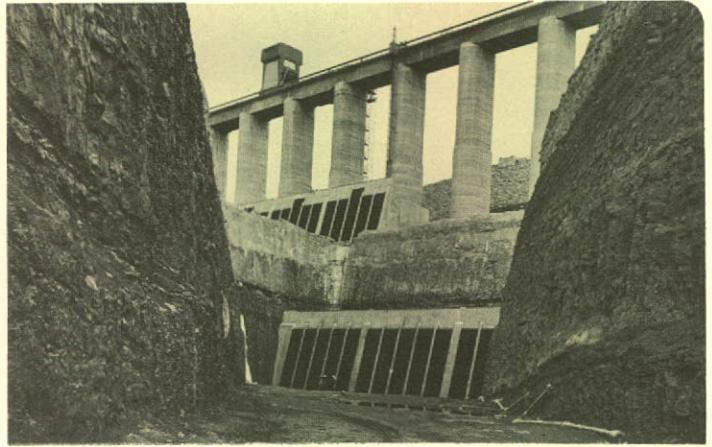
Two 500 kv lines: one—completed at 31 March 1969—575 miles; and the other—scheduled for completion in 1971—548 miles; both to the southwest corner of the Province.

### SECOND STAGE

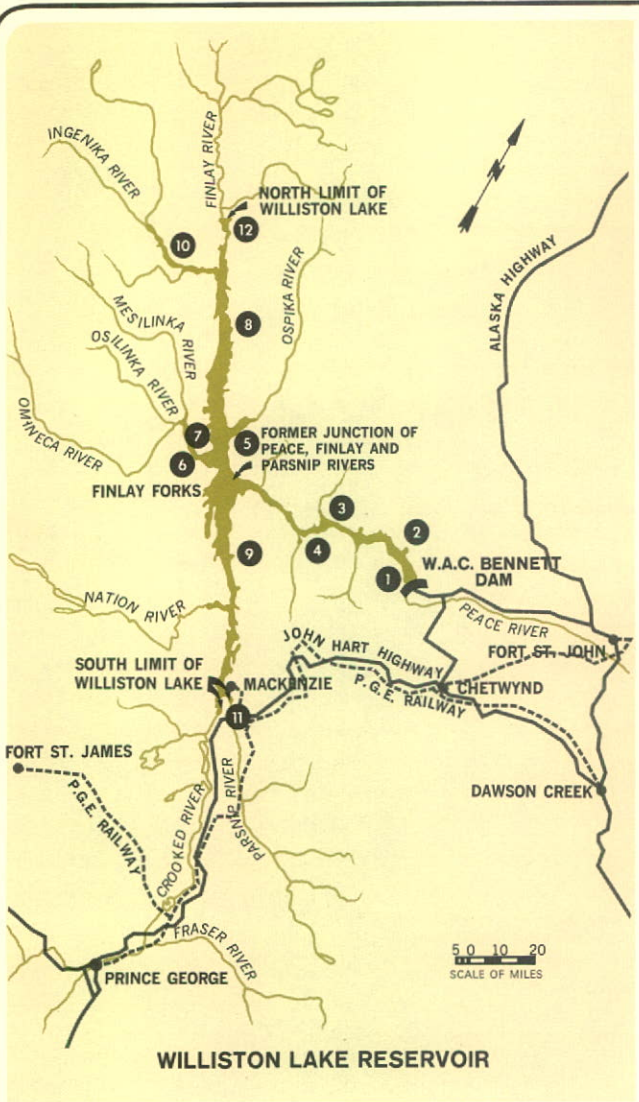
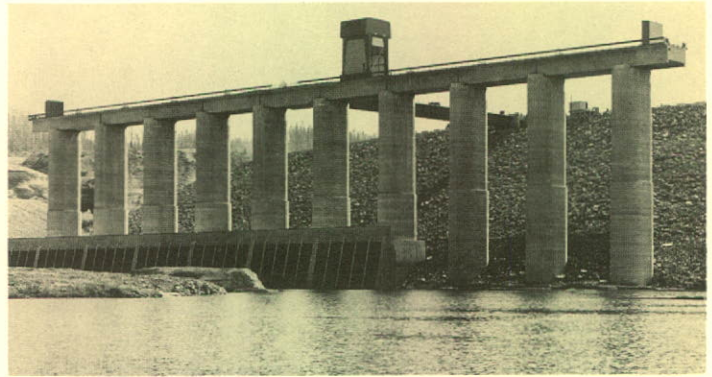
Second dam, 240 feet high, with 650,000 kw power plant planned for construction, when needed, 12 miles downstream from W. A. C. Bennett Dam.



# PORTAGE MOUNTAIN DEVELOPMENT

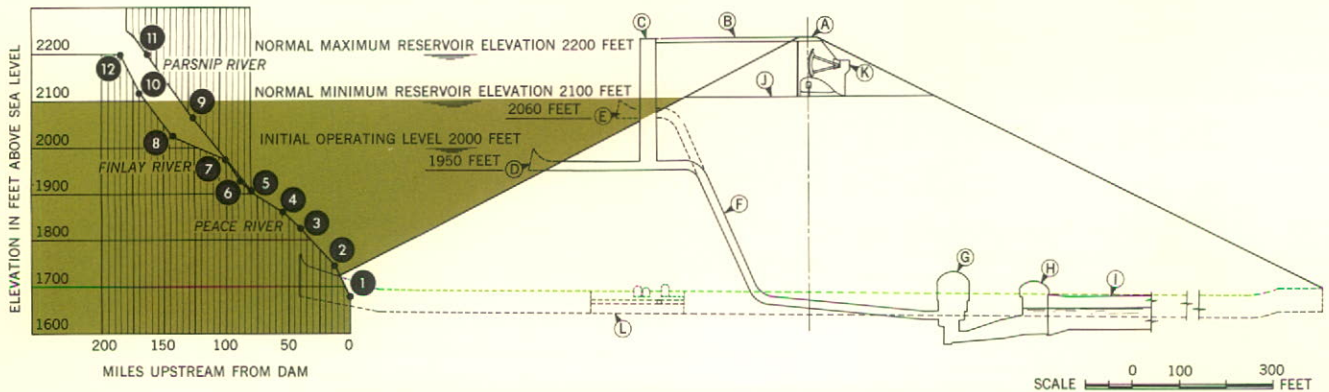


Three intakes were placed lower than others (above) so power could be produced during winter of 1968-69 from first year's runoff (below).



**WILLISTON LAKE RESERVOIR**

Diagrammatic profile and cross-section below relate reservoir elevation to operating requirements of dam and generating station. Numbered key indicated on profile and on map above, shows progress of reservoir filling upstream from dam, as water level rises.



**DIAGRAMMATIC PROFILE OF WILLISTON LAKE RESERVOIR**

**AND CROSS-SECTION OF W. A. C. BENNETT DAM AND GORDON M. SHRUM GENERATING STATION**

### LEGEND

- (A) CREST OF DAM (NOMINAL ELEVATION 2230 FEET)
- (B) ACCESS BRIDGE TO INTAKE STRUCTURES
- (C) INTAKE STRUCTURES (ELEVATION OF TOWERS 2230 FEET)
- (D) INTAKES FOR GENERATING UNITS NUMBERS 1 TO 3 (ELEVATION 1950 FEET)
- (E) INTAKES FOR GENERATING UNITS NUMBERS 4 TO 10 (ELEVATION 2060 FEET)
- (F) PENSTOCKS
- (G) POWER PLANT
- (H) MANIFOLD
- (I) TAILRACE TUNNEL
- (J) SPILLWAY CHANNEL
- (K) SPILLWAY HEADWORKS
- (L) LOW-LEVEL OUTLETS



## COLUMBIA RIVER TREATY STORAGE PROJECTS

The Authority is the Canadian Entity under terms of the Treaty between Canada and the United States relating to development of water resources of the Columbia River Basin. The Treaty called for construction of three storage dams in Canada—Duncan, Arrow and Mica—to regulate river flow for both hydro-electric generation and flood control purposes. The Authority completed the Duncan storage project during the year ended 31 March 1968, several months ahead of schedule; and the Arrow project was virtually completed before the end of 1968, also well in advance of the scheduled date. At the Mica project, work is proceeding satisfactorily. The total spent on the three projects to 31 March 1969 was \$335,737,683, of which \$60,890,516 was spent during the year.

### Duncan Dam

The Duncan storage project was operated throughout the year under provisions of the Columbia River Treaty. Power generated downstream in British Columbia from the operation of Duncan Dam was received during the year from Cominco Ltd. and West Kootenay Power and Light Company, Limited as the Authority's share of downstream power produced at plants on the Kootenay River.

### Arrow Dam

The Arrow storage project was declared operational on 10 October 1968, nearly six months ahead of the time specified in the agreement for the sale of downstream power benefits under the Columbia River Treaty.

Work on the 170-foot-high Arrow Dam, where unique methods were employed to facilitate construction without dewatering the riverbed, was sufficiently advanced by the end of June 1968 to commence storing water in the reservoir. In July, water in the reservoir reached an elevation of 1,404 feet above sea level—40 feet below normal full storage level—as a result of stoplogs having been placed in the uncompleted sluiceways and by the operation of the low-level ports. The reservoir was maintained at that level until the dam became fully operational in October. The amount of concrete placed in

the entire project totalled 564,000 cubic yards, and 9,280,000 cubic yards of fill materials were required for the earth-fill portion of the dam.

Arrow Dam, where the labour force reached a peak of 1,687 men in May 1967, became the second Treaty storage project to be completed by the Authority without loss of life.

In anticipation of early completion of the Arrow project, the Canadian and United States Entities made special arrangements in 1968 for the operation of the Arrow reservoir during the year ended 31 March 1969, whereby the Authority would receive the Canadian share of additional power generated in the United States. As a result of the early completion of this project, and under the arrangements between the Canadian and United States Entities, the Canadian share of additional power was delivered throughout the year to the Authority by United States agencies and used in the Authority's system. The net value of this power, and interest earned from the advanced payment of the \$55,909,812 received by British Columbia for providing flood control, produced financial benefits to the Authority valued at \$4,442,169.

The development of three new communities at Fauquier, Burton and Edgewood in the Arrow Lakes region, to replace former settlements which were flooded, showed good progress during the year. Approximately seventy-five families have settled in the new communities, and the construction of stores, community halls, post offices, schools and service facilities had either been completed or were in the final stages of completion by the year-end. The Department of Recreation and Conservation, Pro-

vincial Parks Branch, is planning the development of a number of parks throughout the Arrow Lakes region on land made available for this purpose by the Authority.

### Mica Dam

Construction of the 645-foot-high Mica Dam is proceeding on schedule towards a completion date of 1 April 1973, as required under terms of the agreement for the sale of downstream power benefits.

Excavation of the riverbed to bedrock was completed in August 1968, and approximately 614,000 cubic yards of fill were placed in the dam during October and November before winter weather conditions halted this activity; 42,000,000 cubic yards of fill will be required ultimately for completion of the dam. Construction during the winter months was limited to excavation of the rock abutments, spillway and low-level access tunnel. A contract was awarded during the year for spillway gates; this is the first contract to be let for major equipment required for this project. The labour force at the Mica project reached a peak of 1,195 men during the year under review.

Access to Mica Dam is excellent following completion of the relocated Big Bend Highway from Revelstoke. At Mica Creek, a modern hotel is scheduled for completion in the summer of 1969.

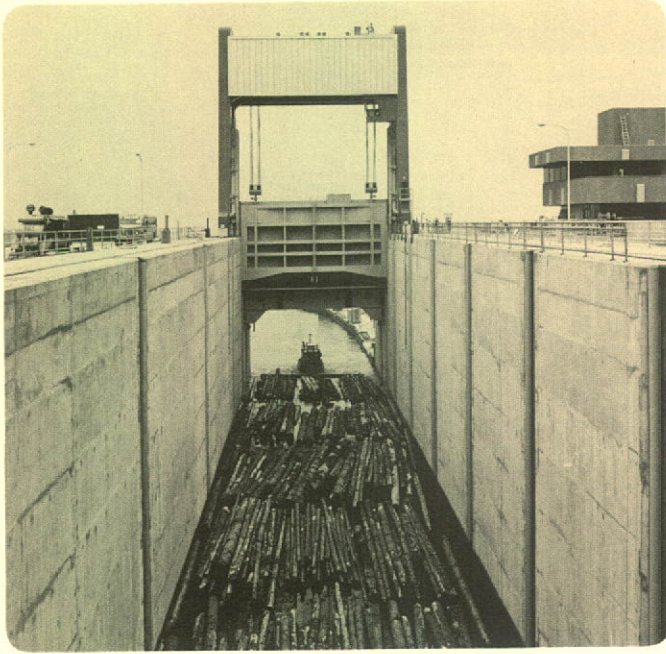
The following major contract was awarded during the year:

Department of Highways,  
Provincial Government  
*Engineering and construction of road between Cranberry Lake and Revelstoke* . . . . . \$1,744,460

### COLUMBIA RIVER TREATY DAMS

	DUNCAN	ARROW	MICA
Height (feet) . . . . .	130	170	645
Length (feet) . . . . .	2,600	2,850	2,600
Volume of fill and concrete (cubic yards in millions) . . . . .	6.4	9.8	42.0
Reservoir (length in miles) . . . . .	28	145	135
Live storage capacity (acre-feet in millions) . . . . .	1.4	7.1	12.0
Scheduled completion date . . . . .	Completed	Completed	1 April 1973





*Navigation lock in Arrow Dam permits the passage of river traffic.*



*Fill for Mica Dam is hauled by huge 120-ton bottom-dump trucks.*



*Mica Dam, the final Columbia River Treaty storage project to be completed by the Authority, will rise 645 feet above the riverbed.*



## OTHER MAJOR ELECTRIC SERVICE PLANT ADDITIONS

At Burrard Thermal Generating Plant, the fifth 150,000 kw turbine generator was brought into service in November 1968. Installation of this unit increased the total capacity of the Burrard plant to 750,000 kw.

Generating capacity at the Strathcona Generating Station near Campbell River on Vancouver Island was doubled with the installation in November 1968 of a 33,750 kw unit. To further augment the Authority's generating capacity on Vancouver Island, plans were completed to redevelop the hydro plant at Jordan River, 45 miles west of Victoria. In December 1968, a contract in the amount of \$7,497,579 was awarded to Emil Anderson Construction Co. Ltd. for construction of a 3.5-mile-long tunnel and associated works. Upon completion in 1971 of the project, capacity of the Jordan River generating plant will be increased from 26,400 kw to 150,000 kw.

The first phase of a high-voltage, direct-current interconnection between the Lower Mainland and Vancouver Island was completed during the year. With an initial capacity of 78,000 kw, which will be increased to 312,000 kw in 1969 with the installation of three submarine cables across Georgia Strait and Trincomali Channel, this system will provide capacity to keep pace with anticipated growth in demand for electricity on Vancouver Island.

Concurrently with the installation of 500 kv facilities at Ingledow Substation to receive power from Gordon M. Shrum Generating Station, one of the transmission lines connecting the Authority's integrated system with that of Bonneville Power Administration was converted to 500 kv, thereby greatly increasing the capacity of the interconnection for exchange of electricity between the Authority and the Northwest Power Pool. With the advent of power from the Peace River, the electric systems serving Chetwynd, Dawson Creek, Fort St. John and Hudson Hope were connected to the Authority's integrated electric system. Construction in 1969 of a 138 kv line from Gordon M. Shrum Generating Station to Fort St. John will strengthen the subsystem and the connection to the Province-wide grid.

To provide for the growing load north of Prince George, a 60 kv line—to operate initially at 25 kv—was constructed to Chief Lake (11 miles). To serve the mercury mine of Cominco Ltd., a 60 kv line from Fort St. James to Pinchi Lake (30 miles) was placed in operation. At Houston, a 138 kv extension was built to supply Bulkley Valley Forest Industries Limited. In the southern interior of the Province, a second 230 kv connection between Kelly Lake Substation and Savona (56 miles) was completed during the year. Load growth in the Powell River area and on the Sechelt Peninsula has reached a stage where additional transmission facilities will be required soon; to meet this need, work was commenced on a 230 kv line from Sechelt to Powell River (61 miles), to be completed in 1970.

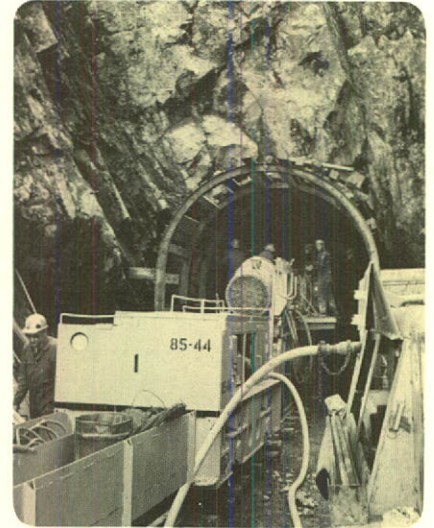
Construction of a new control centre on Burnaby Mountain for the Authority's integrated electric system was completed during the year. This new centre, utilizing the microwave network which has a terminus located atop the 140-foot-high water tower at Simon Fraser University, will enable an operator with the aid of a computer to control the flow of water to turbines, regulate power output from major generating stations, monitor high-voltage transmission lines and control major substations. These functions are scheduled to be transferred from the present location in the Authority's Head Office building in Vancouver in the coming year, when installation of equipment at the new centre is completed.

Additions to generating and transmission plant must be accompanied by expansion of distribution facilities. During the year, new substations, additions to existing substations and new and heavier distribution lines were constructed throughout the Province to serve the continuing demand for power.

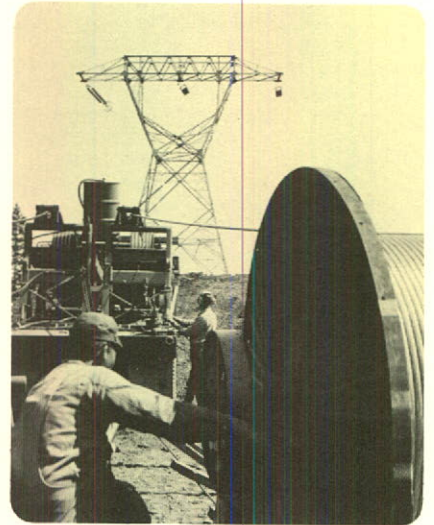
Increased diesel-electric generating capacity was installed during the year to meet new load at Masset and Port Clements, and additional load at Bella Coola, Golden, Mica Creek, Port Alice, Port Hardy, Stewart and Wells.

Major contracts awarded during the year included:

Emil Anderson Construction Co. Ltd.	
Installation of power tunnel and associated works at Jordan River redevelopment.....	\$7,497,579
Canada Wire & Cable Company Limited	
Supply and installation of 230 kv underground cable circuit extensions from 49th Avenue and Cambie Street to Camosun Substation in Vancouver.....	2,710,001
Hume & Rumble B.C. Limited and Peterson Electrical Construction Company Limited, A Joint Venture	
Construction of overhead portion of transmission line from Arnott Substation to Vancouver Island Terminal.....	1,125,169



*Drilling rig excavates 3.5-mile tunnel for Jordan River hydro plant redevelopment.*



*Construction of overhead section of D.C. link from Mainland to Vancouver Island.*



*Helicopter-borne patrolman checks 500 kv transmission line from the Peace River.*



## CORPORATE ORGANIZATION

On 15 May 1968, the Board of Directors approved a number of major changes in the Authority's corporate structure, which were recommended by a committee of senior managers under the chairmanship of an outside consultant. The committee had been established by the Authority's Executive Management Committee to examine the effectiveness of the organization and to recommend improvements.

The changes approved by the Board included the creation of the position of General Manager and a realignment of functions, with a consequent reduction in the number of divisions. Sigurdur Sigmundson, formerly Division Manager-Transportation, was appointed to the position of General Manager, effective 1 June 1968, with responsibility for directing and coordinating the activities of the following eight divisions:

Generation and Supply Division—H. K. Pratt, Manager.

*Functions of the former Engineering Division and Production Division, including planning, designing, constructing and operating electric generation, transmission and substation facilities.*

Distribution Division—Garth Griffiths, Manager.

*Functions of the former Operations Division, including customer services, distribution engineering, constructing and operating electric distribution facilities, promoting sales of electricity and gas in all Regions and distributing gas in Greater Victoria.*

Gas Division—R. K. Kidd, Manager.

*Functions relating to purchasing gas, integrating gas supply and load development, distributing gas to customers and designing, constructing and operating gas transmission and distribution facilities in the Lower Mainland.*

Transportation Division—P. W. Barchard, General Manager of Transportation.

*Functions relating to the operation of urban and interurban passenger services, rail freight service and maintenance of Authority vehicles, and the industrial development functions of the former Commercial Services Division.*

Financial Division—Thomas Chambers, Comptroller and Chief Financial Officer.

*Functions relating to financing, financial forecasting, treasury, accounting, customers' accounts and budgetary control, and all functions of the former Purchasing and Stores Division.*

Corporate Planning Division—D. W. Minion, Manager.

*Functions relating to long-range corporate planning, and functions previously performed by several other divisions, including rates and tariffs, economic studies, productivity services, forecasting and data processing.*

Administration Division—J. N. Olsen, Manager.

*Functions of the former Staff Services Division, including labour relations, industrial relations, personnel services, building services and administration of automotive and office equipment.*

Corporate Services Division—R. W. Gross, Manager.

*All functions of the former Legal Division, Land Division, Internal Audit, Information Services and Office of Secretary.*



SIGURDUR SIGMUNDSON

## EMPLOYEES

The Authority had a staff of 6,905 regular employees at 31 March 1969, an increase of 168 or 2.5% over the previous year. This increase was well below the rate of expansion in the Authority's operations; in the year ended 31 March 1969, volume sales of electricity and gas increased 10.4% and 20.2% respectively.

New collective labour agreements, providing for wage increases and other benefits, were concluded during the year with International Brotherhood of Electrical Workers and Amalgamated Transit Union. The agreement with International Brotherhood of Electrical Workers, covering electrical tradesmen, was for a one-year period ending 31 March 1969; and a separate agreement, covering non-electrical tradesmen engaged in right-of-way clearing, was for a one-year period ending 1 June 1969. Both agreements provided for a wage increase of 6.9%. The agreement with Amalgamated Transit Union was for a two-year period ending 31 October 1970 and provided generally for non-cumulative 7% wage increases for each of the two years. A general salary increase of up to 7% was granted supervisory and professional employees during the year.

The adverse weather conditions mentioned previously placed a great burden on many of the Authority's employees. Hard pressed electric and gas crews had to combat record low temperatures and high snowdrifts for days in a determined effort to restore service to customers; in some areas, manpower took over as snowdrifts made roads in-



Gas crew services valve at Huntingdon regulating station during winter cold spell.



accessible to motor power. Trouble office employees worked around the clock answering calls from customers reporting interruptions to service. Transit operators worked patiently to maintain schedules, despite treacherous road conditions, and to carry the many additional passengers who normally travel by automobile. The dedication of all employees to the vital task of restoring and maintaining service to customers in the face of the severest weather conditions in years is to be highly commended.

A total of 126 employees retired on pension during the year. Twenty-six had 40 or more years' service; of these, the following had served for more than 45 years:

DOUGLAS ROBERT HERITAGE  
Residential Sales Representative  
*51 years, 5 months*

JOHN HAIGH TAYLOR  
Consumer Services Coordinator  
*50 years, 3 months*

ROBERT HENRY KIRKHAM  
Collector Special Reader  
*50 years, 1 month*

ARTHUR ALFRED WHITE  
Credit Representative  
*49 years, 5 months*

HAROLD JOHN MILES  
Credit Union Accountant  
*48 years, 5 months*

ROY WALTER STUART TUSON  
Transit Operator  
*47 years, 9 months*

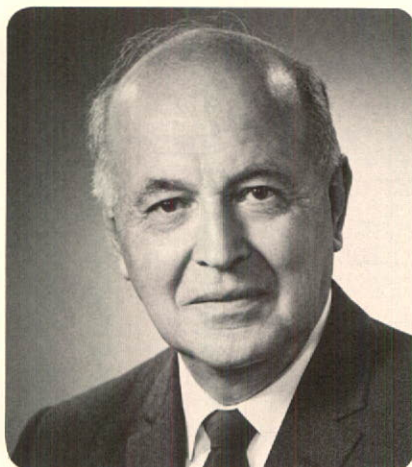
JOHN HERBERT CUPIT  
Power Dispatcher  
*46 years, 10 months*

ARTHUR FRODSHAM  
Fire Equipment Serviceman  
*45 years, 8 months*

The Directors wish to express their sincere appreciation of the spirit of cooperation shown by members of the staff in adjusting to the many changes in corporate organization and in contributing to the substantial achievements of the Authority during the year.



DOUGLAS ROBERT HERITAGE  
*51 years, 5 months*



JOHN HAIGH TAYLOR  
*50 years, 3 months*



ROBERT HENRY KIRKHAM  
*50 years, 1 month*

## OUTLOOK

General economic conditions in British Columbia remained buoyant during the year under review, as reflected by the significant increase in the Authority's sales of electricity and gas.

A continuing upward trend in the economy is indicated, as all facets of the Province's industrial life are forecast to reach higher levels of activity. The growing demand for pulp and newsprint is expected to result in improved utilization of plant capacity, which has been greatly expanded in recent years. The outlook for the lumber and plywood industry is encouraging, and new lumber manufacturing facilities are under construction to serve strong markets, both foreign and domestic. Mineral production, which established a new record in 1968 for the seventh successive year, is expected to increase, with new mills being planned and the rate of exploration continuing to grow; in addition, expansion of coal mining in the East Kootenay area will have important favourable consequences. Development of Roberts Bank Superport will provide tre-

mendous potential for trade with countries on the rim of the Pacific Ocean and, consequently, will play a major role in the economy of British Columbia. It is evident that the Province's economic upsurge which began in the early 1960's will continue well into the next decade.

The generally optimistic outlook for industrial growth, and new homes and commercial establishments associated with that growth, will have a direct impact on requirements for the Authority's services. The Authority's electric generating capacity was increased 37% during the past year, and additional capacity will become available at Gordon M. Shrum Generating Station as more units are installed, but new sources of power must be planned continuously to meet long-term requirements for electric energy. The investigation of potential sources of power, which has been under way for some time, includes hydro, conventional thermal and nuclear installations. Among the sites under consideration for hydro-electric generation are locations

downstream from W. A. C. Bennett Dam on the Peace River; Mica, where a storage dam is being constructed under terms of the Columbia River Treaty; and other sites in the Columbia River Basin. The sequence of development of new sources of power will be determined on the basis of extensive and careful studies to ensure that an adequate supply of power will be available to serve British Columbia's rapidly growing economy.

## FINANCIAL STATEMENTS

The financial statements of the Authority have been examined by Price Waterhouse & Co., the Auditors appointed by the Lieutenant-Governor in Council. The Balance Sheet, Statement of Net Income and Report of the Auditors are included in the following pages, and the Statement of Source and Application of Funds is included on page 14.



**REPORT OF THE AUDITORS**

The Lieutenant-Governor in Council,  
Province of British Columbia:

We have examined the balance sheet of British Columbia Hydro and Power Authority as at 31 March 1969 and the statements of net income and source and application of funds for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

As explained in Note 1 to the accompanying financial statements, an accounting practice has been adopted, for the Peace River Project, of transferring the construction costs of the dam, powerhouse and other common property to plant in service by instalments proportionate to the number of completed and operational generating units in relation to the whole number presently contemplated. Taking into consideration the long-term planning and development of the Peace River Project, we are of the opinion that this practice results in a fair presentation of financial information for the Project.

In our opinion, these financial statements present fairly the financial position of the Authority as at 31 March 1969 and the results of its operations and the source and application of its funds for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Vancouver, B.C.  
21 May 1969

PRICE WATERHOUSE & CO.,  
*Chartered Accountants.*

## BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

**STATEMENT OF NET INCOME FOR THE YEAR ENDED 31 MARCH 1969**

*(with corresponding figures for the year ended 31 March 1968)*

	1969	1968
Gross revenues .....	<u>\$221,108,026</u>	<u>\$201,469,898</u>
Expenses:		
Salaries, wages and employee benefits .....	49,611,424	43,999,168
Materials and services .....	44,932,909	43,340,818
Grants, school taxes, etc. ....	14,953,333	13,265,734
Provision for depreciation .....	38,630,636	34,739,611
Interest on debt (Note 4) .....	\$86,861,147	\$74,334,668
Less—		
Interest charged to construction .....	<u>23,165,291</u> <u>63,695,856</u>	<u>21,100,736</u> <u>53,233,932</u>
	<u>211,824,158</u>	<u>188,579,263</u>
Net income, transferred to stabilization of rates and contingency reserve (Note 6) .....	<u>\$ 9,283,868</u>	<u>\$ 12,890,635</u>

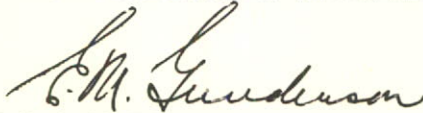


**BALANCE SHEET AS AT 31 MARCH 1969**

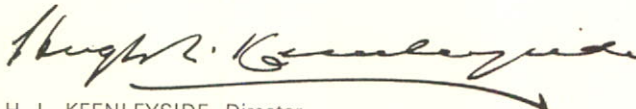
(with corresponding figures as at 31 March 1968)

	1969	1968
<b>PROPERTY ACCOUNT:</b>		
Lands, franchises, water rights, storage dams, plants for the generation, transmission and distribution of electricity and gas, trolley coaches, motor buses, freight railway and rolling stock, etc., at cost . . . . .	\$1,899,718,220	\$1,416,938,821
<i>Less—</i>		
Accumulated depreciation . . . . .	332,045,129	300,097,184
	<u>1,567,673,091</u>	<u>1,116,841,637</u>
Deferred costs of dam, powerhouse and other common property (Note 1) . . . . .	239,225,597	—
<i>Unfinished construction—</i>		
Peace River Project . . . . .	65,855,353	438,129,187
Columbia River Treaty storage projects . . . . .	119,428,503	244,076,300
Other . . . . .	25,400,000	30,100,000
	<u>2,017,582,544</u>	<u>1,829,147,124</u>
<b>CURRENT AND WORKING ASSETS:</b>		
Cash . . . . .	7,094,292	8,342,856
Temporary investments . . . . .	39,790,382	63,142,016
Accounts receivable and unbilled revenues . . . . .	31,758,788	28,405,205
Materials and supplies at average cost . . . . .	10,829,653	10,516,485
Prepaid expenses . . . . .	502,995	568,589
	<u>89,976,110</u>	<u>110,975,151</u>
MORTGAGES AND OTHER DEFERRED ACCOUNTS RECEIVABLE . . . . .	5,893,565	6,251,948
UNAMORTIZED DISCOUNT AND EXPENSE ON LONG-TERM DEBT AND PARITY DEVELOPMENT BONDS . . . . .	21,942,782	22,143,505
	<u>\$2,135,395,001</u>	<u>\$1,968,517,728</u>

APPROVED ON BEHALF OF THE BOARD:



E. M. GUNDERSON, Director



H. L. KEENLEYSIDE, Director



	1969	1968
LONG-TERM DEBT (Notes 2 and 3) . . . . .	<u>\$1,305,940,767</u>	<u>\$1,193,389,518</u>
PARITY DEVELOPMENT BONDS, payable on demand (Notes 3 and 4):		
5½% Series K due 3 August 1968 . . . . .	—	50,505,000
6½% Series P due 1 September 1969 . . . . .	50,505,000	50,505,000
6½% Series R due 1 September 1970 . . . . .	50,505,000	50,505,000
6½% Series AN due 15 August 1972 . . . . .	50,505,000	50,505,000
6½% Series AT due 3 August 1973 . . . . .	50,505,000	—
	<u>202,020,000</u>	<u>202,020,000</u>
CURRENT AND ACCRUED LIABILITIES:		
Accounts payable . . . . .	67,897,629	75,493,098
Interest accrued on long-term debt and parity development bonds . . . . .	22,861,409	20,068,402
Long-term debt payments due within one year—		
Sinking fund instalments . . . . .	14,411,863	13,783,733
Debt maturities . . . . .	—	28,059,974
	<u>105,170,901</u>	<u>137,405,207</u>
CONTRIBUTIONS ARISING FROM COLUMBIA RIVER TREATY (Note 5) . . . . .	<u>418,722,167</u>	<u>344,628,253</u>
CONTRIBUTIONS IN AID OF CONSTRUCTION . . . . .	<u>17,919,583</u>	<u>14,737,035</u>
STABILIZATION OF RATES AND CONTINGENCY RESERVE (Note 6) . . . . .	<u>85,621,583</u>	<u>76,337,715</u>
	<u>\$2,135,395,001</u>	<u>\$1,968,517,728</u>
COMMITMENTS (Note 8)		

*The accompanying notes are an integral part of the above balance sheet.*



## NOTES TO FINANCIAL STATEMENTS AS AT 31 MARCH 1969

**Note 1—Peace River Project:**

Economic considerations have dictated construction of a dam, powerhouse and other common property for the Peace River Project to provide capacity for up to ten generating units. The dam and powerhouse have been completed, but the generating units are being installed over a period of several years to keep pace with the increase in demand for power.

Accordingly, the Authority has adopted an accounting practice of transferring the construction costs of the dam, powerhouse and other common property to plant in service by instalments proportionate to the number of completed and operational generating units in relation to the ten units presently contemplated. The transfers are to be completed during a period of not more than seven years. Three generating units were installed and placed in operation during the year ended 31 March 1969; consequently, 30% of the dam, powerhouse and other common property costs was transferred to plant in service and, in accordance with the Authority's practice, provisions for depreciation will commence thereon effective 1 April 1969.

The costs of the dam, powerhouse and other common property not yet transferred to plant in service are shown separately as deferred costs under property account. These costs will continue to attract interest charged to construction.

**Note 2—Long-term debt:**

*Issued by British Columbia Hydro and Power Authority—*

Bonds:

5¼% Series A due 1 May 1982 .....	\$ 32,496,300
3¼% Series B due 1 October 1979 .....	10,000,000
5% Series C due 1 March 1993 .....	15,000,000
5¼% Series D due 1 May 1993 .....	25,000,000
5¼% Series F due 1 June 1993 .....	10,000,000
5¼% Series G due 15 October 1993 .....	15,000,000
5¼% Series H due 15 December 1993 .....	10,000,000
5¼% Series J due 1 March 1994 .....	10,000,000
5¼% Series L due 2 July 1994 .....	10,000,000
5¼% Series M due 15 December 1994 .....	20,000,000
5¼% Series N due 15 March 1995 .....	10,000,000
5% Series S due 15 September 1995 .....	10,000,000
5½% Series T due 29 December 1995 .....	29,000,000
5¼% Series U due 18 April 1991 .....	40,000,000
5¼% Series X due 1 July 1991 .....	5,000,000
5% Series Y due 2 July 1991 .....	50,000,000*
6¼% Series AG due 1 December 1991 .....	20,000,000
5% Series AH due 2 January 1992 .....	50,000,000*
5.46% Series W-A due 1 February 1987 .....	80,396,000
6% Series AJ due 15 March 1992 .....	25,000,000
6% Series BA due 29 May 1992 .....	2,500,000
6¼% Series AK due 1 June 1992 .....	50,000,000*
6.10% Series AL-A due 2 July 1992 .....	10,000,000
6¼% Series AM due 4 July 1992 .....	25,000,000
6¼% Series BB due 19 July 1992 .....	4,000,000
6½% Series AP due 1 November 1992 .....	20,000,000
6¼% Series BC due 1 February 1993 .....	10,200,000
6¼% Series Z-S due 15 February 1993 .....	3,300,000
6¼% Series Z-T due 15 February 1993 .....	4,200,000
carried forward .....	\$ 606,092,300



**Note 2—Long-term debt** (continued):

brought forward .....	\$ 606,092,300
6.53% Series V-B due 4 March 1988 .....	10,688,000
6% Series AR due 29 March 1993 .....	10,000,000
6.71% Series V-C due 2 April 1988 .....	9,399,000
5.71% Series W-B due 1 February 1988 .....	95,001,000
6.61% Series V-D due 1 May 1988 .....	2,601,000
6.61% Series V-E due 1 May 1988 .....	1,420,000
7¼% Series Z-U due 21 May 1993 .....	1,500,000
7¼% Series AS due 1 June 1993 .....	10,000,000
7¼% Series Z-V due 1 June 1993 .....	2,000,000
6.59% Series V-F due 3 June 1988 .....	10,937,000
7¼% Series Z-W due 19 June 1993 .....	1,000,000
7¼% Series Z-X due 26 June 1993 .....	1,000,000
6.79% Series V-G due 3 July 1988 .....	9,645,000
7% Series Z-Y due 25 July 1993 .....	300,000
7% Series Z-Z due 25 July 1993 .....	2,700,000
7% Series AU due 5 August 1993 .....	10,000,000
7% Series Z-A due 1 September 1993 .....	1,500,000
7% Series Z-B due 1 September 1993 .....	600,000
7% Series Z-C due 1 September 1993 .....	1,000,000
7% Series Z-D due 1 September 1993 .....	4,200,000
6.44% Series V-H due 3 September 1988 .....	2,998,000
6.44% Series V-J due 3 September 1988 .....	5,316,000
7% Series AV due 1 October 1993 .....	10,000,000
7% Series Z-E due 25 November 1993 .....	1,300,000
7% Series Z-F due 25 November 1993 .....	1,200,000
6.76% Series V-K due 2 December 1988 .....	6,222,000
7% Series Z-G due 15 December 1993 .....	7,000,000
7.17% Series V-L due 3 February 1989 .....	6,636,000
7.11% Series V-M due 4 March 1989 .....	6,826,000
7.11% Series V-N due 4 March 1989 .....	4,154,000
7½% Series AW due 31 March 1994 .....	10,000,000
<i>Issued by the former British Columbia Electric Company Limited—</i>	
First Mortgage Bonds, after deducting bonds redeemed in accordance with sinking fund requirements:	
3½% Series "E" due 1 March 1975 .....	13,622,000
4% Series "F" due 1 July 1991 .....	2,581,000
3¾% Series "G" due 1 December 1976 .....	15,083,000*
4¾% Series "H" due 1 December 1977 .....	11,177,000
4¾% Series "I" due 1 February 1979 .....	11,458,000
3¾% Series "J" due 1 June 1980 .....	11,890,000
4¾% Series "K" due 1 February 1981 .....	23,849,000
5% Series "L" due 1 February 1982 .....	32,789,000
5% Series "M" due 2 January 1988 .....	41,917,000
5½% Series "N" due 1 March 1989 .....	25,781,000
6½% Series "O" due 1 April 1990 .....	26,955,000
5¾% Series "P" due 1 May 1991 .....	13,697,000
carried forward .....	\$1,084,034,300



## NOTES TO FINANCIAL STATEMENTS AS AT 31 MARCH 1969 (continued)

## Note 2—Long-term debt (continued):

brought forward.....	\$1,084,034,300
Perpetual Callable Bonds:	
4% .....	328,400
4¼% .....	121,200
4½% .....	204,300
4¾% .....	565,000
5% .....	506,900
5½% .....	329,050
25-year Callable Bonds due 1 August 1986:	
4% Series AA .....	11,671,600
4¼% Series AB .....	10,878,800
4½% Series AC .....	14,795,700
4¾% Series AD .....	25,848,400
5% Series AE .....	24,493,100
5½% Series AF .....	14,670,950
Sinking Fund Debentures:	
5½% Series A due 1 April 1977, after deducting debentures redeemed in accordance with sinking fund requirements .....	35,600,000
<i>Issued by the former British Columbia Power Commission—</i>	
Bonds:	
3¾% Series C due 15 September 1991 .....	3,000,000
4% Series D due 21 May 1992 .....	1,000,000
4% Series E due 15 June 1992 .....	1,000,000
4% Series F due 15 September 1992 .....	1,500,000
4% Series G due 1 November 1988 .....	10,000,000*
3¼% Series H due 15 July 1989 .....	6,300,000*
3¼% Series J due 4 July 1975 .....	10,000,000
5% Series MC due 15 September 1982 .....	5,149,000
5% Series MD due 15 September 1992 .....	18,724,000
5% Series N due 15 September 1992 .....	10,000,000
3% Series S due 1 April 1976 .....	17,738,000
3% Series T due 1 April 1977 (payable in Canadian or United States funds at option of holder) .....	9,285,000
Debentures:	
3¾% Series K due 15 June 1986 .....	20,000,000*
4% Series L due 15 April 1987 .....	25,000,000*
3% Series P due 1 February 1988 .....	20,000,000*
	1,382,743,700
Exchange premium at date of issue on long-term debt payable in United States funds .....	9,151,070
	1,391,894,770
<i>Less—</i>	
Sinking funds on deposit with Trustee, Minister of Finance for the Province of British Columbia .....	71,542,140
	<u>\$1,320,352,630</u>
<i>*Payable in United States funds and carried at par of exchange.</i>	
<i>Classification on balance sheet—</i>	
Long-term debt .....	\$1,305,940,767
Sinking fund instalments due within one year, included in current and accrued liabilities .....	14,411,863
	<u>\$1,320,352,630</u>



**Note 3—Guarantee by Province of British Columbia:**

The Government of the Province of British Columbia has unconditionally guaranteed the principal and interest of the long-term debt and parity development bonds.

**Note 4—Interest:**

Included in interest on debt for the year ended 31 March 1969 is \$1,801,920 for amortization of discount and expense on long-term debt and parity development bonds, and there has been deducted \$3,759,792 for income from sinking fund investments.

The interest rate on parity development bonds was increased from 5½% to 6½% effective 3 August 1968.

**Note 5—Columbia River Treaty:**

The Authority is the Canadian Entity for purposes of the Columbia River Treaty between Canada and the United States and is required to construct three storage dams—Duncan, Arrow and Mica. Canada’s entitlement to half the increased power generation in the United States resulting from the construction of the three dams was sold to the Columbia Storage Power Exchange for periods of 30 years from the scheduled dates of completion of the respective dams. The consideration for this sale was received by the Government of British Columbia and transferred to the Authority. Payments are receivable by the Government of British Columbia for providing flood control as each of the storage dams becomes operational. Duncan and Arrow storage projects have been declared operational, and payments totalling \$67,838,844 for flood control have been received and transferred to the Authority. Because Duncan and Arrow dams were completed ahead of schedule, the Authority benefited by receiving a share of the additional power generated downstream in the United States and Canada. These various payments and benefits, with interest, aggregated \$418,722,167 as at 31 March 1969:

Amount received from sale of entitlement to downstream benefits . . . . .	\$273,291,661
Flood control benefits . . . . .	67,838,844
Additional downstream benefits (net) . . . . .	6,445,999
Interest (including charges to construction of \$31,042,869) . . . . .	71,145,663
	<u>\$418,722,167</u>

The Authority is liable under certain covenants to make compensation to the Columbia Storage Power Exchange if the Mica storage dam, the only one of the three dams still under construction, is not operational by the agreed date of 1 April 1973. The Authority also has obligations relating to the operation and maintenance of the three storage dams.

**Note 6—Stabilization of rates and contingency reserve:**

Balance as at 31 March 1968 . . . . .	\$ 76,337,715
Net income for the year ended 31 March 1969 . . . . .	<u>9,283,868</u>
Balance as at 31 March 1969 . . . . .	<u>\$ 85,621,583</u>

**Note 7—Pension plans:**

Employees of the Authority are covered under contributory pension plans, and provisions are being made for current services according to the requirements of the various plans. Provision has been made for all past service costs under these plans with the exception of those relating to a contributory plan introduced effective 1 January 1965. Employees may elect, by a date to be fixed by the Authority, to transfer from previous plans to this plan. Some transfers will depend upon an examination being made of recent amendments to the previous plans and their relationship to the Canada Pension Plan. Although the number of employees who will eventually transfer to the 1965 contributory plan is not known, the actuary for the plan has made a calculation of past service costs of this plan based on the number of employees already transferred and an estimate of the number who will transfer. The Authority is funding these costs by annual payments of \$393,800 over a fifteen-year period which commenced 1 April 1967.

**Note 8—Commitments:**

Purchase commitments and contracts of the Authority for capital projects and inventories of materials and supplies aggregated approximately \$237,000,000 as at 31 March 1969, which includes contracts in respect of the general commitment of the Authority to construct the Mica dam on the Columbia River (Note 5).



## FINANCIAL STATISTICS

(in millions of dollars)

YEAR ENDED 31 MARCH	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960
<b>SOURCES OF REVENUE</b>										
Electric—residential . . . . .	57.7	51.5	41.6	38.1	40.6	38.5	37.4	40.0	38.2	36.4
—other . . . . .	91.7	86.2	76.8	66.8	60.4	54.8	55.1	50.3	46.6	44.1
Gas . . . . .	40.6	34.4	32.1	31.2	30.0	25.7	24.6	22.5	19.7	17.0
Passenger transportation (1) . . . . .	19.5	18.1	17.6	16.9	14.5	13.8	13.9	13.4	13.9	14.6
Rail freight . . . . .	7.4	7.0	6.4	6.2	5.9	5.6	5.3	5.0	4.8	4.9
Miscellaneous . . . . .	4.2	4.3	3.6	1.6	1.9	1.2	1.4	2.1	3.0	2.2
Total . . . . .	221.1	201.5	178.1	160.8	153.3	139.6	137.7	133.3	126.2	119.2
<i>(1) For 1969, includes \$1.0 million metropolitan transit subsidy received from Provincial Government.</i>										
<b>DISPOSITION OF REVENUE</b>										
Employment costs, materials and services . . . . .	94.5	87.4	76.8	69.2	59.9	54.5	51.7	47.9	46.1	45.6
Grants, school taxes, etc. . . . .	15.0	13.3	11.3	10.6	9.9	9.1	8.4	7.1	6.8	6.2
Provision for depreciation . . . . .	38.6	34.7	31.7	28.8	27.1	25.3	22.8	21.8	20.7	18.9
Taxes on income . . . . .	—	—	—	—	—	—	—	2.8	12.0	11.8
Interest on debt, less interest charged to construction . . . . .	63.7	53.2	49.0	44.7	43.2	41.9	40.8	32.5	25.3	20.3
Dividends on preferred shares . . . . .	—	—	—	—	—	—	—	1.7	5.0	5.0
Dividends on common shares . . . . .	—	—	—	—	—	—	—	1.9	8.1	7.2
Employed in the business . . . . .	9.3	12.9	9.3	7.5	13.2	8.8	14.0	17.6	2.2	4.2
Total . . . . .	221.1	201.5	178.1	160.8	153.3	139.6	137.7	133.3	126.2	119.2
<b>EXPENDITURES ON PLANT . . . . .</b>	<b>227.3</b>	<b>341.2</b>	<b>324.1</b>	<b>227.5</b>	<b>105.3</b>	<b>70.6</b>	<b>54.2</b>	<b>57.1</b>	<b>64.3</b>	<b>81.0</b>

NOTE: For 1960, 1961 and 1962, statistics of the former British Columbia Electric Company Limited and the former British Columbia Power Commission have been combined.



## OPERATING STATISTICS

YEAR ENDED 31 MARCH	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960
<b>ELECTRIC</b>										
Generating capacity at year-end (rated kw in thousands) (1)										
Hydro.....	2,001	1,320	1,320	1,306	1,306	1,295	1,295	1,295	1,296	1,172
Thermal.....	1,055	906	752	738	588	571	570	268	268	253
Total.....	3,056	2,226	2,072	2,044	1,894	1,866	1,865	1,563	1,564	1,425
Peak one-hour demand, integrated system (kw in thousands).....	2,357	2,152	1,860	1,686	1,490	1,244	1,169	1,154	1,083	1,064
Customers at year-end (in thousands).....	605	583	555	529	503	478	459	443	432	420
Electricity sold to public (kwh)										
Total (in millions).....	12,237	11,084	10,000	8,506	7,345	6,431	6,059	5,540	5,149	4,934
Increase over previous year (%).....	10.4	10.8	17.6	15.8	14.2	6.1	9.4	7.6	4.4	10.4
By class of customer (%)										
Residential.....	28	28	28	30	31	32	32	33	33	33
Commercial.....	21	21	20	21	22	23	22	22	22	22
Industrial.....	49	49	50	48	45	43	44	44	43	43
Other systems.....	2	2	2	1	2	2	2	1	2	2
Residential service										
Average annual kwh use per customer.....	6,779	6,222	6,016	5,650	5,486	5,200	5,029	4,829	4,723	4,658
Average revenue per kwh (cents).....	1.7	1.7	1.5	1.5	1.8	1.8	1.9	2.2	2.2	2.2
<i>(1) Excludes electricity available from other systems. Rated capacity has been exceeded on occasion.</i>										
<b>GAS</b>										
One-day capacity at year-end (therms in thousands)										
Mainland—firm pipeline contracts (2).....	2,529	2,260	2,140	2,020	1,900	1,780	1,780	1,780	1,540	1,000
—plant.....	250	250	250	250	250	250	250	250	320	320
Greater Victoria—plant.....	45	36	36	36	36	36	36	36	27	27
Peak one-day demand (therms in thousands)										
Mainland system—including interruptible.....	3,108	2,537	2,634	2,593	2,341	1,359	1,580	1,287	934	828
—excluding interruptible.....	2,289	1,905	1,474	1,493	1,849	1,060	1,342	1,081	733	690
Greater Victoria system.....	24	19	16	17	23	16	18	21	13	16
Customers at year-end (in thousands).....	186	178	169	161	153	145	137	129	120	111
Gas sold to public (therms)										
Total (in millions).....	470	391	357	322	306	260	240	217	186	157
Increase over previous year (%).....	20.2	9.6	10.7	5.3	17.7	8.6	10.3	16.8	18.5	52.1
Average revenue per therm (cents).....	8.6	8.8	9.0	9.7	9.8	9.9	10.3	10.2	10.6	10.8
<i>(2) On basis of 100 cu. ft. to one therm.</i>										
<b>PASSENGER TRANSPORTATION</b>										
Vehicles at year-end										
Urban—buses.....	339	340	321	325	336	339	334	332	342	341
—trolley coaches.....	296	296	296	296	296	312	317	327	327	351
—total.....	635	636	617	621	632	651	651	659	669	692
Interurban buses.....	71	70	56	61	70	80	81	75	71	67
Passengers carried (in millions)										
Urban.....	77.4	74.6	72.7	70.7	73.1	75.8	77.3	78.3	82.4	89.3
Interurban.....	2.2	2.1	2.1	2.0	2.0	2.3	2.5	2.5	2.6	2.7
Revenue miles run—urban (in millions).....	20.9	20.8	20.5	20.4	20.5	20.5	20.5	20.6	21.7	22.6
Passenger revenue per mile—urban (cents).....	72.1	71.2	70.2	68.4	57.7	52.8	54.0	54.2	54.3	56.5
<b>RAIL FREIGHT</b> (tons in thousands).....	2,265	2,057	2,011	1,971	1,832	1,663	1,567	1,527	1,427	1,359
<b>EMPLOYEES AT YEAR-END</b>										
Regular.....	6,905	6,737	6,452	6,250	6,006	5,761	5,641	5,804	5,919	6,053
Temporary.....	717	614	687	647	418	451	328	292	323	340
Total.....	7,622	7,351	7,139	6,897	6,424	6,212	5,969	6,096	6,242	6,393

NOTE: For 1960, 1961 and 1962, statistics of the former British Columbia Electric Company Limited and the former British Columbia Power Commission have been combined.



## DIVISIONAL ORGANIZATION

### Office of General Manager

S. SIGMUNDSON  
*General Manager*  
H. A. ELLIOTT  
*Executive Assistant to General Manager*  
W. D. KENNEDY  
*Executive Engineer to General Manager  
and Manager, Canadian Entity Services*

### Generation and Supply Division

H. K. PRATT  
*Division Manager*  
W. A. BATEMAN  
*Manager, Maintenance Control*  
T. M. BERGER  
*Operations Manager, Central Interior*  
J. S. DAVIDSON  
*Manager, Commissioning and Acceptance*  
R. M. DUNDAS  
*Staff Engineer*  
H. M. ELLIS  
*Manager, System Planning  
and Development*  
M. A. FAVELL  
*Operations Manager, Peace River Area*  
W. F. GEIST  
*Manager, Quality Control and Expediting*  
W. D. GILL  
*Manager, System Projects*  
G. F. GREEN  
*Manager, System Operations  
and Maintenance*  
S. C. IRVING  
*Manager, Burrard Thermal  
Generating Plant*  
W. E. KENNY  
*Manager, Operations Control*  
N. S. KENT  
*Operations Manager, Lower Mainland Area*  
R. C. McMORDIE  
*Manager, Generation and Special  
Projects and Columbia Projects Manager*  
E. H. MARTIN  
*Construction Manager*  
E. MARZOCCO  
*Operations Manager, Vancouver Island*  
J. F. MILES  
*Manager, Generation Planning*  
E. W. NEWBURY  
*Manager, Engineering Services*  
J. B. STEWARD  
*Operations Manager, Southern Interior*  
W. M. WALKER  
*Executive Assistant*

### Distribution Division

G. GRIFFITHS  
*Division Manager*  
W. A. BEST  
*Regional Manager, Central Interior*  
S. C. BURNELL  
*Regional Manager, Metropolitan*  
T. V. FARMER  
*Regional Manager, Southern Interior*  
D. J. McLENNAN  
*Regional Manager, North Coast*

A. J. MACDONALD  
*Regional Manager, Vancouver Island*  
C. W. NASH  
*Manager, Load Development*  
G. J. ROPER  
*Regional Manager, Fraser Valley*  
R. G. SCOTT  
*Marketing Services Manager*  
H. E. SLADEN  
*Senior Distribution Engineer*  
R. J. WARD  
*Staff Engineer*

### Gas Division

R. K. KIDD  
*Division Manager*  
L. A. BERNSTEIN  
*Technical Services Engineer*  
J. L. GEMMELL  
*Manager, Metropolitan Distribution*  
K. S. HENDERSON  
*Manager, Fraser Valley Distribution*  
N. M. KING  
*Manager, Staff Services*  
A. H. MacPHERSON  
*Manager, Engineering*  
G. A. THOMSON  
*Supply Superintendent*

### Transportation Division

P. W. BARCHARD  
*General Manager of Transportation*  
H. C. GIVINS  
*Manager, Transportation Maintenance*  
R. H. GRAM  
*Manager, Industrial Development*  
H. R. HALLS  
*Manager, Victoria Transportation*  
J. F. INTIHAR  
*Operations Manager,  
Metropolitan Transit Lines*  
W. W. McAULAY  
*Manager, Pacific Stage Lines Operations*  
D. J. MARTIN  
*Manager, Railway Operations*  
T. A. ROSS  
*Manager, Transportation Staff Services*

### Financial Division

T. CHAMBERS  
*Comptroller and Chief Financial Officer*  
L. E. BEARD  
*Assistant Comptroller*  
G. F. BLYTH  
*Insurance and Credit Manager*  
D. DAVIS  
*Manager, Customers' Accounts*  
G. EWING  
*Assistant to Chief Financial Officer*  
D. R. HUNDLEBY  
*Pay Manager*  
S. H. JAGGER  
*Stores Manager*  
C. G. KILLAM  
*Research and Laboratory Superintendent*  
I. R. A. MILLS  
*Assistant Treasurer and Registrar*

S. B. PEACH  
*Manager, Revenues and Disbursements*  
J. S. PURVES  
*Manager, Purchasing and Stores*  
A. L. ROLLINS  
*Manager, Plant Accounting*  
J. M. TODD  
*Cashier Manager*  
G. A. WOODBURY  
*Manager, General Accounting*

### Corporate Planning Division

D. W. MINION  
*Division Manager*  
E. S. GARDINER  
*Computing Facilities Manager*  
G. J. A. KIDD  
*Strategic Planning and  
Development Manager*  
D. G. McKILLOP  
*Productivity Services Manager*  
T. A. NORDSTROM  
*Computer Sciences Manager*  
J. A. D. SIMPSON  
*Corporate Information Systems Manager*

### Administration Division

J. N. OLSEN  
*Division Manager*  
G. BARCLAY  
*Manager, Labour Relations and Safety*  
R. H. DOWNEY  
*Manager, Manpower and  
Organization Planning*  
M. H. FOX  
*Manager, Personnel Administration*  
B. A. HAWRYSH  
*Manager, General Services*  
A. R. KLUCKNER  
*Manager, Manpower Development*  
R. H. LUND  
*Manager, Personnel Services*

### Corporate Services Division

R. W. GROSS  
*Division Manager*  
E. S. COLLINS  
*Land Manager*  
J. S. LANG  
*Internal Auditor*  
J. A. MacCARTHY  
*Manager, Information Services*  
W. D. MITCHELL  
*General Solicitor*  
G. G. WOODWARD  
*Corporate Secretary*

### Office of Peace Project and Columbia Construction Manager

J. P. OTTESEN  
*Peace Project and Columbia  
Construction Manager*  
R. B. JACKSON  
*Construction Manager, Mica Project*  
H. P. O'DONNELL  
*Construction Manager, Peace River Project*



# BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

## ELECTRIC TRANSMISSION SYSTEM AT 31 MARCH 1969—WITH PLANNED ADDITIONS



### LEGEND

- HYDRO-ELECTRIC GENERATING STATIONS
- DIESEL-ELECTRIC GENERATING STATIONS
- ▣ GAS-TURBINE-ELECTRIC GENERATING STATIONS
- SUBSTATIONS
- TRANSMISSION LINES 60 KV-360 KV (EXISTING AND UNDER CONSTRUCTION)
- - - TRANSMISSION LINES 500 KV (EXISTING AND UNDER CONSTRUCTION)
- TRANSMISSION LINES 60 KV-360 KV (PLANNED)
- - - TRANSMISSION LINES 500 KV (PLANNED)

### REGIONS:

1. METROPOLITAN
2. FRASER VALLEY
3. VANCOUVER ISLAND
4. SOUTHERN INTERIOR
5. CENTRAL INTERIOR
6. NORTH COAST

### VANCOUVER AREA

#### MAJOR GENERATING PLANTS

- |                             |                |
|-----------------------------|----------------|
| Alouette:                   | Port Mann:     |
| Hydro-Electric              | Gas-Turbine    |
| Burrard:                    | Ruskin:        |
| Steam-Turbine               | Hydro-Electric |
| Lake Buntzen, Nos. 1 and 2: | Steve Falls:   |
| Hydro-Electric              | Hydro-Electric |

#### MAJOR SUBSTATIONS

- |                     |             |
|---------------------|-------------|
| Arnott:             | Mainwaring: |
| Dal Grauer:         | Murrin:     |
| Horne-Payne:        | Newell:     |
| Ingladew:           | Walters:    |
| Kidd, Nos. 1 and 2: |             |

### VICTORIA AREA

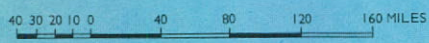
#### MAJOR SUBSTATIONS

- |               |         |
|---------------|---------|
| Esquimalt:    | Goward: |
| George Tripp: | Horsey: |

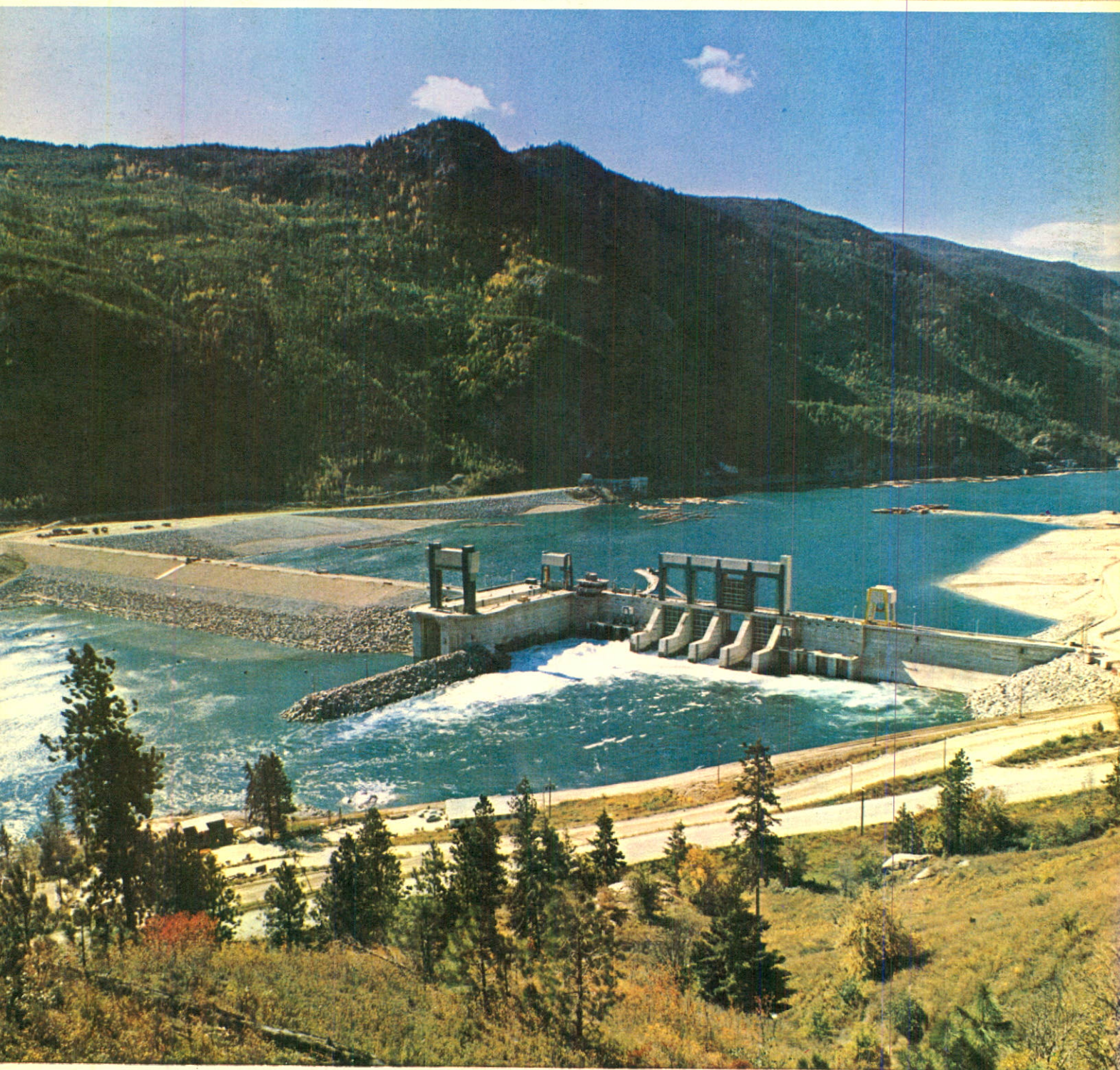
### PRINCE GEORGE AREA

#### MAJOR SUBSTATIONS

- |                |            |
|----------------|------------|
| Canreed:       | Northwood: |
| Patricia:      | Williston: |
| Prince George: |            |







*Arrow Dam, five miles upstream from Castlegar, is the second Columbia River Treaty storage project to be completed by the Authority ahead of schedule.*