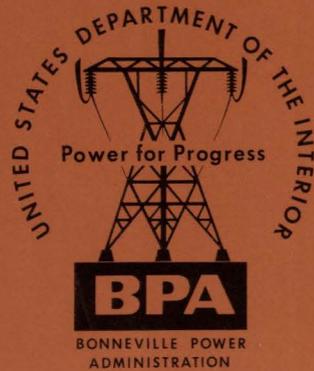
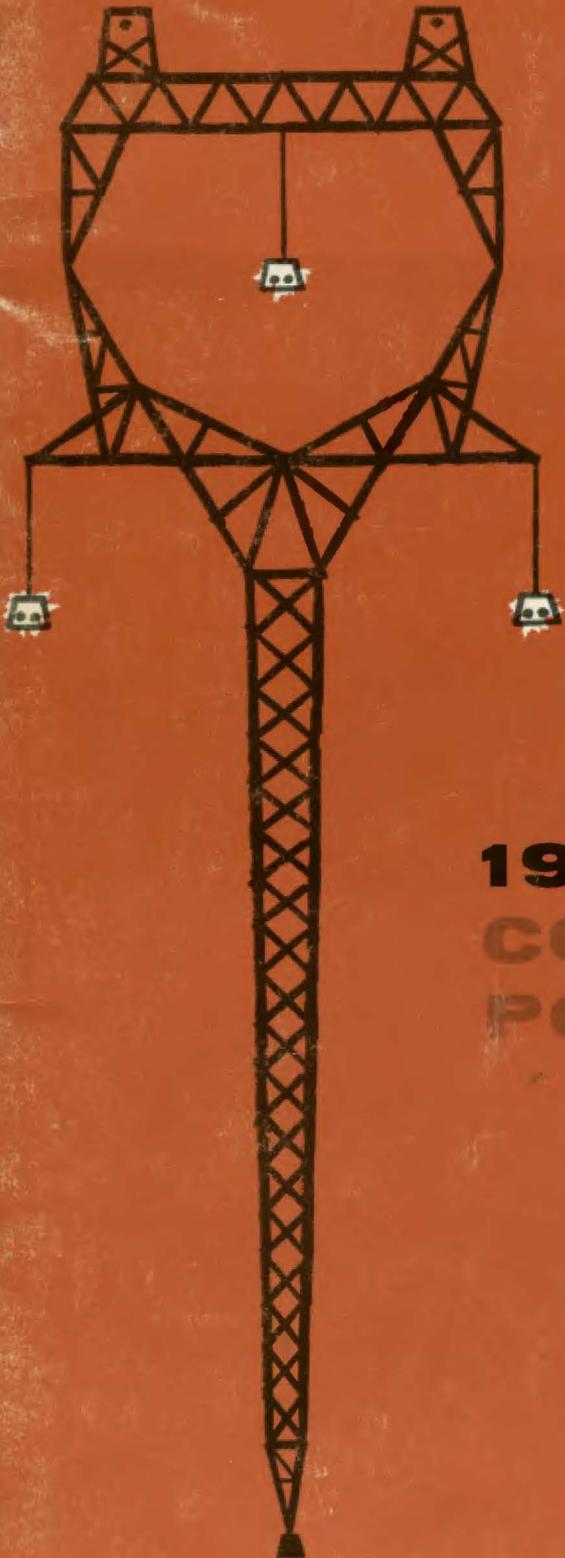


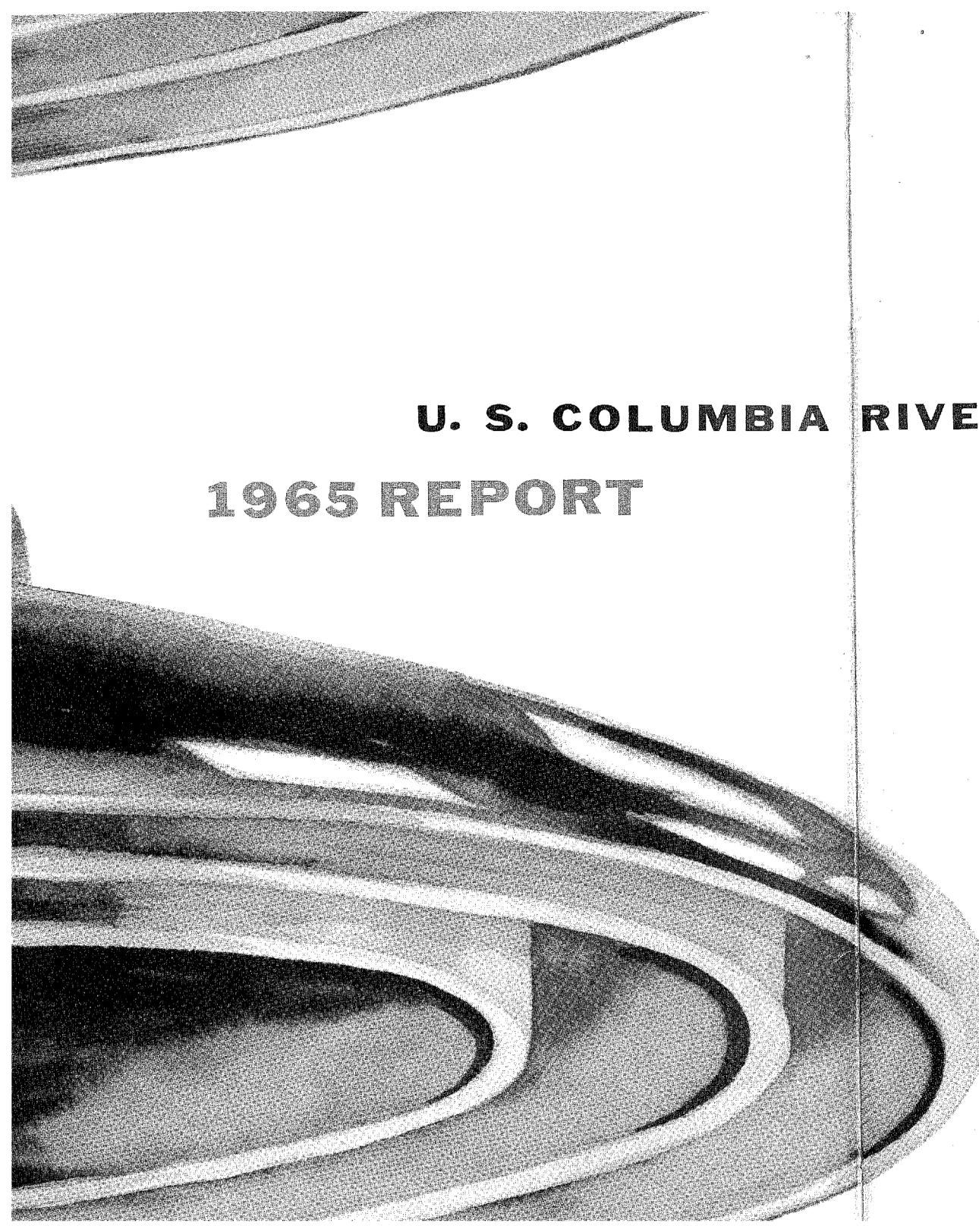
# 1965 REPORT, U. S. COLUMBIA RIVER POWER SYSTEM



U. S. DEPARTMENT OF THE INTERIOR • BONNEVILLE POWER ADMINISTRATION



**1965 REPORT, U. S.  
COLUMBIA RIVER  
POWER SYSTEM**



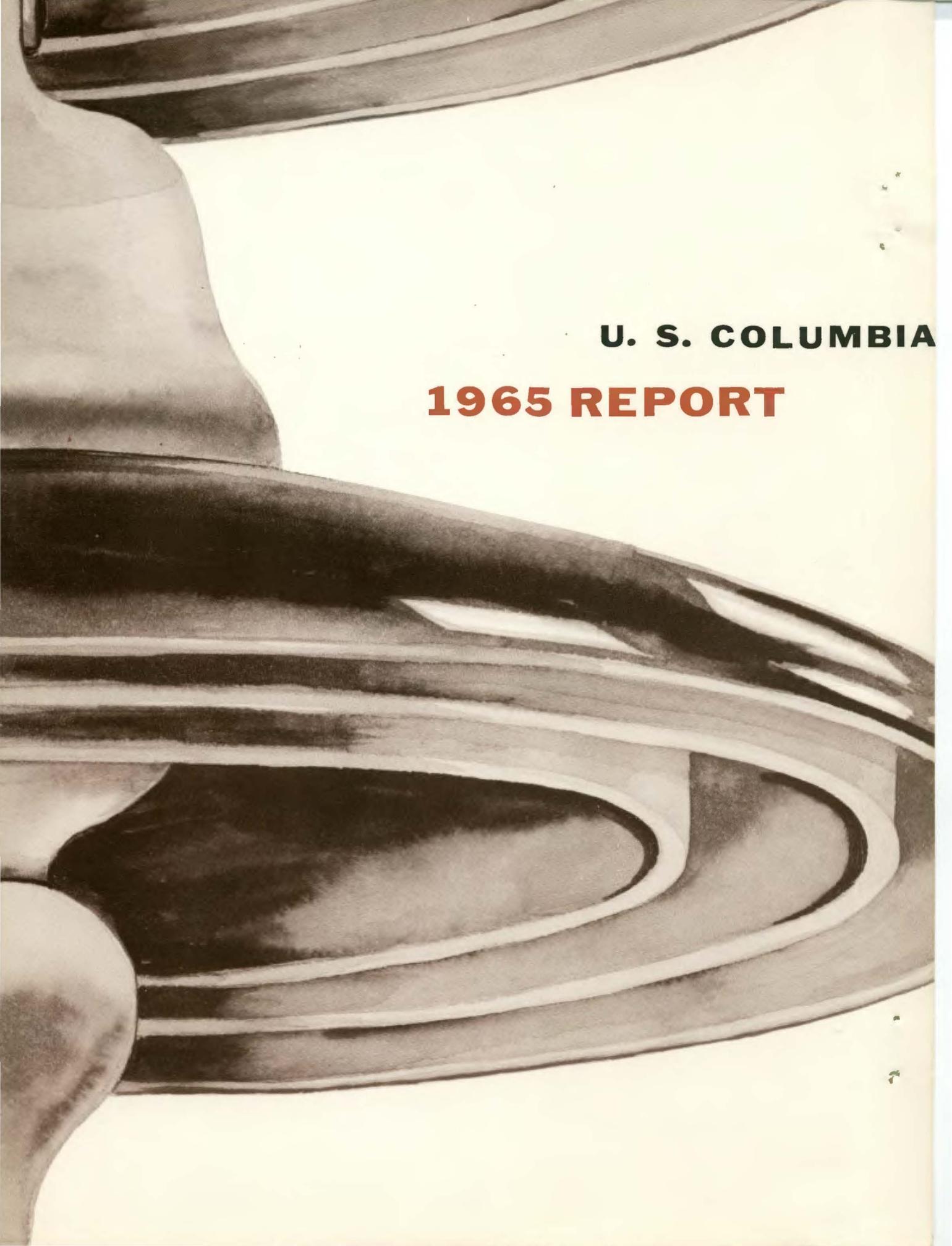
**U. S. COLUMBIA RIVER POWER SYSTEM**  
**1965 REPORT**

**U. S. DEPARTMENT OF THE INTERIOR**

**Stewart L. Udall, Secretary**

**BONNEVILLE POWER ADMINISTRATION**

**Charles F. Luce, Administrator**



**U. S. COLUMBIA**

**1965 REPORT**

# **RIVER POWER SYSTEM**

**U. S. DEPARTMENT OF THE INTERIOR**

**Stewart L. Udall, Secretary**

**BONNEVILLE POWER ADMINISTRATION**

**Charles F. Luce, Administrator**

**December 31, 1965**



# *Letter to the Secretary*

December 31, 1965

Honorable Stewart L. Udall  
Secretary of the Interior  
Washington D. C.

Dear Mr. Secretary:

Herewith is the Twenty-Eighth Annual Report of the Bonneville Power Administration, as required by subsection 9 (c) of the Bonneville Project Act.

As with last year's annual report, we have deviated somewhat from the practice of reporting events only through the June 30, 1965, end of our fiscal year. In the case of new Bonneville rates, the Pacific Northwest-Pacific Southwest Intertie, and certain other matters, we have reported important developments up to our printing deadline.

## BPA RATES

The most important single development affecting BPA in the past year has been approval by the Federal Power Commission of a modest rate increase effective December 20, 1965. It leaves BPA with still by far the lowest wholesale power rates in the nation. The rate increase will average 2.9 percent on firm power over the payout period of our system, and 2.4 percent of total revenues over the same period. In the first 9 years it will increase our revenues by an average \$4 million per year. Ultimately, as our sales increase, it will improve our revenues by about \$6 million per year. Together with power benefits from the Canadian Treaty, and revenues from the Intertie and our stepped-up power marketing program, we believe it will enable us to repay the Federal investment in presently authorized power facilities within the period expected by Congress.

The new rates, which we discuss more fully in the Financial Section, also should have a beneficial effect on the volume of our sales. Embodying many reforms suggested by our customers, the new rates are designed to encourage larger sales of peaking capacity to both publicly and privately owned utilities. With the increase in rate level kept small, industries currently are negotiating with us for the purchase of more than 600,000 kilowatts, either for expansion of plants already in the region or for new plants. Further, in the first 9 months of 1965, since it became certain any BPA rate increase would be relatively small, 25 public and cooperative systems reduced rates. In turn, this should increase the volume of their sales -- and ours. Other public agencies which have been postponing rate reductions because of concern over a possible large increase in the cost of their wholesale power can now reduce their resale rates.

Thus, we believe it fair to say that our new rates will increase our revenues, stimulate greater industrial expansion throughout our marketing area, and encourage our distributors to make more resale rate reductions. The ultimate beneficiaries of all this will be the electric consumers of the Pacific Northwest.

#### REVENUES AND PAYOUT

Financial statements prepared for audit and certification by the Comptroller General are based upon depreciation cost accounting principles. Under this accounting concept, the capital investment in each project is assigned for recovery by annual charges over the service life of the components of the projects, which according to present estimates will average approximately 70 years. On that basis, we show a surplus of \$6,272,000 for fiscal 1965 and a cumulative surplus of \$202,791,000 since the beginning of operations. The General Accounting Office audit for fiscal year 1965 pertains to these statements, which are set forth on page

This accounting and reporting technique, however, is not fully responsive to our need to demonstrate compliance under criteria presently established by the Congress for repayment of the investment in each hydroelectric project within 50 years after it is completed, a period much less than the average of component service lives. Investment in the transmission system is to be recovered over a period equal to its estimated average life, presently 40 years. We have, therefore, included on page 28, a schedule of our repayment status under those criteria. It shows that with our new rates we will be able to pay operations and maintenance, interest, provide for replacements, and fully amortize each project within 50 years after it is completed, as well as amortize the transmission system in 40 years and provide irrigation assistance in the years it falls due.

Like the "basin account" analysis used by the Bureau of Reclamation in the Missouri Valley, Central Valley, and the Colorado River Storage Project, our new payout schedule does not show an annual surplus or deficit. It requires that total amortization payments be sufficient to pay out each project within 50 years, but it does not require repayment of the capital investment in fixed annual amounts. It is based on an "allowable unpaid balance" concept which takes into account projections of revenues and expenses over the period 50 years after the last project is added to the system. When a new project goes into service its capital cost is added to the allowable unpaid balance. Fifty years later this sum is subtracted from the allowable unpaid balance. As long as our actual unpaid balance is less than the allowable unpaid balance in each year of the repayment period, we are meeting our payout test.

Further refinements of our payout analysis will be possible as the years go by; for example, as we accumulate more accurate data on the requirements for, and costs of, replacements at dams, and gain more experience on the service lives of components of our transmission system, we can revise the payout analysis accordingly. When we review the adequacy of our rates each five years, the impact of these refinements, as well as other new factors, will be considered.

## SOUTHERN IDAHO

Congress in October, 1965, appropriated \$1 million for BPA to start planning and designing an extra-high voltage transmission line from our Main System dams on the Columbia and Snake Rivers to Southern Idaho, but with two important provisos. We are to spend the funds only if we cannot obtain an equitable wheeling agreement with the private utilities which also serve Southern Idaho, and we are not to provide electric service directly to any industrial load or indirectly through a preference customer to any phosphate load in Southern Idaho, Utah or Wyoming.

We have sought for more than a year to achieve a wheeling contract with the companies, and apparently have reached agreement on price and almost all other points save this crucial one: the companies will agree to provide transmission capacity for the existing 20 preference customers we now serve in Southern Idaho, but not to serve additional preference customers who in the future may apply for Bonneville service. When it passed our FY 1966 appropriations bill in October, Congress made clear its intent that any wheeling agreement we sign must provide for service to tomorrow's preference customers as well as today's.

If we are unable within a reasonable time to achieve a proper wheeling contract, we will report that fact to Congress, and proceed to spend the planning and design funds. In our efforts to resolve this problem, we also have offered to build jointly with the private companies a 500,000-volt transmission line and share its capacity. That offer still stands.

## EMPLOYMENT LEVELS

Although our total program in FY 1965 was 267 percent greater than when you became Secretary of the Interior in 1961, we are accomplishing it with only 22 percent more employees.

In 1952, Bonneville's employment was at a peace-time high of 3,396. The construction and O & M program that year involved expenditures of \$54.5 million, for an average of 62.3 employees per million dollars of program. When the Kennedy Administration took office in 1961, employees were down to 2,383 and program to \$30 million, for an average of 78.9 employees per million dollars of program. As of June 30, 1965, our employment stood at 2,901, but our program was a record high \$110 million and our average of 26.4 employees per million dollars of program was an all-time low.

## CONSTRUCTION PROGRAM

The Pacific Northwest region is now in the midst of the greatest dam building program in the nation's history, and BPA is now in the midst of the greatest transmission line building program in its history. Both stem from authorizations of

projects and programs -- the Intertie and the Canadian Treaty notable among them -- in the past four years.

There are now under construction in the Pacific Northwest 13 generating projects in the United States and 3 storage dams in Canada. The 13 U.S. projects include eight Federal hydro projects, four non-Federal hydro projects, and the non-Federal Hanford atomic steam plant.

The Hanford project has been delayed about five months by bad weather, late deliveries of materials, and labor disputes. It now is expected to produce its first power in February or March, 1966. Full output of 800,000 kilowatts is expected by September 1, 1966. Costs are still running below original estimates.

Total output of the 13 U.S. projects will be about 7 million kilowatts. The three Canadian storage dams, all under construction and all on schedule, will enable existing U.S. dams downstream to produce an additional 2.8 million kilowatts by 1973. At Mica Creek, one of the three Canadian dams, almost 2 million additional kilowatts can be installed.

As reported in the Annual Operations Section, BPA is building a new 500,000-volt grid to overlay its lower-voltage transmission system. Completion of the new generating projects will require us by 1970 to provide transmission capacity for some 5.6 million additional kilowatts - about 3.4 million Federal kilowatts and 2.2 million non-Federal. By then we must also have three of the intertie lines completed and be well along on the fourth. All of this will require 3,000 circuit miles of new transmission lines, two-thirds of which will be 500,000 volts or higher.

Including BPA's portions of the four Intertie lines, as of June 30, 1965, we had under construction 2,085 circuit miles of transmission lines, 1,630 circuit miles of which are 500,000 volts or higher.

Construction schedules for three of the four Intertie lines have been changed. Completion of the two 500,000-volt alternating current lines has been stepped up from October 1967 and October 1968 to May 1967 and May 1968, respectively. Completion of the first 750,000-volt direct current line -- to Los Angeles -- has been postponed from October 1968 to April 1969. The second 750,000-volt d-c line -- to Hoover Dam -- is still scheduled for completion in 1971.

We expect to meet these new dates provided materials are delivered on schedule.

#### FUTURE STEAM PLANTS

While hydro will carry the region's base load electricity requirements through 1975 and its peaking requirements through 2000, we foresee that by 1976 it will be economic to provide for increases in base load with steam electric plants.

These plants may be fired either by atomic or conventional fossil fuels. Planning for such plants, we believe, should be regional in scope. It should have as its objective the construction of the right size plants at the right locations at the right times. To achieve the highest efficiency and lowest cost the utilities of the region will have to plan and operate these plants much as if they were under a single ownership.

The task of planning and building these plants will be so complex a lead time of approximately 8 years would be highly desirable. Therefore, we propose before the end of Fiscal Year 1966 to open discussions with the utility industry, public and private, looking toward planning of such facilities.

#### TECHNOLOGICAL LEADERSHIP

Bonneville continues to provide technological leadership in the electric utility industry. Four subheadings in the Annual Operations Section -- "Computers and BPA," "Research and Development," "Design Innovations," and "Direct Current Tests" -- tell part of this story.

We are proud that despite higher labor and materials costs, technological improvements have enabled us to keep the cost of transmission per kilowatt-hour handled slightly lower than it was 20 years ago. Engineering research and development of extra-high voltage techniques, designs of light steel towers, improvements in transformers, circuit breakers and system controls will continue to help us hold the line on transmission costs.

BPA is pioneering extra-high voltage direct current transmission in the United States. Our d.c. test center at The Dalles, Oregon is providing information that will be of value to the entire electric utility industry. And we continue to work with others in the industry to establish a high voltage a.c. test laboratory in the Mid-Columbia. It now appears the center will be located at Grand Coulee Dam, rather than at Wanapum Dam as first proposed, because of the higher short circuit capacities available for testing equipment.

We are working toward as complete automation of our system as practicable. As the complexity of our system grows, this becomes essential to maintain system stability and minimize line losses.

#### BEAUTILITY

America is becoming beauty conscious. No longer is the public satisfied with just good electric service at reasonable rates. Americans want their cities and their countryside to be attractive. They do not want their landscape cluttered with ugly or unnecessary structures. And so designers of electric systems must add a new dimension to their designs: appearance or "beautility."



At Bonneville, we were beginning to recognize the need to improve the appearance of our facilities even before the President expressed his policies on beautification. BPA projects in past years were designed to satisfy three basic criteria: function, safety and cost. We have established appearance as a new design criteria for all new projects, electric and non-electric. We have employed a consulting architect, as have some of our distributors.

In general, the new BPA appearance program places special emphasis on design criteria appropriate to the environment of a particular facility. And, because beauty in the Northwest is partly our problem and partly the problem of our distributors, we will endeavor at customer service substations to obtain customer cooperation. Many of our customers are making an excellent start, and we wish to build on this start so that BPA-customer substations and contiguous transmission-distribution facilities are in harmony with an overall design concept.

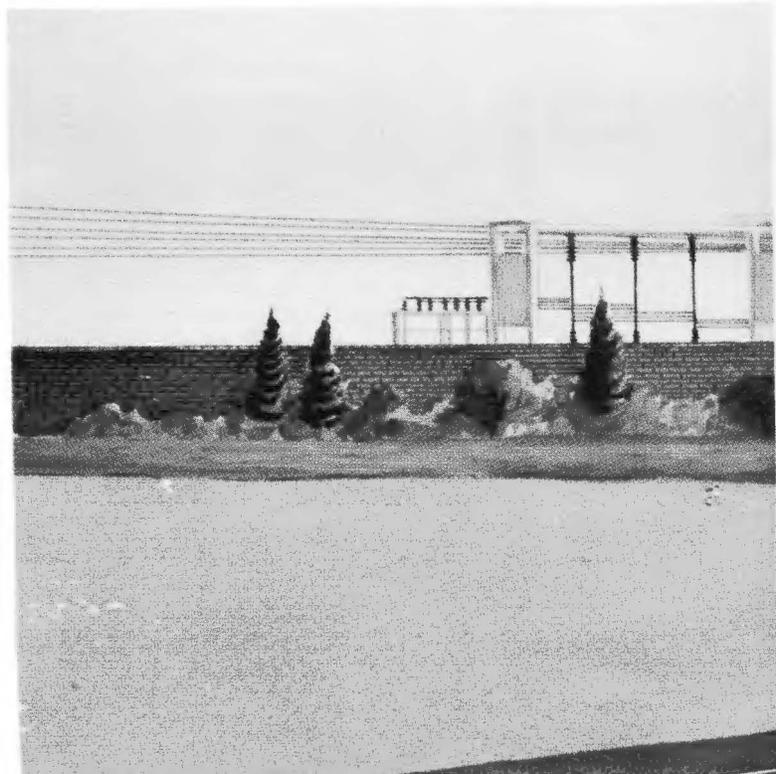
On a long-term basis, we believe that our appearance program -- except to the extent that we build underground -- will not result in greatly higher construction costs. Appearance of electric facilities is enhanced by streamlining, eliminating and integrating; cost reduction is frequently the result of such an approach.

Our Fiscal 1966 annual report will present both a written and pictorial report of progress in our appearance program.

#### NORTHEAST POWER BLACKOUT

Bonneville engineers, together with engineers from other utility systems across the nation, were called upon to assist the Federal Power Commission in determining the cause of the November power blackout in the Northeast, and to suggest methods

*Low Profile Substation*



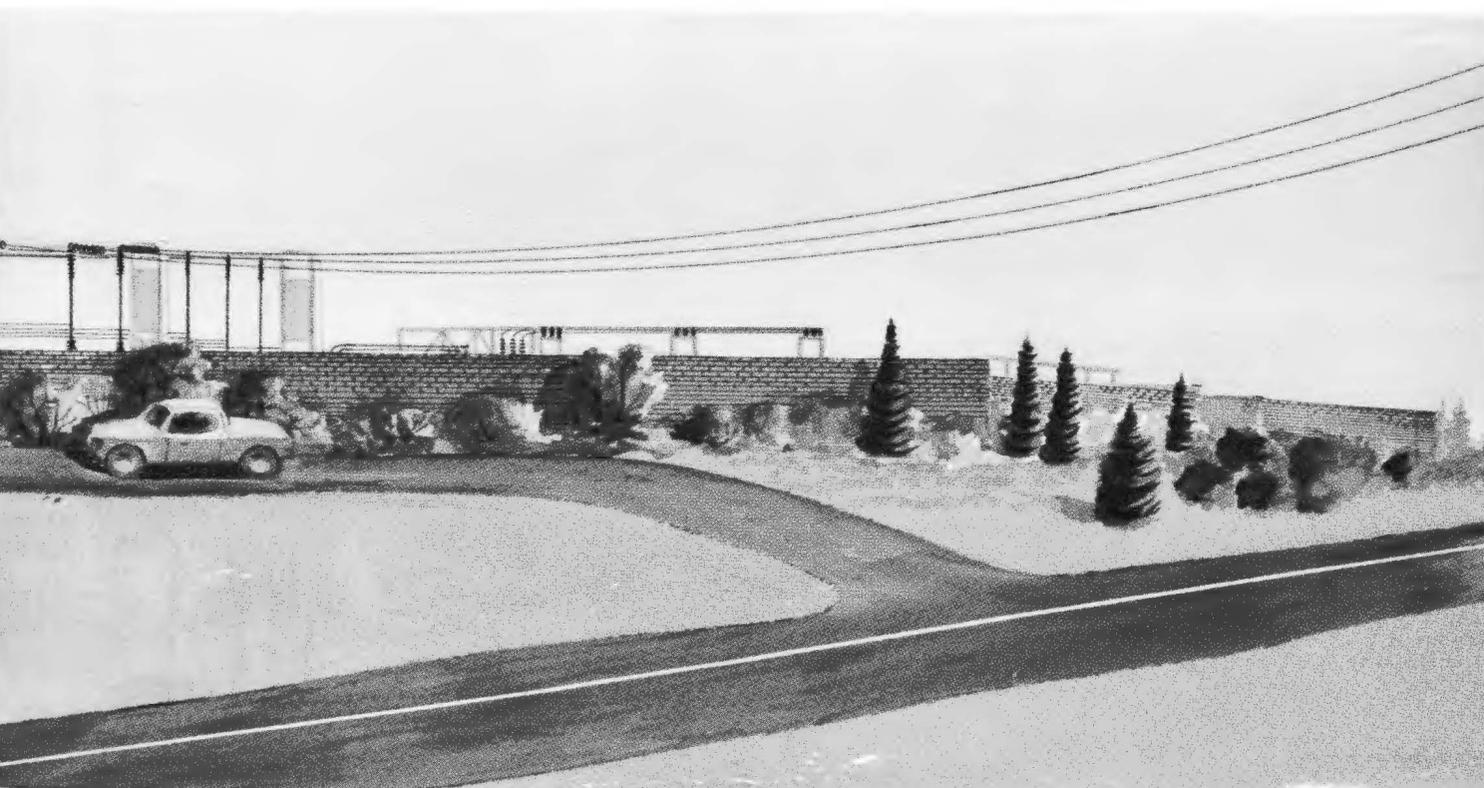
to avoid repetition. Their work was not completed when this Annual Report went to press. We can report, however, that they have found nothing in the experience of the Northeast to cast doubt on the wisdom of our intertie program. On the contrary, the Northeast's experience appears to demonstrate the need for stronger interconnections.

Our engineers also have concluded there is far less danger of a massive, region-wide power blackout occurring in the Pacific Northwest than in the Northeast; and that should one occur our region could recover much more quickly. This is primarily because the Pacific Northwest is more strongly interconnected and closely coordinated than the Northeastern system, and because our energy source is hydroelectric rather than steam. Hydro plants can respond to restore service much more quickly than steam plants, which require a heating up process. Also, our region has a number of large industrial loads which are dropped automatically to help avoid a system break-up; and if a break-up does occur, these large industrial loads are isolated from the rest of the system to make easier the power dispatchers' job of restoring service by matching load to generation. Since 1950, Bonneville and the other generating utilities have had a "load shedding" program which automatically drops more than 5 million kilowatts of industrial loads whenever system frequency drops from the normal 60 cycles to 57 cycles. Thus we could absorb the loss of power equal to two Grand Coulee dams, and still maintain essential service to Seattle, Portland, and other centers of population.

Nevertheless, we are not complacent about the stability of our system. We will continue to work to strengthen it, and we will apply whatever lessons are to be learned from the Northeast blackout.

*Charles F. Luce*

Charles F. Luce  
Administrator



*Hungry Horse Dam*



# ANNUAL OPERATIONS

## GENERATION

The Pacific Northwest's power requirements will double in the next 10 years. By 1975 the region will require 11.9 million kilowatts of new generating capacity at Federal and non-Federal plants.

There are now 16 major generating plants under construction -- eight Federal dams including Libby Dam which is just getting started, three Canadian storage projects, four non-Federal dams, and the Hanford atomic power plant. The Canadian projects will add 2.8 million kilowatts of dependable capacity to the region's resources. The other 13 projects will add nearly 7 million kilowatts of generating capacity. Altogether, this adds up to the greatest construction program in the history of the electric industry of the Northwest.

The eight Federal plants now under construction will have been completed by 1973. They will increase the generating capacity at Federal plants by more than 50 percent. The projects, besides Libby, are Green Peter, Foster, John Day (14 units), Lower Monumental, Little Goose, Lower Granite and Dworshak. Their total capacity is rated at 3,920,000 kilowatts, and is the largest block of Federal generation under construction at one time in the history of the region.

At the end of fiscal 1965 the nameplate capacity of generation installed at the 21 existing Federal dams in the U. S. Columbia River power system totaled 6,678,150 kilowatts.

Isolated Navy, Bureau of Reclamation, National Park Service, and Bureau of Indian Affairs plants in the region have an additional 38,817 kilowatts of Federal generation not marketed by BPA.

The installed generating capacity of non-Federal plants in the region increased to 7,914,889 kilowatts during fiscal 1965. Portland General Electric Company added 247,050 kilowatts of capacity at its Round Butte plant. Of the non-Federal generating capacity, 7,570,920 kilowatts are hydroelectric and 443,969 kilowatts are old steam plants.

Scheduled additions under construction or licensed will add another 3,300,100 kilowatts of capacity and will increase the non-Federal total to 11,214,989 kilowatts. The High Mountain Sheep project, although licensed for non-Federal construction, is not included in this figure because the license currently is in litigation. High Mountain Sheep will add another 900,000 kilowatts of capacity to the region's resources.

## CANADIAN TREATY

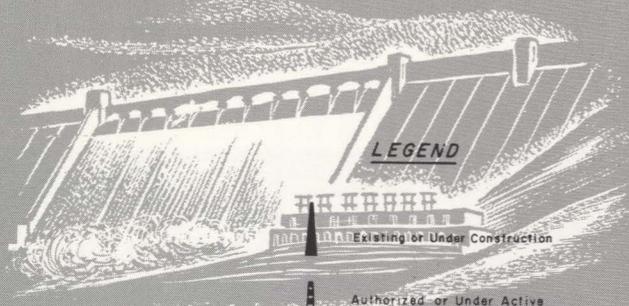
Duncan and Arrow dams, two of the three projects Canada is building under the treaty to develop the upper Columbia River, are ahead of schedule. Major construction has begun on the third project, Mica, and the first phase of Mica Village, the construction community, is nearly completed.

At Duncan, fill is about 30 per cent completed and diversion of the river through tunnels is scheduled for mid-February, 1966.

At Arrow, the coffer-dam is nearing completion and placement of fill by barges has begun. Railroad and highway relocations at Arrow -- the only one of the three sites with those problems -- were completed last year, tying the area into a highway network for the first time. Also for the first time there will be a bridge across Arrow Lakes. About 500 purchases of the 1600 properties that must be acquired in the reservoir area have been made, and plans have been completed for new communities to replace the ones that will be flooded.

Work on Duncan began in November 1964. The project is to be completed by April 1, 1968. Arrow was started in March 1965. It is to be finished by April 1, 1969. Mica is scheduled for completion by April 1, 1973.

In Montana, the Corps of Engineers is preparing to let contracts and go to work at the site of Libby Dam on the Kootenai River. The reservoir behind Libby will extend 42 miles into Canada. The plans for Libby are more than two-thirds complete, and



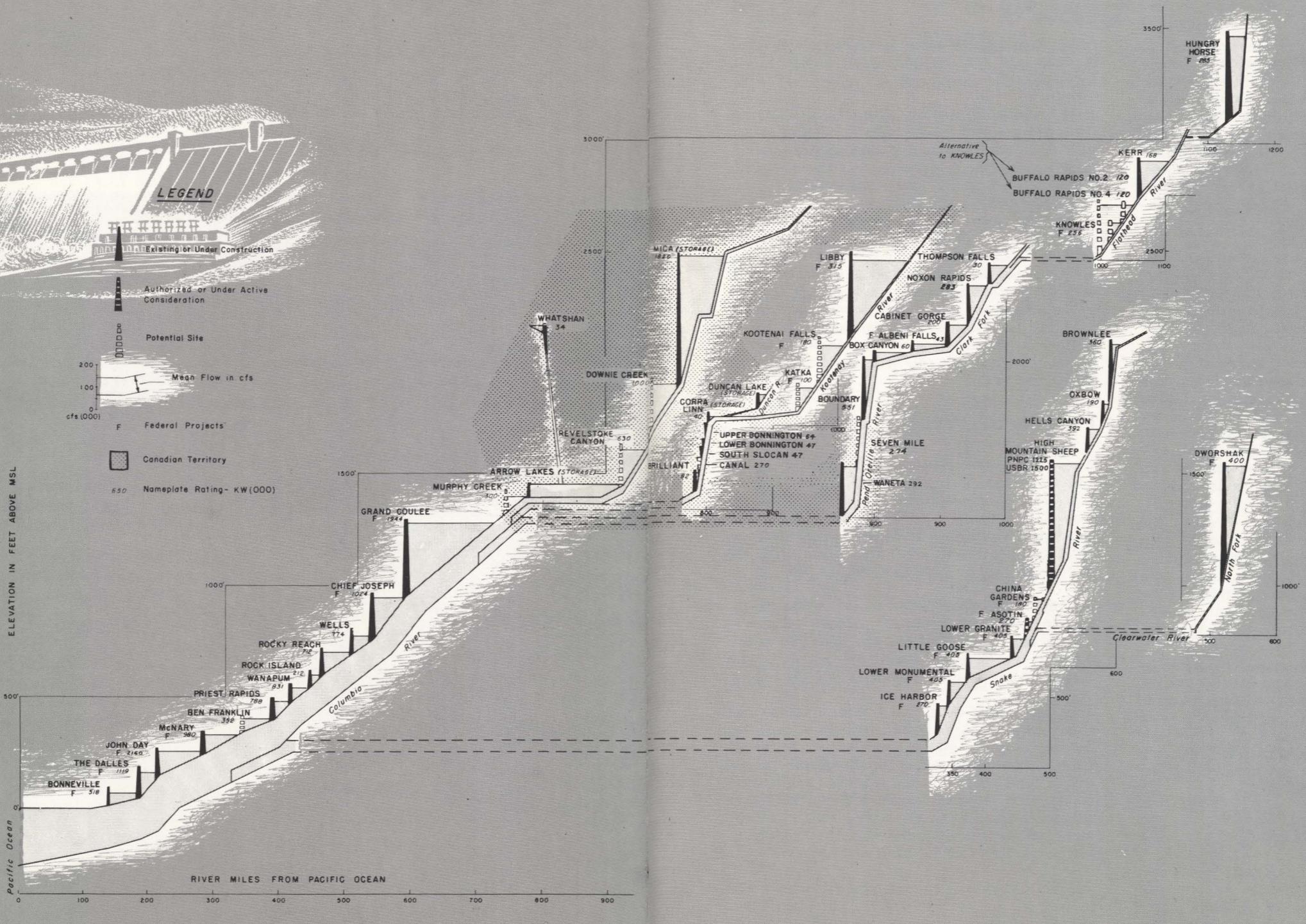
- LEGEND**
- Existing or Under Construction
  - Authorized or Under Active Consideration
  - Potential Site
  - Mean Flow in cfs
  - Federal Projects
  - Canadian Territory
  - Nameplate Rating - kW(000)

ELEVATION IN FEET ABOVE MSL

RIVER MILES FROM PACIFIC OCEAN

OCTOBER 1965

EXISTING & POTENTIAL POWER DEVELOPMENT, COLUMBIA RIVER & UPSTREAM TRIBUTARIES



Congress has appropriated \$7-1/2 million to begin construction in fiscal 1966.

Canada and the United States have designated entities to plan and perform operating arrangements required by the treaty. Canada's entity is British Columbia Hydro and Power Authority. The U.S. entity is the Administrator, Bonneville Power Administration, and the Division Engineer, North Pacific Division, Corps of Engineers. The entities have set up five international task forces to effect programs required by the treaty. There are task forces on Power Operating Plans, Flood Control Operating Plans, Hydrometeorological Network, Initial Filling of Reservoirs, and Discharge Capacity.

A Permanent Engineering Board consisting of four members, two appointed by the United States and two by Canada, is organized and functioning. Such a board is required by Article 15 of the Treaty, which spells out its duties: to report to Canada and the United States whenever there is substantial deviation from the hydroelectric and flood control operating plans; to assist in reconciling differences concerning technical or operational matters; to make periodic inspections; to make reports to Canada and the United States at least once a year on results achieved under the Treaty, and, at the request of either nation, investigate and report with respect to any other matter within the scope of the Treaty.

The three Canadian projects will provide 15.5 million acre-feet of storage. Water releases from these projects will increase the dependable capacity of 11 dams downstream in the United States by a maximum of 2.8 million kilowatts. The United States and Canada will divide this power equally. Canada has sold her share to U.S. purchasers for 30 years.

Libby will add another 5 million acre-feet of storage and some 750,000 kilowatts of firm power at site and downstream in the United States. It will also increase the firm power capability of downstream Canadian dams, including a canal plant to be built below Kootenai Lake, by about 200,000 kilowatts. The four projects should end disastrous flooding on the Kootenai and Columbia Rivers.

## HANFORD STEAM PLANT

During December 1965, as this annual report was sent to the printer to be published, contractors rushed to complete the first of two generating units at the Hanford atomic power plant. They were about five months behind schedule for a variety of reasons, including a tight initial construction schedule, late deliveries of material, the severe 1964-65 winter, and labor disputes. The builder, Washington Public Power Supply System, has reported the first 430,000

kilowatt turbine-generator is now expected to begin producing power early in 1966, and the second unit in late spring.

Direct construction costs are running well under the estimated \$73.6 million, but all the figures will not be available until spring.

Under critical streamflow conditions, the delay of the Hanford atomic power plant could have forced BPA to curtail deliveries of interruptible power to industries this winter. However, warm temperatures and high streamflows have made curtailment unnecessary thus far. Reservoirs are full enough to carry firm power loads through the winter and assure interruptible power deliveries through January 1966. Based on 30 years of streamflow records, the chances are only 2 in 30 there may have to be some curtailment in February, and 4 in 30 in March and April. Next winter the Hanford plant will be absolutely essential; without it, should critical streamflow conditions arise, we would be forced to curtail not only interruptible power but some firm power.

## POWER DELIVERIES

Bonneville Power Administration sold 35 billion kilowatt-hours of energy to 145 wholesale customers in fiscal 1965. Sales revenues rose 7 percent and totaled \$82,046,000, a new high. Energy sales went up 6.9 percent over last year. BPA's total revenues, which includes \$8,143,000 from sources other than sales, increased 6.6 percent to \$90,189,000.

Aluminum and other industrial customers led the demand for power with a 1.2 percent increase in firm power and a 31.4 percent jump in nonfirm. Deliveries to publicly owned utilities rose 11.5 percent. Sales to private utilities fell 15 percent.

Aluminum plants bought 33.8 percent of the total energy sold, and 24 other industries including Federal agencies 14.8 percent. Kaiser Aluminum and Chemical Corporation purchased the largest amount -- 4.2 billion kilowatt-hours. Aluminum Company of America was second with 2.5 billion kilowatt-hours. Among customers other than aluminum producers, Hanna Nickel Smelting Company led with purchases of 689 million kilowatt-hours.

Publicly owned utilities, numbering 103, took 44.3 percent of total energy sales. Nine privately owned utilities bought 7.1 percent. The City of Seattle purchased 2.5 billion kilowatt-hours, and Snohomish County PUD 1.7 billion kilowatt-hours. Seattle and Snohomish led all public utility purchases. Portland General Electric led the privately owned utilities with purchases of 1.1 billion kilowatt-hours.

TABLE I  
ELECTRIC ENERGY SALES TO CUSTOMERS OF THE BONNEVILLE POWER ADMINISTRATION  
FISCAL YEAR ENDED JUNE 30, 1965

Customers	Energy deliveries for year (000) kwh	Revenue from sales of energy	Customers	Energy deliveries for year (000) kwh	Revenue from sales of energy
<b>Publicly Owned Utilities</b>			<b>Publicly Owned Utilities</b>		
<b>Municipalities</b>			<b>Municipalities</b>		
Albion, Idaho	1,649	\$ 5,337	Idaho Co. L & P Coop. Assn.	24,080	\$ 80,736
Bandon, Oregon	29,657	98,683	Inland P & L Co.	152,172	484,380
Bonners Ferry, Idaho	6,208	36,289	Kootenai Elec. Coop.	28,303	88,475
Burley, Idaho	45,301	137,511	Lane Co. Elec. Coop.	131,676	445,616
Camby, Oregon	26,263	94,825	Lincoln Elec. Coop. - Montana	19,911	65,683
Cascade Locks, Oregon	17,368	58,243	Lincoln Elec. Coop. - Washington	41,589	120,566
Centralia, Washington	17,281	105,523	Lost River Elec. Coop.	11,740	34,814
Cheney, Washington	36,099	114,780	Lower Valley P & L, Inc.	30,759	107,555
Coulee Dam, Washington	20,320	35,404	Midstate Elec. Coop.	26,683	75,118
Declo, Idaho	1,240	4,042	Missoula Elec. Coop.	26,021	85,707
Drain, Oregon	17,037	62,195	Nespelem Valley Elec. Coop.	12,387	37,968
Ellensburg, Washington	72,166	232,914	Northern Lights	44,679	151,631
Eugene, Oregon	614,573	1,499,516	Okanogan Co. Elec. Coop.	8,023	25,250
Forest Grove, Oregon	68,961	236,442	Orcus P & L Co.	27,001	78,313
Grand Coulee, Washington	20,894	43,527	Prairie Power Coop.	1,981	7,275
Heyburn, Idaho	23,742	76,992	Quinault Light Co.	4,306	12,144
Idaho Falls, Idaho	105,065	426,414	Roft River Rural Elec. Coop.	67,163	174,179
McMinville, Oregon	99,450	328,537	Ravalli Co. Elec. Coop.	20,483	68,659
Milton-Freewater, Oregon	60,816	197,190	Riverside Elec. Co.	2,078	7,092
Mindoka, Idaho	666	2,169	Rural Elec. Co.	11,548	36,379
Monmouth, Oregon	26,202	96,899	Salem Electric	103,244	341,694
Port Angeles, Washington	271,265	696,766	Salmon River Elec. Coop.	9,529	26,384
Richland, Washington	192,731	650,571	South Side Elec. Lines	7,743	21,956
Rupert, Idaho	29,099	88,119	Surprise Valley Elec. Corp.	25,489	82,784
Seattle, Washington	2,490,505	5,109,065	Tanner Electric	2,882	9,476
Springfield, Oregon	133,198	389,624	Umatilla Elec. Coop. Assn.	53,038	154,235
Tacoma, Washington	1,194,899	2,419,913	Unity Light & Power Co.	14,911	47,069
Vera Irrigation Dist. No. 15	49,817	160,595	Walcott Elec. Co.	257	873
Total Municipalities (28)	<u>5,672,472</u>	<u>\$ 13,408,085</u>	Wasco Elec. Coop.	75,077	232,343
			West Oregon Elec. Coop.	30,587	103,518
			Total Cooperatives (48)	<u>1,972,616</u>	<u>\$ 6,242,212</u>
<b>Public Utility Districts</b>			<b>Public Utility Districts</b>		
Benton Co. PUD No. 1	356,456	\$ 1,123,323	B. C. Hydro & Power Authority	11,289	28,222
Central Lincoln PUD	570,886	1,635,031	Total Publicly Owned Utilities	<u>15,503,582</u>	<u>\$ 41,848,276</u>
Cheban Co. PUD No. 1	202,289	442,861	<b>Privately Owned Utilities</b>		
Clallam Co. PUD No. 1	118,987	351,254	California-Pacific Utilities	20,684	\$ 46,166
Clark Co. PUD No. 1	941,049	2,913,530	Idaho Power Co.	119,898	329,720
Clatskanie PUD	35,034	118,887	Montana Power Co.	365,060	911,654
Cowlitz Co. PUD No. 1	1,312,044	2,915,215	Pacific Power & Light Co.	791,277	1,780,529
Douglas Co. PUD No. 1	230,985	617,274	Paul Electric Co.	8,164	24,702
Ferry Co. PUD No. 1	24,239	70,123	Portland General Elec. Co.	1,131,464	2,321,714
Franklin Co. PUD No. 1	190,988	616,688	Puget Sound P & L Co.	6,887	17,222
Grant Co. PUD No. 2	349,747	1,120,836	Washington Water Power Co.	23,067	57,670
Grays Harbor Co. PUD No. 1	613,193	1,660,728	Total Privately Owned Utilities (8)	<u>2,466,501</u>	<u>\$ 5,489,377</u>
Kittitas Co. PUD No. 1	15,065	47,215	<b>Federal Agencies (11)</b>		
Klickitat Co. PUD No. 1	108,106	325,767		2,977,253	\$ 6,761,592
Lewis Co. PUD No. 1	210,338	629,330	<b>Industries</b>		
Mason Co. PUD No. 1	17,546	56,333	<b>Aluminum</b>		
Mason Co. PUD No. 3	149,728	433,813	Aluminum Co. of America		
Northern Wasco Co. PUD	45,513	157,462	Vancouver Plant	1,853,016	\$ 3,721,759
Okanogan Co. PUD No. 1	189,519	548,628	Wanatchee Plant	616,340	1,237,252
Pacific Co. PUD No. 2	123,694	404,313	Anacosta Aluminum Co.	1,280,253	2,132,232
Pend Oreille Co. PUD No. 1	29,147	60,292	Harvey Aluminum Co.	1,536,609	2,582,747
Skamania Co. PUD No. 1	49,931	161,857	Kaiser Alum. & Chem. Corp.		
Snohomish Co. PUD No. 1	1,689,946	4,913,246	Spokane Reduction Plant	3,464,110	6,983,057
Tillamook PUD	193,162	633,786	Spokane Rolling Mill	333,780	804,605
Wahkiakum Co. PUD No. 1	23,488	74,744	Tacoma Reduction Plant	359,443	739,298
Wheatcom Co. PUD No. 1	55,825	137,321	Reynolds Metals Co.		
Total Public Utility Districts (26)	<u>7,847,205</u>	<u>\$ 22,169,751</u>	Longview Plant	1,225,290	2,454,614
			Trousdale Plant	1,167,587	2,340,695
<b>Cooperatives</b>			<b>Other Industries</b>		
Benton Rural Elec. Assn.	76,770	\$ 241,651	American Tel. & Tel. Co.	4	45
Big Bend Elec. Coop.	116,266	318,411	Carbondum Co.	226,230	458,850
Blanchly-Lane Co. Coop. Elec. Assn.	47,144	146,278	Crown Zellerbach Corp.	148,095	331,148
Central Electric Coop.	39,840	115,250	Hanna Nickel Smelting Co.	688,815	1,513,196
Clearwater Power Co.	61,554	210,529	Ida Gem Dairymen	346	2,271
Columbia Basin Elec. Coop.	54,156	174,048	Keokuk Electro-Metals Co.	117,039	256,971
Columbia Power Coop. Assn.	21,888	76,479	Montana Phosphate Co.	59,773	138,820
Columbia Rural Elec. Assn.	37,766	109,651	Pacific Carbide & Alloys	44,481	97,514
Consumers Power	151,248	512,731	Pacific Northwest Alloys	159,563	159,563
Coos-Curry Elec. Coop.	156,304	503,262	Pennsalt Chemical Corp.	332,723	690,164
Douglas Elec. Coop.	57,104	192,667	Rayonier, Incorporated	59,773	131,647
East End Mutual Elec. Co.	2,862	9,561	Stuffer Chemical Co.	355,390	729,430
Eastern Oregon Elec. Coop.	7,271	25,473	Stewart Eisner	59	368
Fall River Elec. Coop.	13,854	63,890	Union Carbide Metals Co.	176,129	390,108
Farmers Elec. Coop.	2,268	7,108	Total Industries (23)	<u>14,022,900</u>	<u>\$ 27,946,354</u>
Fleethad Elec. Coop.	35,749	109,797			
Horney Elec. Coop.	41,953	111,395			
Hood River Elec. Coop.	33,279	105,559			
			Total Sales of Electric Energy (145)	<u>31,970,236</u>	<u>\$ 82,045,599</u>

† These sales do not conform with accounting totals since they include adjustments for billing revisions made subsequent to close of accounting records.

**TABLE 2**  
**U. S. COLUMBIA RIVER POWER SYSTEM**  
 General specifications, projects existing, under construction and authorized  
 June 30, 1965

Project	Operating agency 1/	Location	Stream	Plant installations		Date in service (initial unit)	
				Number of units	Total capacity kilowatts 2/		
<b>Existing</b>							
<u>Primary System</u>							
Bonneville	CE	Washington-Oregon	Columbia	10	518,400	June	1938
Grand Coulee	BR	Washington	Columbia	18	1,944,000	September	1941
Hungry Horse	BR	Montana	South Fork Flathead	4	285,000	October	1952
Detroit	CE	Oregon	North Santiam	2	100,000	July	1953
McNary	CE	Washington-Oregon	Columbia	14	980,000	November	1953
Big Cliff	CE	Oregon	North Santiam	1	18,000	June	1954
Lookout Point	CE	Oregon	Middle Fork Willamette	3	120,000	December	1954
Albeni Falls	CE	Idaho	Pend Oreille	3	42,600	March	1955
Dexter	CE	Oregon	Middle Fork Willamette	1	15,000	May	1955
Chief Joseph	CE	Washington	Columbia	16	1,024,000	August	1955
Chandler	BR	Washington	Yakima	2	12,000	February	1956
The Dalles	CE	Washington-Oregon	Columbia	16	1,119,000	May	1957
Roza	BR	Washington	Yakima	1	11,250	August	1958
Ice Harbor	CE	Washington	Snake	3	270,000	December	1961
Hills Creek	CE	Oregon	Middle Fork Willamette	2	30,000	May	1962
Cougar	CE	Oregon	South Fork McKenzie	2	25,000	February	1964
<u>Upper Snake River System</u>							
Minidoka	BR	Idaho	Snake	7	13,400	May	1909
Boise Diversion	BR	Idaho	Boise	3	1,500	May	1912
Black Canyon	BR	Idaho	Payette	2	8,000	December	1925
Anderson Ranch	BR	Idaho	South Fork Boise	2	27,000	December	1950
Palisades	BR	Idaho	Snake	4	114,000	February	1957
Subtotal - 21 Projects					<u>6,678,150</u>		
<u>Under Construction</u>							
Green Peter	CE	Oregon	Middle Santiam	2	80,000		
Foster	CE	Oregon	South Santiam	2	20,000		
John Day 3/	CE	Washington-Oregon	Columbia	14	1,890,000		
Lower Monumental	CE	Washington	Snake	3	405,000		
Little Goose	CE	Washington	Snake	3	405,000		
Lower Granite	CE	Washington	Snake	3	405,000		
Dworshak	CE	Idaho	North Fork Clearwater	3	400,000		
Subtotal - 7 Projects					<u>3,605,000</u>		
<u>Authorized</u>							
Libby	CE	Montana	Kootenai	3	315,000		
Asotin	CE	Washington-Idaho	Snake	2	270,000		
Strube	CE	Oregon	South Fork McKenzie	1	4,500		
Lost Creek	CE	Oregon	Rogue	2	52,000		
Fremont	BR	Idaho	Teton	2	22,000		
Subtotal - 5 Projects					<u>663,500</u>		
TOTAL - 33 Projects					<u>10,946,650</u>		

1/ CE - Corps of Engineers; BR - Bureau of Reclamation.

2/ Nameplate rating.

3/ Additional units may be installed subsequent to completion of the present schedule.

Power sales brought an average of 2.35 mills per kilowatt-hour. By class of customer, sales ranged from an average of 1.99 mills per kilowatt-hour for industries (including at-site deliveries), 2.23 mills for privately owned utilities, and 2.7 mills for publicly owned utilities.

As a general rule, it costs less to supply power to a purchaser who buys at high load factor. The load

factor is the ratio of the average load over a designated period, such as a month, to the peak load occurring in that period.

Our industrial customers buy at nearly 100 percent load factor, and their average cost of power is therefore the lowest of any class of customer.

Private utilities, who use large amounts of their

own generation to meet their peak loads, also purchase power from BPA at a high load factor. This results in a lower cost to them as a class.

Many public agencies buy all of their power, including peak needs, from BPA. This results in a slightly higher average cost of power, as compared with industrial and private purchasers.

## **INDUSTRIAL SALES**

Industrial sales have increased nearly 700,000 kilowatts in the past 4-1/2 years, from 1,123,000 kilowatts in March 1961 to 1,820,000 kilowatts in October 1965. Another 485,000 kilowatts of power is under contract for delivery as soon as new plants under construction are completed.

Including the power under contract, our industrial sales have increased 100 percent within the past 4-1/2 years, and likely will increase another 50

percent within a year or two. We are now negotiating contracts with industries for about 600,000 kilowatts of additional power, and we have inquiries from industries for another 575,000 kilowatts. While the inquiries have not reached the stage of contract negotiations, they are a strong indication of further industrial growth in the region.

Our industrial sales record since 1961 stands in sharp contrast to an increase of only 6 percent during the years 1952-61.

Contracts were signed in fiscal 1965 to serve new industrial plants of Intalco Aluminum and Georgia-Pacific in the vicinity of Bellingham, Washington.

Since 1961, contracts for a larger supply of firm power at existing plants have been signed with Harvey Aluminum at The Dalles, Oregon; Alcoa Aluminum at Vancouver, Washington; Anaconda Aluminum at Columbia Falls, Montana; Kaiser Aluminum



**TABLE 3**  
**PACIFIC NORTHWEST GENERATION**  
Nameplate rating of plants existing, under construction and authorized or licensed  
Kilowatts  
June 30, 1965

Ownership	Existing		Under construction		Licensed or authorized		Total	
	No. of plants	Nameplate rating	No. of plants	Nameplate rating	No. of plants	Nameplate rating	No. of plants	Nameplate rating
<b>Federal Agencies</b>								
Hydro. . . . .	26	6,698,710	7	3,605,000	5	663,500	38	10,967,210
Thermal. . . . .	5	18,257	0	0	0	0	5	18,257
Total Federal Agencies. . . . .	<u>31</u>	<u>6,716,967</u>	<u>7</u>	<u>3,605,000</u>	<u>5</u>	<u>663,500</u>	<u>43</u>	<u>10,985,467</u>
<b>Publicly Owned Agencies</b>								
Hydro. . . . .	44	3,889,290	3	1,625,250	3	444,950 1/	50	5,959,490
Thermal. . . . .	20	195,584	1	860,000	0	0	21	1,055,584
Total Publicly Owned Agencies. . . . .	<u>64</u>	<u>4,084,874</u>	<u>4</u>	<u>2,485,250</u>	<u>3</u>	<u>444,950</u>	<u>71</u>	<u>7,015,074</u>
<b>Privately Owned Agencies</b>								
Hydro. . . . .	95	3,581,630	1	369,900	0	0	96	3,951,530
Thermal. . . . .	11	248,385	0	0	0	0	11	248,385
Total Privately Owned Agencies. . . . .	<u>106</u>	<u>3,830,015</u>	<u>1</u>	<u>369,900</u>	<u>0</u>	<u>0</u>	<u>107</u>	<u>4,199,915</u>
<b>Total</b>								
Hydro. . . . .	165	14,169,630	11	5,600,150	8	1,108,450	184	20,878,230
Thermal. . . . .	36	462,226	1	860,000	0	0	37	1,322,226
Grand Total. . . . .	<u>201</u>	<u>14,631,856</u>	<u>12</u>	<u>6,460,150</u>	<u>8</u>	<u>1,108,450</u>	<u>221</u>	<u>22,200,456</u>

1/ Includes additions to existing Rocky Reach Project.

at Spokane, Washington; Pennsalt in Portland, Oregon, and both Crown Zellerbach and Rayonier at Port Angeles, Washington. The Kaiser Aluminum Company plant at Tacoma, Washington, has reopened after a 6-year closure, and we are again serving it.

The impact on the Northwest's economy from these additional industrial sales is just beginning to be felt. In calendar year 1964 Northwest industrial plants served directly by BPA employed 11,500 workers with total wages and salaries of about \$85 million. The 1964 employment figure was up about 1200 over 1963. And when all the plant expansion based on our new industrial sales contracts to date is completed, employment should increase another 1,000. This does not take into account the indirect employment of approximately two jobs for every one in basic industry.

In calendar year 1964 industries served directly by BPA purchased materials and supplies and services in the Northwest totaling \$76 million. They paid freight payments of \$39 million. They bought \$34 million worth of electricity; and paid state and local taxes of nearly \$8 million. They also spent \$34 million in 1964 on plant additions.

Indirectly, through our utility customers, we also supply large amounts of power for industrial growth. New large industrial loads contracted for since 1961 by utilities which purchase all or much of their wholesale power from BPA include the new Inter-

**TABLE 4**  
**Electric energy account for fiscal year 1965**

Energy received (millions of kilowatt hours)	
Energy generated for BPA	
Bureau of Reclamation . . . . .	12,982
Corps of Engineers. . . . .	24,340
Power interchanged in. . . . .	<u>16,677</u>
Total received. . . . .	<u>53,999</u>
Energy delivered (millions of kilowatt hours)	
Sales. . . . .	34,970
Power interchanged out . . . . .	16,724
Used by Administration . . . . .	<u>40</u>
Total delivered. . . . .	51,734
Energy losses in transmission and transformation . . . . .	<u>2,265</u>
Total. . . . .	<u>53,999</u>
Losses in percent of total received - 4.2%	
Maximum demand on Federal plants (kilowatts) . . . . .	6,397,000
December 17, 1964, 5-6 p.m. PST	
Load factor in percent of total generated for BPA . . . . .	66.6%

national Paper plant at Gardiner, Oregon, and the expanded Georgia-Pacific paper mill at Toledo, both served by Central Lincoln PUD; the new Crown Zellerbach plant at Wauna, Oregon, served by Clatskanie PUD; the new Air Reduction Corporation plant at Vancouver, Washington, served by Clark County PUD; and the Ashgrove Lime Company of

Portland, Oregon, served by Portland General Electric Company. These and other utilities are also serving the increasing power requirements of a wide variety of growing chemical, metallurgical, forest products, agricultural and food-processing industries.

## WHEELING

“Wheeling,” in electrical parlance, refers to the transportation of electric energy owned by “A” over transmission lines owned by “B”.

Bonneville’s wheeling policy originated in the 1950’s with construction of Priest Rapids and Rocky Reach dams by Grant and Chelan County PUDs. A number of smaller utilities, whose purchase of fractional shares of the output of these dams was essential to financing them, did not have the means to build transmission lines from the dams to their load centers. The underwriters of these dams felt that the revenue bonds could be sold only if BPA agreed to wheel the power purchased by such utilities. So, in order to make it possible for these non-Federal dams to be built, BPA agreed to deliver the output over its main grid on a firm basis.

Our wheeling policy was further developed with construction of Wanapum Dam by Grant County PUD. Until then BPA refused to wheel secondary energy if the Federal system had secondary energy for sale. In our Wanapum wheeling contracts we agreed that purchasers of wheeling capacity in the BPA system could use that capacity to wheel their own power or anyone else’s up to the limit of the capacity they had purchased, even if it would displace BPA sales.

Our wheeling policy now conceives as its ultimate objective the construction, in cooperation with other utilities, of a regional transmission system as efficient and reliable as could be built if there were but a single owner of all electric facilities in the Northwest. To accomplish this, we not only make our lines available to wheel for others but, where circumstances warrant, use the lines of non-Federal utilities to wheel BPA power.

Such a policy, if adopted by all utilities that own transmission lines, would enable the grid system of the Pacific Northwest to operate as a unit. Regardless of ownership of generating and transmission facilities, loads would be served from the nearest generation. In the past five years, we have made great progress in the implementation of this policy.

Seattle, for example, is building the Boundary project on the Pend Oreille River in northeast Washington. Through a wheeling arrangement, this

power will be used by BPA to serve loads in eastern Washington, northern Idaho, and western Montana. Power from Grand Coulee and Chief Joseph dams will serve Seattle. Without wheeling, Seattle would have had to build unnecessary transmission facilities from Boundary Dam to Seattle over the Cascade Range at a cost of about \$50,000 per mile. BPA would have had to build additional facilities east of Grand Coulee. The capital savings for BPA under this one arrangement is about \$14 million.

There are other advantages of wheeling. It provides better loading of facilities, thereby making possible more efficient use of equipment at lower average costs. BPA and other utilities can take advantage of economies offered by transmission at higher voltages. And it holds to a minimum the amounts of land cleared and used for transmission rights-of-way.

Many millions of dollars have been saved for both BPA and its customers. These savings are reflected in lower electric costs to Northwest consumers.

Without this wheeling policy and the arrangements it makes possible, it is probable that the Hanford atomic power plant would not have been built, nor the Columbia River Treaty with Canada ratified. The sale of fractional shares of the output of a single generating plant to many utilities throughout a large region requires that the regional transmission grid be made available to each purchaser.

In fiscal 1965 BPA wheeled or transferred for other utilities 12.9 billion kilowatt-hours of energy. This compares to 11.7 billion kilowatt-hours wheeled or transferred during fiscal 1964.

Power is being delivered under long-term wheeling contracts from the Packwood project of the Washington Public Power Supply System, the Priest Rapids and Wanapum projects of Grant County Public Utility District, the Rocky Reach project of Chelan County Public Utility District, the Box Canyon project of Pend Oreille County Public Utility District, and the Carmen-Smith project of the City of Eugene.

Excess capacity contracts cover wheeling power from the Swift project of the Pacific Power and Light Company, the Mayfield project of the City of Tacoma, and from the Priest Rapids project, and energy wheeled to utilities in the region from the Idaho Power Company.

BPA’s wheeling program is an important revenue producer. In fiscal 1965 it produced \$4,397,000, or nearly 5 percent of our total revenues. By 1970 wheeling will account for about \$11 million, or 9 percent of our total revenues.

BPA's fiscal 1967 budget contains \$4.9 million of a total cost of \$8.5 million to be invested in three lines to wheel power for non-Federal utilities. This comparatively small investment, plus use of excess capacity on the balance of our system, will produce additional wheeling revenues of \$2,750,000 a year. Wheeling is good business. It is an important factor in enabling BPA to meet its payout requirements.

#### NORTHWEST POWER POOL

During fiscal 1965, the U.S. Columbia River Power System supplied 48.9 percent of the total energy generated by the major utilities of the Pacific Northwest. BPA provided 7 billion kilowatt hours of energy in addition to its other load to meet the net requirements of 12 other Pool utilities. BPA is capable of transmitting 80 percent of the power produced in the region and does transmit between 66 and 80 percent, depending on water conditions and operating agreements.

#### SAN JUAN CABLE

The three-phase, 25,000-volt underwater cable serving some 6,000 residents of the San Juan Islands broke twice in less than a year. The cable supplied all of the electricity to six main islands and had functioned without mishap since it was laid in 1951.

The cable first parted on November 16, 1964, and took 20 days to repair. The break plunged the islands, where 55 percent of the homes are heated with electricity, into darkness. Within a few hours Orcas Power and Light Company, the islanders' cooperative, began generating a limited amount of power -- less than a third of the island's requirements -- with 10 old diesel generators that had supplied the islands with electricity before the cable went in.

Nearly a week passed before BPA could locate enough additional generation to meet the islands' essential needs. A mobile, 500-kilowatt generator was brought by truck from northern British Columbia. BPA next located a barge with two 1,000-kilowatt generators at New Westminster, B.C. It was leased and brought to the islands. A National Guard barge with a 460-kilowatt unit was brought from Tacoma. Two small, 75-kilowatt units owned by BPA were placed in service on Lopez Island, one of the smaller of the six main islands.

Troubles plagued the diesel operations, but the islanders gradually adjusted to an uncertain supply of electric power.

Swift tides and bad weather hampered repairs following the first break. It occurred at a depth of 180 feet in the navigation channel of Rosario Strait which

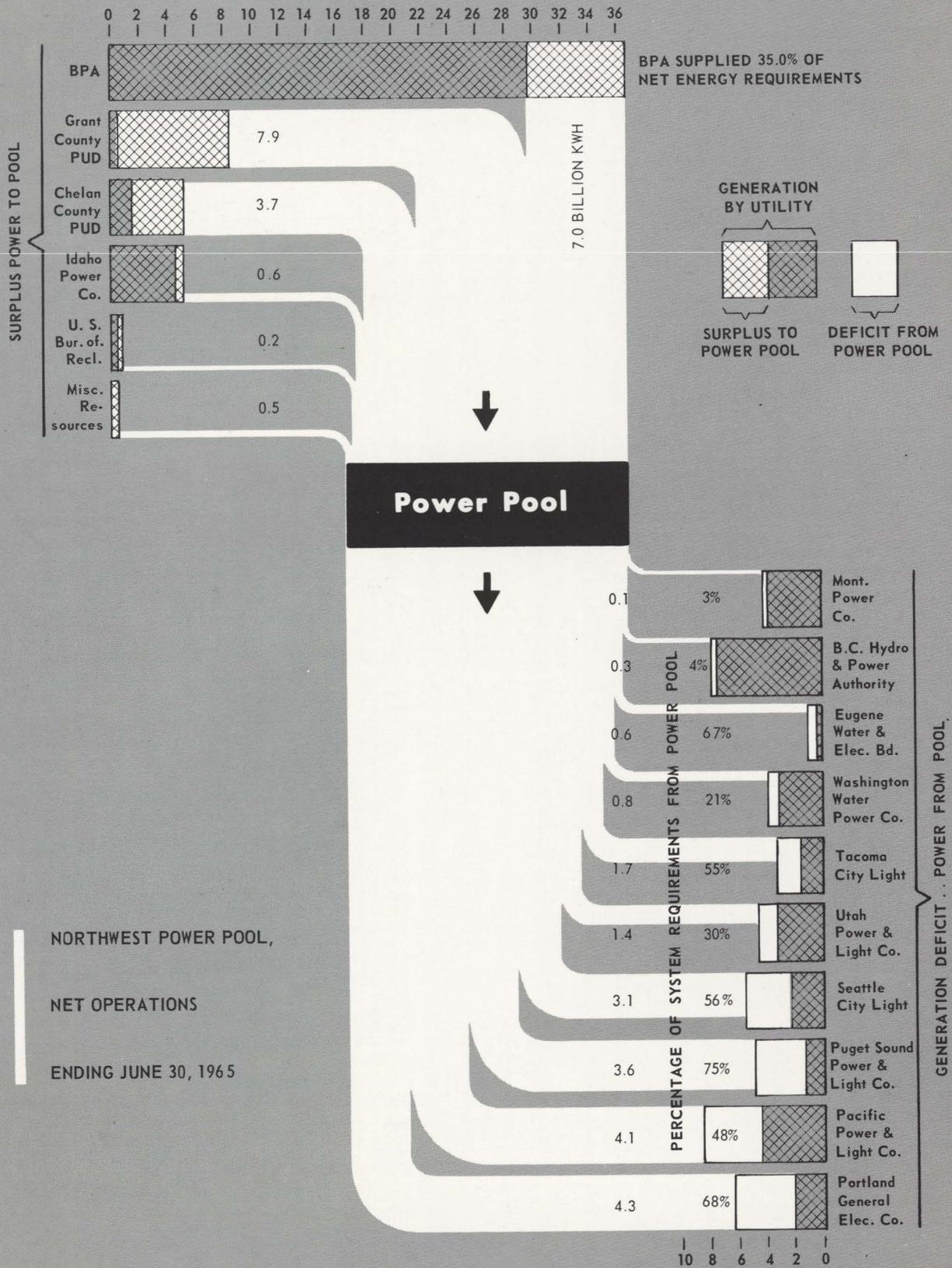
links the Strait of Juan de Fuca with Georgia Strait and the inside passage to Alaska. Tides in the channel frequently reach a velocity of 8 miles per hour.

The cable broke again on August 26, 1965. However, before it parted the second time, BPA installed or leased ample generation for an emergency. Loads on the islands were served adequately, and the second break was repaired in nine and a half days.

Before the first break, BPA had used a two-man submarine to inspect the cable, and based on the results of the inspection, had taken steps toward the design and purchase of a new cable. We expect to have the new cable installed in August or September, 1966. A \$1,150,300 turnkey contract to manufacture and install the new cable was awarded in late December, 1965, to the Simplex Wire and Cable Co. of Cambridge, Massachusetts.

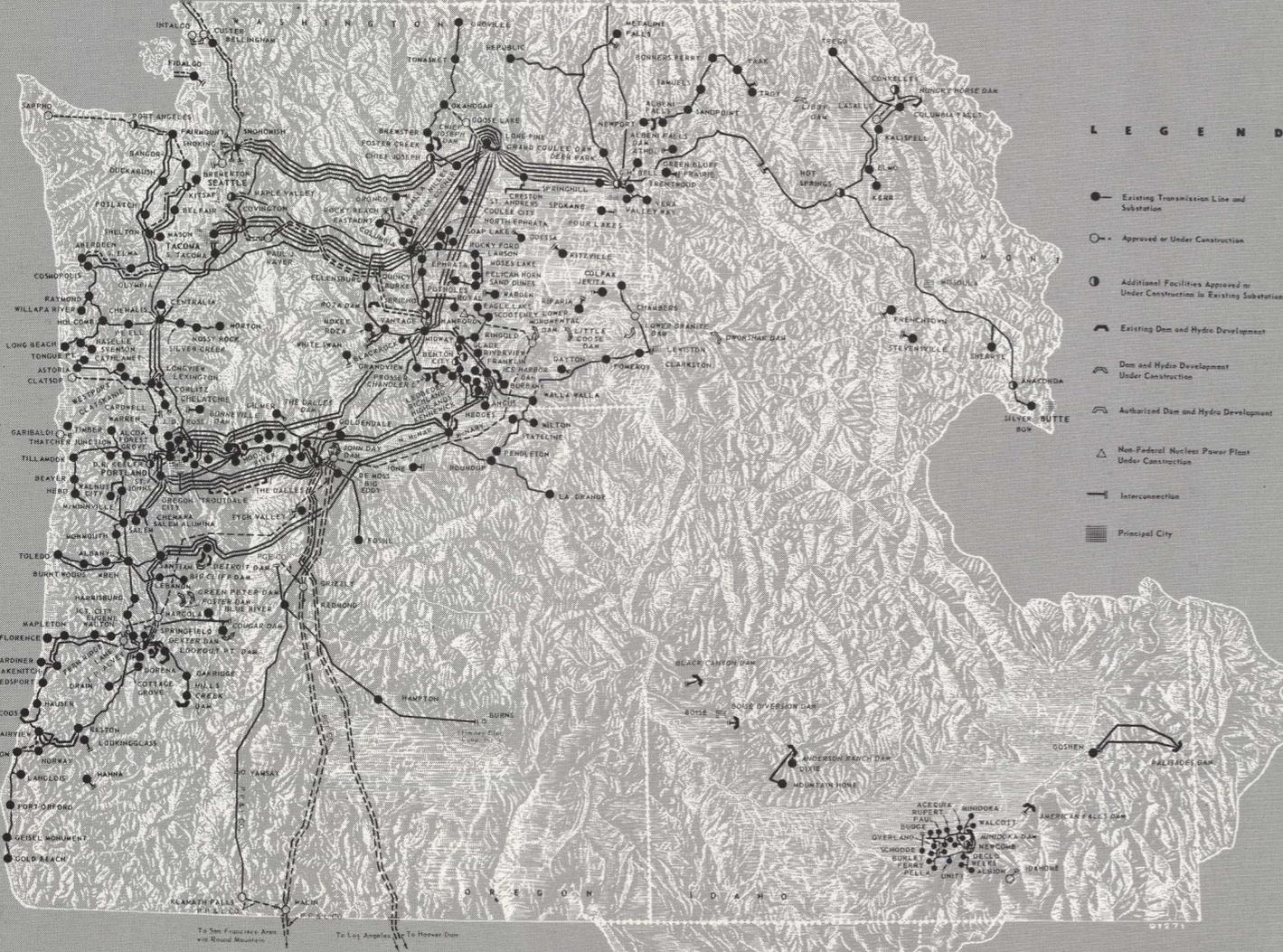


*San Juan Cable Repaired*



# TRANSMISSION SYSTEM CONSTRUCTION

U. S. Columbia River Power System



BONNEVILLE POWER ADMINISTRATION TRANSMISSION GRID

At the end of the fiscal year Bonneville Power Administration was operating 9326.7 circuit miles of transmission line at voltages ranging up to 345,000 volts. The transmission system included 263 substations with a total capacity of 10,515,000 kilovolt-amperes. System reactive facilities, which improve voltage control and lower transmission costs, totaled 3,236,000 kilovolt-amperes.

## INTERTIE PROGRESS

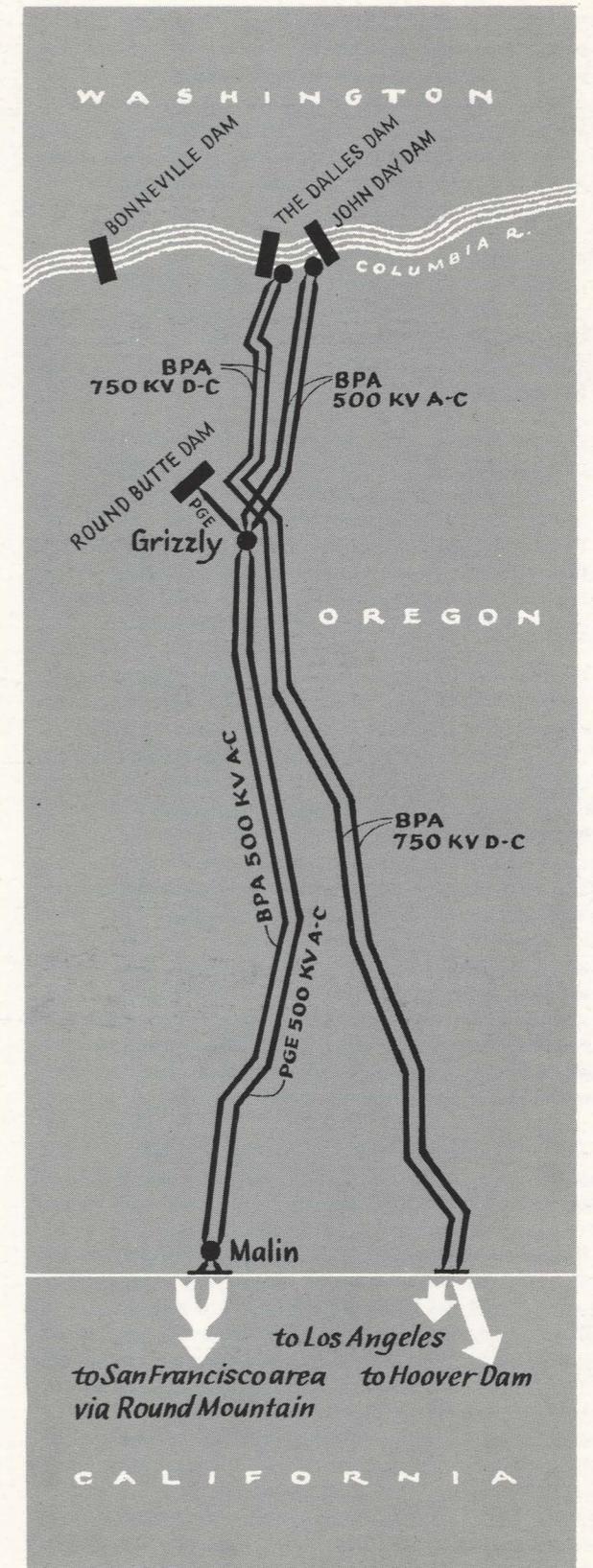
When the Pacific Northwest-Pacific Southwest Intertie is completed, two corridors, each containing two large extra high voltage lines, will cross central Oregon from north to south. One corridor with two 500,000-volt alternating current lines will begin near John Day Dam, a Columbia River project 20 miles east of The Dalles, Oregon. The second corridor with two 750,000-volt direct current lines will begin near The Dalles Dam, just east of The Dalles. The total capacity of the four lines will be about 4.6 million kilowatts.

The Intertie, largest single transmission program ever undertaken in the United States, will serve electric systems in 11 Western States. It will be part of a system of extra high voltage lines extending from northern British Columbia to the Mexican border.

At the end of the fiscal year the following Intertie transmission lines were under construction by BPA:

1.--A 185-mile, 500,000-volt a.c. line from Grizzly Substation, 12 miles northeast of Prineville, to Malin Substation near the Oregon-California border. Destined to be the first BPA line to carry Intertie power, this line initially will connect at Grizzly with a Portland General Electric 500-kilovolt line from the Company's Round Butte Dam. Later it will connect at Grizzly with one of the two 500,000-volts described in the next paragraph.

2.--Two 87-mile, 500,000-volt a.c. lines from John Day Dam to Grizzly Substation. The first of these will link BPA's main grid with the first Intertie line at Grizzly. The second will connect at Grizzly with a 500-kilovolt line being built by PGE from Grizzly to Malin.



3.--A 267-mile, 750,000-volt d.c. line from a converter terminal near The Dalles Dam to the Oregon-Nevada border. There it will connect with a line jointly constructed by the City of Los Angeles and Southern California Edison Company from the border to a converter terminal near Los Angeles. Surveys are complete. Major line materials are being ordered.

4.--A 267-mile, 750,000-volt d.c. line from The Dalles to the Oregon-Nevada border where it will connect with a line being built to Hoover Dam by the Bureau of Reclamation. Surveys are complete. The line is to be the last of four major lines built for the Intertie by BPA.

For the two a.c. Intertie lines, BPA and PGE are participating in the construction of Grizzly Substation. Two Federal and two private entities, BPA and the Bureau of Reclamation, and PGE and Pacific Power and Light, are participating in the construction of Malin Substation. Design and construction costs for each substation will be divided among its participants according to trust agreements.

During 1965 BPA awarded a contract for d.c. terminal facilities which was the largest single construction contract in its history. General Electric Company and Allmanna Svenska Elektriska Aktiebolaget were given contracts to furnish two of the four direct current terminals required for the Intertie.

The two terminals purchased are for the northern terminus of The Dalles-Los Angeles and the southern terminus of The Dalles-Hoover Dam lines. The contracts total about \$52 million. The Dalles terminal will be built under the direction of BPA, and the Hoover terminal under the Bureau of Reclamation. BPA also obtained an option to purchase a third terminal. It will be the northern terminus of The Dalles-Hoover line.

The d.c. terminal near Los Angeles will be built jointly by the City of Los Angeles and Southern California Edison Company.

Construction on the d.c. terminal facilities near The Dalles will begin in the spring of 1966. The station will be built on a hill 1-1/2 miles south of The Dalles Dam. A large building will face west, parallel to a bluff east of the highway that runs from The Dalles to California. Visitors to the station will have a panoramic view of Mt. Hood, the city of The Dalles, and the Columbia River. The station will be the first of its kind in the United States.

When fully developed the building will be 126 feet wide, 790 feet long and about three stories high. It will consist of a central section and two wings. The

central section and one wing will be built first. The central section will house the control room, viewing gallery, and maintenance facilities. The wing will house mercury arc valves for the d.c. line to Los Angeles. The second wing, which will be built later, will house valves for the line to Hoover Dam. The building and outdoor equipment will cover about five acres.

The energization schedule for the four major intertie lines follows:

1.--The portion of the first 500-kv a.c. line from Grizzly Substation to Malin is to be energized with power from PGE's Round Butte Dam in May 1967. The John Day Dam-Grizzly portion of the line is to be energized in October 1967, when power will begin flowing between BPA's main grid and California.

2.--The portion of the second 500-kv a.c. line from John Day Dam to Grizzly Substation will be energized in May 1968. PGE will build the line from Grizzly to the California border.

3.--The 750-kv d.c. line from The Dalles Dam to Los Angeles is to be energized in April 1969.

4.--The 750-kv d.c. line from The Dalles Dam to Hoover Dam is to be energized in May 1971.

## **DEVELOPING A 500-KV GRID**

BPA currently is building a 500,000-volt grid to overlay the existing system which consists mostly of 230,000 and 115,000-volt lines. The 500,000-volt system, as presently planned, will include 1640 miles of line, exclusive of the Intertie.

More than 1000 miles of 500-kilovolt line now under construction, exclusive of the Intertie, will be energized between 1967 and 1970. The grid will give BPA the capability needed to move power from new sources of generation to expanding loads throughout the Northwest.

Months of investigation preceded the decision to go to 500,000 volts. The economies of 500-kv were a powerful incentive. A 500,000-volt line that costs twice as much as a 230,000-volt line will move four times as much power for the same distance. The higher voltage also conserves forest and farm lands, for the standard 500-kv right of way with four times greater capacity is only 30 feet wider than the standard 120-foot right of way for 230-kv.

There were, however, operational problems which had to be solved before the transition could be made. The system is integrated electrically and hydraulically with power flowing into the network of lines

from 21 Federal and a number of private dams. The network serves an area of 290,000 square miles and a population of 5-1/2 million, and it must remain stable under violent system disturbances. This last criterion had to be met before 500-kv could be used, despite its economies. The unscheduled outage of a single 500-kv trans-Cascade line can severely jolt the entire interconnected Northwest system; on peak, such a line will carry more than 1 million kilowatts, twice the output of Bonneville Dam.

No other utility system in the nation, public or private, has announced plans for such extensive use of 500-kv. Electrical equipment manufacturers tell us BPA's planned 1640 miles of backbone grid 500-kv lines, plus our share of the Intertie, amounts to about one-third of the 500-kv presently planned by the utility industry in the United States.

SYSTEM STATISTICS TABLE (Design Voltage)  
(as of June 30, 1965)

Voltage	Circuit Miles in Operation	Circuit Miles Under Construction
750 Kv		
Direct Current		534
500 Kv	72.1	1096
345 Kv	731.4	53
287 Kv	1663.3	-
230 Kv	3069.2	191
115 Kv & Lower	3790.7	211
TOTALS	9326.7	2085

## COMPUTERS AND BPA

BPA is on the threshold of solving problems of design and system operations, both with the aid of computers. We foresee the day when the entire Bonneville system, including water releases and switching operations, will be computer-controlled.

Even today, computers are a practical tool in the hands of our designers. Engineers can now design a tower, with the aid of the computer, in four man-months, where before it took six man-months. Further, the computer told us lighter towers would do the job, and we are realizing significant savings in materials.

Late in 1965 we set up a new computer program using cost data for material and labor prepared by the estimating engineer. The computer now searches a catalog tape for prices and other information, makes all necessary calculations, and prints a finished estimate in approximately 15 seconds. The estimator uses his time now to make engineering decisions rather than calculations. His production has risen 50 percent.

In operation, we use computers daily to schedule generation at all the dams for which we market power and, as required, to make load flow studies and transformer loading reports, and to solve load frequency problems. We also use computers for a variety of daily, weekly and monthly reports.



Mercury Arc Valve  
Key to D.C. Transmission



This past year, computers even helped track down a gremlin. During the fall of 1964 a large number of system frequency oscillations plagued the Northwest Power Pool. A contract was made with Northwestern University to locate the cause. Dr. J.E. Van Ness directed an analysis using computers that traced the trouble to the governing mechanisms on 120 generators at various Federal and non-Federal dams. The Pool adopted a standard for governor adjustments on November 10, 1964. As a result, system stability improved and, incidentally, all the electric clocks in the region, whose accuracy depends on frequency control, kept better time.

As our system develops, operating decisions will become more complicated, and will have to be made more rapidly. Many such decisions will be beyond human capability within necessary time limits, and will be soluble only with computers. Loads change every moment, as does generating capacity available to serve them. Further, water releases must be scheduled within limits for flood control, navigation and other non-electric purposes. If we are to get optimum use of water for all purposes, and at the same time provide maximum reliability of electric service, instantaneous decisions must be made concerning water releases and transmission system switching. These problems are not limited to BPA; they are regionwide. We have undertaken joint studies with the Corps of Engineers and the Bureau of Reclamation of computer needs and applications. We hope also to bring other generating utilities into the studies.

## RESEARCH AND DEVELOPMENT

BPA's largest economies have been achieved through technological improvements. With new technology and use of higher voltages, we have kept our transmission costs per kilowatt-hour to less than they were 20 years ago -- despite a continuous rise in the cost of labor and materials. For example, in 1954 the cost of transmitting each kilowatt-hour was 1.01 mills. In 1965 it was .81 mills.

Engineering research and development of extra-high voltage techniques, designs of light steel towers, improvements in transformers, circuit breakers, and system controls will continue to reduce transmission costs per kilowatt-hour. These are industry accomplishments to which Bonneville has contributed substantially.

In the past several years BPA and some of the universities have joined in research and development projects. Though small in scope, these projects have contributed to improvements in the design and operation of the BPA system. At the same time the

work has given faculty and graduate students opportunities to extend their knowledge through research. Studies of vibration of conductors have been carried on and are continuing, as are studies on radio noise measuring instruments and decay in wood poles. These investigations already have led to a number of improvements in design and application.

## DESIGN INNOVATIONS

For 230-kv and lower voltages BPA in the past has used a main and auxiliary bus arrangement with one power breaker for each line, plus spare breakers which could be used in lieu of any of the line breakers.

Two new schemes are going into designs for 500-kv substations. The first, known as the "ring bus," forms a circle or ring with power circuit breakers and line terminals alternating around the ring. The advantage is that a line may be served by either of two breakers, or by both, and that it requires less circuit breakers than a main and auxiliary bus setup. However, reliability considerations limit use of the ring bus to substations with less than six terminals.

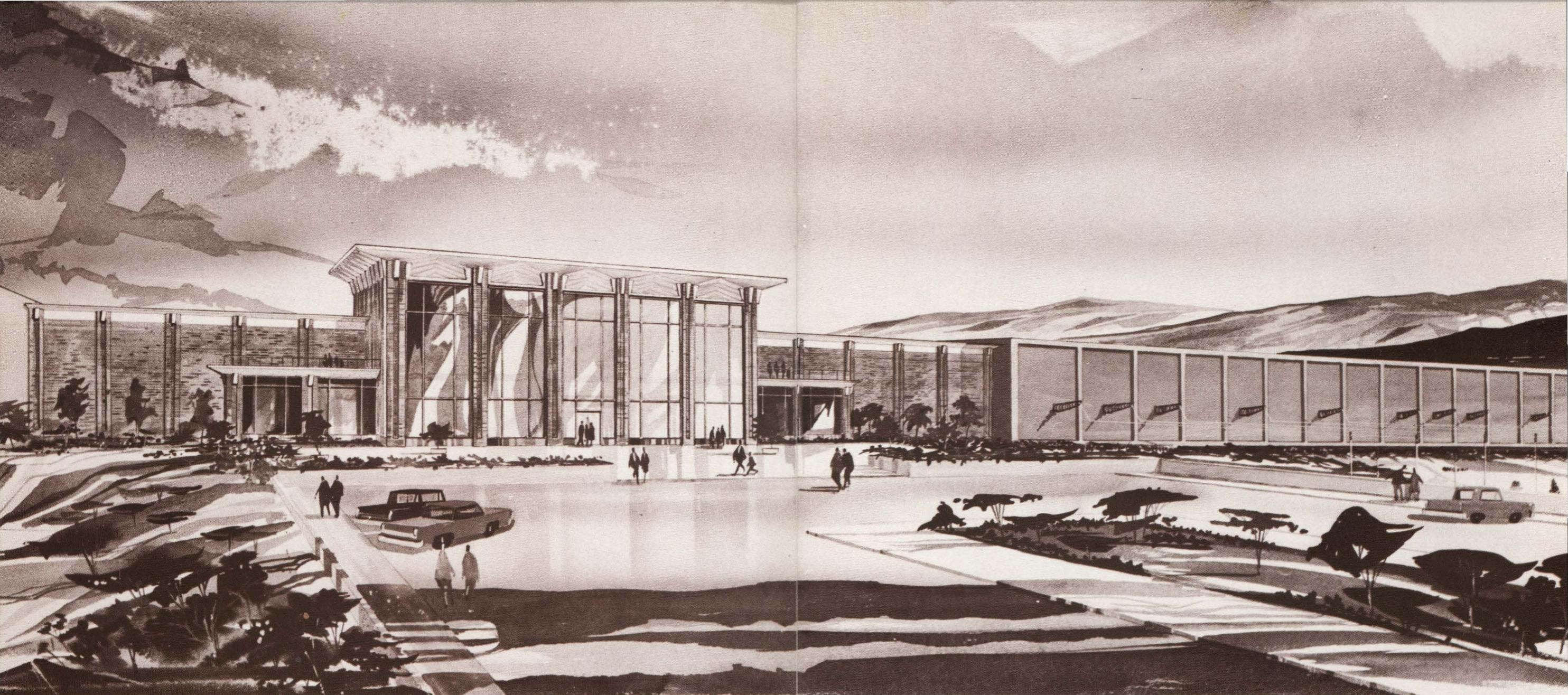
The second scheme is the "breaker and one-half" arrangement. It provides one full-time circuit breaker for each line plus one standby breaker for two lines. This plan is considered to offer greater reliability for continuous service. There is no limit to the number of lines terminating at a station.

Layouts are being arranged so that a "ring bus" station may be converted at minimum cost to a "breaker and one-half." Many other technical and physical changes are planned for inside the control houses. The new designs will make BPA's system one of the most modern in the world.

Another innovation is a new type tower that will be used for portions of the Pacific Northwest-Pacific Southwest Intertie. The first of these towers was erected 15 miles east of Bend, Oregon, in October 1965.

The design is a delta configuration. The upper part of the tower is a six-sided open frame. One model of this tower, which is shown on the cover of this report, stands on a single mast of lattice steel. Guy wires hold it upright. Another model has four legs and is self-supporting.

One conductor splits the open frame. Two other conductors hang from the lower corners of the frame. The conductors thus form a triangle 40 feet wide at the base and 26 feet high. This delta arrangement offers several electrical advantages. Reactance in the line is reduced 6 to 7 percent which enables the line to carry more power with less series compensation equipment.



*Architect's Sketch of Celilo Converter Station*

## **DIRECT CURRENT TESTS**

The Direct Current Test Center near The Dalles, Oregon, has been used to set design standards for the 750-kv d.c. lines of the Pacific Northwest-Pacific Southwest Intertie. The test program is designed to learn, by measurement, the effects of transmission lines energized up to 1,100,000 volts d.c.

Measurements of radio interference voltages, losses due to electrical corona, and the flashover and

leakage currents of transmission line insulators are of great importance to engineers attempting to develop the best possible designs for d.c. transmission lines operating at extra-high voltages. A great deal of testing has been done to determine the shape and materials for insulators that will provide economy as well as reliability. They are tested under dry, wet and contaminated conditions.

In addition, numerous measurements have been made in tests in which hundreds of amperes of direct current were circulated in the ground between electrodes spaced up to 250 miles apart. The various

gas pipeline companies, communications utilities, and railroad companies have participated. These organizations measured electrical effects on their facilities during the time that large ground currents were deliberately circulated near their facilities. As a result of these tests, BPA's engineers are convinced that any problems that might arise from large currents circulating in the earth can easily be solved by conventional methods. Further, current will flow through the ground only under emergency conditions when one of the conductors might be out of service for a brief period. The most serious problems arise in the vicinity of ground electrodes.

The proper selection of locations for these electrodes can do much to minimize the problems. A study done by a consulting engineering firm for the public utility commissions of five western states said cathodic protection techniques can provide "reasonable protection" providing there is "reasonable separation" between electrodes and structures. It described reasonable separation as "several miles" for railway systems and power transformer neutrals, "5 to 10 miles" for buried communication cables, and "500 feet" for overhead communication circuits. Bonneville plans to meet or exceed these standards for the d.c. Intertie lines.



# CONSTRUCTION UNDERWAY

## MAIN GRID CONSTRUCTION

- A 120-mile, 500-kilovolt a.c. line from Vantage Substation, Vantage, Washington, to Covington Substation near Kent, Washington. The first 33-mile section, energized at 230-kilovolts August 24, 1965, runs from Vantage to a temporary tie into the existing 230-kilovolt Grand Coulee-Tacoma line. When completed, the line will operate at 500-kilovolts into Covington to serve growing Puget Sound area loads.
- A 130-mile, 500-kilovolt a.c. line from John Day Substation to Keeler Substation near Portland. Seventy-one and a half miles between Big Eddy Substation and Keeler are complete and operating at 230 kilovolts. When completed, the entire line will be energized at 500 kilovolts, providing capability to meet increasing loads in Portland and the Willamette Valley.
- A 20-mile, 500-kilovolt a.c. line from John Day Substation to Big Eddy Substation. This line will provide part of the transmission required to link BPA's main grid to the Intertie. Surveys are complete. Major materials are ordered.
- A 169-mile, 500-kilovolt a.c. line from John Day Substation to Marcola Substation near Eugene. This line will be the cheapest way to bring power to southwest Oregon users after the winter of 1967-68. In 1968 loads will begin to outstrip local resources by about 100,000 kilowatts a year.
- A 58-mile, 500-kilovolt a.c. line from Lower Monumental Dam on the Snake River in Washington to a switching station at Washington Public Power Supply System's Hanford generating plant. Surveys are completed, and materials ordered.
- A 138-mile, 500-kilovolt a.c. line from Lower Monumental Dam to John Day Substation. This line and the Lower Monumental-Hanford line will

integrate power generated at Hanford and Federal dams on the Lower Snake River with the main grid. Both lines are essential to the main grid system.

- A 97-mile, 500-kilovolt a.c. line from Hanford to John Day Substation. It will increase transmission capacity from Vantage, Hanford and the Lower Snake plants to western Oregon.
- A 127-mile, 500-kilovolt a.c. line from Rocky Reach Substation near Wenatchee to Raver Substation southeast of Seattle, then west to Covington Substation. Part of the 500-kilovolt main grid in northwestern Washington, the line will add capacity to serve new loads.
- An 82-mile, 500-kilovolt a.c. line from Oregon City Substation near Oregon City to Marcola Substation. The line is needed to help supply growing loads in Eugene and the Willamette Valley.

## OTHER LINE CONSTRUCTION

Transmission facilities of lesser voltages under construction at the end of the fiscal year included:

- A 45-mile, 230-kilovolt line from Longview Substation, Longview, Washington, to Clatsop Substation near Astoria, Oregon. The capacity it adds will maintain acceptable service to users in northwestern Oregon's coastal and Lower Columbia areas. Among these customers is Crown-Zellerbach Corporation's \$75 million plant at Wauna.
- A two-mile, 230-kilovolt loop from the Alvey-Tahkenitch line and a six-mile, 115-kilovolt loop from the Eugene-Mapleton line to Lane Substation, five miles west of Eugene. The loops add capacity to serve winter peaks at Eugene.

- Two eight-mile, 230-kilovolt lines from Custer Substation near Bellingham to International Aluminum Company's new plant.
- A 47-mile, 230-kilovolt line from Olympia Substation, Olympia, to Aberdeen Substation, Aberdeen. It will improve service to Aberdeen and prevent overloads on existing lines when outages occur.
- A 20-mile, 115-kilovolt line from Fairview Substation near Coquille, Oregon, to Bandon Substation, Bandon. It is needed to regulate voltage and improve service to the Bandon-Gold Beach coastal area.
- A 24-mile, 115-kilovolt line from Bangor Substation near the U. S. Navy Ammunition Depot at Bangor, Washington, to Fairmount Substation near Port Discovery Bay.
- A 42-mile, 115-kilovolt line from Port Angeles, Washington, to Sappho to serve growing loads and improve voltage control in western Clallam County.



# FINANCIAL REPORT

## FINANCIAL REPORT

BPA has worked long and hard with the General Accounting Office in an effort to develop financial statements that would meet the principles, standards and related requirements for accounting prescribed by the Comptroller General of the United States. Although problems still exist, agreement has been reached on the presentation of the financial position and the results of power operations on a cost accounting basis which includes depreciation of the power facilities based upon their estimated service lives averaging about 70 years for the generating projects and 40 years for the transmission system. The combined Statement of Commercial Power Revenues and Expenses and the Statement of Assets and Liabilities satisfy the reporting requirements of the Comptroller General of the United States.

However, important committees of Congress dealing with the Bonneville program require BPA to demonstrate to the Congress that each generating project will be repaid with interest within 50 years from the time it is completed, and our rate levels therefore must be predicated upon such 50-year payout period. BPA's financial condition based on the above-stated accounting results is not a measure of the adequacy of our rates to meet this financial obligation principally because the depreciation accounting method assigns for recovery the cost of power facilities over a considerably longer period than present BPA requirements for repayment. To demonstrate to the Congress that each generating project will be repaid within 50 years from the time each project is completed, and that assistance to irrigation will be paid within the periods expected by Congress, we have prepared the payout analysis presented in Table 6.

## REVENUES AND EXPENSES

Power system revenues for the fiscal year 1965 were \$90,112,000. Total expenses on the cost accounting basis, including depreciation, were \$83,840,000. Net revenues were \$6,272,000.

A condensed version of the revenue and expense statement is shown below:

Revenues	\$ 90,112,000
Expenses:	
Operation and Maintenance	28,664,000
Depreciation	19,952,000
Interest	35,224,000
Total Expenses	\$ <u>83,840,000</u>
Net Revenues	\$ <u>6,272,000</u>
Accumulated Net Revenues	\$ <u><u>202,791,000</u></u>

## PAYOUT REQUIREMENTS

As explained above, payout requirements exceed depreciation because the repayment period is shorter than the service lives used to calculate depreciation. The net revenues shown on the revenue and expense type statements therefore cannot be interpreted to mean that we are repaying the power investment more rapidly than required by Congress.

Actually, our long range payout analysis completed during the year showed that the revenues we could expect from our old rates would not fully repay all projects within 50 years. Hence, the decision to increase rates for the first time in BPA's history.

A payout analysis similar to the one presented to the Federal Power Commission in support of our rate filing, but updated to show actual fiscal 1965 revenues and expenses, is shown in Table 6.

In this analysis, revenues, operating expense, maintenance expense, replacements, interest, repayment of irrigation costs, and repayment of power investment are forecast over the system repayment period. The analysis extends 50 years after the last generating project added to the system is completed, or to the end of the repayment period

TABLE 5  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 BONNEVILLE POWER ADMINISTRATION  
 REVENUE AND REVENUE TRENDS  
 Sales of energy, firm and nonfirm  
 by class of customer and miscellaneous power revenues

Class of customer	(In thousands of dollars)									
	F.Y. 1956	F.Y. 1957	F.Y. 1958	F.Y. 1959	F.Y. 1960	F.Y. 1961	F.Y. 1962	F.Y. 1963	F.Y. 1964	F.Y. 1965
<b>Aluminum Industry</b>										
Firm	\$13,119	\$13,693	\$13,980	\$14,227	\$15,293	\$14,978	\$14,341	\$14,382	\$15,733	\$16,068
Nonfirm	6,979	6,333	3,512	2,384	2,168	1,981	3,042	3,715	5,297	6,930
Total Aluminum	20,098	20,026	17,492	16,611	17,461	16,959	17,383	18,097	21,030	22,998
Trend Percentages 1/	100%	100%	87%	83%	87%	84%	86%	90%	105%	114%
<b>Other Industry</b>										
Firm	2,569	2,836	3,006	3,138	3,163	3,205	3,194	2,927	3,431	3,608
Nonfirm	1,313	748	407	680	868	613	855	625	1,064	1,342
Total Other Industry	3,882	3,584	3,413	3,818	4,031	3,818	4,049	3,552	4,495	4,950
Trend Percentages 1/	100%	92%	88%	98%	104%	98%	104%	92%	116%	128%
<b>Publicly Owned Utilities</b>										
Firm	19,324	21,384	22,593	24,861	28,304	29,520	32,598	35,466	36,965	41,230
Nonfirm	181	660	981	768	357	583	1,340	682	746	508
Total Publicly Owned Utilities	19,505	22,044	23,574	25,629	28,661 2/	30,103	33,938	36,148	37,711	41,738
Trend Percentages 1/	100%	113%	121%	131%	147%	154%	174%	185%	193%	214%
<b>Privately Owned Utilities</b>										
Firm	9,226	10,476	11,526	11,846	9,907	8,338	5,678	6,900	4,974	4,875
Nonfirm	2,773	3,974	2,645	2,552	2,659	1,301	1,536	332	781	662
Total Privately Owned Utilities	11,999	14,450	14,171	14,398	12,566	9,639	7,214	7,232	5,755	5,537
Trend Percentages 1/	100%	120%	118%	120%	105%	80%	60%	60%	48%	46%
<b>Federal Agencies</b>										
Firm	4,253	4,777	5,860	6,015	5,986	6,194	6,217	6,646	7,089	5,874
Nonfirm	52	90	194	388	239	281	253	303	182	872
Total Federal Agencies	4,305	4,867	6,054	6,403	6,225 2/	6,475	6,470	6,949	7,271	6,746
Trend Percentages 1/	100%	113%	141%	149%	145%	150%	150%	161%	169%	157%
<b>Total Sales of Electric Energy</b>										
Firm	48,491	53,166	56,965	60,087	62,653	62,235	62,028	66,321	68,192	71,655
Nonfirm	11,298	11,805	7,739	6,772	6,291	4,759	7,026	5,657	8,070	10,314
Total Sales of Energy	59,789	64,971	64,704	66,859	68,944	66,994	69,054	71,978	76,262	81,969
Trend Percentages 1/	100%	109%	108%	112%	115%	112%	115%	120%	128%	137%
<b>Miscellaneous Power Revenues</b>										
Firm	1,045	1,299	1,871	1,615	2,054	2,707	5,429	5,726	6,589	5,316 3/
Nonfirm	1,045	1,299	1,871	1,615	2,054	2,707	5,429	5,726	6,589	5,316 3/
Total Miscellaneous Power Revenues	1,045	1,299	1,871	1,615	2,054	2,707	5,429	5,726	6,589	5,316 3/
Trend Percentages 1/	100%	124%	179%	155%	197%	259%	520%	548%	631%	509%
<b>Total Revenue</b>										
Firm	60,834	66,270	66,575	68,474	70,998	69,701	74,483	77,704	82,851	87,285
Nonfirm	60,834	66,270	66,575	68,474	70,998	69,701	74,483	77,704	82,851	87,285
Total Revenue	60,834	66,270	66,575	68,474	70,998	69,701	74,483	77,704	82,851	87,285
Trend Percentages 1/	100%	109%	109%	113%	117%	115%	122%	128%	136%	143%

1/ F. Y. 1956 base year.

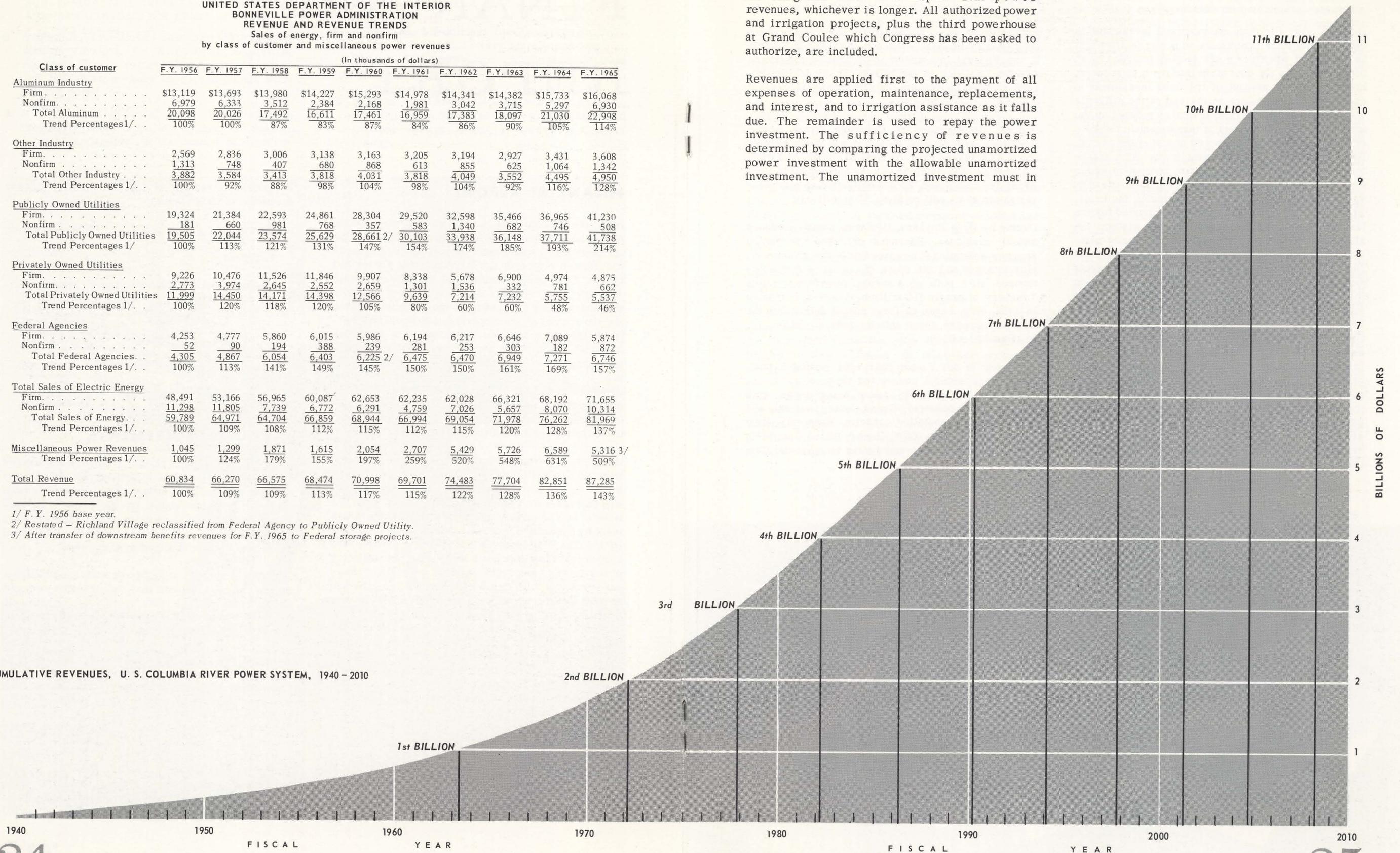
2/ Restated - Richland Village reclassified from Federal Agency to Publicly Owned Utility.

3/ After transfer of downstream benefits revenues for F.Y. 1965 to Federal storage projects.

for irrigation costs to be repaid from power revenues, whichever is longer. All authorized power and irrigation projects, plus the third powerhouse at Grand Coulee which Congress has been asked to authorize, are included.

Revenues are applied first to the payment of all expenses of operation, maintenance, replacements, and interest, and to irrigation assistance as it falls due. The remainder is used to repay the power investment. The sufficiency of revenues is determined by comparing the projected unamortized power investment with the allowable unamortized investment. The unamortized investment must in

CUMULATIVE REVENUES, U. S. COLUMBIA RIVER POWER SYSTEM, 1940 - 2010



each year of the repayment period be less than the allowable unamortized investment.

Initially, the allowable unamortized investment is equal to the total investment in power facilities. It is increased whenever a new facility is added by an amount equal to the cost of the facility. It is reduced, however, by the amount of the total investment in each generating project at the end of the project's 50-year repayment period. It is also reduced by the amount of each increment of investment in the BPA transmission system at the end of a 40-year period. Each increment of investment in the BPA transmission system is scheduled for repayment within 40 years., the approximate average service life of the various components of the transmission facilities. At the end of the 50-year repayment period for the last generating project added to the system, the allowable unamortized investment declines to zero. We finally adopted this analysis of payout in fiscal 1965. It is very similar to the method of payout analysis approved by the Federal Power Commission in its review of rates for Southeastern Power Administration (Docket No. E-7160, decided July 1, 1964).

Under the new method, however, the amount of amortization accomplished in any one year is not in itself significant. The crucial test of the adequacy of revenues is whether they will fully repay the power investment within the time allowed. Hence, an annual surplus or deficit is not calculated under the payout method. This method has the advantage of averaging repayment requirements over the entire repayment period. It levels out year to year fluctuations and permits stable rates for extended periods.

## RATES

Bonneville Power Administration has a tremendous obligation to the U. S. Treasury. As shown in Exhibit 2, the Federal investment in generation and transmission facilities in the Northwest, as of June 30, 1965, totalled \$1.9 billion. This included \$318,044,000 of construction in progress.

Orderly development of Columbia River power resources will require an additional investment of about \$2.6 billion over the next 10 years. And when all Northwest irrigation projects authorized by Congress are completed, BPA's obligation to help repay irrigation costs will be about \$700 million.

During its first 20 years, BPA consistently produced annual surpluses. Revenues exceeded the annual amounts scheduled for repayment of the investment, plus interest and the costs of operation and maintenance. BPA built up a surplus of payments to the Treasury of nearly \$80 million. However, beginning in 1958, BPA began to incur annual deficits. In the next seven years, these deficits reduced the surplus to about \$20 million.

As noted in our Fiscal year 1961 Annual Report, there were several causes for these deficits, one basic and irreversible cause being higher cost projects. For example, Grand Coulee cost only \$91 per kilowatt of installed capacity, Bonneville Dam \$120, McNary Dam \$261, Hungry Horse Dam \$272, Ice Harbor Dam \$344 and Lower Monumental Dam \$366.

In 1962 the Administration set out to reverse the deficit trend with a program that included:

1. A system-wide repayment plan, as explained in the preceding section, that would be more realistic and similar to plans used in other river basins.

2. A program to market more power, and particularly the large amounts of secondary energy and peaking capacity being spilled over the dams and wasted to the sea. The Pacific Northwest-Pacific Southwest Intertie is part of this program.

3. A long-range program to develop projects that would assure the region of an abundance of low cost power. Key projects in this program included the Canadian Treaty, the Hanford atomic power plant and a third powerhouse at Grand Coulee Dam.

4. An increase in rates to the extent necessary for the system to pay itself out within the periods expected by Congress.

Without a high degree of success in the first three items of this program, we would have needed a 20 or 30 percent rate increase. We found we still needed a rate increase to meet our enormous obligations, but only a small one.

Over the full payout period, the new rates will increase firm power revenues by 2.9 percent, and total revenues from all sources by 2.4 percent. We estimate the new rates will improve BPA's revenues by an average of \$4 million for the next nine years,

and later on, as sales volumes increase, by about \$6 million per year. The new rates assure that the U. S. Columbia River Power System can meet its obligations to repay the Federal investment in each Northwest power facility, as Congress expects, with interest and within 50 years after each project is completed.

The new rates seek to distribute increases equitably among all classes of customers. It was impossible to set up rates that bring the same increase to every customer, because loads and conditions vary. The changes will result in varying increases when applied to present purchases. The impact of these rates on customers will change as the years go by. The long range impact will depend on the extent to which customers alter their operations and promote new loads.

The old BPA rate pattern had been in effect since 1939. The "E" rate was added in 1944. Over the years certain inequities were built up among customers. We believe the new rate better reflects true costs of service and that in the long run it will benefit customers and encourage wider use of electricity. Changes in the rate structure include:

1. A change from the old E-4 schedule to a single energy charge of 1.25 mills per kilowatt-hour and a \$.95 per kilowatt demand charge.

2. A decrease in the minimum demand charge under the E rate from 70 percent to 50 percent of the highest peak in the previous 11 months.

ESTIMATED PACIFIC NORTHWEST POWER GENERATION & USE, 1965

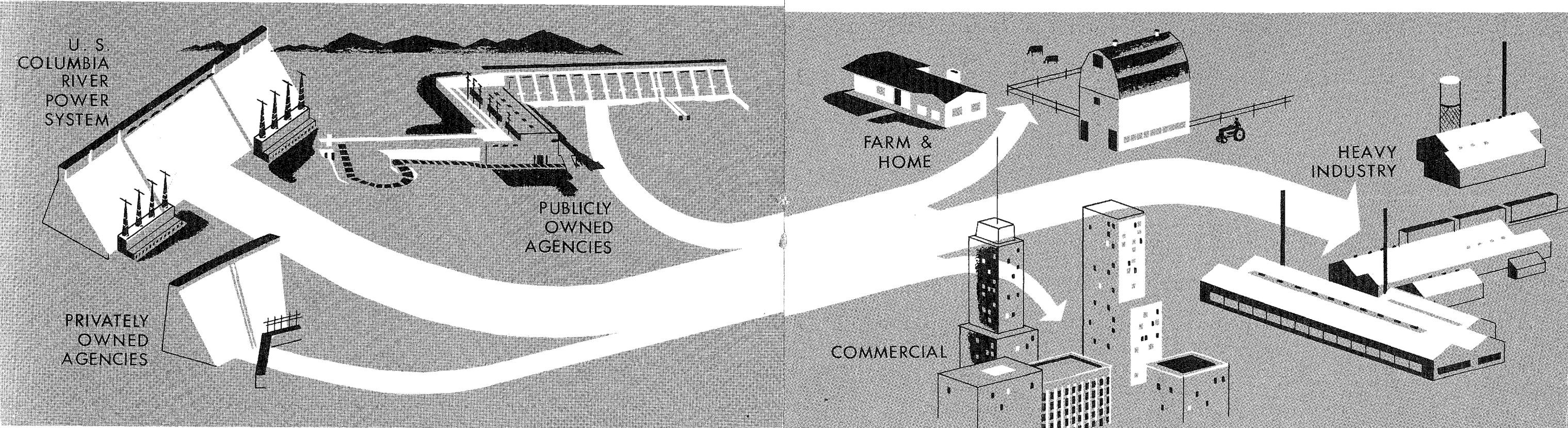


TABLE 4  
 COLUMBIA RIVER FEDERAL POWER SYSTEM - REPAYMENT STUDY  
 Authorized projects plus Grand Coulee third powerplant - new rates effective December 20, 1965  
 (All amounts in \$1,000)

Fiscal Year	Plant Allocated to Commercial Power						Irrigation Assistance							
	Revenues	Operation and Maintenance Expense	Replacements (Annuity Basis) <sup>2/</sup>	Interest Expense	Investment Placed in Service	Cumulative Investment In Service	Amortization	Unamortized Investment	Allowable Unamortized Investment	Cumulative Amount in Service	Amortization	Unamortized Amount	Allowable Unamortized Amount	Cumulative Surplus Revenues
6-30-65 <sup>1/</sup>	1,150,883	334,701		398,328	1,802,230	1,802,230	417,854	1,384,376	1,801,310	335,693		335,693		
1966	91,252	28,485	10,693	35,163	50,000	1,852,230	19,950	1,394,426	1,811,310	337,164				
67	96,662	29,314	11,031	35,418	95,172	1,927,402	22,899	1,466,699	1,926,482	359,178				
68	106,599	32,451	11,595	37,254	403,215	2,330,617	25,099	1,844,615	2,329,697	340,640				
69	114,277	35,605	14,082	46,853	229,674	2,560,291	18,337	2,055,958	2,559,371	351,142				
1970	124,744	37,135	14,836	56,361	342,241	2,902,532	15,412	2,387,281	2,906,612	364,649				
71	137,717	39,338	17,393	67,519	271,336	3,178,868	13,847	2,645,270	3,177,948	376,093				
72	149,326	41,369	19,459	73,803	332,938	3,511,806	14,695	2,965,513	3,510,886	383,072				
73	159,053	43,997	20,389	82,682	267,663	3,779,469	11,985	3,219,191	3,778,549	396,192				
74	169,248	47,204	21,683	89,815	661,276	4,440,745	10,546	3,869,921	4,439,825	411,743				
1975	176,729	49,327	23,348	110,293	1,440	4,442,785	(6,739)	3,878,100	4,441,265	428,264				
76	187,200	50,426	23,864	110,526	201,567	4,643,752	2,384	4,077,223	4,642,352	459,213				
77	197,700	51,623	25,067	116,203	57,964	4,701,716	4,807	4,130,440	4,700,796	482,618				
78	207,700	51,901	25,617	117,718	-	4,701,716	12,464	4,117,976	4,700,796	509,795				
79	216,400	52,443	25,617	117,362	80,584	4,782,300	21,178	4,177,382	4,779,833	536,772				
1980	225,400	53,038	26,269	119,473	20,345	4,802,645	26,620	4,217,107	4,796,494	563,749				
81	227,900	53,172	26,483	119,294	-	4,802,645	28,951	4,142,156	4,784,157	590,726				
82	231,700	53,686	26,483	118,466	73,412	4,876,057	33,065	4,182,503	4,847,364	617,703				
83	233,700	54,058	27,057	119,620	-	4,876,057	32,965	4,149,538	4,842,359	644,680				
84	237,000	54,241	27,057	118,677	50,330	4,906,387	37,025	4,142,843	4,839,083	671,657				
1985	239,200	54,576	27,399	118,900	45,844	4,952,231	38,325	4,150,362	4,874,385	680,644				
86	242,200	55,143	27,796	119,115	32,547	4,984,778	40,146	4,142,763	4,900,117	689,210				
87	246,800	55,534	28,102	118,897	50,141	5,034,919	44,267	4,146,637	4,915,217					
88	249,700	55,945	28,465	119,066	29,070	5,063,989	46,204	4,131,503	4,961,621					
89	253,100	56,191	28,814	118,574	15,283	5,079,272	49,521	4,097,265	4,966,533					
1990	254,300	56,457	28,878	118,001	30,465	5,109,737	50,959	4,076,763	4,962,085					
91	256,000	56,839	29,282	117,411	69,710	5,179,447	53,466	4,094,605	5,006,593					
92	262,900	57,534	29,476	117,907	69,710	5,249,157	57,783	4,105,932	5,045,113					
93	267,900	58,164	30,055	118,251	54,057	5,303,214	61,430	4,098,599	4,982,121					
94	268,700	58,374	30,532	118,038	-	5,303,214	61,756	4,036,803	4,937,100					
1995	269,400	-	-	116,260	-	-	64,234	3,972,569	4,902,073					
96	269,400	-	-	114,410	-	-	66,084	3,906,485	4,861,551					
97	280,700	-	-	117,507	-	-	67,816	3,838,669	4,835,812	11,471	689,210	689,210	689,210	677,739
98	284,200	-	-	110,354	-	-	84,740	3,753,929	4,803,519					677,739
99	284,200	-	-	102,113	-	-	87,181	3,666,748	4,782,307					677,739
2000	283,800	-	-	105,602	-	-	89,292	3,577,456	4,773,239					677,739
01	284,100	-	-	103,031	-	-	75,789	3,501,667	4,752,156	16,374	681,365	681,365	681,365	661,365
02	284,200	-	-	100,848	-	-	94,446	3,407,221	4,535,742					661,365
03	284,500	-	-	98,126	-	-	97,466	3,309,755	4,520,049					661,365
04	288,900	-	-	95,321	-	-	104,673	3,205,082	4,383,309					661,365
2005	-	-	-	82,306	-	-	106,712	3,098,370	4,281,264					660,389
06	-	-	-	79,233	-	-	110,761	2,987,609	4,229,440					660,389
07	-	-	-	86,043	-	-	113,951	2,873,656	3,923,559					660,389
08	-	-	-	82,761	-	-	114,055	2,759,603	3,746,640	3,178	657,211	657,211	657,211	657,211
09	-	-	-	79,477	-	-	116,254	2,643,349	3,523,942	4,263	652,948	652,948	652,948	652,948
2010	-	-	-	76,128	-	-	123,866	2,519,483	3,447,202					652,948
11	-	-	-	72,561	-	-	127,433	2,392,050	3,116,078					652,948
12	-	-	-	68,891	-	-	130,633	2,261,417	2,995,454	470	652,478	652,478	652,478	652,478
13	-	-	-	65,129	-	-	107,353	2,154,064	2,875,444	27,512	624,966	624,966	624,966	624,966
14	-	-	-	60,037	-	-	106,369	2,047,695	2,756,433	31,588	593,378	593,378	593,378	593,378
2015	-	-	-	58,974	-	-	111,264	1,936,431	2,754,993					563,662
16	-	-	-	55,769	-	-	111,035	1,825,396	2,697,393					530,432
17	-	-	-	52,571	-	-	122,590	1,702,606	2,643,866					505,599
18	-	-	-	49,041	-	-	132,554	1,570,252	2,466,871					487,200
19	-	-	-	45,223	-	-	140,234	1,450,018	2,212,877					452,663
20	-	-	-	41,763	-	-	143,196	1,306,822	1,933,776					437,626
21	-	-	-	37,656	-	-	157,110	1,143,712	1,779,495					432,398
22	-	-	-	33,112	-	-	160,175	989,537	1,456,948					425,671
23	-	-	-	28,499	-	-	156,569	829,968	973,476					413,745
24	-	-	-	23,903	-	-	165,318	664,150	609,429					403,472
2025	-	-	-	19,128	-	-	172,837	488,313	488,220					396,443
25	-	-	-	14,863	-	-	182,869	313,453	523,062					371,372
26	-	-	-	9,200	-	-	186,019	133,434	471,668					371,372
27	-	-	-	3,243	-	-	187,432	0	460,298					371,372
28	-	-	-	0	-	-	0	0	406,114					360,729
29	-	-	-	0	-	-	0	0	374,164					348,664
30	-	-	-	0	-	-	0	0	324,154					328,664
31	-	-	-	0	-	-	0	0	274,154					288,101
32	-	-	-	0	-	-	0	0	224,154					248,096
33	-	-	-	0	-	-	0	0	174,154					208,090
34	-	-	-	0	-	-	0	0	124,154					168,084
2035	-	-	-	0	-	-	0	0	74,154					128,078
35	-	-	-	0	-	-	0	0	24,154					88,072
36	-	-	-	0	-	-	0	0	0					48,066
37	-	-	-	0	-	-	0	0	0					8,060
38	-	-	-	0	-	-	0	0	0					0
39	-	-	-	0	-	-	0	0	0					0
2040	-	-	-	0	-	-	0	0	0					0
40	-	-	-	0	-	-	0	0	0					0
41	-	-	-	0	-	-	0	0	0					0
42	-	-	-	0	-	-	0	0	0					0
43	-	-	-	0	-	-	0	0	0					0
44	-	-	-	0	-	-	0	0	0					0
2045	-	-	-	0	-	-	0	0	0					0
45	-	-	-	0	-	-	0	0	0					0
46	-	-	-	0	-	-	0	0	0					0

(Commonly called the "ratchet," this provision means that each time one of these utilities hits a new high in peak demand it incurs a new minimum charge for the ensuing 11 months. However, this charge now drops from 70 percent of the high peak to 50 percent.)

3. For "E" rate customers, average peak demand will be measured over the period of one hour rather than 30 minutes as before. This should result in a slightly lower measured demand.

4. A reduction from 2.5 to 2 mills per kilowatt-hour for sale of excess energy, under a new S-1 rate. This rate is available to purchasers within, as well as outside, the Northwest whenever BPA has excess energy available for export. The rate continues at 2.5 mills per kilowatt-hour for all other nonfirm energy and for obligated energy, as well as energy used for emergency, experimental, or testing purposes (Schedule H-4).

5. A special discount for electric systems that serve in thinly populated areas with relatively light loads. The discount will be either 2 or 5 percent, depending on the level of power use as related to net plant investment. Nineteen utilities will receive the 5 percent discount, 18 of them cooperatives. Seventeen will receive the 2 percent discount, 14 of them cooperatives.

6. An increase from .4 mills to .6 mills per kilowatt-hour in the discount for power for irrigation. This discount will be available for the region's

entire irrigation season, instead of just five summer months.

7. Provisions for "C" rate customers -- utilities who have their own generation and buy only part of their requirements from BPA -- which give them greater flexibility on the use of water in their own reservoirs. This benefit, we believe, is comparable to the reduction in the minimum demand charge for nongenerating customers.

8. Generating utilities may now purchase firm power under a combination of rates -- peaking capacity under the F-5 rate with residual base load requirements under the C-5, or kilowatt-year, rate. Revisions also will permit purchase of power by generating utilities on a contract demand basis in lieu of computed demand.

9. A new rate for "modified firm" power. Under the new rates, the basic charge for firm power goes up from \$17.50 to \$18.60 per kilowatt-year. The rate for modified firm power will be \$18. Modified firm power is the same as firm power except that BPA has the privilege, in the event of unscheduled outages on its system, to reduce deliveries by 25 percent of the contract amount.

10. Special provisions limit the impact of rate changes for the first four years on individual distributors who purchase all requirements from BPA. During this period, these provisions put a ceiling of 6 percent and a floor of 2 percent on any increases in rates, as compared with what the utility would have paid under the old rates.

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# FINANCIAL STATEMENTS

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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

December 30, 1965

B-114858

Honorable Stewart L. Udall  
Secretary of the Interior  
Washington D. C.

Dear Mr. Secretary:

The General Accounting Office has examined the accompanying financial statements of the Columbia River Federal Power System for fiscal year 1965, which were prepared by the Bonneville Power Administration. The designation Columbia River Federal Power System (previously the Columbia River Power System) is used to describe the integrated power system in the Pacific Northwest consisting of (1) power-generating facilities of the Corps of Engineers (Civil Functions), Department of the Army, and of the Bureau of Reclamation, Department of the Interior, and (2) transmission facilities of the Bonneville Power Administration. The Administration markets the power generated by the integrated system.

Our examination of the financial statements was made in accordance with generally accepted auditing standards and included such tests of the accounting records of the Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power Administration and such other auditing procedures as we considered necessary in the circumstances. Our last examination of financial statements of the system was made for fiscal year 1963. Although no examination was made of fiscal year 1964 statements, our examination of fiscal year 1965 financial statements included appropriate tests of transactions--recorded in the accounts during fiscal year 1964--to determine the reasonableness of the account balances at the beginning of fiscal year 1965. Our examination was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

The accompanying statements present the combined financial results of operations in the generating, transmitting, and marketing of electric power and the financial position of the integrated power system. Combined statements for the integrated power system were last prepared for fiscal year 1962. The financial statements prepared for fiscal years 1963 and 1964 were statements of the Bonneville Power Administration only. Accordingly, the financial statements of the Columbia River Federal Power System for fiscal year 1965 have not been prepared on a comparative basis. Also, a statement of sources and application of funds for fiscal year 1965 has not been prepared. We have suggested that this information be included as part of the financial statements for future years. The Administration has agreed to present such statements beginning with fiscal year 1966.

The method of measuring the financial condition and operating results of the system has changed substantially in the past 3 fiscal years. Adjustments made as a result of these changes primarily account for the \$145.6 million increase in accumulated net power revenues from \$57.2 million at June 30, 1962, to \$202.8 million at June 30, 1965. (See note 9 of the accompanying statements.) The conversion from the straight-line method of depreciation to the compound-interest method for facilities throughout the system accounts for about \$131.7 million of this increase. (See explanation in note 3.) We concurred in this change.

Under the compound-interest method of computing depreciation, the annual provisions increase each year during the period used for the depreciable life of the asset; whereas, under the straight-line method of computing depreciation, equal annual amounts are provided for depreciation. Accordingly, under the latter method of computing depreciation, the combined amount recorded for depreciation and interest on the unrepaid investment is high during the early life of the asset and decreases as interest on the investment decreases because of repayments on the investment; whereas, under the compound-interest method of computing depreciation, the combined amount recorded for depreciation and interest tends to be about the same for each year because the provision for depreciation increases as interest on the investment decreases. At the end of the depreciable life of the asset the total amounts computed under each method would be equal--only the yearly allocations would have differed.

As applied to the facilities of the Columbia River Federal Power System, the compound-interest method for determining depreciation conforms to the method used to determine a factor for amortization of capital investment in establishing rates charged for power deliveries to customers and to measure requirements for repayment of capital investment, except that the period of years during which depreciation is assigned as an operating cost is based on the composite economic service lives of the assets. The composite economic service lives are generally longer than the 50-year periods used in establishing power rates and repayment schedules. In the fiscal year 1963, the Administration changed the method of computing depreciation for the transmission facilities from the straight-line to the compound-interest method but the Bureau and the Corps continued computing depreciation for generating projects by the straight-line method.

We suggested to the Department of the Interior that depreciation for transmission facilities and for generating projects be computed on a uniform basis. The Department proposed, and we agreed, that depreciation for generating projects be computed by the compound-interest method and that the depreciation be included in the financial statements although it would not be recorded in the project accounts until adopted by the Corps.

The Columbia River Federal Power System is required to provide from its power revenues repayment to the Federal Government for the costs of irrigation facilities that water users are unable to repay. The contribution required to provide this assistance to irrigation amounted to \$335.7 million at June 30, 1965. The Administration estimates that repayment of this obligation will begin in 1997, after the repayment of the major portion of the power investment. For purposes of the financial statements of the power system, the amount for irrigation assistance from power revenues is shown as a deferred charge and a related liability.

In a report on our examination of financial statements prepared by Bonneville Power Administration for fiscal year 1963, we expressed the opinion that those financial statements did not fairly present the results of power operations for the year or the financial position of the integrated power system at June 30, 1963 (B-114858, February 16, 1965). The primary reasons for our adverse opinion were that the cost of generating power marketed by the Administration had not been properly disclosed, firm cost allocations were lacking for nine generating projects, and the effect of following accounting practices that were inconsistent with those of prior years was not adequately disclosed in the notes to the statements. Also, we concluded that, until appropriate principles relating to financial statement disclosures were adopted and applied, our continued examination of the Administration's financial statements would serve no useful purpose.

The points of difference regarding the fiscal year 1963 financial statements were subsequently discussed by representatives of our Office, the Office of the Secretary of the Interior, and the Bonneville Power Administration. These discussions led to the adoption of several improvements in the presentation of the financial status and operations of the integrated power system. We are of the view that substantial progress has been made in the presentation of the financial aspects of these operations and that, with continuing effort devoted to further improvement, the remaining problems, referred to below, will be resolved within a reasonable period of time.

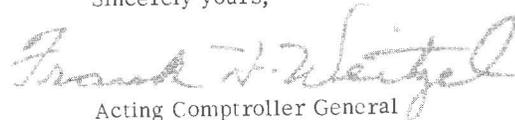
The notes to the accompanying financial statements indicate that a number of matters remain to be resolved for improved disclosure of the financial position and results of operations of the integrated power system. The more important of these, described in notes 3 through 7, are (1) the need to establish uniform composite service lives of turbines and generators for use in computing depreciation, (2) the inconsistency in the capitalization of interest costs during construction, (3) the inconsistency in capitalization of preliminary survey and investigation costs, (4) the exclusion from the accounts of the costs applicable to power-system operations for space rental and audit service furnished by other Federal agencies, and (5) the need for the Corps to record in the official accounting records depreciation of plant assets as determined under the compound-interest method.

The accounts and financial statements are subject to adjustment because firm allocations of the cost of constructing joint-use facilities at 8 of the 16 generating projects in operation at June 30, 1965, had not been made to power and nonpower purposes. (See note 5 to the statements.) The cost of joint-use facilities at the 8 projects amounted to \$459.5 million at June 30, 1965, of which \$224.9 million was tentatively allocated to power. Changes in allocations may require significant adjustments because of the recent changes illustrated in note 5. The changes in fiscal year 1963 for The Dalles, McNary, and Columbia Basin projects resulted in transferring about \$63.0 million of the cost of joint-use facilities from power to nonpower purposes and increasing annual net power revenues by about \$2.8 million. Further, the amount of net power revenues accumulated before fiscal year 1963 was increased \$5.0 million because the accounts for The Dalles and McNary projects were adjusted retroactively to the start of project operations. In contrast, the change for the Ice Harbor Project illustrates that adjustments to allocations can be relatively insignificant.

In our opinion, the accompanying financial statements, together with the explanatory comments provided by us above, present fairly the assets and liabilities of the Columbia River Federal Power System at June 30, 1965, the financial results of its power operations for the year then ended, and the financial effects of the substantial changes in accounting principles and practices adopted between June 30, 1962, and June 30, 1965, in conformity with principles and standards of accounting prescribed for executive agencies of the Federal Government by the Comptroller General of the United States, except for the lack of firm construction cost allocations described in the preceding paragraph--the financial effect of which is not now determinable.

Copies of this report are being sent today to the Administrator, Bonneville Power Administration, and to the Commissioner of Reclamation.

Sincerely yours,



Acting Comptroller General  
of the United States

Enclosure

The Honorable  
The Secretary of the Interior

UNITED STATES OF AMERICA  
 COLUMBIA RIVER FEDERAL POWER SYSTEM  
 COMBINED STATEMENT OF COMMERCIAL POWER REVENUES AND EXPENSES  
 FOR THE FISCAL YEAR ENDED JUNE 30, 1965

EXHIBIT 1

(In thousands of dollars)

	Fiscal Year <u>1965</u>
OPERATING REVENUES:	
Sales of electric energy by Bonneville Power Administration:	
Publicly owned utilities	41,738
Privately owned utilities	5,537
Federal agencies	6,746
Aluminum industry	22,998
Other industry	4,950
Total	<u>81,969</u>
Other operating revenues:	
Wheeling revenues	4,397
Other revenues	3,746
Total	<u>8,143</u>
Total operating revenues	<u>90,112</u>
OPERATING EXPENSES:	
Purchased power	1,615
Operation	16,695
Maintenance	10,349
Depreciation (Note 3)	19,952
Property losses	10
Total operating expenses	<u>48,621</u>
Net operating revenues	<u>41,491</u>
INTEREST AND OTHER DEDUCTIONS (Note 4):	
Interest on Federal investment	36,130
Interest charged to construction	906 *
Miscellaneous income deductions, net	5 *
Net interest and other deductions	<u>35,219</u>
NET REVENUES	<u>6,272</u>
ACCUMULATED NET REVENUES:	
Balance at beginning of year	129,790
Net revenues - current year	6,272
Prior years adjustments (Note 8)	66,729
Balance at end of year	<u>202,791</u>

\*Deduction

“Notes to the financial statements”  
 are an integral part of this statement.

UNITED STATES OF AMERICA  
COLUMBIA RIVER FEDERAL POWER SYSTEM  
COMBINED STATEMENT OF ASSETS AND LIABILITIES  
OF THE COMMERCIAL POWER PROGRAM  
AS OF JUNE 30, 1965  
(In thousands of dollars)

<u>ASSETS</u>	June 30, 1965
FIXED ASSETS:	
Completed plant (Schedule A)	1,776,934
Less accumulated depreciation (Note 3)	189,767
	<u>1,587,167</u>
Construction work in progress (Schedule A)	318,044
Total fixed assets	<u>1,905,211</u>
CURRENT ASSETS:	
Unexpended funds	112,516
Special funds	1,025
Accounts receivable	13,211
Materials and supplies	4,906
Total current assets	<u>131,658</u>
SPECIAL FUNDS:	
Trust funds	1,239
Advances	--
Total special funds	<u>1,239</u>
DEFERRED CHARGE FOR PAYMENT OF IRRIGATION ASSISTANCE (Schedule A)	<u>335,693</u>
OTHER ASSETS AND OTHER DEFERRED CHARGES:	
Retirement work in progress	1,611
Other assets and deferred charges	905
Total other assets and deferred charges	<u>2,516</u>
	<u>2,376,317</u>

“Notes to the financial statements”  
are an integral part of this statement.

<u>LIABILITIES</u>	June 30, 1965
INVESTMENT OF U.S. GOVERNMENT:	
Congressional appropriations	2,424,356
Revenues transferred to continuing fund	3,909
Transfers from other Federal agencies, net	16,538
Interest on Federal investment (Note 4)	488,047
Gross Federal investment	<u>2,932,850</u>
Less funds returned to U.S. Treasury	1,129,334
Net investment of U.S. Government	<u>1,803,516</u>
ACCUMULATED NET REVENUES:	
Balance at June 30, 1964	129,790
Net revenues - current year (Exhibit 1)	6,272
Prior years adjustments (Note 8)	66,729
Balance at June 30, 1965	<u>202,791</u>
LIABILITY OF U.S. GOVERNMENT FOR PAYMENT OF IRRIGATION ASSISTANCE (Schedule A)	<u>335,693</u>
CURRENT LIABILITIES AND OTHER CREDITS:	
Accounts payable	29,738
Employees' accrued leave	3,003
Trust fund advances	1,239
Other deferred credits	337
Total current liabilities and other credits	<u>34,317</u>
	<u>2,376,317</u>

UNITED STATES OF AMERICA  
 COLUMBIA RIVER FEDERAL POWER SYSTEM  
 AMOUNT AND ALLOCATION OF PLANT INVESTMENT  
 AS OF JUNE 30, 1965  
 PROJECTS IN SERVICE AND UNDER CONSTRUCTION  
 (In thousands of dollars)

Project	COMMERCIAL POWER					ALLOCATED TO:								% of Total Plant Investment Returnable from Commercial Power Revenues
	Total	Construction		Total	Returnable From Commercial Power Revenues	IRRIGATION		NONREIMBURSABLE						
		Completed Plant	Work In Progress			Returnable From Other Sources	Total Irrigation	Navigation	Flood Control	Fish and Wildlife	Recreation	Other		
<u>Projects in service</u>														
Transmission facilities (BPA)	613,627	569,917	43,710	613,627	--	--	--	--	--	--	--	--	100.0	
Albeni Falls (CE)	32,360	31,801	--	31,801	--	--	133	--	172	--	254	--	98.3	
Boise (BR)	65,425	4,809	4	4,813	10,862	34,810	45,672	--	14,940	--	--	--	24.0	
Bonneville (CE)	89,111	61,108	151	61,259	--	--	--	27,852	--	--	--	--	68.7	
Chief Joseph (CE)	155,374	155,260	--	155,260	--	--	--	--	--	--	114	--	99.9	
Columbia Basin (BR)	564,740	171,168	1,917	173,085	282,404	61,423	343,827	1,000	46,325	--	--	503	80.7	
Cougar (CE)	56,843	16,959	--	16,959	--	2,772	2,772	574	36,538	--	--	--	29.8	
Detroit-Big Cliff (CE)	66,292	41,933	2	41,935	--	3,396	3,396	131	20,419	--	--	411	63.3	
Hills Creek (CE)	48,710	14,013	--	14,013	--	4,986	4,986	623	29,088	--	--	--	28.8	
Hungry Horse (BR)	102,169	77,358	142	77,500	--	--	--	--	24,669	--	--	--	75.9	
Ice Harbor (CE)	135,575	93,084	314	93,398	--	--	--	41,466	--	--	711	--	68.9	
Lookout Point-Dexter (CE)	94,187	41,908	1	41,909	--	5,068	5,068	853	46,282	--	75	--	44.5	
McNary (CE)	303,732	256,602	37	256,639	--	--	--	46,830	--	--	263	--	84.5	
Minidoka (BR)	36,435	1,815	--	1,815	--	34,298	34,298	--	--	--	28	294	5.0	
Palisades (BR)	59,793	10,475	--	10,475	17,369	9,348	26,717	--	22,456	--	145	--	46.6	
The Dalles (CE)	265,367	224,128	8	224,136	--	--	--	41,231	--	--	--	--	84.5	
Yakima (BR)	63,615	4,596	1	4,597	9,998	47,868	57,866	--	--	1,152	--	--	23.0	
<u>Projects under construction</u>														
Dworshak (CE)	12,399	--	11,048	11,048	--	--	--	403	689	--	44	215	89.1	
Green Peter-Foster (CE)	42,932	--	16,370	16,370	--	1,753	1,753	389	24,327	--	93	--	38.1	
John Day (CE)	252,546	--	171,692	171,692	--	--	--	53,006	8,464	--	619	18,765 <sup>(a)</sup>	68.0	
Little Goose (CE)	17,378	--	12,809	12,809	--	--	--	4,463	--	--	17	89	73.7	
Lower Granite (CE)	3,033	--	2,388	2,388	--	--	--	631	--	--	14	--	78.7	
Lower Monumental (CE)	73,317	--	57,450	57,450	--	--	--	15,500	--	--	367	--	78.4	
<u>Irrigation assistance at 9 projects having no power generation</u>														
	15,060	--	--	--	15,060	--	15,060	--	--	--	--	--	100.0	
<b>Total</b>	<b>3,170,020</b>	<b>1,776,934</b>	<b>318,044</b>	<b>2,094,978</b>	<b>335,693</b>	<b>205,722</b>	<b>541,415</b>	<b>235,085</b>	<b>274,369</b>	<b>1,152</b>	<b>2,744</b>	<b>20,277</b>	<b>76.7</b>	

BPA - Bonneville Power Administration  
 CE - Corps of Engineers Project  
 BR - Bureau of Reclamation Project

(a) - Non-reimbursable road costs

"Notes to the financial statements" are an integral part of this statement.

UNITED STATES OF AMERICA  
COLUMBIA RIVER FEDERAL POWER SYSTEM  
NOTES TO THE FINANCIAL STATEMENTS

Note 1. Financial reporting policy for fiscal year 1965

The reporting policy adopted for the Columbia River Federal Power System (CRFPS) for fiscal year 1965 was developed after extensive conferences among personnel of the Office of the Secretary of the Interior, the General Accounting Office, Bonneville Power Administration (BPA), Corps of Engineers (Corps), and the Bureau of Reclamation (Bureau). The plan agreed upon is a consolidation of the commercial power financial data submitted by each of the entities of the power system. (See Note 2). Nonpower features are not included in the consolidation of financial data included in Exhibit 1, Statement of Commercial Power Revenues and Expenses; or in Exhibit 2, Statement of Combined Assets and Liabilities of the Commercial Power Program, except that the liability for payment of irrigation construction costs assigned for repayment from commercial power revenues is reflected in Exhibit 2. The U.S. Government's investment in plant of all features of the multiple purpose projects is shown in Schedule A, which discloses also the percentage of plant investment in each project which is to be returned from commercial power revenues.

These financial statements are presented on the accrued cost accounting basis, which includes depreciation as one of the elements of cost. The statements do not purport to show financial results on a repayment basis, either for the fiscal year or cumulatively. The average composite service life of 69.8 years for the generating projects of the system, upon which depreciation is based, is considerably longer than the 50-year repayment period reaffirmed by the Secretary of the Interior in 1963 as his understanding of the intent of the Congress. Hence, depreciation charges within the 50-year period are considerably less than repayment requirements for the same period. Wholesale power rates are based upon the 50-year repayment requirement. Accumulated Net Revenues on the accrued cost basis, therefore, are not a measure of the adequacy of wholesale power rates to complete repayment in fifty years.

Note 2. Composition of the Columbia River Federal Power System

The Columbia River Federal Power System (previously called Columbia River Power System) is the name applied to the Bonneville Power Administration's transmission system and the hydroelectric generating plants constructed and operated by the Corps of Engineers and Bureau of Reclamation for which the Administration is the power marketing agent. The CRFPS, however, is not an official government agency, nor is it an individual legal entity. BPA, the Corps, and the Bureau are separate agencies, separately managed and financed, with separate accounting systems. However, the transmission system and generating plants are operated as an integrated power system, and the financial statements are prepared under the name of Columbia River Federal Power System to show the financial results of operations on a system basis.

At June 30, 1965, there were ten Corps and six Bureau projects in service for which BPA is the power marketing agent. Total installed generating capacity at all 22 power-

plants (one project includes three separate powerplants, while four others include two powerplants, thus making a total of 22) was 6,678,150 kilowatts. The projects in service and under construction at June 30, 1965, are listed in Schedule A.

At June 30, 1965, the transmission system included 262 substations with a transformer capacity of 15,284,655 kilovolt-amperes, and 9,327 circuit miles of transmission lines.

### Note 3. Depreciation

Depreciation policies and procedures for the Columbia River Federal Power System have changed considerably in recent years, as outlined under the agency headings below. The major change was the adoption of the compound interest method of depreciation for the entire system in place of the straight line method previously used. Representatives of the agencies and the General Accounting Office have agreed that the compound interest method is an acceptable method for this power system, and this method was adopted for the financial statements. The adjustment for the generating projects in fiscal year 1965 was made retroactive to the start of operations for each major project, in order to be consistent with the retroactive adjustment made for the transmission system in fiscal year 1963. A significant feature of the compound interest method is that depreciation charges are lower in the early years of the project's life and higher in the later years. This method produces a more level annual charge to operations when combined with interest expense than does the straight line method of depreciation, since interest expense is higher in the early years and lower in the later years.

#### Bonneville Power Administration

BPA changed from the straight line method of depreciation to the compound interest method with an interest factor of 2-1/2% for the accounts of the transmission system starting in fiscal year 1963. An adjustment was made retroactive to the start of transmission operations and incorporated into the financial statements for that year. The change had the effect of increasing accumulated net revenues by \$36,021,000 through June 30, 1962, and \$2,831,000 for fiscal year 1963.

#### Bureau of Reclamation

Through fiscal year 1962 the Bureau maintained memorandum accounts for depreciation which were used for system financial statement purposes. In 1963 the Bureau adopted the principles of depreciation accounting in their official accounts, using the straight line method for all projects. (The Columbia Basin Project had used the compound interest method in the memorandum accounts with an interest factor of 2-1/2%.) They recorded as accumulated depreciation the balances in the "Reserve for Replacements," which had been maintained in their official accounts. Concurrently, the Bureau revised service lives for certain asset groups. The official accounts are now used for system financial statement purposes. The net effect of all of these changes was to increase accumulated net revenues through fiscal year 1962 by \$18,916,000.

BPA presented financial data for fiscal year 1964 for the projects of the system using the compound interest method of depreciation. Accordingly, BPA changed the Bureau's straight line depreciation expense to an estimated amount of compound interest depreciation expense. This adjustment increased net revenues \$2,136,000 for fiscal year 1964. (See Note 8. a. (1))

The Bureau adopted the compound interest method of depreciation in their official project accounts in fiscal year 1965, with an interest factor of 3% (2-1/2% for the Kennewick Division of the Yakima Project). Net revenues for fiscal year 1965 were increased \$1,997,000 by this change. The accounts were adjusted retroactively to the start of operations for the two large projects--Columbia Basin and Hungry Horse Projects--which increased accumulated net revenues \$10,643,000 through June 30, 1964. If a similar retroactive adjustment had been made for the small projects--Yakima, Boise, Minidoka, and Palisades--there would have been an additional increase in accumulated net revenues, estimated at \$750,000 through June 30, 1964.

#### Corps of Engineers

The Corps had not adopted compound interest depreciation in their official accounts at June 30, 1965. BPA changed the Corps' straight line depreciation to compound interest depreciation, using an interest factor of 2-1/2%, for financial statement purposes for fiscal years 1964 and 1965. Restatement of the depreciation by BPA is an interim measure pending consideration by the Corps of adoption of the compound interest method in the official accounts of the projects.

The fiscal year 1964 adjustment was made for that year only, and increased net revenues \$7,711,000. The 1965 adjustment, made retroactive to the start of operations, increased net revenues an additional \$44,432,000 through June 30, 1964, and \$6,861,000 for fiscal year 1965.

The Walla Walla District of the Corps revised composite service lives of turbines and generators from 35 years to 65 years for the McNary and Ice Harbor Projects in fiscal year 1965, based on their reanalysis of service lives. This adjustment to the straight line depreciation expense recorded in the books of the Corps increased accumulated net revenues \$7,638,000 through June 30, 1964, and \$979,000 for fiscal year 1965. The Portland and Seattle Districts did not take similar action and continued to use composite service lives for turbines and generators for their projects, ranging from 35 to 41 years. In comparison with the practice of the Corps, the Bureau adopted a 72.5-year composite service life for turbines and generators for all of their projects in fiscal year 1963. The effect of these variations can be illustrated for The Dalles Project. The Dalles Project used a 40-year composite service life for turbines and generators, and this project's total compound interest depreciation expense for fiscal year 1965 was \$1,901,000. If the 35-year composite service life for turbines and generators had been used, the Dalles depreciation expense would have been \$281,000 higher. If the 72.5-year composite service life had been used, depreciation expense would have been \$654,000 lower. The Department of Interior and the Corps are currently seeking to adopt more uniform service lives and depreciation methods.

All of the foregoing depreciation changes, and other relatively minor depreciation items, resulted in net prior years' adjustments which increased accumulated net revenues through June 30, 1965, by \$131,693,000. (See Note 9a.) In addition to these prior year adjustments, depreciation changes have affected the net revenues for fiscal years 1963, 1964, and 1965 shown in Note 9.

#### Note 4. Interest

The interest rates applicable to the generating projects and the various increments of transmission investment are as follows:

Generating Projects in Service at June 30, 1965

Albeni Falls	2-1/2%	Hungry Horse	3%
Boise	3	Ice Harbor	2-1/2
Bonneville	2-1/2	Lookout Point-Dexter	2-1/2
Chief Joseph	2-1/2	McNary	2-1/2
Columbia Basin	3	Minidoka	3
Cougar	2-1/2	Palisades	3
Detroit-Big Cliff	2-1/2	The Dalles	2-1/2
Hills Creek	2-1/2	Yakima, Roza Division	3
		Yakima, Kennewick Div.	2-1/2

Bonneville Power Administration  
Investment at June 30, 1965

Included in investment in fiscal year 1963 and prior	2-1/2%
"    "    "    "    "    "    1964	2-7/8%
"    "    "    "    "    "    1965	3%

Generating Projects Under Construction at June 30, 1965

Dworshak	2-5/8%	Little Goose	2-1/2%
Green Peter-Foster	2-1/2	Lower Granite	2-1/2
John Day	2-1/2	Lower Monumental	2-1/2

The interest rates for the Boise, Columbia Basin, Hungry Horse, Minidoka, and Palisades Projects, and the Roza Division of the Yakima Project were established by the Bureau pursuant to Section 9(c) of the Reclamation Project Act of 1939 (43 U.S.C. 485 h(c)). The rate for the Kennewick Division of the Yakima Project was established pursuant to Section 3 of the Act of June 12, 1948, (62 Stat. 382), which authorized construction of that division.

The interest rates applicable to the Corps projects and the BPA transmission system are not stipulated by law, but, rather, have been fixed pursuant to administrative policies in effect at the time the projects were constructed. In the case of the Bonneville Project, for instance, the Federal Power Commission, in connection with making the cost allocation for that project in 1945, determined that the average interest rate paid by the Treasury on new long-term bonds issued during the period the project was under construction averaged approximately 2-1/2 percent, and a 2-1/2 percent rate was adopted as the official interest rate for that project by the Corps with BPA's concurrence. BPA also adopted this rate for the initial investment in the transmission system.

Since the interest paid by the Treasury on outstanding long-term marketable bonds continued to average around 2-1/2 percent, this rate also was adopted for the Chief Joseph, Detroit-Big Cliff, Lookout Point-Dexter, Albeni Falls, McNary, and The Dalles Projects, construction of which was started shortly after World War II. Bureau of the Budget Circular A-47, issued in December 1952, provided that the financial analysis of projects submitted with requests for construction appropriations be based upon the average interest rate payable by the Treasury on long-term marketable bonds outstanding at the time of the presentation. The interest rate computed under the A-47 formula continued at 2-1/2 percent through fiscal year 1960. This rate was thus adopted for Columbia River Basin projects for which appropriations requests were submitted during that period. These include Cougar, Hills Creek, Ice Harbor, Green Peter-Foster, John Day, and Lower Monumental.

In accordance with A-47, the rate was increased to 2-5/8 percent in fiscal years 1961-62 and this rate was applied to the Dworshak Project. Circular A-47 was rescinded in May 1962 when the President approved new policies for planning water resource projects. These policies, which were published as Senate Document 97, 87th Congress, contain an interest rate formula similar to that in A-47. Although Senate Document No. 97 does not specifically apply to interest rates for repayment purposes, BPA adopted the Senate Document No. 97 interest rate formula for application to new transmission investment in fiscal year 1964. Starting in fiscal year 1964, the interest rate applied to each year's new transmission investment, therefore, is the rate certified by the Treasury Department pursuant to Senate Document 97 for the previous fiscal year. If the rate so computed is not a multiple of 1/8 of 1 percent, it is rounded to the next lowest 1/8. The Corps also has adopted this policy for new projects. However, on the Lower Snake River, where projects have been authorized as units of a navigation system, the same interest rate has been applied to all projects in the group regardless of when construction started. The 2-1/2 percent rate initially established for the Ice Harbor Project, therefore, also has been applied to the Little Goose, Lower Granite, and Lower Monumental Projects.

Financial data for the Corps and BPA include interest on a base which covers all elements of the net federal investment in the commercial power program including plant investment, working capital, and operation and maintenance costs. Through fiscal year 1962 the Bureau maintained memorandum accounts for financial statement reporting purposes which included interest at a rate of 2-1/2 percent on the same base as used by the Corps and BPA. Beginning in fiscal year 1963, the Bureau discontinued the memorandum accounts, and used their official accounts which included interest at a rate of 3 percent on the unrepaid investment in commercial powerplant required to be repaid with interest (except for one division of one project which uses the 2-1/2 percent rate). As previously discussed, the interest rates currently in use for Bureau projects are based on section 9(c) of the Reclamation Project Act of 1939 (43 U.S.C. 485 h(c)). However, the base for computing interest used in the official accounts has been defined by the Bureau according to their interpretation of law. Accordingly, the Bureau's financial data do not include interest (1) during the construction period for four projects and one division of a fifth project; (2) on plant costs that were allocated as benefits to downstream hydro plants for river regulation provided by the Columbia Basin Project; and (3) on other items such as investments in working capital. The foregoing changes at Bureau projects in base and rate, and other relatively minor interest changes at Bureau projects resulted in a net adjustment which increased accumulated net revenue through June 30, 1965, by \$17,715,000 (See Note 9b).

The Corps and BPA both capitalize interest during the construction period, and have done so for all projects included in the system. The Bureau currently capitalizes interest during construction, but did not do so in all cases prior to 1956 because it was not specifically required by project authorizing legislation. Interest during construction has been included in the accounts of the Palisades Project and the Roza Division of the Yakima Project, but has not been included at the Boise, Columbia Basin, Hungry Horse, and Minidoka Projects, or the Kennewick Division of the Yakima Project. The amount of interest during construction as computed for the Columbia Basin and Hungry Horse Projects and the Kennewick Division was \$14,217,000 based on the data in the memorandum accounts as of June 30, 1962. Interest during construction for the Boise and Minidoka Projects is estimated at \$300,000.

Note 5. Cost Allocations

Costs of facilities which serve only one purpose are assigned to that purpose. For projects which serve more than one purpose, (e.g., power, irrigation, navigation, flood control), it is necessary to allocate the costs of joint-use facilities among the purposes served. The term "cost allocation" is used to describe this process and result. The discussion which follows pertains to the cost allocation of joint-use facilities.

Cost allocations are designated as firm or tentative. A tentative allocation is one which may be adjusted retroactively when it is made firm. A firm allocation may be changed in the future, if conditions warrant, but only prospectively. The following table presents the status of cost allocations for the generating projects at June 30, 1965:

Status of Cost Allocations

<u>Project</u>	<u>Status</u>
Albeni Falls	Firm
Boise	Firm
Bonneville Dam	Firm
Chief Joseph	Tentative
Columbia Basin	Firm
Cougar	Tentative
Detroit-Big Cliff	Tentative
Hills Creek	Tentative
Hungry Horse	Firm
Ice Harbor	Tentative <sup>a/</sup>
Lookout Point-Dexter	Tentative
McNary	Firm
Minidoka	Firm
Palisades	Tentative
The Dalles	Tentative
Yakima	Firm

<sup>a/</sup> A firm allocation was approved by FPC Docket No. E-7235 dated September 1, 1965. The tentative allocation used through June 30, 1965, allocated 78.5 percent of joint plant costs and 81.0 percent of joint operation and maintenance expenses to power. The firm allocation assigns 78.6 percent of both joint plant costs and operation and maintenance costs to power. Joint plant costs assigned to power will be increased about \$60,000. Joint operation and maintenance costs assigned to power through June 30, 1965, will be decreased about \$30,000 when retroactive adjustment is made.

BPA has recommended to the Corps that the Corps develop allocations for its operating projects which the Department of the Interior and the Corps can agree upon and adopt as firm allocations as soon as possible. The cost allocations for all of the generating projects of the Bureau and the Corps shown in these financial statements are those used in their respective official accounts except for The Dalles Project, as explained below.

Recent Changes - Corps of Engineers Projects

Revised tentative allocations of joint costs based on the most recent allocation studies for The Dalles and McNary Projects were approved by the Chief of Engineers for use in the BPA financial statements starting in fiscal year 1963. These cost allocations were recorded in memorandum accounts rather than the official accounts for these projects pending adoption of cost allocation criteria by the President's Water Resources Council. The revised tentative cost allocations were used through fiscal year 1965 for The Dalles Project and through fiscal year 1964 for the McNary Project. The Federal Power Commission established a firm allocation for the McNary Project which was recorded in the official accounts in fiscal year 1965. The following table shows the effect of these changes on plant costs allocated to power for these two projects:

	<u>The Dalles</u>	<u>McNary</u>
<u>Percent allocated to power:</u>		
Old tentative allocation	92.72	97.5
Revised tentative allocation	74.5	80.0
Firm allocation	--	81.3
<u>Amount of decrease in plant costs</u> <u>allocated to power:</u>		
Old tentative to revised tentative	\$19,300,000	\$23,700,000
Revised tentative to firm	--	1,600,000 <u>a/</u>

a/ Increase.

The change from the old tentative allocation to the revised tentative allocation increased accumulated net revenues through June 30, 1962, \$3,272,000 for The Dalles Project and \$1,761,000 for the McNary Project. The increase for fiscal year 1963 was \$741,000 for The Dalles and \$1,092,000 for McNary. The change from the revised tentative allocation to the firm allocation for the McNary Project decreased accumulated net revenues through June 30, 1964, by \$546,000, and for fiscal year 1965 by \$97,000.

In addition to these changes, future changes may be made at the following hydro projects: Cougar, Detroit-Big Cliff, Hills Creek, Lookout Point-Dexter, and Green Peter-Foster. A total of \$17,975,000 of the joint plant costs of these five projects has been allocated to irrigation, as shown on Schedule A. These allocations have been made pursuant to Section 8 of the Flood Control Act of 1944 (P.L. 534, 78th Congress) which authorizes projects constructed by the Corps to be utilized for irrigation purposes. According to an opinion from the Office of the Portland Regional Solicitor of the Department of the Interior, Section 8 limits the allocation of joint costs to irrigation to an amount which is within the ability of the irrigation water users to repay. However, related irrigation projects have not been authorized, and until they are, a determination of the water users' repayment ability cannot be made. Hence, the amount of joint plant costs allocated to irrigation may be revised. In addition, joint operation and maintenance costs allocated to irrigation to June 30, 1965, of \$2,916,000 for the four hydro projects in service may also be revised.

Recent Changes - Bureau of Reclamation Projects

At the close of fiscal year 1962 the cost allocation was firm for the Columbia Basin Project and provided for charging 56 percent of joint plant costs to commercial power

and 44 percent to irrigation, after allocation of minor amounts to navigation and other purposes. A revision to this firm cost allocation was approved by the Assistant Secretary of the Interior in fiscal year 1963. The revised firm cost allocation recognized flood control as a project purpose and changed the allocation percentages to 29.5 percent to flood control, 43.1 percent to commercial power, and 27.4 percent to irrigation. The new firm cost allocation transferred about \$20,000,000 of joint plant costs from power and about \$26,000,000 from irrigation to nonreimbursable flood control. The change was made prospectively, and the initial annual effect was to increase net revenues by an estimated amount of \$1,000,000.

Other adjustments since June 30, 1962, were for: (1) a change in the effective date of implementing the revised firm cost allocation for the Columbia Basin Project, and (2) a correction of the retroactive adjustment for interest expense made in fiscal year 1960 when the firm cost allocation for the Hungry Horse Project was adopted. Accumulated net revenues were decreased a net of \$209,000 because of these two adjustments.

The foregoing changes in allocations at both Corps and Bureau projects resulted in prior years' adjustments which in total increased accumulated net revenues through June 30, 1965, by \$4,278,000. (See Note 9c.) In addition to these prior year adjustments, cost allocation changes have affected the net revenues for fiscal years 1963, 1964, and 1965 shown in Note 9.

#### Note 6. Costs Incurred by Other Agencies

BPA, the Bureau, and the Corps do not currently include in their accounts the estimated costs of space rental and audit services furnished by other federal agencies. BPA had included such costs in its accounts, and incorporated them in the financial statements through fiscal year 1962, but discontinued recording them starting in fiscal year 1963. Other power agencies of the Department of the Interior do not include these costs, and the decision to discontinue them for BPA was made to be consistent with the other agencies of the Department of the Interior, pending clarification of policy for accounting for these items.

The most recent official determination of the magnitude of these costs for BPA was made in fiscal year 1963. At that time the space rental and audit services furnished by other agencies without charge totaled \$475,000 for the year, of which \$260,000 would have been charged to operating expenses and \$215,000 to plant investment. The figures for fiscal year 1965 would be approximately the same.

#### Note 7. Preliminary Survey and Investigations Costs

The Bureau, as a matter of policy, capitalizes all preauthorization general investigations costs which relate to a project in the form authorized by Congress. However, the Corps' policy is to exclude all preliminary surveys and investigations costs which are incurred prior to project authorization. The Corps implemented this policy in fiscal year 1964 and deleted \$1,913,000 of such costs from project plant accounts. These costs were deleted upon instructions from the office of the Chief of Engineers to permit consistency with Senate Document 97, 87th Congress, which defines project installation costs, and the Corps interprets as limiting their inclusion to those which occur after project authorization.

Note 8. Adjustments to Accumulated Net Revenues

The following table summarizes the adjustments which have caused the net increase in Accumulated Net Revenues of \$66,729,000 shown on Exhibits 1 and 2:

	<u>Thousands of Dollars</u>	
a. Restatement of depreciation from the straight line method to the compound interest method (see Note 3):		
(1) Bureau projects:		
Total effect through June 30, 1964	10,643	
Less compound interest adjustment made by BPA in fiscal year 1964	<u>2,136</u>	8,507
(2) Corps projects:		
Total effect through June 30, 1964	52,143	
Less compound interest adjustment made by BPA in fiscal year 1964	<u>7,711</u>	<u>44,432</u>
Net compound interest depreciation adjustment made in fiscal year 1965		52,939
b. Correction of error in accounting for loss on disposal of Coulee Dam Village and write-off of investment in preliminary survey work abandoned at Columbia Basin Project		3,742*
c. Adjustment to operation and maintenance expense due to change in effective date of new firm cost allocation at Columbia Basin Project <u>a/</u>		284*
d. Recognition for consolidation purposes of Southern Idaho projects net revenues accumulated through June 30, 1963 <u>b/</u>		9,560
e. Elimination of miscellaneous nonpower revenue and expense items through June 30, 1964:		
(1) Columbia Basin Project	361	
(2) Other Bureau projects	<u>131*</u>	230
f. Adjustment for Federal Power Commission determination of downstream benefits for the period 1957-1961 assigned to storage projects <u>c/</u>		616
g. Adjustment due to change in service lives of turbines and generators (See Note 3):		
(1) McNary Project	7,187	
(2) Ice Harbor Project	<u>451</u>	7,638
h. Adjustment for change from the revised tentative allocation to the firm allocation for the McNary Project (See Note 5)		546*
i. Adjustment to reinstate net power revenues through June 30, 1964, from generator units one through six at the Minidoka Project, that were relinquished by irrigation districts		336
j. Adjustment for miscellaneous minor items		<u>18*</u>
		<u><u>66,729</u></u>

\*Deduction

- a/ The Bureau recorded joint costs for depreciation, interest, and operations and maintenance expenses for fiscal year 1963 in accordance with the new firm cost allocation for the Columbia Basin Project (See Note 5). This adjustment of \$283,799, principally to operation and maintenance expenses, restates these costs to reflect the change in the effective date of the new cost allocation from the beginning of fiscal year 1963 to the beginning of fiscal year 1964. The interest adjustment was made in fiscal year 1964 and the depreciation adjustment was made as part of the retroactive restatement of depreciation to the compound interest method.
- b/ BPA was designated marketing agent for federal power generated and sold in Southern Idaho by order dated May 21, 1963. The transmission facilities, personnel and marketing agreements were transferred to BPA on September 1, 1963, with an effective date for accounting purposes of July 1, 1963. Data for fiscal year 1964 were included in the BPA financial statements for that year only. Financial data for these projects were included in consolidated financial statements, starting with fiscal year 1965, and the following accumulated net revenues recorded by the projects through June 30, 1963, were included in system financial statements in fiscal year 1965, as follows:

Boise	\$4,203,989
Minidoka	704,512
Palisades	<u>4,651,133</u>
	<u>\$9,559,634</u>

- c/ Federal Power Commission's determination of downstream benefits payments to be made by nonfederal owners of downstream licensed projects for benefits received from upstream federal reclamation storage projects are made pursuant to section 10(f) of the Federal Power Act (16 U.S.C. 803f). The determinations had previously been made for the period January 1, 1949, through December 31, 1956, and from September 1, 1961, through August 31, 1964. In fiscal year 1965, under Docket E-6384, determination was made for the period January 1, 1957, through August 31, 1961, in the amount of \$777,300. Of this amount, \$130,500 was recorded as a prior year adjustment to accumulated net revenues for the Columbia Basin Project and \$590,600 was recorded as a prior year adjustment for the Hungry Horse Project. The amount applicable to the Albeni Falls Project, \$56,200, was recorded in current year revenues by the Corps.

An offsetting amount in accumulated net revenues is the transfer of \$105,080 from BPA's accumulated net revenues to the Albeni Falls Project, representing the prior year's portion of the FPC determination for the period September 1, 1963, through August 31, 1964, recorded initially in March 1965. The Albeni Falls Project recorded the transfer in the current year revenues. The net effect of these adjustments was an increase in accumulated net revenues of \$616,020 through June 30, 1964.

Payments by the nonfederal project owners are currently collected by BPA through the provisions of the Pacific Northwest Coordination Agreement. Transfers to the Federal Power Commission are made from these funds, and amounts are assigned to federal storage projects, based on the FPC determinations of benefits. These benefits result principally from the controlled storage and release of water, which increases the downstream projects' firm power-producing capability.

Note 9. Reconciliation of Accumulated Net Power Revenues from June 30, 1962, through June 30, 1965.

Combined statements showing results of electric power generating, transmitting, and marketing operations and the financial position of the integrated power system were last prepared for fiscal year 1962. Several major changes have been made in the manner of presenting statements showing results of operations and financial condition of the system since that time. Accumulated net revenues on a consolidated system cost accounting basis were \$57,172,000 at June 30, 1962, and the increase to \$202,791,000 through June 30, 1965, was caused primarily by these changes. The following table summarizes the changes and includes also the aggregate results of power operations recorded by BPA and the 16 individual generating projects for the three intervening years:

	<u>Thousands of Dollars</u>	
Accumulated net revenues for the integrated power system through June 30, 1962		57,172
Net power revenues recorded in the accounts of BPA and the 16 individual power generating projects combined for:		
Fiscal year 1963	8,889*	
Fiscal year 1964	5,451*	
Fiscal year 1965	<u>591* a/</u>	14,931*
Adjustments to accumulated net power revenues made in fiscal years 1963, 1964, or 1965 (See items a through d below)		<u>160,550</u>
Accumulated net power revenues through June 30, 1965		<u><u>202,791</u></u>

\*Deduction

a/ The difference between this figure and the \$6,272,000 reported in Exhibit 1 is principally the adjustment to the compound interest depreciation method made for Corps projects by BPA (See Note 3).

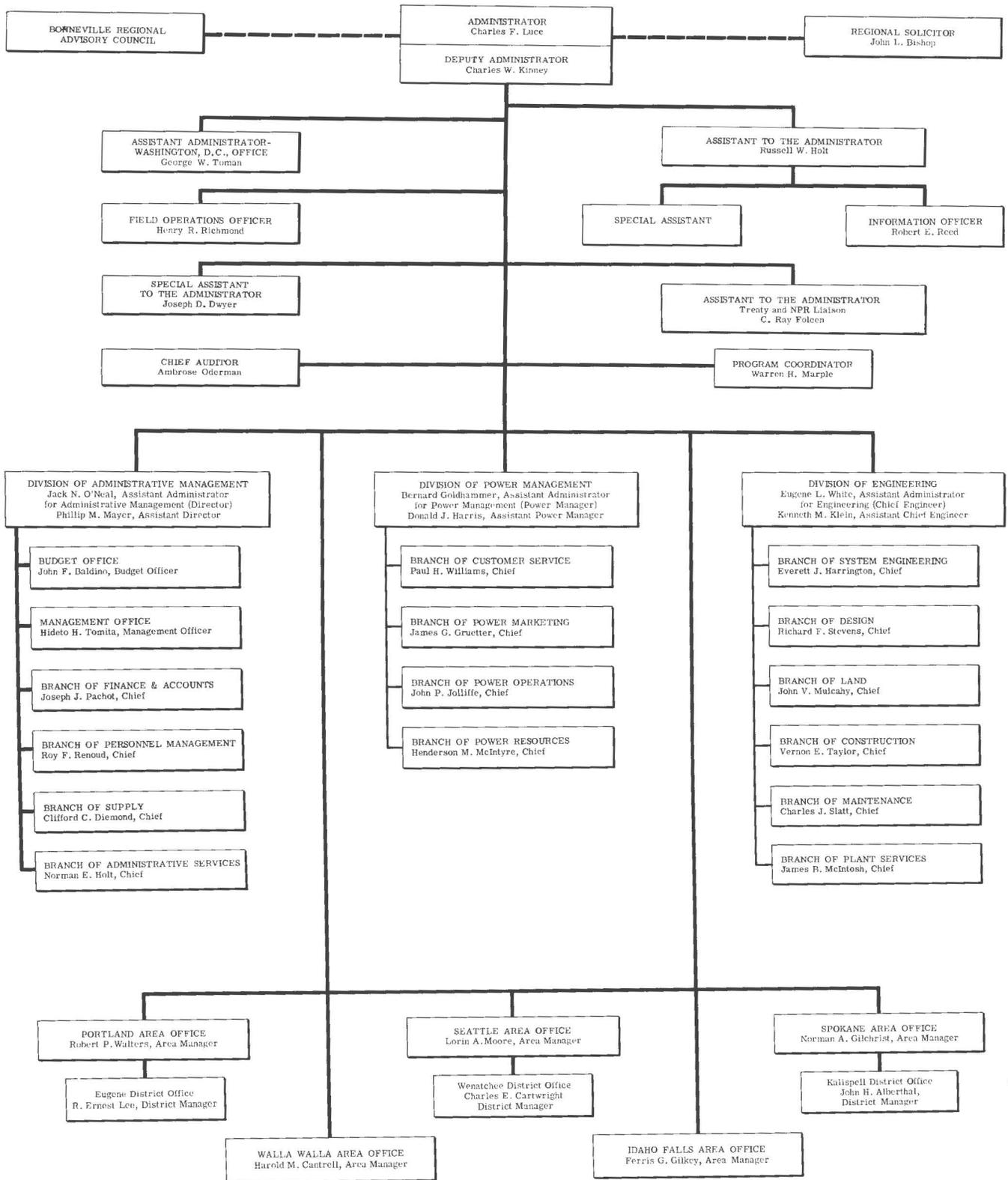
	<u>Thousands of Dollars</u>
<u>Explanation of Adjustments:</u>	
a. <u>Depreciation.</u> To convert system-wide from the straight-line depreciation method to the compound-interest method; to adopt longer estimated service lives for eight projects; and to adjust for other depreciation changes as explained in Note 3.	131,693
b. <u>Interest.</u> To convert from interest at a rate of 2-1/2 percent on the net federal investment to interest at a rate of 3 percent on the	

unpaid plant investment at Bureau projects and to adjust for other interest changes as explained in Note 4. 17,715

c. Cost Allocations. To reallocate expenses recorded since the start of operations based on revised allocations of the cost of joint-use facilities for two Corps projects and to adjust for other allocation changes as explained in Note 5. 4,278

d. Other. To recognize \$9,560,000 of net power revenues accumulated for the Southern Idaho projects before they were transferred into the system (See Note 8d); to reduce net revenues for \$3,864,000 excess of expense over revenues on irrigation operations at Bureau projects accumulated in memorandum accounts through June 30, 1962; and to increase net revenues \$1,168,000 for miscellaneous reclassifications, corrections, and other adjustments. 6,864

160,550



BPA  
MANAGEMENT  
GROUPS

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COLUMBIA BASIN INTER-AGENCY COMMITTEE

M. BOYD AUSTIN, Chairman  
Federal Power Commission

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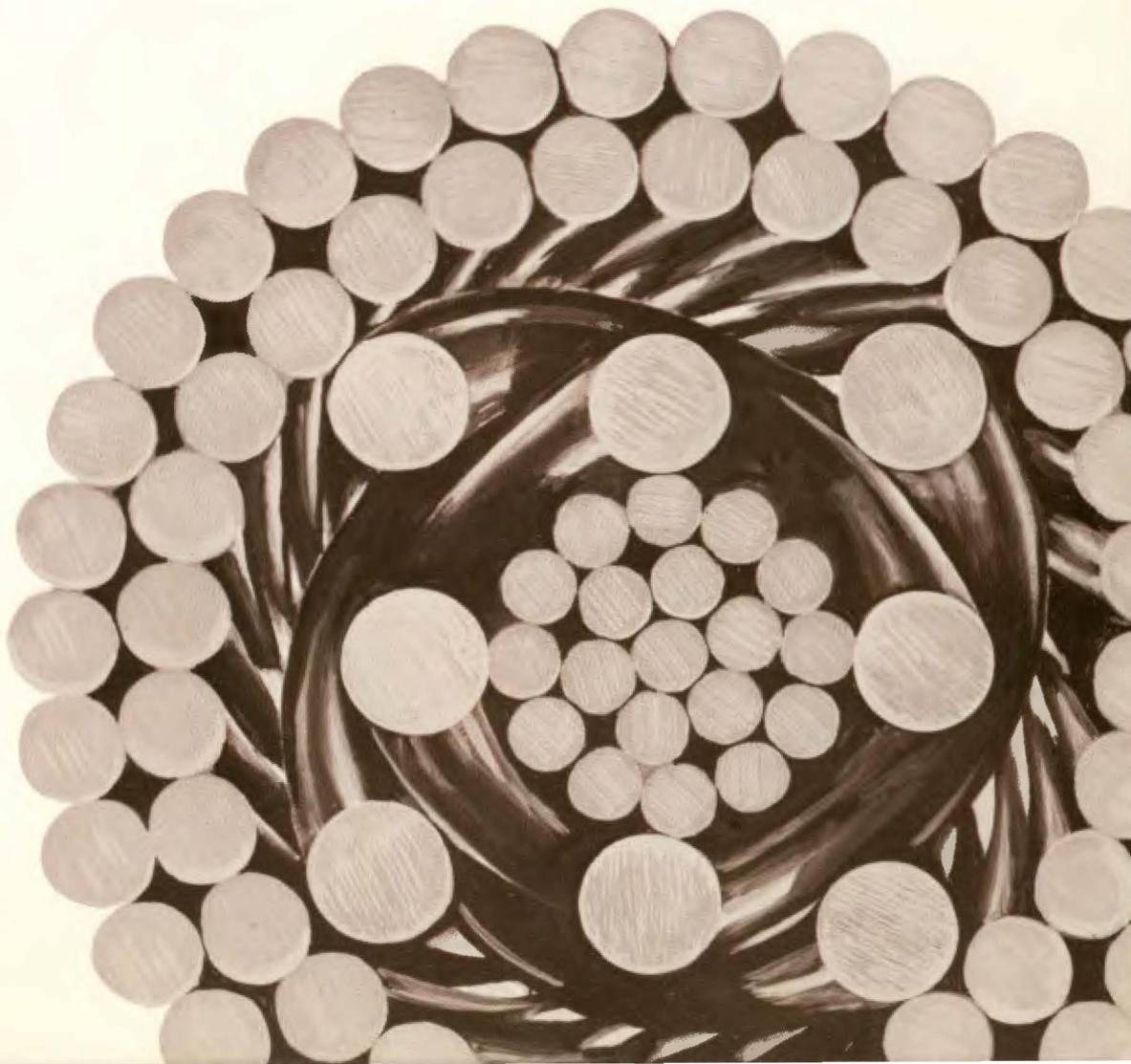
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Created in 1849, the Department of the Interior – America's Department of Natural Resources – is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States – now and in the future.

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*Enlarged cross-section of the new 500 kv conductor  
to be used on 275 miles of BPA line.  
( Actual diameter: 2½ inches )*





**BPA**  
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