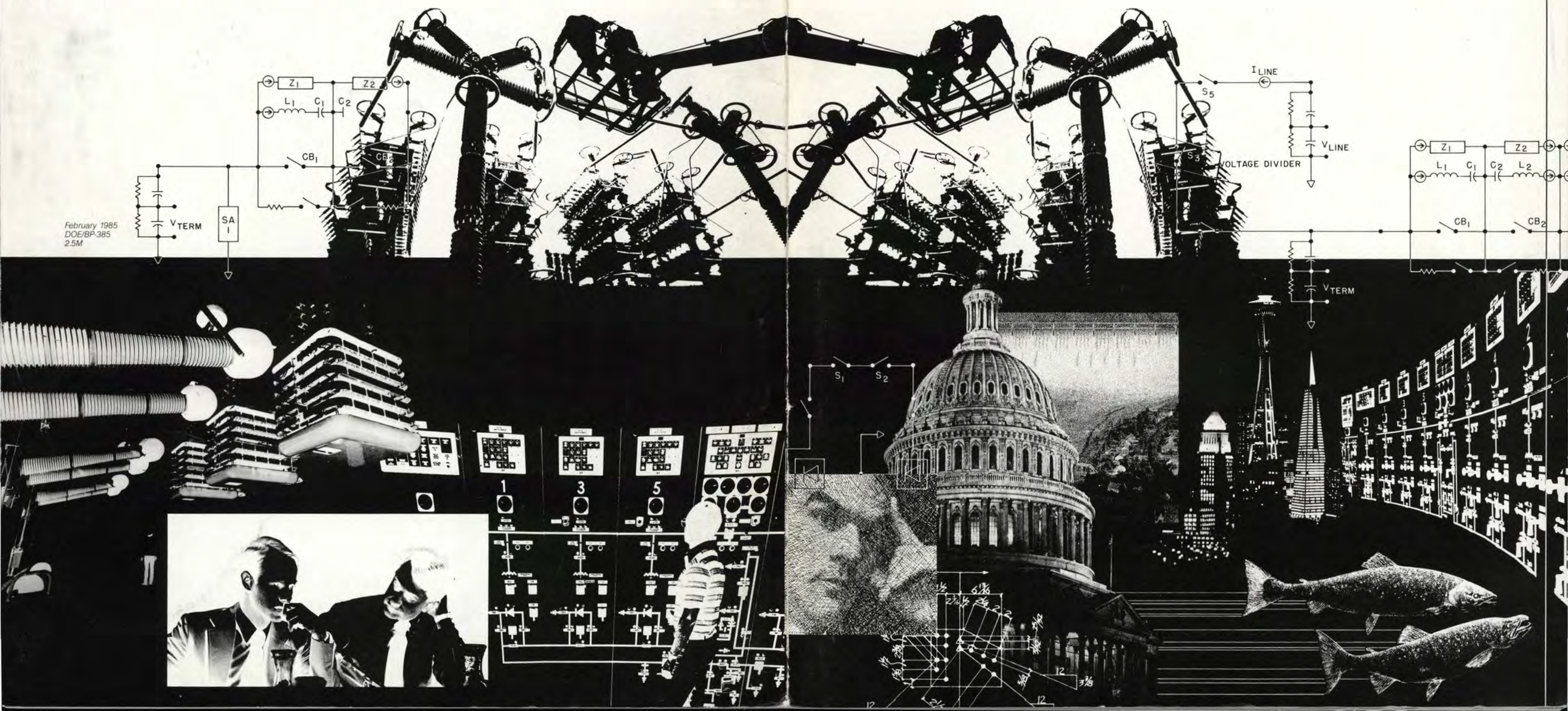
1984 Annual Report

BPA

Bonneville Power Administration
U.S. Department of Energy

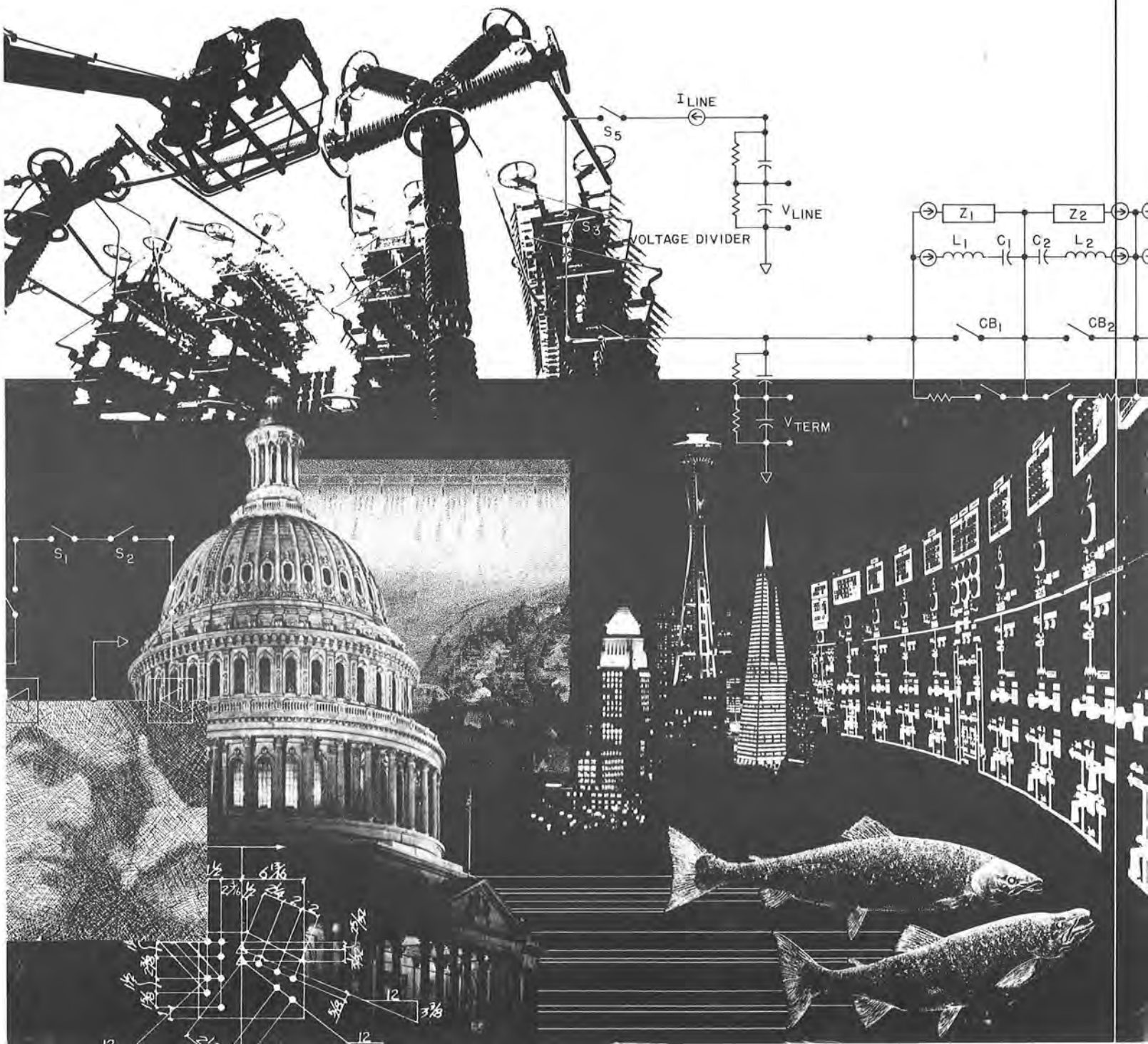


February 1985
DOE/BP-385
2.5M

1984 Annual Report

BPA

Bonneville Power Administration
U.S. Department of Energy



Fiscal Highlights

(In thousands)	**FY 1984**	FY 1983	Percentage Increase
Sales of Electric Energy (kWh)	**120,763,609**	103,061,347	17%
Operating Revenues	**$2,666,475**	$1,845,382	44%
Operation and Maintenance Expense	**263,465**	219,646	20%
Purchase Power Expense	**872,314**	706,341	23%
Writeoff of Net Billing Advance	**189,738**		
Residential Energy Purchased	**835,254**	549,469	52%
Depreciation Expense	**74,949**	63,857	17%
Net Interest Expense	**329,725**	292,031	13%
Net Revenues (Expense)	**$ 101,030**	$ 14,038	
Funds Returned to U.S. Treasury (Includes Interest)	**$ 649,069**	$ 318,946	

Fiscal Year

The results of the fiscal year reflect increasing strength in the Northwest's economy and improved conditions for selling this region's surplus power in the Southwest. Gross revenues increased $821 million, or 44 percent, over 1983. They totaled $2,666 million.

Net revenues in 1984 increased $87 million due to our efforts to recover more revenue and stabilize expenses. This figure represents a substantial improvement over 1983 when net revenues totaled $14 million. BPA also increased by $330 million the amount returned to the U.S. Treasury for operation, maintenance and interest expense.

BPA sold a record 120.8 billion kilowatthours in fiscal 1984. Spurred by the improved economy and innovative marketing to BPA's industrial customers, sales increased 17 percent over 1983.

Bonneville sold 21.4 billion kilowatthours outside the Pacific Northwest, primarily to California utilities. Most of this was nonfirm energy. Sales outside the region increased 8 percent over 1983.

Preference customers bought a total of 36.2 billion kilowatthours, up 11 percent over 1983.

Sales to our industrial customers rose by 39 percent to 26.1 billion kilowatthours. BPA managed to maintain its industrial sales despite a drastic decrease in world aluminum prices.

Expenses increased to $2,565 million, up from last year's figure of $1,831 million. The increase was due largely to Washington Public Power Supply System costs and the additional requirements of the 1980 Pacific Northwest Power Act.

Purchase power expense increased $166 million over 1983 to a new high of $872 million, due mainly to the funds needed to complete Washington Public Power Supply System Plant 2. Part of this increase was offset, however, by the decision to suspend construction of WNP 3.

A one-time expense occurred during the fiscal year when $190 million of net-billing advances for the Washington Public Power Supply System's Plant 2 was written off. (See Note 1 to the Financial Statements for a more detailed explanation.

Residential energy purchased totaled $835 million, or $286 million more than in 1983. The increase was due largely to the 10 percent increase for 1984 in the percentage of residential power exchange allowed by the 1980 Act.

Interest expense for 1984 amounted to $330 million, or $38 million more than in 1983. New borrowings for transmission construction and conservation programs, plus more appropriations for generating facilities, accounted for the increase.

New transmission and generating facilities were placed in service, causing the depreciation expense to increase $11 million over 1983. Depreciation expenses totaled $75 million in 1984.

The strong actions taken to assure BPA's financial integrity have resulted in the positive financial results for 1984. They reflect BPA's commitment to provide its customers, and ultimately the individual ratepayer, with high quality electrical service at the lowest possible cost.

Honorable
John S. Herrington
Secretary of Energy
Washington, D.C. 20585

Letter to the Secretary

Dear Mr. Secretary:
This is the Bonneville Power Administration's Annual Report for 1984, BPA's 47th year of service to the Pacific Northwest.

After several years of difficult adjustments to changing market conditions, Bonneville is pleased to report some very positive developments. Chief among these are improvements in BPA's financial stability and long-term prospects for power sales. Nothing better demonstrates the positive fiscal and operating conditions of BPA than the new rates proposed for adoption in July 1985.

Because of actions taken during 1984 and in previous years to bring costs under control, BPA was able to propose a priority firm power rate increase of only 3.2 percent. If adopted, the rate will remain in effect from July 1, 1985 through September 1987. This proposal represents a decrease in the "real cost" of power to our customers, after accounting for inflation.

And, we plan to hold rates down while fully satisfying scheduled obligations to the U.S. Treasury on the Federal investment in the Columbia River Power System. Following several years of steeply ascending rates and rising costs, this is good news for the Northwest's economy. With this rate proposal, we achieve one of the goals we set for the agency three years ago: rate stability.

As described to you in previous annual reports, BPA adopted strategies to return stability, predictability and balance to the Northwest power system.

Among BPA's objectives were: carrying out a least-cost strategy for development of power resources; overcoming marketing constraints and developing new markets for Northwest nonfirm energy; paying deferred and current obligations on the Federal investment in the Columbia River System; and improving public involvement in major energy issues.

Peter T. Johnson, administrator: "Initiatives to control costs and improve power sales began to bear fruit in 1984. Stable Bonneville power rates mean a more productive future for utilities and the Northwest economy."

Benchmarks

BPA has achieved results on each of these objectives.

The Northwest began to receive power from Washington Nuclear Project No. 2 at Hanford in 1984. The earlier halting of construction and preservation of WNP 1 and 3 focused the Supply System's resources on WNP 2. This greatly contributed to the successful completion of a plant which had previously been plagued by difficulties.

BPA and the Supply System also continued to pursue the Preservation Enhancement Program (PEP) — an effort aimed at improving contract terms and streamlining construction plans for WNP 1 and 3 pending resumption of construction. We remain confident that both projects could be completed at substantial savings compared to previous cost projections, when and if the plants are needed by the region.

BPA continued to keep a tight rein on its program levels. The agency earlier had reduced scheduled transmission construction and shifted emphasis in the area of conservation to the building of capability.

A better balance of benefits was established in 1984 between utilities in California and in the Northwest from use of the Northwest-Southwest Intertie powerlines. BPA also continued to increase the capacity of the Intertie by making technological improvements to existing facilities.

The agency extended rate incentives to Northwest aluminum companies when the world market for their product weakened. The incentives kept potlines in operation without burdening other ratepayers. This action buttressed BPA's revenue, preserved jobs, and boosted the region's economy.

BPA was able to achieve a goal of paying all deferred interest to the U.S. Treasury in 1984 — a full year sooner than planned. In addition, BPA made a large interest payment for 1984.

Bonneville made substantial improvements in its public involvement program. The administration makes no major policy decision without first bringing the issue before the public for consultation. Without a doubt, this information has improved our decisions and helped BPA better serve the public.

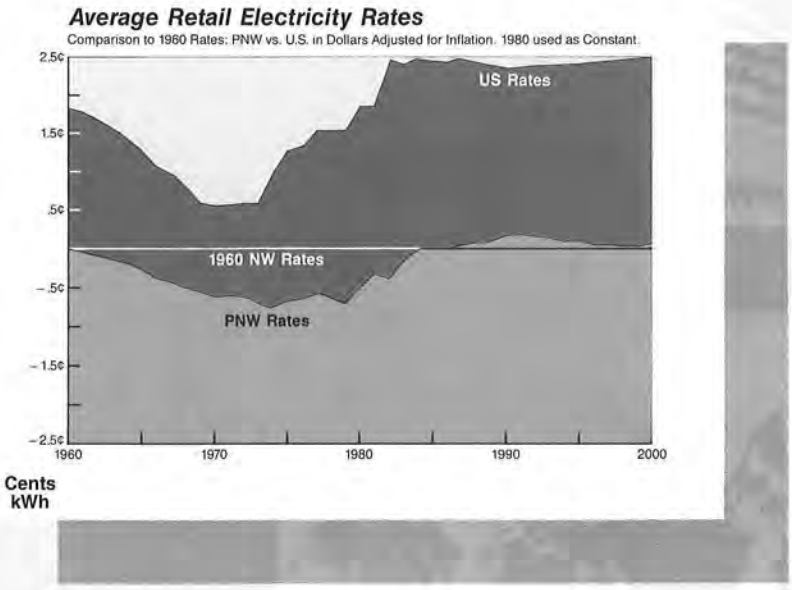
BPA took these actions while carrying out the mandate in the Northwest Power Act to enhance fish and wildlife on the Columbia River and its tributaries. Among major commitments made in 1984 is the effort over 4 years to bring the salmon back to the Yakima River.

A Turning Point

These steps helped restore balance and predictability to the Northwest's electric power system. Relieved of much of the pressure of large construction programs, BPA and the region's utilities again faced critically important decisions about the future. The decisions come to this: Choose now to move ahead as a region to achieve the goals of the Northwest Power Act; or fall back into the patterns of the past.

BPA has committed itself to the path that leads to much greater efficiency in the generation, distribution, and end uses of electricity. We do so because we are convinced that acquiring efficiency is, quite simply, a good business decision.

Robert Ratcliffe, deputy administrator: "Bonneville is determined to maximize the value of regional generating assets. Completion of one nuclear project in 1984 and preservation of two others for future use demonstrates this commitment."



In the years ahead, we have the opportunity to deliver better value for the energy dollar by encouraging consumers to expend electricity more efficiently; by shaping electrical loads to make better use of the generating capacity presently available; and by building new power plants only when they are needed and less expensive than alternatives.

None of these ideas is new. But most power suppliers, including BPA, are now struggling to absorb the costs of terminated or mothballed power plant projects. BPA and some generating utilities will carry surpluses of power for the next 5 years or more. Utilities may be inclined to place conservation low on their list of priorities.

BPA believes this would be a big mistake.

The Northwest Power Planning Council has mapped out an electric energy plan for the region. It calls for development of the "capability" to acquire conservation. That means planting the seeds of efficiency now so that a harvest of conservation can be reaped as the current surplus is consumed.

After a year of activity under the Power Council's 2-year action plan, we have demonstrated that regional planning works. While there were some implementation difficulties, some slippages in schedules, and yes, some differences of opinion at the technical level, nearly all of the 115 action items requested of BPA in the Council's action plan are on track.

This is gratifying to us. It is the result of cooperation and hard work by both BPA and the Council. The difficulties surrounding conservation in the commercial and irrigation sectors, and in the use of residential appliances, also appear to be on the road to resolution.

Less is more

The work is just beginning. In the future, we can have more low-cost power available for economic expansion, but only if we increase our capability to acquire greater efficiency.

BPA will do this, first, by increasing activity in pilot programs. Our targets for pilot programs now include: lighting, heating and cooling systems in residential and commercial buildings; motor drive and other process systems in industry; and irrigation systems in agriculture.

Second, by encouraging building practices that will yield a new generation of energy-efficient homes and commercial buildings. BPA and the region's utilities are currently working on a program to provide the necessary training and promotional tools to the homebuilding industry.

Third, by stimulating, through education and economic incentives where necessary, selection of state-of-the-art technology for powering new industry and commerce in the Northwest.

Fourth, by educating consumers about dollar savings to be attained from energy-efficient home appliances, and by encouraging manufacturers to produce such appliances.

Efficient use of resources fits perfectly with our way of life in the Northwest. Better use of our energy resources will enable BPA to hold down power rates, stimulate the Northwest economy, and fulfill Federal investment obligations.

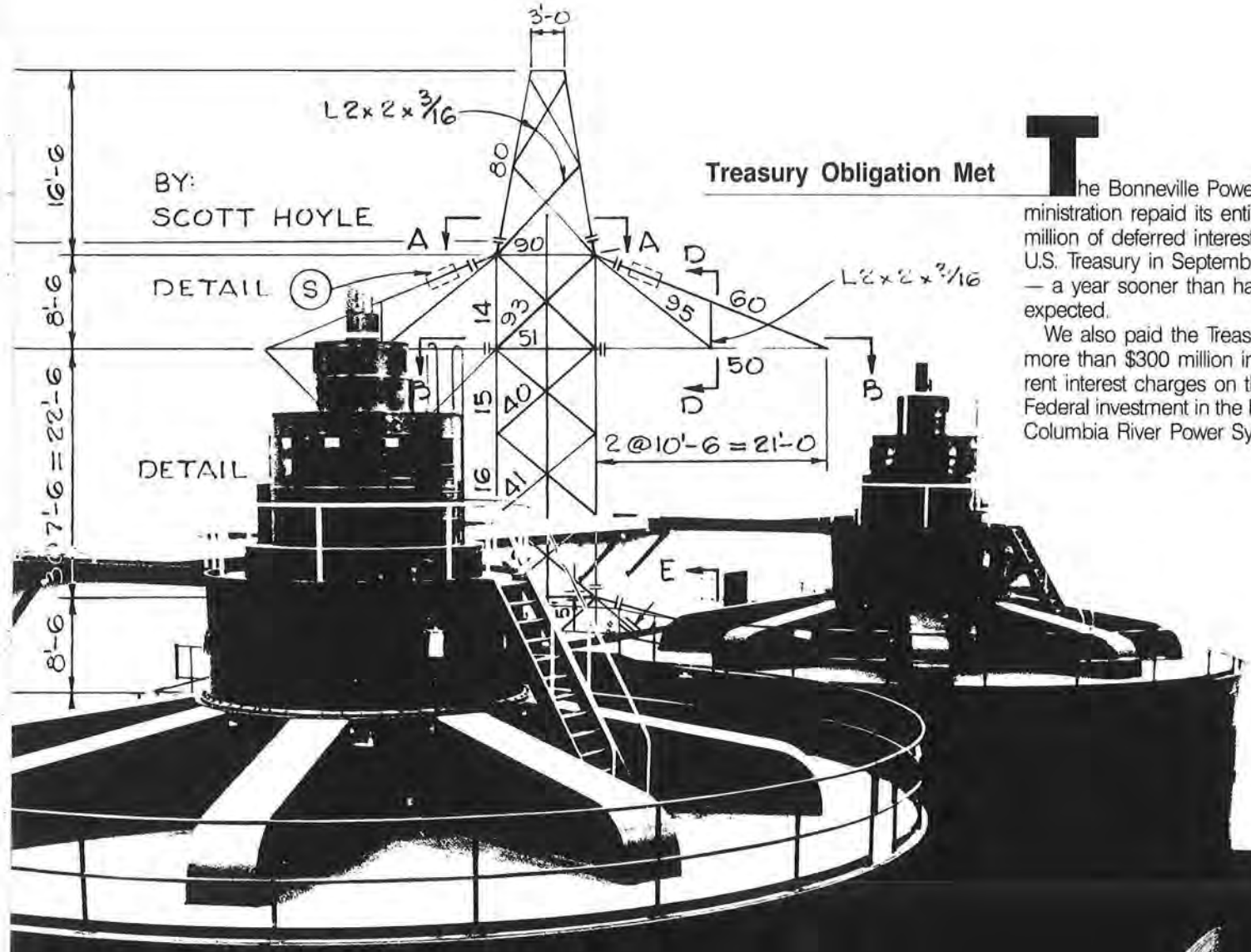
BPA is well positioned to achieve these goals.

Sincerely,

Peter T. Johnson

Administrator

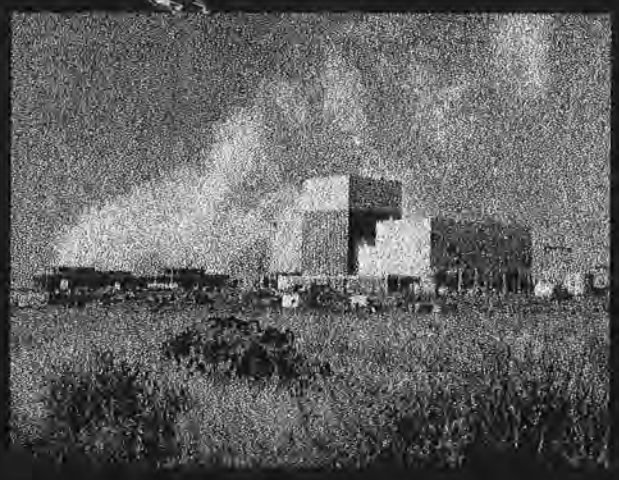
James Jura, executive assistant administrator: "BPA's employees achieved high productivity under demanding conditions in 1984."



Treasury Obligation Met

The Bonneville Power Administration repaid its entire $218 million of deferred interest to the U.S. Treasury in September 1984 — a year sooner than had been expected.

We also paid the Treasury more than $300 million in current interest charges on the Federal investment in the Federal Columbia River Power System.



We were able to make the entire interest payment in September because revenues came in as forecast and because our efforts held costs in check. We realized savings in the residential exchange program and in operations and maintenance. We held the line on plant costs and trimmed other expenses.

Refiguring the Exchange

BPA revised the method used to calculate the subsidy for the residential power exchange in 1984.

The exchange has provided more than $550 million in rate relief for customers of 9 investor-owned and 16 publicly-owned utilities since 1981 when it went into effect.

We finished revising the methodology in June. The Federal Energy Regulatory Commission (FERC) approved the revision in September.

The process began early in 1983 after BPA's 17 industrial customers and the Northwest Public Power Council asserted the old method of calculating the subsidy was not working. They asked BPA for a review with public input, and we were obligated to comply.

The Bonneville staff listened to more than 100 hours of public testimony and examined 7,000 pages of written documents submitted by parties and persons interested in the exchange. The staff then recommended the revision to the Bonneville Power Administrator.

The revision changed the method used to calculate exchange costs in that it no longer permits the investor-owned utilities to include income taxes in their generating and transmission costs, as was their practice before the methodology was revised.

In another major change, BPA tightened up procedures to insure that no costs are included for generating plants started but abandoned before completion.

The 1980 Pacific Northwest Power Act set up the exchange with the provision that BPA pay a subsidy to cover some of the resource costs of exchanging utilities. This subsidy is passed on directly to household customers of these utilities in the form of rate relief.

Most of the benefits have gone to five investor-owned utilities. From 1981 until the end of 1984, Portland General Electric received some $215.1 million, Pacific Power & Light $199.9 million, Utah Power & Light $49.7 million, Idaho Power $35.1 million, and Puget Sound Power & Light $15.3 million.

Here is a breakdown in percentages of the total distributed as of the end of the fiscal year: PGE 39.11 percent, PP&L 36.35 percent, UP&L 9.04 percent, Idaho Power 6.38 percent, and PSP&L 2.78 percent. Other private utilities received 1.85 percent. The 16 participating public utilities received 4.49 percent.

The utilities continue to receive the subsidy. Future benefits will total about $170 million a year. The three major investor-owned utilities — PGE, PP&L, and UP&L — will not be able to pass on as much of their cost to BPA.

Ed Sienkiewicz, power manager: "We made substantial progress in the areas of power marketing and transmission policymaking in 1984. Our objective is to adjust quickly and effectively to changing market conditions."

The investor-owned utilities have chosen to raise their rates to retail customers and thus pass on costs no longer covered by the subsidy. But the new method of calculating the subsidy is primarily affecting the rates of only three utilities — PGE, PP&L, and UP&L. Their rates are rising slightly because the subsidy has been trimmed back.

When the Congress set up the exchange program, the Act was intended to extend benefits of the Federal Columbia River Power System primarily to 2 1/2 million residential and small farm customers of investor-owned utilities in the Northwest. Congress sought to give these customers access to low-cost power generated at Federal dams on the Columbia River.

Most of the cost of the exchange has been borne by BPA's industrial customers. The industrial customers agreed to assume most of the burden from 1980 to July 1985 in return for an assured, long-term supply of power. Costs of the exchange not paid by the industries have been covered by other BPA rates. After July 1, 1985, the cost of the exchange will be spread over all classes of BPA wholesale customers, subject to the 1980 Act and its rate tests.

The Administrator's action and the Commission's approval will help to ensure a fair sharing of benefits of the Federal Columbia River Power System.

Rates Level as Construction Costs Decline

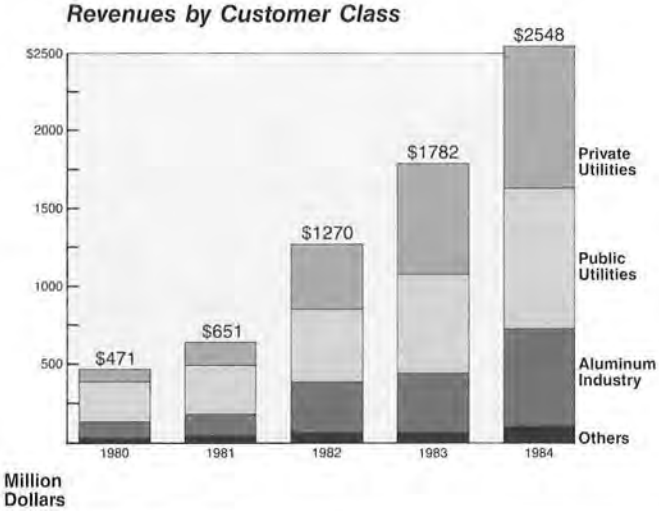
BPA's strong effort to rein in costs of the Supply System has greatly eased the upward pressure on rates. BPA is proposing a rate increase of only 3.2 percent for priority-firm power for the next rate period. Priority firm is the class of power sold to publicly, cooperatively, and investor-owned utilities for resale to household customers.

Several laws require BPA to set its rates at a level that will recover the U.S. Treasury investment in the Federal power system — with interest. The Congress also expects us to operate on a balanced budget. BPA's rates have been raised six times since they were first established in 1938.

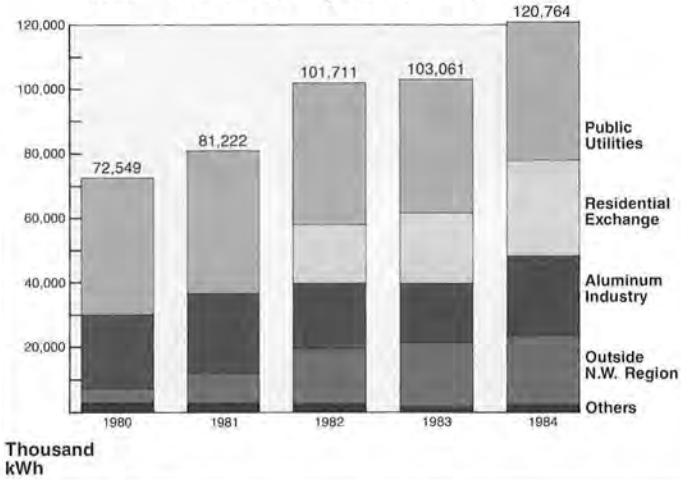
Existing rates will remain in force until the current, 20-month rate period ends on June 30, 1985. The new rate period will begin July 1, 1985, and end 27 months later on September 30, 1987. We opted for a longer rate period to restore stability to the rates.

BPA's initial proposal in September 1984 called for a boost of 10 percent in the priority-firm rate for the new period. This proposal was dropped to 3.2 percent in November when the Administrator decided — after a long study by his staff and an extensive public review — to exclude future construction costs of nuclear plants WNP 1 and 3 from the rate proposal. Construction of both plants has

Revenues by Customer Class



Kilowatt Hours Used by Customer Class



been suspended, and prior to the decision, BPA had assumed for planning purposes that construction of WNP 3 would resume in 1985 and WNP 1 in 1986.

The study reviewed construction schedules and financing assumptions. It confirmed that: (1) power from the plants will not be needed as soon as had been expected, and (2) future financing is not likely to be available at reasonable interest rates during the coming rate period.

Public hearings have been held on the rate proposal. Formal hearings began in the fall of 1984 and will continue into 1985. The rate process will be concluded in the spring when the new rates are filed for approval with the Federal Energy Regulatory Commission on May 1, 1985.

BPA's latest proposal for each class of power is:

	Current Rates (Cents)	Proposed Rates (Cents)	Percent Change
Priority Firm	2.2	2.27	+3.2
Industrial Firm	2.49	2.49	0
Surplus Firm	3.12	2.91	- 6.7
Nonfirm Energy	1.39	1.63	+17.3

Pacific Northwest electric rates have not been rising as fast as the Consumer Price Index, which measures the cost of living. Most electric rates in the Northwest are still lower than rates elsewhere in the country. Northwest residents pay an average of 3.4 cents per kilowatthour. The national average is about 7 cents.

Responding to Markets

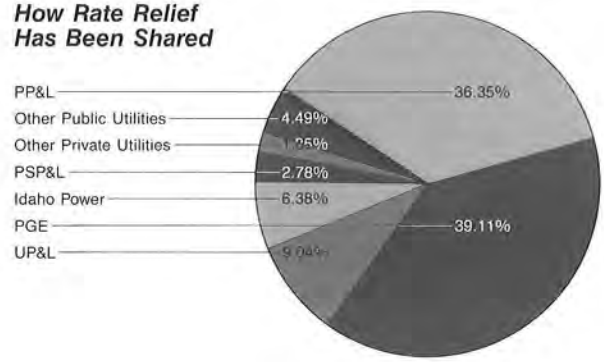
The Bonneville Power Administration activated an incentive rate for its industrial customers in 1984, based on a provision in its 1983 rate filing. A rate discount of a half cent (5 mills) per kilowatthour went into effect September 1. The discount will remain in effect until March 1, 1985. The incentive rate avoided a precipitous drop in revenue for BPA and kept as many as 3,000 Northwest aluminum workers on the job.

World aluminum prices began to decline unexpectedly early in 1984. The U.S. price slipped from a high of 80 cents a pound in January to 56 cents in July.

As the price tumbled, the six companies who produce aluminum in the Pacific Northwest cut production. They curtailed power purchases from 2,850 megawatts (MW) in March to less than 2,600 MW in July. This difference represented a drop in revenues of almost $5 million a month to BPA.

From Celilo, BPA staff monitor the flow of thousands of megawatts of Northwest power to California over the Intertie. Sales benefit North and South.

How Rate Relief Has Been Shared



Most industry analysts assumed the decline was temporary. They expected the price to go up again, for it had climbed to its January high from a 1980-82 recession low of 50 cents a pound.

But BPA thought otherwise. Internal and independent studies indicated the companies might reduce their power purchases to as little as 2,050 MW by September 1984 and 1,650 MW by February 1985. If the worst case had developed, BPA would have seen its monthly revenues drop $20 million below its July income. A drop of this size would have reduced employment within the industry by 3,000 jobs and affected many more jobs in allied and supporting industries.

A BPA team, composed of forecasters, rate experts, attorneys, and customer service people, studied a rate discount and determined that a 5-mill discount would keep most of the plants operating and raise BPA's revenues above what we could otherwise expect in a declining and difficult market. The staff polled the industry and confirmed this finding.

BPA announced it would lower its average industrial rate from 2.77 cents per kilowatthour to 2.27 cents if the industries would agree to consume about 2,700 MW. The companies signed up for a total of 2,640 MW.

Subsequent events have validated the wisdom of this action. World aluminum prices have continued to fall, but most Northwest aluminum plants have continued to operate at reasonably high levels.

Marketing the Surplus

A joint effort to sell more surplus power to Pacific Southwest utilities was set up in 1984 by a group of Northwest utilities and BPA.

Early last spring, Northwest utilities asked BPA to act as their agent for sales outside the region, and an arrangement was set up. The owner of each block of power sets its price. Other Northwest utilities may purchase BPA power and services to support regional exports even though they are not part of the agency export arrangement. The Northwest utilities and BPA are now negotiating with the Southwest utilities.

BPA also launched a concerted effort in 1984 to make nonfirm power more attractive to industrial customers. We are working with our utility customers to sell nonfirm power at low prices to industries. Some may purchase power for production purposes, and others may buy it in lieu of operating their own small generating plants.

We have also set up several pilot programs to furnish nonfirm energy to utilities for irrigation loads.

New Nuclear Plant in Production

A milestone in the history of Northwest power development was reached at 2:30 p.m. December 12, 1984. That was the hour the Washington Public Power Supply System Plant 2 entered commercial operation. Plant 2 is the third nuclear plant to begin supplying power in the Northwest.

Construction crews are out. Operating crews are in at WNP-2. The plant went into commercial operation in 1984. WNP-1 and -3 remain in preservation status.

The price of aluminum ingot has been on a rollercoaster for two years. BPA is competing for domestic production by offering lower rates when metal prices fall.

BPA has acquired all of the output of Plant 2 and the Hanford Generating Project and 30 percent of Trojan, a Portland General Electric Company nuclear generating plant near Rainier, Oregon. Plant 2 supplies more than $1 million worth of electricity to the BPA system each full day that it operates. The plant, which cost more than $3.3 billion to build, came on line 11 years after the Supply System received its construction permit.

A year of testing preceded commercial operation. The plant went from low power operation and testing to commercial production in just under 12 months. This was a better than average time for a nuclear plant in a power ascension phase. The industry average is about 14 months.

With the addition of this plant, there are now 80 nuclear plants in commercial operation in the United States. They have a total capacity of 64,500 megawatts and provide about 13 percent of the country's electricity. The three Northwest plants have a total capacity of about 3,000 megawatts.

Load Forecasts: Another Dip

BPA in 1984 produced its third annual 20-year forecast of how much power BPA must supply to meet demand. The forecast is one of a number of tools we use in setting rates and planning for acquisition of power resources.

The 1984 forecast reflects more uncertainty about the future of the economy than did the 1982 and 1983 forecasts. We are less certain as to how much energy Northwest industries will buy in the form of electricity or in the form of fossil fuels. The 1984 forecast shows a greater spread between its low case and high case, which represent the lowest and highest predicted growth.

The 1984 low case forecasts a total load of about 17,000 MW in the year 2000. The high case sees a total of 29,000 MW.

The 1984 median case forecasts a total load of 20,918 MW for the year 2000. This figure is down 900 MW from the 1983 forecast. It is 1,900 MW lower than the 1982 median forecast.

BPA planners prefer to use the range between the high and low predictions rather than the median case in the belief that a range makes for sounder planning.

BPA will continue to make these forecasts annually and compare them carefully with similar predictions by the Northwest Power Planning Council and the Pacific Northwest Utilities Conference Committee.

Agreement Reached with Canadians

During 1984, BPA and British Columbia Hydro executed a 10-year agreement on the use of Columbia River water stored in Canadian reservoirs. It provides for the filling of Revelstoke, for more storage space at Mica, and for use by B.C. Hydro, BPA and Northwest utilities of water stored at Arrow. In addition, B.C. Hydro agreed to repay BPA and Northwest utilities for water used in 1979 to fill B.C. Hydro's Seven-Mile reservoir.

The agreement gives BPA greater control over Columbia River hydro operations.

BPA reached an important agreement with Canada on upstream storage in reservoirs such as Duncan. BPA has a long history of cooperation with Canada in operation of the Columbia River system.

Power hums from Celilo in Oregon 846 miles to Sylmar in California. Microwave communications help operate the system. Sales should increase in years ahead.

Bonneville Dam and other facilities were built with Federal funds. In 1984, BPA repaid all deferred interest on the Federal investment. Principal is also being paid.

Projects Enhance Fish and Wildlife

BPA's program for fish and wildlife surged ahead again in 1984. The program has been gaining momentum since 1978 when we first assumed a direct role in support of fisheries. It has expanded rapidly since 1980 when Congress passed the Northwest Power Act.

The Act created the Northwest Power Planning Council and directed the Council to put together a plan to "protect, mitigate, and enhance" fish and wildlife resources, a plan now known as the Columbia River Fish and Wildlife Program. Congress called on BPA to furnish funds to enhance the resources — consistent with the program. It became BPA's responsibility to put about half of the fish and wildlife program's 220 measures into effect.

By 1982, BPA was managing 30 fish and wildlife enhancement projects. The number grew to 93 in 1983. BPA renewed 79 of the contracts in 1984 and added 53 new ones.

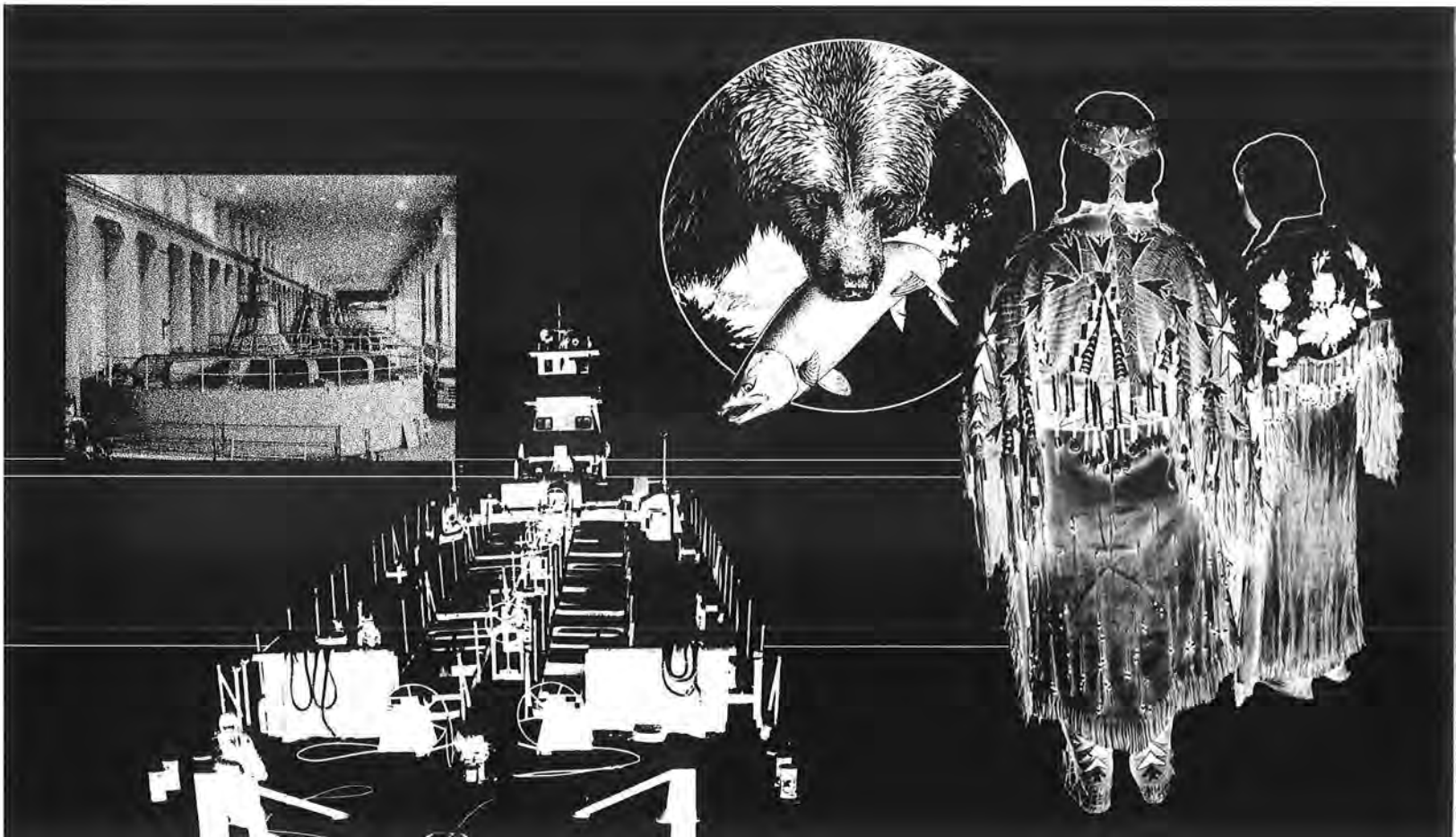
BPA committed $19.5 million to the program in 1984. Eighty-six percent of the 1984 obligations went to improve Columbia River salmon and steelhead runs in Washington, Oregon and Idaho. Nine percent was spent on upriver, nonmigratory game fish. The other 5 percent was used to identify the effects of hydroelectric projects on wildlife and to find ways to lessen these effects.

BPA, which has been paying for fish facilities at Federal dams since 1938, expended slightly more than $25 million on these facilities in 1984. Of this amount, about $11 million went for operations and maintenance expenses. About $14 million went to the U.S. Treasury for interest on the $410 million investment in the facilities.

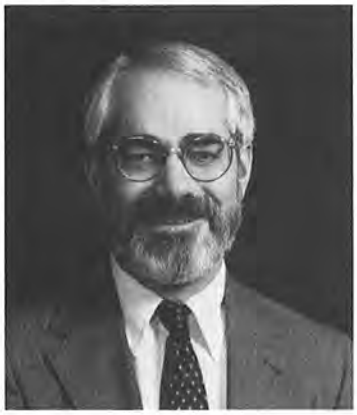
A major part of BPA's work in support of fish and wildlife addressed systemwide impacts in 1984. One such effort is the annual "water budget." It involves a series of well timed water releases from a number of dams to create river flows strong enough to carry millions of young salmon and steelhead downriver. The young fish are tracked, trapped, and examined carefully on their way downstream to improve their chances of survival.

Another project involved an agreement with The Washington Water Power Company and the Idaho Department of Fish and Game for a new kokanee hatchery on Idaho's Lake Pend Oreille. The hatchery will produce 2 million kokanee beginning in 1986. BPA and Washington Water Power will split the cost of constructing the hatchery. Idaho Fish and Game will operate it.

In the Flathead Valley in Montana, wildlife biologists slipped collars equipped with tiny radio transmitters around the necks of a number of adult, wild Canada geese. The biologists tracked the geese through the nesting season to gather information on how fluctuating water levels on Flathead Lake and some of the nearby rivers affect nests and goslings. Sudden releases of water to generate power can flood the nests or strand goslings on the shorelines where they may fall prey to predators.



Marvin Klinger, chief engineer: "Several technological achievements in 1984 are enabling BPA to expand the capacity and usefulness of the Intertie. We will continue to improve the system to meet marketing goals."



Money is being spent to increase hatchery production. Spectacular results are being achieved in disease control. Scientists made major breakthroughs in discovering the keys to disease control. One project promises to control a virus that kills millions of fingerlings.

BPA also is paying for work to rehabilitate streams for spawning salmon and steelhead. Seventeen projects are bringing damaged stream beds back into production.

Other projects are opening sections of rivers to migratory fish by removing log jams, bypassing barriers, and breaking up torrential chutes. On the Lower Umatilla, for example, crews blasted a narrow channel that will permit returning fish to move upstream when flows are low.

Irrigation works built over the past century along the Yakima River and its tributaries in eastern Washington have blocked the way to gravel spawning beds. These beds, which once supported annual runs of 600,000 fish, have escaped damage. But they now lie virtually unused.

BPA funded the first of 13 projects in the Yakima River Basin. The projects will make it easier for anadromous fish to get up and down the river and keep them from straying into irrigation canals. New screens are being installed to divert fish from the canals, and new fish ladders will be installed at irrigation diversion dams.

We continued to evaluate plans for hydropower projects in 1984 to determine how these new projects may affect fish and wildlife resources. These evaluations are incorporating new standards into power planning and marketing decisions and improving the long-range outlook for fish and wildlife resources.

BPA is making good progress in implementing the Council's Fish and Wildlife Program. The Council and BPA have found mutually satisfactory solutions to most problems.

Every measure of the program ready for implementation has been put into effect, often faster than was originally contemplated — with the help and cooperation of other State and Federal fish and wildlife agencies upon whom BPA has relied for expert assistance.

BPA is determined to protect the growing investment in fish and wildlife resources and secure the maximum return from this investment.

A new generation of Yakima Indians will benefit from restoration of fish runs on the Yakima River. BPA is engaged with other entities in improving passage and spawning.

If only he could speak, what secrets he would tell. BPA sponsors programs to unravel the complex biology of migrating fish, hoping to bring back big runs.

Conserving Electricity

BPA has now completed the first year of effort under the Northwest Power Planning Council's first Two Year Action Plan. The plan contains a number of specific actions BPA was asked to undertake to build its capability to acquire cost-effective conservation and generating resources. Most of the actions have been completed or are underway. A few are still being analyzed to determine how to best achieve the Council's objective.

The current power surplus, which is expected to last into the 1990s, has given the Northwest time to try new approaches to conservation. BPA intends to be ready to put tested and proven conservation methods into effect when the surplus finally dwindles away. We are emphasizing: (a) pilot programs and demonstration projects to learn how to implement very large programs regionwide; and (b) home weatherization programs that improve the long-term use of electricity in the region.

The Hood River Project

One of the pilot projects is the Hood River, Oregon, project, a 2-year, $20-million effort to discover how much electricity can be saved in a short-term, intensive project. BPA is paying the full cost of insulating and tightening electrically heated homes in the community to very high levels.

So far, the owners of 2,400 homes — out of a possible 3,100 — have agreed to take part. Insulation being installed measures 16 inches deep in ceilings, 13 inches under floors, and up to 6 inches inside walls — whenever it can be fitted into the available space.

Crews are also installing triple-glazed windows, caulking, weatherstripping, dehumidifiers, heat exchangers, switchplate gaskets, electric waterheater wraps, waterflow regulators, and flow restrictors for shower heads.

BPA has teamed up with two utilities, Pacific Power & Light and the Hood River Electric Cooperative, to get the work done. PP&L is the prime contractor.

The Hood River Project is probably the most comprehensive home weatherization program in the United States. It was planned jointly with the Northwest Power Council, Northwest Public Power Association, Pacific Northwest Utilities Conference Committee, and the Natural Resources Defense Council.

Other Residential Weatherization

A broader and less intensive weatherization program has been under way throughout the region since 1981. Under this program, 100 utilities — using BPA funds and working with private contractors — weatherized 30,000 Northwest homes in 1984. The homes included 2,800 low-income units.

The owner of an average home in this program has seen his or her electric bill drop by $150 a year. The program is already saving the Northwest some 50 average megawatts a year.

BPA changed some of the program's basic provisions in 1984. It increased the amount paid to weatherize low-income homes to 100 percent of cost, and it limited its contribution for all other dwellings to 85 percent of cost.

BPA also completed an expanded version of its original environmental impact statement on weatherizing homes. The latest version addresses indoor air pollution. While preparing the report, BPA funded a 3-year study on the effects of such home tightening measures as storm windows, caulking, weather-stripping, and wall insulation.

In town and country, BPA moved ahead with the Hood River Project. BPA hopes to learn much about providing weatherization services in this typical rural Northwest setting.

Conservation programs are managed by BPA's area and district offices. BPA employees help students get in touch with the energy they consume by learning how it is made.

George Tupper, regional operations manager: "Good communication with utilities, local governments and the public is more important today than ever before. Area and district offices are strengthening this vital link with customers."

These measures were disallowed in most homes under the original BPA weatherization program. The study showed that tightening measures can increase the concentration of pollutants inside a home. But it also showed this pollution can be held to an acceptable level.

As a result, BPA expanded its program to include tightening measures for all electrically heated homes. The move made 1.2 million more homes eligible for full weatherization. Only 372,000 homes were eligible under the former program.

BPA will work with owners of tightened homes to monitor the presence of radon gas, which occurs naturally in soils beneath houses. BPA will help homeowners obtain air-to-air heat exchangers when measurements show a need to reduce radon concentrations.

The residential weatherization program is saving electricity and money, providing greater comfort, and raising property values.

Institutional Buildings

During 1984, BPA paid for 245 detailed audits of institutional buildings operated by state or local agencies and public institutions. It also fitted 44 such buildings with energy saving energy saving measures. We estimate savings of 4 average megawatts a year for as long as the buildings are used. BPA pays for the training of auditors, the audits, and the installation of energy saving measures.

Street and Area Lights

BPA paid for the installation of 10,000 energy efficient street and area light fixtures in 1984. Less-efficient mercury vapor, fluorescent and incandescent lamps are being replaced with more-efficient sodium and metal halide lamps. More than 250,000 lamps have been converted since this program began. Utilities are reimbursed by BPA for the cost of conversion.

Residential Standards Demonstration Project

Pursuant to the 1980 Northwest Power Act, the Northwest Power Planning Council has developed a set of home construction standards which it calls the Model Conservation Standards. The standards set a limit on the amount of electricity used for space heating. Homes constructed to meet these standards cost more to build, but they are more economical in the long run because they use less electricity.

BPA is paying the added cost of constructing 450 homes to these standards at various places in the Northwest as part of a demonstration project. So far, 368 homes have been started, and some have been completed and sold.

Model building code standards will help bring about a revolution in the home construction industry. Tacoma adopted such standards, which mean lower monthly costs for homeowners.

Residential savings are a major thrust of the BPA conservation program. But improvement of commercial buildings also promise significant energy savings.

An electrical worker installs an energy-efficient street light. BPA paid for the installation of 10,000 such lamps in 1984 as part of the region-wide effort to conserve electricity.

Construction of the homes will give builders and homeowners a better idea of construction costs and a clearer indication of how much energy can be saved. It also gives the builders an opportunity to learn the new techniques that are required.

BPA has paid for training sessions that have been attended by more than 1,000 builders. More sessions are scheduled.

Tacoma Adopts Model Conservation Standards

The City of Tacoma adopted the Council's Model Conservation Standards in November 1983 and incorporated them into its building code this past June. It was the first local government to do so.

BPA has given Tacoma a $2.6 million grant to help put the standards into effect. The City will pass $1.8 million of the grant through to builders or buyers in the form of incentives to offset the added construction cost of meeting new and higher standards.

New electrically heated homes in Tacoma City Light's service territory will have to meet the standards as a condition of electrical service.

Tacoma is a testing ground where BPA hopes to develop concepts that can be applied throughout the Northwest.

Super Good Cents

"Super Good Cents" is a regional marketing program for new electrically heated homes built to the Model Conservation Standards. The typical Super Good Cents home built in western Washington or western Oregon will cost $150 to $200 a year to heat. It will be more comfortable, less drafty, and quieter than most older homes. Its resale value will be higher.

Local utilities will assist builders by promoting and certifying Super Good Cents homes. BPA plans to help local utilities in this effort and advertise the benefits of Super Good Cents homes to potential buyers.

Energy Savings for Businesses, Farms, and Industries

BPA has retained 15 private contractors to audit commercial buildings in the service territories of 26 utilities. The purpose is to identify ways electric energy can be conserved.

BPA also is developing and testing financial incentives to encourage conservation in commercial buildings. In one project, BPA is purchasing energy savings from 29 commercial buildings. In another case, BPA is developing a project to test the effectiveness of providing no-interest loans to commercial building owners for the installation of energy conserving measures.

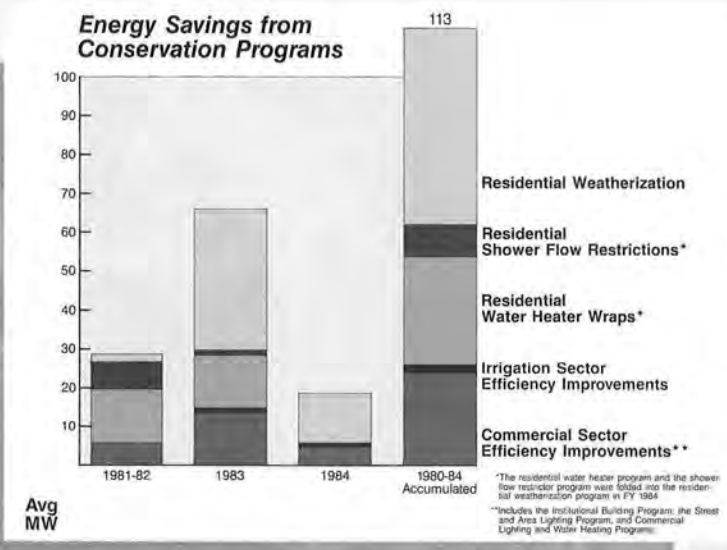
To accomplish a similar program on irrigated farms, BPA has hired specialists to inspect the irrigation systems and iden- and identify potential savings. Twenty-six of BPA's utility customers are taking part. Incentives are being paid to farmers to improve their systems.

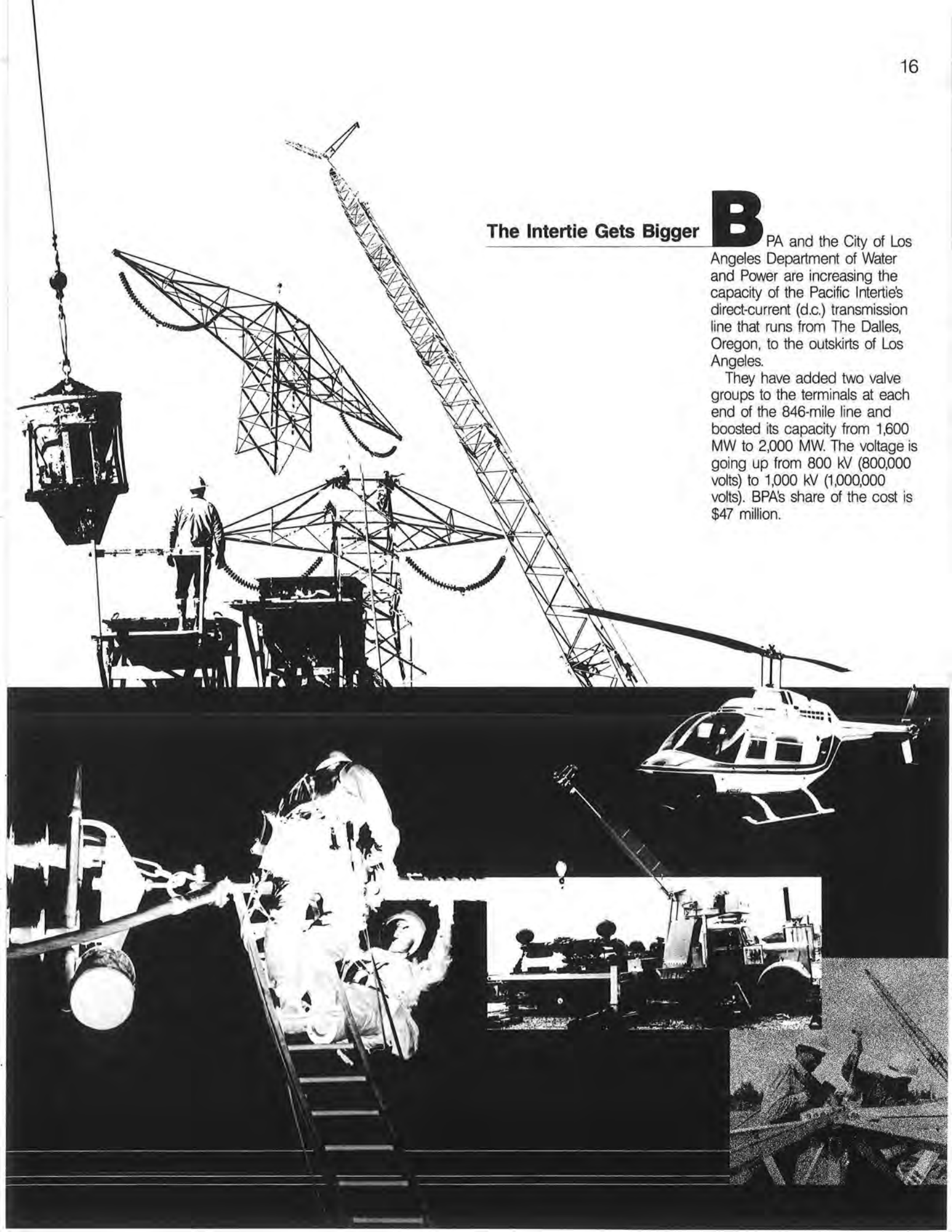
On the industrial front, BPA has hired five contractors at a cost of $700,000 to conduct 25 energy analyses of Northwest wood products, pulp and paper, and food and food processing industries.

BPA has many other smaller, but similar programs under way. They include study, pilot, demonstration, and research and development projects. All will teach us how to use electricity more efficiently. BPA hopes to establish models the entire nation will find useful.

The table below tallies energy savings that have resulted from BPA's conservation program.

City of Tacoma employees inspect the site of a future Super Good Cents home. The new concept is producing superior homes, conserving electricity.





The Intertie Gets Bigger

BPA and the City of Los Angeles Department of Water and Power are increasing the capacity of the Pacific Intertie's direct-current (d.c.) transmission line that runs from The Dalles, Oregon, to the outskirts of Los Angeles.

They have added two valve groups to the terminals at each end of the 846-mile line and boosted its capacity from 1,600 MW to 2,000 MW. The voltage is going up from 800 kV (800,000 volts) to 1,000 kV (1,000,000 volts). BPA's share of the cost is $47 million.

The valves convert alternating current (a.c.) to direct current and send it out over d.c. lines. Valves at the other end convert it back to alternating current.

The equipment, energized for test in November, is scheduled to begin operating at 1,000-kV in February 1985.

The Pacific Northwest-Pacific Southwest Intertie consists of two 500-kV alternating-current transmission lines and the direct-current line. These three lines run from The Dalles, Oregon, to southern California. They have a total carrying capacity of about 4,300 megawatts, or enough capacity to supply four cities as large as Seattle. BPA owns most of the Intertie capacity north of Oregon's southern border.

The three existing Intertie lines have been loaded to peak capacity or close to it for several years. Their total capacity will be raised from 4,300 MW to 4,700 MW when the voltage is increased in February.

Congress has also authorized an additional, major expansion of the two d.c. terminals. This will increase the d.c. line's capacity from 2,000 to 3,100 MW and bring the total capacity of the Intertie up to 5,800 MW. This expansion project is to be completed in 1988.

BPA expects to spend $111 million to expand the northern terminal. Los Angeles and its southern partners will invest a similar amount at their end.

The total cost will exceed $220 million, but BPA and the other sponsors foresee a fast payout. The total benefits are expected to average $60 million a year.

Congress has also authorized the Secretary of Energy to work toward the construction of a third a.c. Intertie line. It is to run from Oregon to central California. Line segments already built in Oregon will become part of this line. The third a.c. line will add 1,600 MW of capacity to the Intertie and raise its total capacity to about 7,400 MW.

The effort to obtain congressional approval for expansion of the Intertie has been spearheaded by members of the Northwest congressional delegation, led by Senator Mark Hatfield of Oregon and Senator Dan Evans and Congressman Norm Dicks of Washington.

The expansion will enable the Northwest to sell more surplus power in the Pacific Southwest. The sales will help to hold down rates for Northwest consumers and result in long-term benefits worth hundreds of millions of dollars to both regions.

New Policy Governs Use of the Intertie

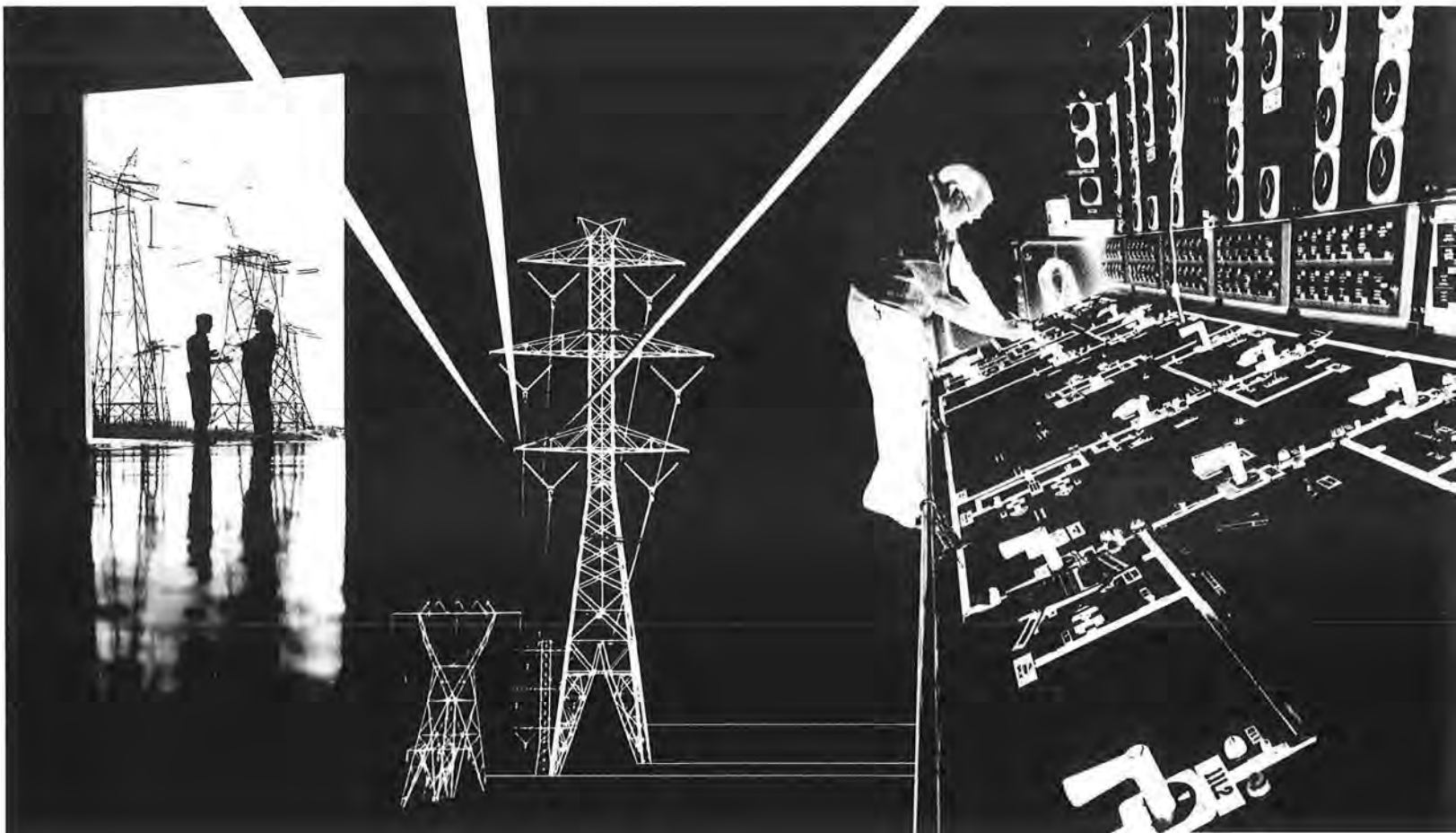
BPA in 1984 adopted a new access policy for the Pacific Intertie — on a near-term basis — and set out to nail down a long-term policy. These moves are restoring a measure of balance between the Pacific Northwest and Pacific Southwest, which share the benefits of the Intertie.

The access policy's major purposes are to:

(1) Protect the financial integrity of the Federal Columbia River Power System;

(2) Assure BPA access to the Pacific Intertie so BPA may fulfill its obligations and responsibilities; and

(3) Help assure that BPA will be able to sell power to Pacific Southwest utilities at prices close to the cost of producing and transmitting this power.



Stephen Ailshie, financial manager: "Bonneville's improved fiscal performance in 1984 was good news for several reasons, not the least of which was our ability to make substantial payments on U.S. Treasury obligations."

BPA is now selling large amounts of its firm surplus power for an average of 2.6 cents per kilowatthour. It is selling nonfirm power to Southwest utilities for about 1.8 cents per kilowatthour. In the past, BPA sometimes found itself selling power to California at prices below current production and transmission costs.

The rates still provide substantial savings to Southwest utilities who pay more than these average amounts for power from other sources.

The new access policy sets up procedures for utilities and BPA to receive firm and nonfirm access to the Intertie. BPA determines the amount of Intertie capacity available for access by others consistent with the needs of the Administrator's power marketing program, operating limitations, and existing contractual obligations. If the surplus power from BPA and Pacific Northwest utilities will not fill the Intertie, utilities from outside the Northwest States may gain access to the unfilled portion.

The near-term policy gives Northwest utilities an opportunity to dispose of their respective surpluses while providing assurance that BPA will have access to a portion of its own Intertie capacity.

The World Gets a Giant Switch

BPA in 1984 played the lead role in an important technical breakthrough that will have an almost revolutionary impact on transmission systems throughout the world. It led the development and testing of the world's first extra high-voltage, direct-current circuit breaker. The breaker will allow the operation of long-distance, multi-terminal d.c. transmission lines.

If d.c. breakers had existed before the Pacific Intertie came into being, the 846-mile d.c. line that runs from The Dalles, Oregon, to Los Angeles could have been tapped with branch lines to serve San Francisco, Phoenix, and Salt Lake City. The branch lines were impractical when the d.c. line was built in 1970 because there were no breakers to isolate individual lines during faults.

Two prototypes of the breaker have been built, one by Brown Boveri of Switzerland and the other by Westinghouse. Both were successfully tested on the Intertie's d.c. line last spring.

In 1984, BPA completed a 200,000-volt upgrade of the direct-current Intertie with California. It included installation of new equipment to control the system.

Former BPA Administrator Charles F. Luce is shown at a 1960s meeting dealing with the Pacific Northwest-Pacific Southwest Intertie. He played a key part in getting the Intertie built.

Most of the world's electric power is transmitted on alternating-current (a.c.) lines. They can be switched on and off. Alternating current reverses its flow 50 or 60 times a second (60 in the U.S). For an instant, just as the current changes direction, the current reaches a zero point where the flow stops. High-speed circuit breakers can seize on this instant and switch off the electricity. Thus, a.c. breakers were relatively easy to develop. They have been in use for years.

Low voltage d.c. breakers also have been around for a long time. But until this year no one had been able to come up with a high voltage d.c. breaker that worked. At higher voltages, d.c. tends to sustain an arc over large gaps. At 800,000 volts, even if one draws the contacts 50 feet apart, direct current is likely to continute to flow across the gap — snapping and twisting like lightning.

This problem was solved by engineers from BPA, Brown Boveri, Westinghouse, and the Electric Power Research Institute (EPRI) of Palo Alto.

They figured out how to apply a counter voltage to the arc with the help of capacitors and bring the current to the zero point with the aid of zinc oxide resistors — for an instant. At that instant, the switch opens and the line is disconnected.

The breaker can interrupt a flow of energy large enough to supply two cities the size of Seattle.

There are certain applications where engineers find it advantageous to use direct-current transmission. D.c. costs less when power is being sent very long distances, say, a minimum of 400 or 500 miles. And it avoids the troublesome problem of synchronizing a.c. systems when they are connected to one another.

The program to develop the breaker was sponsored jointly by BPA and EPRI. Part of the funds came from the U.S. Department of Energy.

Colstrip

Construction of the Colstrip 500-kV circuits continued in 1984. Four major construction contracts totaling more than $44 million were awarded to build sections the 157-mile double-circuit line between Garrison and Taft substations.

In addition, most of the preconstruction work, such as surveying and locating tower sites, has been completed for a single-circuit 500-kV line that will run from Taft Substation in western Montana to Bell Substation near Spokane, a distance of 97 miles.

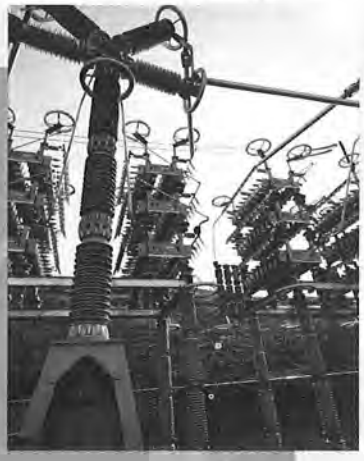
The design work for this line will be finished and the right-of-way acquired in 1985. Construction will follow in 1986 and 1987.

Garrison Substation

The construction of Garrison Substation entered its final phase in 1984. The work remaining includes the installation of series capacitors, three more circuit breakers, and a reactor. They will be energized in the fall of 1985.

Garrison is one of the largest substations on the BPA system. It was built on a 40-acre site on a windswept hill 7 miles south of Gold Creek in western Montana.

BPA in 1984 played the leading role in developing this new high-voltage direct-current circuit breaker. The giant switch is an important breakthrough in transmission technology.



Installation of new solid-state thyristor converter valves boosted the direct-current Intertie with California by 200,000 volts. The improvement will pay for itself in less than five years.

George Bell, administrative manager: "Construction of BPA's new headquarters building began in 1984. A lot of work went into planning a facility that will allow Bonneville to operate more efficiently and at lower cost."

The transformer bank, which consists of three large transformers and a spare, has a total capacity of 1,000 megavolt-amperes. The bank will step the voltage down to 230 kV to serve four lines, two of which are owned by BPA and two by Montana Power Company.

Solar power is used to heat the headquarters and maintenance building at Garrison Substation. The building's attic contains 10 huge 600-gallon water tanks that capture heat from the sun's rays. The rays enter through windows. Warm air from the attic is blown to the various rooms. The solar system will save BPA about $17,000 a year in heating costs and conserve enough electricity to serve 18 homes.

Taft Substation

BPA has constructed a single large building to house the entire 500-kV Taft Substation. The building measures 50 by 196 feet. Part of it is three stories high.

Gas-insulated equipment, which requires much less space than traditional equipment, is being installed in a large hall within the building. The use of this equipment has reduced the amount of land required for the substation from a total of 38 acres to 10 acres.

The substation site is in the Lolo National Forest near the Idaho border. It is about 4 miles from Interstate Highway 90.

The decision to put the substation under one roof was made because of heavy snows. They average 8 feet deep at the site.

The substation is scheduled to be energized in the fall of 1985.

New Facilities

Bonneville placed 7 new substations, 107 substation additions, and 337 circuit miles of new transmission lines in service in fiscal 1984.

One undertaking, Scarcello Substation, was a rush project brought on by a decision of Louisiana Pacific to start up its new Chilco Mill near Twin Lakes, Idaho, in 1984 instead of 1986. BPA met the schedule despite delays in acquiring land and equipment, unforeseen problems caused by poor soil conditions, and severe winter weather during construction.

New lines completed in 1984 included the 92-mile Townsend-Garrison double-circuit 500-kV line, the 46 mile Paul-Satsop 500-kV line, the 19-mile Fairview-Rogue 230-kV line, the 39-mile Fairview-Bandon 115-kV line, and the 46-mile Bandon-Rogue 115-kV line.

Workmen install electrical equipment at Garrison Substation in Montana. Construction of the substation, one of the largest on the BPA system, entered its final phase in 1984.

This is one of the structures at Taft Substation in western Montana. The substation, which is equipped with gas-insulated equipment, will be energized in 1985.

When the fiscal year ended on September 30, BPA had a total of 14,093 circuit miles of transmission lines and 382 substations in operation.

Of this total, approximately 4,038 miles were operating at 500 kV, 709 miles at 345 kV, 1,450 miles at 287 kV, 3,796 miles at 230 kV, and 92 miles at 138 kV. About 265 circuit miles are part of the Pacific Intertie's direct-current line. The remaining 3,743 circuit miles are operated at 115 kV or at lower voltages. The system has 61,471,691 kVA of transformer capacity.

A New Way to Read Meters

As recently as 1981, we recorded all our power deliveries to utilities by reading meters. All 430 meters were read periodically by substation operators who filled out meter slips by hand and mailed them to BPA headquarters in Portland.

In Portland, information on the slips was keypunched into cards and fed into a general purpose computer. The computer calculated the power bills and printed monthly statements that were sent to BPA's customers.

Today, we read meters with a master computer and 185 remote units. The remote units record the power deliveries. The dedicated computer simply dials the telephone numbers of these units and calls up the recorded figures.

About 300 more remote units will be installed by December 1987. Customers will be billed automatically. The new system will shorten the billing cycle by several days — and save BPA about $500,000 a year.

New BPA Headquarters Building

Construction of a new headquarters building for BPA began September 4, 1984.

As the year came to an end, workers were completing the excavation and pouring the footings for the new structure.

The building is being built on what was once a parking lot south of BPA's present headquarters. It is to be completed by August 1986. We are scheduled to begin moving into the new building in November 1986.

BPA's new home is designed to be one of the most energy-efficient buildings in the nation. Its 368,000 square feet of floor space will enable us to consolidate our headquarters offices under one roof.

The building will have seven stories above ground, a basement level for light industrial shops, and two basement levels for parking. It will be equipped with a high-tech communications system.

The General Services Administration has awarded the $35,500,000 construction contract to Blount Brothers Corporation of Montgomery, Ala.

Doing Things Better For Less Money

Buckley Substation in central Oregon has been in operation for more than a year now. Most of the equipment at Buckley is insulated with a gas, sulfur hexafloride, instead of air. It was the first major gas-insulated substation to go into operation on the BPA system.

Larry Hilberg (left), Keith Hartner and Dana Fox of BPA work with a new automated metering system that speeds up data flow and billings, saving time and money.

In the fall, construction crews went to work on the site of BPA's future headquarters building, just south of the existing structure. The new building is scheduled for completion in 1986.

Steven Hickok, conservation manager: "Conservation is our swing resource short-term and our most cost-effective source of energy long-term. We are pressing ahead with pilot programs and demonstration projects to meet future needs."

BPA's Office of Regional Operations recently reported that even though the gas-insulated equipment in Buckley Substation is more complex than air-insulated equipment, it is proving to be more economical to own and operate. As a result, we believe many more gas-insulated substations like Buckley will be built to meet future requirements.

Our Regional Operations people also report that elsewhere on the system they are using more infrared monitoring systems to detect hot spots in substations. Often, a rise in temperature indicates that a piece of equipment needs attention or is about to fail.

The infrared systems are reducing the failure rate, shortening downtime, and cutting the number of man-hours required to keep equipment operating.

The operations staff has nearly finished installing equipment that will monitor the performance of BPA's seven microwave communication channels. Like nerves in the human body, the microwave circuits control the operation of the system's various parts. They control hundreds of individual pieces of equipment at more than 380 substations. The addition of the microwave monitoring equipment strengthens our control system and makes the whole electrical system more reliable.

Regional Operations saved 600 man-hours in 1984 through the introduction of a new program to test static single-pole relays. The relays are used to sense electrical disturbances and switch off valuable equipment before it suffers extensive damage. We plan to expand this new relay testing program because we believe it may save as much as 10,000 man-hours in a single year.

Regional Operations set up an unusual work arrangement this year that is reducing overtime and overhead. It gave 22 persons, mostly communications engineers, a chance, if they wished, to work a 40-hour week in longer shifts.

The employees are working an average shift of 11 hours. The arrangement keeps specialists on a work site for longer periods and increases the expertise present at any one time. This makes it easier for management to juggle the special skills necessary to get the work done in a hurry.

As a result, the work is getting done faster. Morale is up. It has become easier to recruit new workers and keep them on the job after they are employed. The workers like the arrangement because part of their leisure time comes in bigger chunks.

An artist's rendering of the "Federal Building East" shows the structure as it will look when completed in 1986. The building will bring BPA headquarters employees under one roof.

Maintenance is key to operating one of the most reliable high-voltage electrical systems in the world. BPA crews keep more than 14,000 miles of line and nearly 400 substations humming.

The Public Becomes More Involved

Since passage of the Northwest Planning Act in 1980, BPA's public involvement program has grown into one of the largest programs of its kind in the Federal government.

In light of this rapid growth and to make sure the program was truly effective, we hired a nationally recognized public involvement consultant, James L. Creighton, in 1983. He conducted a comprehensive study of the methods we use to involve customers, ratepayers, and other interested persons in our decisions.

When his study was complete, his findings and recommendations were sent to BPA's Policy Committee. The Committee approved five actions, one of which calls for professional training for about 400 BPA employees by December 31, 1986. The study is having considerable impact on BPA policymaking.

For example, the public was asked to help define what assumptions BPA should make on construction schedules for the suspended Washington Public Power Supply System nuclear plants 1 and 3.

BPA opened the process in May by asking the question: "What factors should BPA consider in putting together our study of the plants?" The answer came from a wide range of persons — from unemployed construction workers to utility managers, ratepayers, and stockholders — representing a diversity of interests. About 400 persons responded at meetings in Seattle, Portland, Eugene, Richland, Burley, and Missoula.

A technical audience formed around the issue, and as a result of the comments we received, we revised our study plan. A draft of the study was released in September for another round of public meetings. This time, we asked: "Are our proposed assumptions, processes, conclusions, and recommendations valid?"

We received hundreds of comments and analyzed all of them. During this process, the public was invited to review specific alternatives and remain involved while a policy was developed. The effort was highly successful, and BPA intends to use it as a model for future programs.

To help explain regional power issues in nontechnical terms, the BPA Office of External Affairs began publishing 4-to-8 page pamphlets called Issue Alerts and Backgrounders in late 1983. They are intended to be timely, concise, and highly informative. The pamphlets gained great popularity with the public. In 1 month alone, we mailed out several thousand Issue Alerts and Backgrounders to people on our mailing lists and responded to 1,760 requests for additional copies.

The number of contacts we have with the public and the number of comments we get back are increasing. The quality of the comments and the material they offer has also improved. The number of telephone calls has jumped from an average of some 90 calls a day to 127. In one month alone, 274 members of the public visited BPA's public reference room in Portland.

BPA seeks to consult the public before making important decisions. Comprehensive analyses and improvements of the public involvement program were made in 1984.

A newly reorganized External Affairs Office retreats to plan more effective communication with public interest groups, the press, governments and the public.

Financial Section

Basis for Financial Reporting

BPA prepares financial statements for FCRPS to report its financial condition as if it were a public utility. The financial statements are independently audited by the firm of Arthur Andersen & Co., Certified Public Accountants, in accordance with generally accepted auditing standards. The financial statements with the auditors' opinion appear on pages 33 through 44. Graphs of financial results on this basis appear on pages 24 and 26. Power rates, however, are based on the FCRPS Revenue Requirement Study (Table 4, pages 30 and 31).

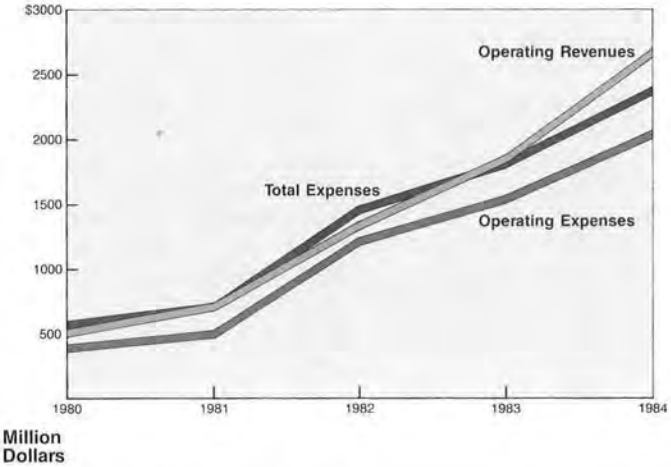
The financial statements show historical results, while the Revenue Requirement Study shows projected costs to be recovered from rates. The Revenue Requirement Study on pages 30 and 31 considers BPA's obligation to recover costs and sets a revenue level sufficient to meet those obligations through FY 1985. Costs include operation and maintenance, purchase and exchange power, and interest and payment of the FCRPS investment in power generating, conservation, and transmission facilities. The two sets of financial reports measure different things; historical results in the financial statements and projected obligations in the Revenue Requirement Study.

There are two differences between the financial statements and the Revenue Requirement Study. The financial statements include depreciation of the power facilities over their expected useful lives, which may extend up to 100 years. The repayment policy (see page 29), however, requires that the investment in power facilities be paid within 50 years of each facility being placed in service. Also, conservation costs that are included in operation expense in the financial statements are scheduled for recovery as amortization in the Revenue Requirement Study.

Revenue Requirement Study

The Revenue Requirement Study (Table 4, pages 30 and 31) is the Final Revenue Requirement Study using rates from the 1983 Wholesale Power and Transmission Rate Proceedings. On September 14, 1984 the Federal Energy Regulatory Commission (FERC) approved the proposed rate increases on an interim basis. Adjustments to this study reflect the actual results through FY 1984 and planned payments in FY 1985.

Revenue and Expense Trend



Electric Energy Account Table 1
Fiscal Year 1984

Energy Received (Millions of kilowatt hours)	
Energy Generated for BPA (Excludes Residential Exchange)	
Bureau of Reclamation	22,230
Corps of Engineers	67,382
WNP No. 2	485
Hanford Steamplant (NPR)	3,556
Centralia Thermal Project	428
Trojan Nuclear Plant	1,479
Other Generation	521
Power Interchanged In	49,209
Total Received	145,290
Energy Delivered (Millions of kilwatts hours)	
Sales (1)	87,689
Power Interchanged Out	53,971
Used by Administration	70
Total Delivered	141,730
Energy Transmission Losses	3,560
Total	145,290
Losses as Percent of Total Received	2.45%
Maximum demand on generation (kilowatts)	17,584

(1)Based on actual billings. Excludes residential exchange and accounting accruals.

Generation by the Principal Electric Utility Systems of the Pacific Northwest (1) Table 2
Fiscal Year 1984

Utility	MWH	Per Cent of Total
Publicly Owned:		
Federal Columbia River Power System (2)	97,900	52.4
Grant County PUD	10,000	5.3
Chelan County PUD	9,000	4.8
Seattle City Light	7,000	3.7
Douglas County PUD	4,000	2.1
Tacoma City Light	3,000	1.6
Eugene Water and Electric Board	500	0.3
Pend Oreille County PUD	500	0.3
Total Publicly Owned	131,900	70.5
Privately Owned		
Pacific Power and Light	15,600	8.4
Idaho Power Company	16,100	8.7
Montana Power Company	7,200	3.8
Portland General Electric	8,300	4.4
Washington Water Power Company	5,500	2.9
Puget Power and Light Company	2,500	1.3
Total Privately Owned	55,200	29.5
Total Generation	187,100	100.0

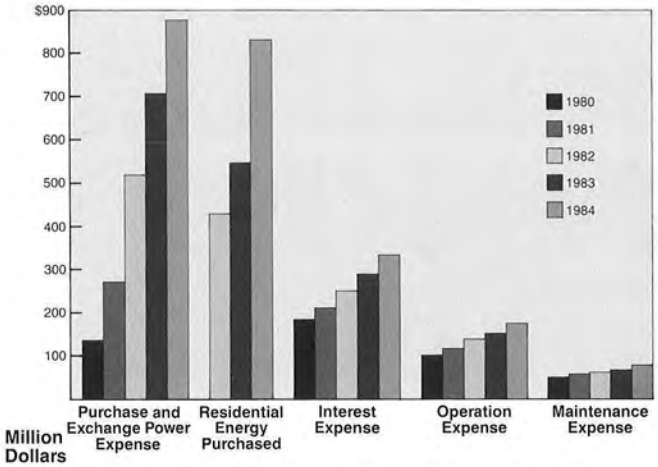
(1) Generation shown is for members of the Northwest Power Pool plus Pend Orielle County PUD and the Washington Public Power Supply System. Utah Power & Light Co., British Columbia Hydro and Power Authority, West Kootenay Power and Light and Trans Alta Utilities, who are members of the Power Pool, are not included because their service areas are outside the Pacific Northwest.

(2) Includes: Washington Public Power Supply System's nuclear plant (WNP-2), Hanford steam plant (NPR), and Packwood hydro plant; the Okanogan PUD share of Wells; the municipality shares (Forest Grove, McMinnville, and Milton-Freewater) of Priest Rapids and Wanapum; the Kittitas PUD share of Priest Rapids; the Snohomish PUD share of the Centralia steam plant and the Jackson hydro plant: the federal share of the Trojan nuclear plant; the Clark County PUD-Great Western Malting co-generation project; and the Seattle City Light and Tacoma City Light shares of Southern Columbia Basin Irrigation hydro generation.

Sales of Electric Energy ($000) Table 3

Customer	Capacity Sales		Energy Sales	
Northwest Region Municipalities	MW	Revenue	MWH	Revenue
Albion, ID	8	$32	3,326	$49
Ashland, OR	285	1,114	126,714	1,819
Bandon, OR	120	469	48,170	690
Blaine, WA	90	367	41,386	601
Bonners Ferry, ID	105	392	23,308	345
Burley, ID	248	964	108,124	1,558
Canby, OR	233	932	96,220	1,393
Cascade Locks, OR	61	235	26,406	381
Centralia, WA	326	1,304	109,167	1,594
Cheney, WA	272	844	96,821	1,399
Cons. Irrig, Dist., WA	6	22	1,757	25
Coulee Dam, WA	33	148	16.512	244
Declo, ID	7	29	3,065	44
Drain, OR	40	167	17,436	251
Eatonville, WA	39	152	15,805	229
Ellensburg, WA	311	1,203	149,710	2,158
Eugene, OR	2,245	8,490	1,395,009	20,237
Fircrest, WA	100	396	42,316	613
Forest Grove, OR	51	299	44,738	661
Heyburn, OR	154	570	71,290	1,016
Idaho Falls, ID	1,101	4,448	490,899	7,171
McCleary, WA	84	323	36,785	529
McMinnville, OR	500	1,847	250,599	3,638
Milton, WA	76	302	31,086	450
Milton-Freewater, OR	71	83	5,958	95
Minidoka, ID	3	10	1,212	18
Monmouth, OR	120	486	49,355	714
Port Angeles, WA	1,155	4,365	686,726	9,665
Richland, WA	1,089	4,386	492,911	7,132
Rupert, ID	169	689	75,457	1,096
Seattle, WA	1,702	6,524	1,803,212	25,067
Springfield, OR	1,327	5,251	657,072	9,455
Steilacoom, WA	90	363	37,570	547
Sumas, WA	18	70	8,156	117
Tacoma, WA	3,575	13,271	2,454,492	35,206
Vera Irrig. Dist., WA	315	1,301	137,850	2,001
WPPSS, WA	602	2,024	275,314	3,526
Total Municipalities (37)	16,731	$63,872	9,931,934	$141,734

Expense Trend



Customer	Capacity Sales		Energy Sales	
Public Utility Districts	MW	Revenue	MWH	Revenue
Benton, Co.	2,675	$10,072	1,263,103	$18,002
Central Lincoln	2,311	8,990	1,251,369	17,885
Chelan Co.	536	863	239,835	3,549
Clallam Co.,	898	3,600	374,340	5,418
Clark Co.	4,693	19,251	2,316,073	33,552
Clatskanie	1,189	4,419	737,534	10,482
Columbia River	41	100	22,364	352
Cowlitz Co.	4,160	14,850	3,059,273	43,144
Douglas Co.	286	129	76,006	1,037
Emerald	680	2,801	283,578	3,604
Ferry Co.	124	451	60,323	802
Franklin Co.,	1,123	4,178	538,277	7,624
Grant Co. #2	1,048	632	54,292	741
Grays Harbor	2,099	8,334	1,085,144	15,610
Kittitas Co.	65	243	26,441	352
Klickitat Co.	485	1,737	225,113	2,990
Lewis Co.	1,108	4,408	615,961	8,828
Mason Co. #1	114	461	49,497	649
Mason Co. #3	866	3,455	376,468	5,432
Northern Wasco Co.	453	1,816	202,348	2,936
Okanogan Co.	513	2,088	291,049	4,226
Pacific Co. #2	528	2,133	230,845	3,332
Skamania Co.	224	840	99,360	1,336
Snohomish Co.	8,891	35,526	3,920,037	56,235
Tillamook	701	2,834	290,035	4,163
Wahkiukum Co.	80	308	35,050	478
Whatcom Co.	208	767	137,835	1,954
Total Public Utility Districts (27)	36,099	$135,286	17,861,550	$254,713

Customer	Capacity Sales		Energy Sales	
Cooperatives	MW	Revenue	MWH	Revenue
Alder Mutual Light	5	$19	2,027	$29
Benton Rural Elec. Assn.	578	1,986	272,042	3,621
Big Bend Coop.	703	2,005	344,334	4,271
Blachly-Lane Coop.	230	836	102,496	1,380
Central Elec. Coop.	573	2,079	257,016	3,380
Clearwater Power Co.	309	1,140	133,574	1,776
Columbia Basin Coop.	209	694	97,395	1,235
Columbia Power Coop.	56	190	23,904	313
Columbia Rural Elec. Assn.	336	922	159,336	2,009
Consumers Power	650	2,347	286,828	3,790
Coos-Curry Elec. Coop.	405	1,522	185,460	2,459
Douglas Elec. Coop.	242	894	109,276	1,441
East End Mutual Elec.	34	126	15,149	213
Elmhurst Mutual P&L	455	1,834	188,631	2,736
Fall River Elec. Coop.	243	841	104,785	1,472
Farmers Elec. Co.	10	40	4,046	59
Flathead Elec. Coop.	233	900	111,901	1,549
Glacier Elec. Coop.	294	1,105	159,928	2,176
Harney Elec. Coop.	273	817	138,319	1,766
Hood River Elec. Coop.	174	676	83,783	1,211
Idaho Co. L&P Coop.	74	280	32,763	438
Inland P&L	961	3,658	430,591	5,794
Kootenai Elec. Coop.	344	1,265	156,240	2,077
Lakeview L&P	473	1,864	224,014	3,238
Lane Elec. Coop.	526	2,002	223,968	3,068
Lincoln Elec. Coop. -MT	140	558	65,370	945

Lincoln Elec. Coop. -WA	164	426	74,800	867
Lost River Elec. Coop.	111	339	53,242	689
Lower River P&L	641	2,416	293,128	3,948
Midstate Elec. Coop.	413	1,479	197,251	2,590
Missoula Elec. Coop.	246	921	111,047	1,478
Nespelem Valley Elec.Coop.	80	295	35,977	492
Northern Lights	412	1,512	210,976	2,804
Ohop Mutual Light Co.	2,588	328	29,246	406
Okanogan County Coop.	58	219	27,536	378
Orcas P&L	230	851	100,302	1,347
Parkland Light & Water	212	836	94,641	1,372
Peninsula Light Co.	730	2,970	301,925	4,381
Prairie Power Coop.	26	77	9,560	124
Raft River Elec. Coop.	258	701	135,744	1,721
Ravali Elec. Coop.	165	605	72,920	964
Riverside Elec. Co.	30	119	13,195	179
Rural Elec. Co.	175	655	78,393	1,064
Salem Elec.	536	2,140	249,967	3,610
Salmon River Coop.	506	1,747	208,811	2,785
South Side Elec. Lines	67	227	30,337	399
Surprise Valley Elec.	213	671	97,741	1,250
Tanner Elec.	58	220	23,445	316
Umatilla Elec. Coop.	940	2,967	614,540	7,983
Unity P&L	132	479	57,354	785
Vigilante Elec. Coop.	231	743	103,046	1,326
Wasco Elec. Coop.	245	905	104,347	1,374
Wells Rural Coop.	157	536	81,845	1,075
West Oregon Coop.	132	487	58,106	772
Total Cooperatives (54)	18,286	$56,471	7,382,598	$98,925

Customer	Capacity Sales		Energy Sales	
Federal Agencies	MW	Revenue	MWH	Revenue
U.S. Department of Energy	907	$3,368	521,707	$7,412
U.S. Bureau of Mines	17	67	5,766	84
U.S. Air Force	65	246	31,476	450
U.S. Bureau of Reclamation	0	0	7,268	96
U.S. Bureau of Indian Affairs	429	1,672	176,067	2,537
U.S. Navy	630	2,359	324,665	4,621
Total Federal Agencies (6)	2,048	$7,712	1,066,949	$15,200

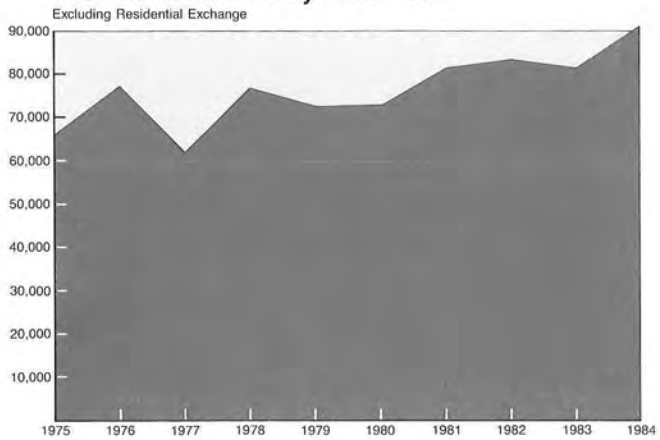
Customer	Capacity Sales		Energy Sales	
Privately Owned Utilities	MW	Revenue	MWH	Revenue
California Pacific National Corp.	0	$0	23,221	$256
Colockum Transmission Co.	483	221	37,520	836
Idaho Power Co.	0	0	14,735	225
Montana Power Co.	960	3,535	1,146,715	13,025
Pacific Power & Light Co.	10,269	34,772	1,398,165	13,501
Portland General Elec. Co.	8.703	28,281	1,528,370	22,994
Puget Sound P&L Co.	3,132	4,531	1,173,777	14,435
Utah Power & Light Co.	0	0	1,171,619	9,251
Washington Water Power	1,352	3,715	873,984	11,509
Total Privately Owned Utilities (9)	24,899	$75,055	7,368,106	$86,032

Customer	Capacity Sales		Energy Sales	
Aluminum Industries	MW	Revenue	MWH	Revenue
Alcoa	5,460	$53,893	4,028,447	$48,681
Arco Aluminum Co.	3,609	33,683	2,671,471	30,795
Intalco Aluminum Co.	5,271	50,517	3,890,210	47,853
Kaiser Aluminum	6,633	63,682	4,851,174	59,984
Martin Marietta Co.	4,745	45,704	3,514,602	43,520
Reynolds Metals Co.	7,661	74,542	5,693,408	69,672
Total Aluminum Industries (6)	33,379	$322,021	24,649,312	$300,505

Customer	Capacity Sales		Energy Sales	
Other Industries	MW	Revenue	MWH	Revenue
Carborundum Co.	15	$32	1,162	$3
Georgia Pacific Corp.	278	2,726	230,679	2,712
Gilmore Steel	3	27	1,118	15
Hanna Nickel Smelting	1	1	466,019	3,252
Oregon Metallurgical	72	684	47,411	570
Pacific Carbide	89	841	63,957	777
Pennwalt Corporation	678	6,485	504,580	6,085
Pt Townsend Paper/ Crown Zellerbach	173	1,663	99,430	1,214
Stauffer Chemical	0	0	0	(42)
Stewart Elsner	0	0	0	0
Union Carbide	0	0	0	0
Total Other Industries (11)	1,309	$12,459	1,414,356	$14,586
Total Sales NW Region (150)	132,751	$672,876	69,674,805	$911,695

Kilowatt Hours Sold by Fiscal Year

Excluding Residential Exchange



Thousand kWh

Customer	Capacity Sales		Energy Sales	
Outside Northwest Region	MW	Revenue	MWH	Revenue
Bountiful, UT-Public	0	$0	0	$0
Burbank, CA-Public	0	0	321,913	3,557
B.C. Hydro-Public	0	0	(95,500)	(476)
Glendale, CA-Public	0	0	353,806	3,846
Los Angeles, CA -Public	0	0	3,680,924	40,149
Pasadena, CA-Public	0	0	220,480	2,492
Cominco, LTD., B.C. -Private	0	0	0	0
Pacific Gas & Elec. Co.-Private	3,000	7,654	7,850,776	117,377
Public Service Co. Private	0	0	0	0
San Diego Gas & Elec.-Private	0	0	517,800	6,956
Sierra Pacific Power Co.-Private	0	0	6,451	72
So. Cal. Edison Co. -Private	0	0	6,279,454	74,015
State of California -Public	0	0	328,872	3,625
WAPA-Mid Pacific Region-Fed.	2,600	9,873	1,971,245	40,686
Total Outside NW Region (14)	5,600	$17,527	21,436,221	$292,299
Total Sales Excluding Residential Exchange (164)	138,351	$690,403	91,111,026	$1,203,994

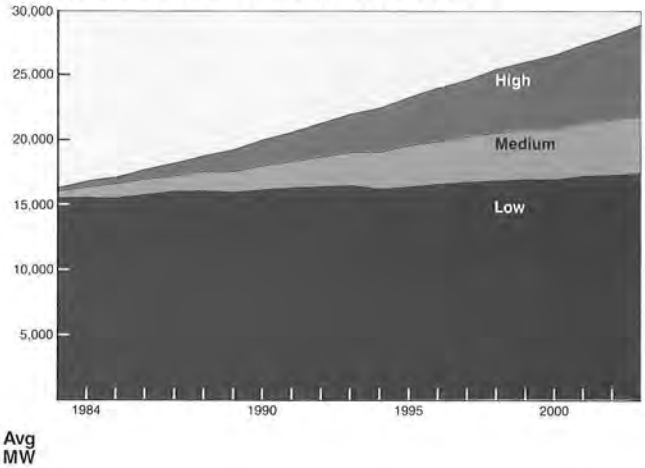
Customer	Capacity Sales		Energy Sales	
Residential Exchange	MW	Revenue	MWH	Revenue
Benton REA	338	$1,213	154,521	$2,101
Blachly-Lane Coop.	78	291	33,761	463
CP National	480	1,804	241,469	3,447
Central Elec. Coop.	231	858	76,106	1,194
Clark County PUD	2,649	10,666	1,254,994	18,236
Clearwater Power Company	206	751	80,870	1,088
Consumers Power Company	342	1,296	149,544	2,026
Coos-Curry Coop.	233	849	100,131	1,331
Douglas Elec. Coop.	79	224	34,646	423
Fall River Elec. Coop.	178	556	75,093	964
Idaho Power Co.	6,895	25,702	3,839,621	54,783
Lincoln Elec. Coop. -WA	95	238	45,442	558
Lost River Elec. Coop.	74	222	34,314	437
Lower Valley Power & Light	343	1,288	144,520	1,939
Montana Light & Power	19	73	8,348	121
Montana Power	789	3,032	441,933	6,377
Portland General Electric	9,757	38,504	5,092,023	73,623
Pacific Power & Light	10,431	40,405	5,651,192	81,417
Puget Sound Power & Light	13,540	53,592	6,793,628	98,511
Raft River Coop.	170	472	85,435	1,086
Snohomish PUD	4,255	17,833	1,968,440	28,876
Umatilla Elec. Coop.	352	1,122	176,695	2,374
Utah Power Co.	1,221	4,013	686,623	9,052
Washington Water Power	4,735	19,643	2,483,235	35,884
Total Residential Exchange (24)	57,490	$224,647	29,652,584	$426,311
Total Sales	195,841	$915,050	120,763,610	$1,630,305

Repayment Policy

BPA determined its revenue requirements and rate levels using the repayment policy. This policy, based on the Department of Energy's interpretation of laws and regulations, requires that FCRPS revenues be sufficient to:

1. Pay the cost of obtaining power through purchase and exchange agreements.
2. Pay the cost of operating and maintaining the power system.

Forecasts of Firm Electricity Loads for the Pacific Northwest 1984-2004



3. Pay interest on and amortize the outstanding revenue bonds sold to the treasury to finance transmission system construction.
4. Pay interest on the unamortized investment in power facilities financed with appropriated funds. (Federal hydroelectric projects are all financed with appropriated funds, as were BPA transmission facilities constructed before 1978.)
5. Pay, with interest, any outstanding deferral.
6. Pay the power investment in each Federal hydroelectric project within 50 years after it goes into service (except for the Chandler Project, which has a legislated repayment period of 66 years).
7. Pay each increment of the investment in the BPA transmission system financed with appropriated funds within the average service life of the transmission facilities (45 years).
8. Pay each increment of financing for conservation within the benefit period (20 years).
9. Pay the investment in each replacement at a Federal hydroelectric project within its service life. (Investments bearing the highest interest rate will be amortized first to the extent possible while still completing repayment of each increment of investment within its prescribed repayment period).
10. Pay construction costs at Federal reclamation projects which are beyond the ability of the irrigation water users to pay, and which are assigned for payment from commercial power revenues, within the same period available to the water users for making payments. These periods range from 40 to 66 years with 60 years being applicable to most of the irrigation payment assistance.

1984 Wholesale Rate Filing Final Revenue Requirement Study

Adjusted to Incorporate Fiscal Year 1984 Actual Results (All Amounts in $000) Table 4

Fiscal Year Ending Sept. 30	Revenue Requirement	Annual Obligations	Purchase and Exchange Power	Interest Expense	Amortization	Irrigation Amortization	Surplus Revenues	Investment Place in Service: Replacements Through 9-30-84	Cumulative Amount in Service	Amortization as of 9-30-84	Unamortized Investment	Term Schedule	Irrigation Assistance: Cumulative Amount in Service	Amortization	Unamortized Amount
Cumulative 1984	10,522,117	2,202,676	4,887,222	2,792,529	639,690	0	0		8,001,643	639,690	7,361,953		700,624	0	700,624
Adjustment (1)	426,982	177,721	267,746	65,429	(1,381)	0	(82,533)		719,813	(1,381)	721,194		(5,157)	0	(5,157)
1985	3,073,792	357,146	2,002,533	405,706	225,874	0	82,533		8,721,456	225,874	8,495,582	8,591,347	695,467	0	695,467
Adjustment (2)	0	(21,154)	0	0	21,154	0	0		0	21,154	(21,154)	0	0	0	0
1986	2,833,848	335,992	2,009,833	395,703	92,320	0	0	58,550	8,780,006	92,320	8,440,658	8,629,591	706,278	0	706,278
1987	2,833,848	335,992	2,011,033	387,042	99,781	0	0	99,060	8,879,066	99,781	8,439,937	8,701,062	744,921	0	744,921
1988	2,833,848	335,992	2,012,833	372,916	112,107	0	0	63,598	8,942,664	112,107	8,391,428	8,696,068	765,143	0	765,143
1989	2,833,848	335,992	2,012,733	367,149	117,974	0	0	80,273	9,022,937	117,974	8,353,727	8,731,242	919,325	0	919,325
1990	2,833,848	335,992	2,015,033	364,480	118,343	0	0	96,273	9,119,210	118,343	8,331,657	8,802,223	959,597	0	959,597
1991	2,833,848	335,992	2,014,733	354,295	128,828	0	0	76,038	9,195,248	128,828	8,278,867	8,784,750	1,008,678	0	1,008,678
1992	2,833,848	335,992	2,014,133	355,516	128,207	0	0	244,037	9,439,285	128,207	8,394,697	8,968,081	1,045,789	0	1,045,789
1993	2,833,848	335,992	2,009,533	350,955	137,368	0	0	76,633	9,515,918	137,368	8,333,962	8,973,214	1,078,439	0	1,078,439
1994	2,833,848	335,992	2,008,933	349,517	139,406	0	0	120,965	9,636,883	139,406	8,315,521	9,041,761	1,104,674	0	1,104,674
1995	2,833,848	335,992	2,008,833	345,508	143,515	0	0	85,819	9,722,702	143,515	8,257,825	9,116,715	1,138,297	0	1,138,297
1996	2,833,848	335,992	2,014,233	336,273	147,350	0	0	142,177	9,864,879	147,350	8,252,652	9,236,316	1,172,067	0	1,172,067
1997	2,833,848	335,992	2,029,633	329,519	120,002	18,702	0	124,117	9,988,996	120,002	8,256,767	9,324,081	1,206,123	18,702	1,187,421
1998	2,833,848	335,992	2,028,033	329,623	140,200	0	0	91,545	10,080,541	140,200	8,208,112	9,367,788	1,235,599	0	1,216,897
1999	2,833,848	335,992	2,028,233	322,293	147,330	0	0	111,096	10,191,637	147,330	8,171,878	9,433,171	1,265,202	0	1,246,500
2000	2,833,848	335,992	2,028,033	320,781	149,042	0	0	92,204	10,283,841	149,042	8,115,040	9,480,201	1,289,043	0	1,270,341
2001	2,833,848	335,992	2,028,033	324,862	134,670	10,291	0	143,247	10,427,088	134,670	8,123,617	9,527,743	1,312,986	10,291	1,283,993
2002	2,833,848	335,992	2,020,033	331,098	146,725	0	0	129,531	10,556,619	146,725	8,106,423	9,511,779	1,331,373	0	1,302,380
2003	2,833,848	335,992	1,996,433	335,552	165,871	0	0	98,624	10,655,243	165,871	8,039,176	9,194,155	1,349,838	0	1,320,845
2004	2,833,848	335,992	1,997,633	340,829	158,613	781	0	121,005	10,776,248	158,613	8,001,568	8,886,628	1,368,667	781	1,338,893
2005	2,833,848	335,992	1,996,833	347,045	153,978	0	0	110,249	10,886,497	153,978	7,957,839	8,407,786	1,388,148	0	1,358,374
2006	2,833,848	335,992	1,996,833	353,838	147,185	0	0	112,572	10,999,069	147,185	7,923,226	8,352,073	1,407,997	0	1,378,223
2007	2,833,848	335,992	1,991,233	360,543	146,080	0	0	157,493	11,156,562	146,080	7,934,639	8,321,394	1,431,686	0	1,401,912
2008	2,833,848	335,992	1,991,633	367,184	136,088	2,951	0	117,751	11,274,313	136,088	7,916,302	8,202,868	1,455,473	2,951	1,422,748
2009	2,833,848	335,992	1,991,633	373,995	125,930	6,298	0	126,864	11,401,177	125,930	7,917,236	8,185,097	1,479,066	6,298	1,440,043
2010	2,833,848	335,992	1,991,633	381,253	124,970	0	0	172,307	11,573,484	124,970	7,964,573	8,192,163	1,502,756	0	1,463,733
2011	2,833,848	335,992	1,991,633	389,293	116,930	0	0	161,334	11,734,818	116,930	8,008,977	8,259,009	1,523,607	0	1,484,584
2012	2,833,848	335,992	1,892,733	390,492	214,128	503	0	165,662	11,900,480	214,128	7,960,511	8,173,012	1,544,248	503	1,504,722
2013	2,833,848	335,992	1,892,733	397,707	169,239	38,177	0	171,420	12,071,900	169,239	7,962,692	8,341,183	1,564,973	38,177	1,487,270
2014	2,833,848	335,992	1,892,733	389,785	173,198	42,140	0	129,381	12,201,281	173,198	7,918,875	8,274,304	1,588,458	42,140	1,468,615
2015	2,833,848	335,992	1,892,733	386,992	171,515	46,616	0	120,723	12,322,004	171,515	7,868,083	8,272,230	1,612,038	46,616	1,445,579
2016	2,833,848	335,992	1,892,733	383,260	155,670	66,193	0	217,928	12,539,932	155,670	7,930,341	8,311,143	1,635,713	66,193	1,403,061
2017	2,833,848	335,992	1,800,733	378,878	262,283	55,962	0	157,834	12,697,766	262,283	7,825,892	8,189,265	1,668,208	55,962	1,379,594
2018	2,833,848	335,992	1,619,533	367,794	490,046	20,483	0	153,567	12,851,333	490,046	7,489,413	8,103,098	1,684,520	20,483	1,375,423
2019	2,833,848	335,992	1,502,033	326,684	606,206	62,933	0	124,968	12,976,301	606,206	7,008,175	7,763,170	1,709,387	62,933	1,337,357
2020	2,833,848	335,992	1,502,033	314,985	652,551	28,287	0	188,694	13,164,995	652,551	6,544,318	7,700,825	1,734,273	28,287	1,333,956
2021	2,833,848	335,992	1,502,033	279,602	697,102	19,119	0	165,810	13,330,805	697,102	6,013,026	7,656,360	1,751,875	19,119	1,332,439
2022	2,833,848	335,992	1,502,033	232,693	743,765	19,365	0	209,416	13,540,221	743,765	5,478,677	7,755,739	1,769,477	19,365	1,330,676
2023	2,833,848	335,992	1,502,033	151,912	837,785	6,126	0	121,488	13,661,709	837,785	4,762,380	7,473,173	1,798,764	6,126	1,353,837
2024	2,833,848	335,992	1,502,033	129,516	848,081	18,226	0	138,320	13,800,029	848,081	4,052,619	7,519,547	1,828,051	18,226	1,364,898
2025	2,833,848	335,992	1,502,033	106,771	878,146	10,906	0	143,764	13,943,793	878,146	3,318,237	7,120,635	1,850,509	10,906	1,376,450
2026	2,833,848	335,992	1,502,033	86,794	887,362	21,667	0	234,784	14,178,577	887,362	2,665,659	6,813,003	1,872,967	21,667	1,377,241
2027	2,833,848	335,992	1,502,033	65,349	926,977	3,497	0	163,049	14,341,626	926,977	1,901,731	6,701,344	1,894,818	3,497	1,395,595
2028	2,833,848	335,992	1,502,033	41,495	817,287	22,702	114,339	128,376	14,470,002	817,287	1,212,820	6,389,957	1,916,669	22,702	1,394,744
2029	2,833,848	335,992	1,502,033	23,492	153,628	4,029	814,674	155,995	14,625,997	153,628	1,215,187	6,158,803	1,938,520	4,029	1,412,566
2030	2,833,848	335,992	1,502,033	23,299	120,215	2,458	849,851	122,588	14,748,585	120,215	1,217,560	5,993,939	1,959,764	2,458	1,431,352
2031	2,833,848	335,992	1,502,033	24,302	173,603	11,223	786,695	176,003	14,924,588	173,603	1,219,960	5,943,404	1,981,008	11,223	1,441,373
2032	2,833,848	335,992	1,502,033	25,163	200,342	0	770,318	202,805	15,127,393	200,342	1,222,423	5,503,462	2,002,252	0	1,462,617
2033	2,833,848	335,992	1,502,033	24,254	121,391	0	850,178	123,974	15,251,367	121,391	1,225,006	5,265,600	2,023,648	0	1,484,013
2034	2,833,848	335,992	1,502,033	24,809	136,669	11,165	823,180	139,367	15,390,734	136,669	1,227,704	5,178,855	2,045,044	11,165	1,494,244
2035	2,833,848	335,992	1,502,033	25,092	132,208	29,484	809,039	135,035	15,525,769	132,208	1,230,531	5,150,491	2,065,984	29,484	1,485,700
Totals	155,715,291	19,515,989	97,815,351	17,051,846	14,933,547	580,284	5,818,274	6,804,313		14,933,547				580,284	

(1) The adjustments line represents the difference between 1983 and 1984 actual results and the 1983 and 1984 estimates included in the repayment study. Repayment study estimates assume average conditions, and differences which occur in any given year are expected to cancel out over the entire period covered by the study.

(2) BPA planned to make amortization payments of $225,874 million by the end of FY 1985 as determined by the Revenue Requirement Study. However, the rates filed with FERC provide additional revenues of $21,154 million by the end of FY 1985. 1985 amounts are adjusted to reflect to rate filing.

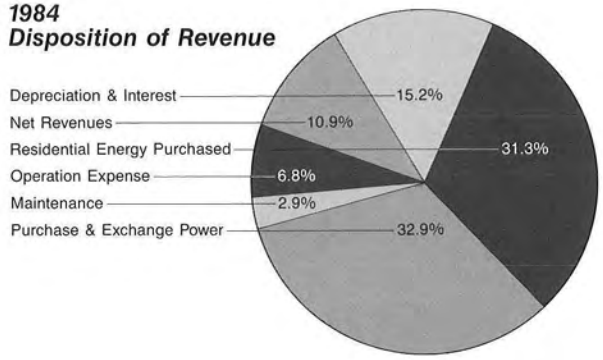
Note to Federal Columbia River Power System Revenue Requirement Study

Section 2 of Public Law 98-448 requires an annual financial statement which includes all projects authorized by Congress in the FCRPS Annual Report. Through FY 1978 the FCRPS Revenue Requirement Study included the estimated costs of all authorized projects even through some were not yet in service or were not yet under construction. In determining revenue requirements for establishing power rates, however, customers objected to including projects in the Revenue Requirement Study which would not be in service during the period in which the power rates would be in effect. During preparation of the wholesale power rate increase which took effect December 20, 1979, the BPA General Counsel issued an opinion concluding that while P.L. 89-448 requires that all authorized projects be included in the annual financial statements, the Revenue Requirement Study used as a basis for establishing rate levels should include only those projects which will be in service during the rate period. The Revenue Requirement Study in this annual report includes only those Federal power facilities expected to be in service during the cost evaluation period.

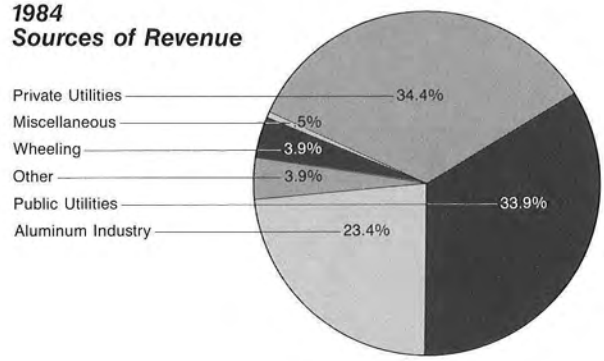
The estimated capital cost in 1984 dollars and the estimated completion dates of those authorized projects not included in the new Revenue Requirement Study are shown below. These projects will be included in future Revenue Requirement studies only when they are completed and placed in service.

Cougar Unit No. 3	$ 30 million
Strube Unit No. 1	$ 57 million
McNary Second Powerhouse	$715 million
John Day Additional Units	$146 million

1984 Disposition of Revenue



1984 Sources of Revenue



Auditors' Report

To the Administrator of
Bonneville Power Administration,
United States Department of Energy:

We have examined the statement of assets and liabilities of the Federal Columbia River Power System (FCRPS) as of September 30, 1984 and 1983, and the related statements of revenues and expenses, changes in federal investment and source and use of funds for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As more fully discussed in Note 1 to the financial statements, the FCRPS financial statements have been prepared in accordance with the accounting practices prescribed by applicable legislation and executive directives of government agencies. These practices differ in some respects from generally accepted accounting principles. Accordingly, the financial statements do not purport to present financial position and results of operations in conformity with generally accepted accounting principles.

In our auditors' report dated December 16, 1983, our opinion on the 1983 financial statements was subject to the effect of such adjustments, if any, as might have been required had the outcome of litigation relating to 1981 and 1982 rate schedules been known. As explained in Note 9, this litigation has been settled at no material cost to FCRPS. Accordingly, our present opinion on the 1983 financial statements, as presented herein, is unqualified as to this litigation.

As discussed in Note 9, pending and threatened litigation surrounding the Washington Public Power Supply System (the Supply System), including litigation relating to the Supply System's default on $2.25 billion of bonds relating to nuclear projects Nos. 4 and 5 for which FCRPS has no obligation, may have a significant impact on FCRPS. The cases and legal issues involving the Supply System have not been fully developed and the ultimate impact on FCRPS, if any, presently cannot be determined.

In our opinion, subject to the effect of any adjustments that might have been required had the outcome of the contingency mentioned in the preceding paragraph been known, the financial statements referred to above present fairly the assets and liabilities of FCRPS as of September 30, 1984 and 1983, and its revenues and expenses, changes in federal investment and source and use of funds for the years then ended, in conformity with the accounting principles described in Note 1 applied on a consistent basis.

Our examinations were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The Schedule of Amount and Allocation of Plant Investment as of September 30, 1984 (Schedule A) is presented for purposes of additional analysis and is not a required part of the basic financial statements. The information in Schedule A has been subjected to the auditing procedures applied in the examination of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Portland, Oregon,
December 14, 1984.

Arthur Andersen & Co.

Federal Columbia River Power System

Statement of Revenues and Expenses

for the years ended September 30, 1984 and 1983

In thousands of dollars	1984	1983
Operating Revenues (Notes 1, 2 and 6):		
Sales of electric power-		
Publicly owned utilities	**$ 901,568**	$ 624,236
Privately owned utilities	**917,184**	702,164
Federal agencies	**77,032**	44,966
Aluminum industry	**622,526**	393,240
Other industry	**27,045**	17,733
	2,545,355	1,782,339
Other operating revenues-		
Wheeling	**104,847**	50,533
Other	**16,273**	12,510
	121,120	63,043
Total operating revenues	**2,666,475**	1,845,382
Operating Expenses:		
Operation	**183,831**	151,394
Maintenance	**79,634**	68,252
Purchase and exchange power (Notes 1, 5 and 9)-		
Hanford	**26,826**	8,420
Trojan	**39,452**	38,920
WNP No. 1	**228,862**	201,450
WNP No. 2	**393,169**	269,682
WNP No. 3	**175,818**	161,875
Writeoff of net billing advances (Note 1)	**189,738**	—
Other	**8,187**	25,994
Residential energy purchased (Note 6)	**835,254**	549,469
Depreciation	**74,949**	63,857
Total operating expenses	**2,235,720**	1,539,313
Net operating revenues	**430,755**	306,069
Interest Expense (Note 3):		
Interest on federal investment-		
On appropriated funds	**227,699**	214,923
On Transmission System Act borrowings	**129,859**	113,825
Allowance for funds used during construction	**(27,833)**	(36,717)
Net interest expense	**329,725**	292,031
Net Revenues	**$ 101,030**	$ 14,038

The accompanying notes are an integral part of this statement.

Statement of Assets and Liabilities

September 30, 1984 and 1983

In thousands of dollars	**Assets**	**1984**	1983
Utility Plant (Notes 3 and 4):			
Completed plant		**$ 7,460,303**	$ 7,166,969
Accumulated depreciation		**(722,405)**	(659,646)
		6,737,898	6,507,323
Construction work in progress		**634,457**	586,395
Net utility plant		**7,372,355**	7,093,718
Current Assets:			
Unexpended funds		**182,593**	144,049
Accounts receivable		**26,558**	20,236
Accrued unbilled revenues		**109,710**	86,687
Materials and supplies, at average cost		**37,449**	41,407
Total current assets		**356,310**	292,379
Other Assets and Deferred Charges:			
Trust funds		**7,686**	8,907
Net billing advances, net of accumulated amortization ($22,769 in 1983) (Note 1)		**—**	189,738
Investment in Teton and Libby reregulating dams (Note 8)		**32,449**	32,453
Deferred conservation program costs, net of accumulated amortization ($20,218 in 1984 and $6,582 in 1983) (Notes 1 and 3)		**312,014**	258,867
Other		**36,382**	35,610
Total other assets and deferred charges		**388,531**	525,575
Total Assets		**$ 8,117,196**	$ 7,911,672
	Federal Investment and Liabilities		
Federal Investment:			
Net investment of U.S. Government (Note 3)		**$ 7,769,004**	$ 7,611,482
Accumulated net revenues		**162,360**	61,330
Irrigation assistance, $748 million and $716 million, respectively (Note 7)			
Total federal investment		**7,931,364**	7,672,812
Commitments and Contingencies (Notes 2, 3, 4, 5, 6, 7, 8, and 9)			
Current Liabilities:			
Accounts payable		**149,983**	198,995
Employees' accrued leave		**10,655**	10,108
Total current liabilities		**160,638**	209,103
Deferred Credits:			
Trust fund advances		**7,686**	8,907
Other		**17,508**	20,850
Total deferred credits		**25,194**	29,757
Total Federal Investment and Liabilities		**$ 8,117,196**	**$ 7,911,672**

The accompanying notes are an integral part of this statement.

Statement of Changes in Federal Investment

for the years ended September 30, 1984 and 1983

In thousands of dollars	Balance September 30, 1982	Additions (Reductions)	Balance September 30, 1983	Additions (Reductions)	**Balance September 30, 1984**
Congressional appropriations (Note 3)	$ 7,372,856	$ 170,733	$ 7,543,589	$ 211,559	**$ 7,755,148**
U.S. Treasury transfers to Continuing Fund	7,005	—	7,005	—	**7,005**
Transfers from (to) other federal agencies, net	40,567	(1,799)	38,768	(2,526)	**36,242**
Federal Columbia River Transmission System Act borrowings (Note 3)	910,000	255,000	1,165,000	240,000	**1,405,000**
Interest on federal investment:					
On appropriated funds	2,394,264	149,477	2,543,741	445,334	**2,989,075**
On Transmission System Act borrowings	201,204	113,825	315,029	129,859	**444,888**
Unpaid annual expense (Note 3)	152,189	65,446	217,635	(217,635)	**—**
Less:					
Interest payments	(2,595,468)	(263,302)	(2,858,770)	(575,193)	**(3,433,963)**
Funds returned to U.S. Treasury	(1,304,871)	(55,644)	(1,360,515)	(73,876)	**(1,434,391)**
Net investment of U.S. Government	7,177,746	433,736	7,611,482	157,522	**7,769,004**
Accumulated net revenues	47,292	14,038	61,330	101,030	**162,360**
Total federal investment	$ 7,225,038	$ 447,774	$ 7,672,812	$ 258,552	**$ 7,931,364**

The accompanying notes are an integral part of this statement.

Statement of Source and Use of Funds

for the years ended September 30, 1984 and 1983

In thousands of dollars	**1984**	1983
Source of Funds:		
Operations-		
Net revenues	**$ 101,030**	$ 14,038
Charges not requiring funds:		
Depreciation	**74,949**	63,857
Amortization and writeoff of net billing advances	**189,738**	6,072
Amortization of deferred conservation program costs	**13,636**	5,164
Funds provided from operations	**379,353**	89,131
Increase in net investment of U.S. Government	**157,522**	433,736
Decrease (increase) in current assets-		
Unexpended funds	**(38,544)**	(18,663)
Receivables	**(29,345)**	(23,631)
Materials and supplies	**3,958**	(4,982)
Increase (decrease) in current liabilities	**(48,465)**	32,336
Other sources (uses), net	**(4,110)**	(7,181)
Total funds provided	**$ 420,369**	$ 500,746
Use of Funds:		
Investment in utility plant, net	**$ 353,586**	$ 296,654
Conservation program costs	**66,783**	204,092
Total funds used	**$ 420,369**	$ 500,746

The accompanying notes are an integral part of this statement.

Notes to Financial Statements

1. Basis of Preparation of Financial Statements and Summary of Significant Accounting Policies:

General

The Federal Columbia River Power System (FCRPS) includes the accounts of the Bonneville Power Administration (BPA), which purchases, transmits and markets power, and the accounts of the Pacific Northwest generating facilities of the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau), for which BPA is the power marketing agency. Each entity is separately managed and financed, but the facilities are operated as an integrated power system with the financial results combined under the FCRPS title. Costs of multipurpose Corps and Bureau projects are assigned to the individual purposes through a cost allocation process. The portion of total project costs allocated to power is included in these statements as Utility Plant. Some of these costs are for fish and wildlife facilities to mitigate the effects of the projects. BPA may acquire power resources but cannot own or construct generating facilities. BPA's resource acquisition priorities are: conservation, renewable resources, resources using waste heat or having high fuel conversion efficiency and other resources. Properties and income are tax-exempt.

The acounts are kept in accordance with standards and principles prescribed by the Comptroller General of the United States and the uniform system of accounts prescribed for electric utilities by the Federal Energy Regulatory Commission (FERC). FCRPS accounting policies described herein also reflect requirements of specific legislation and executive directives issued by the involved government departments (BPA is a unit of the Department of Energy; the Bureau is part of the Department of Interior and the Corps of the Department of Defense).

The FCRPS accounting policies differ from generally accepted accounting principles as follows:

1) Depreciation expense for power generating facilities is not matched with recovery of the related plant cost in revenues as required by generally accepted accounting principles. In addition, the compound interest method utilized by FCRPS is not a generally accepted accounting method, unless prescribed by the ratemaking.

2) Deferral of certain net billing advances (written-off in 1984) is not in accordance with generally accepted accounting principles as no specific recovery of these costs will be included in future revenues.

   Both of these policies are discussed in more detail under "Revenues" and "Thermal Plant Net Billing Advances and Amortization" below.

Revenues

Operating revenues are recorded on the basis of service rendered. Rates established under the Bonneville Project Act and related legislation are intended to provide sufficient cash to meet all required payments for system costs (including operating expenses, payment of the federal investment and interest thereon, and costs of net billed thermal projects and assigned irrigation costs — see Notes 3, 5 and 7).

The priority for application of revenues is: net billing credits; additional payments required for net billed thermal projects and BPA operating expenses; debt service on Federal Columbia River Transmission System Act borrowings from the U.S. Treasury; Corps and Bureau operating expenses, including fish and wildlife costs allocated to power; interest on unpaid annual expense and on the federal investment in power facilities financed through appropriations; amortization of unpaid annual expense (see Note 3); amortization of the federal investment in power facilities financed through appropriations; irrigation repayment assistance. No irrigation repayment assistance is required until 1997. If there is insufficient cash to meet all planned payments, the priority order will be used in reverse order to determine what payments will be deferred. There is no fixed annual requirement for payment of the power investment or assigned irrigation costs, the only requirement being that repayments be completed within prescribed periods. Payments to repay an investment bearing a higher rate of interest may be scheduled ahead of other investments bearing a lower rate to the extent that this is possible while still complying with prescribed repayment periods.

The rates are intended to recover the capital investment in transmission facilities within their average, estimated useful service lives and within 50 years for power generating facilities. These assets are depreciated using a compound interest method over their estimated useful lives, which average 45 years for transmission facilities and 85 years for generating facilities. Thus, annual depreciation charges are not matched with the recovery of the related capital costs and will, in the case of generating facilities, continue beyond the period within which such costs will have been recovered through revenues.

Rates in effect during fiscal 1984 were intended to recover approximately $153.4 million to reduce the September 30, 1983 unpaid annual expense of $217.6 million. Actual payments of $219 million were made to retire the entire unpaid annual expense plus apply toward amortization of the federal investment.

Rates in effect during fiscal year 1983 were intended to recover approximately $224.1 million for payment of the September 30, 1982 unpaid annual expense and amortization of federal investment. However, due to a considerable revenue shortfall, these payments were not made and an additional $65.4 million of unpaid annual expense was incurred in fiscal year 1983.

Regulatory Authority

FERC has sole authority to approve both interim and final rates.

Utility Plant and Depreciation

Utility plant is stated at original cost. Cost includes direct labor and materials, payments to contractors, indirect charges for engineering, supervision and similar overhead items, and an allowance for funds used during construction. The cost of additions, renewals and betterments is capitalized. Repairs and minor replacements are charged to operating expenses. The cost of utility plant retired, together with removal costs and less salvage, is charged to accumulated depreciation when it is removed from service.

Depreciation of utility plant is computed on the estimated service lives of the various classes of property using the compound interest method (rates from 2½% to 5½%). Service lives average 85 years for generating plant. Effective October 1, 1983, the estimated average service life for transmission plant was extended from 35 years to 45 years and the estimated costs to remove were adjusted. The change was made in recognition of recent studies which indicated that such plant would continue in service beyond the period in which it would have become fully depreciated under the estimated service lives in effect at September 30, 1983. The effect of the change was not material.

Depreciation expressed as a percent of the average cost of plant in service approximated 2.0% in 1984 and 1983 for transmission plant and 0.4% for generating plant. The compound interest method results in increasing depreciation charges in the later years of service lives.

Allowance for Funds Used During Construction

The allowance for funds used during construction (AFUDC) represents capitalized interest on federal investment applicable to utility plant under construction. AFUDC results in a noncash reduction of interest expense with a corresponding increase in utility plant, in accordance with accounting requirements of FERC.

AFUDC capitalization rates are stipulated for certain generating projects (2.5% to 10.75%) and approximate the cost of borrowings from the U.S. Treasury for other construction (10.6% in 1984 and 11.6% in 1983).

Energy Conservation Costs

Energy conservation costs are deferred and amortized over twenty years, which is the planned revenue recovery period and the term of related borrowings from the U.S. Treasury. Conservation amortization was $13,636,000 for 1984 and $5,164,000 for 1983.

Thermal Plant Net Billing Advances and Amortization

Net billing agreements provide that BPA make payments and/or grant billing credits before a nuclear project's date of commercial operation. At September 30, 1983, payments and billing credits totaling $189.7 million made prior to December 20, 1979 for Washington Public Power Supply System Nuclear Project (WNP) No. 2 were included as deferred charges under the caption "net billing advances" in the accompanying statement of assets and liabilities. In 1984, WNP No. 2 was licensed for commercial operation. The 1985 rate proposal does not provide for the recovery of the net billing advances nor is recovery in future rate proposals anticipated. Accordingly, the net billing advances were expensed in 1984. Similar payments and billing credits made since December 20, 1979 have been charged to Purchase and Exchange Power expense, which matches their recovery in rates.

Retirement Benefits

Substantially all employees engaged in FCRPS activities participate in the federal government's Civil Service Retirement Fund, a contributory pension plan. Retirement benefit expense is 7% of eligible employee compensation.

2. Revenues Subject to Refund:

On July 1, 1981, October 1, 1982 and November 1, 1983 increased power rates were placed into effect on an interim basis. On June 15, 1983, FERC issued an order confirming as final the 1981 and 1982 rate changes except for power sales to nonfirm customers outside the Pacific Northwest region but within the United States. FERC found that it could not at that time determine whether the proposed revenue level or the bases upon which the rate schedules were designed were appropriate. The FERC Administrative Law Judge to whom this matter was assigned issued his initial decision on November 27, 1984. He concluded that the rates should be disapproved because they were set at too low a level. If made final and adopted by FERC, the matter would be remanded to BPA for development of higher rates for the 1981 and 1982 period. Since BPA contracts do not permit upward adjustment based on final FERC approval, this action would have no effect on the FCRPS financial statements. In the opinion of BPA management, the rates in effect on an interim basis in 1981 and 1982 for power sales to nonfirm customers outside the Pacific Northwest region but within the United States will be those approved. Fiscal year 1984 revenues include $288 million attributable to the 1983 interim rates which are subject to refund. In the opinion of BPA management, the 1983 rates in effect on an interim basis will be those approved. See Note 9 (Contingencies) for additional information on litigation involving the rate schedules.

3. Net Investment of U.S. Government:

In order to finance construction, acquisition and replacement of the transmission system, and energy conservation measures, renewable resources, and fish and wildlife programs, BPA is authorized under the Federal Columbia River Transmission System Act to issue to the U.S. Treasury and have outstanding at any time up to $3.75 billion of bonds, notes or other debt bearing interest and having terms and conditions comparable to similar bonds issued by government corporations. $1.25 billion of the $3.75 billion is reserved for conservation and renewable resource loans and grants. $290 million of this reserved amount and $1.115 billion of other borrowings were outstanding at September 30, 1984. Interest rates on these borrowings range from 8.95% to 16.60%.

BPA's energy conservation budget for fiscal year 1985 is approximately $167 million, which will be financed primarily by borrowing and for which substantial commitments have been made. BPA's construction budget for fiscal year 1985 is approximately $225 million, which will also be primarily financed by borrowing and for which substantial commitments have been made.

Construction and replacement of power generating facilities by the Corps and Bureau is financed by annual Congressional appropriations. Such appropriations for fiscal year 1985 are $45 million and $40 million for the Corps and Bureau, respectively. Interest rates on these funds range from 2.5% to 10.75% (the weighted average rate was 3.4% in 1984 and 3.3% in 1983). The rates have been set either by law, administrative order pursuant to law, or administrative policies.

If, in any given year, revenues collected are not sufficient to cover all cash requirements, including interest, such deficiency becomes unpaid annual expense which is payable from subsequent years' revenues before any repayment of the federal investment. As of September 30, 1983, the $217.6 million of unpaid annual expense consisted of $65.4 million, $43.7 million, and $108.5 million for fiscal years 1983, 1982, and 1981 and prior, respectively. This unpaid annual expense was collected in revenues and repaid during fiscal year 1984.

The federal investment in power generating projects and the transmission system is to be repaid to the U.S. Treasury within 50 and 35 years, respectively, from the time the facility is placed in service. The cumulative amount of federal investment amortized and repaid through September 30, 1984 was $639.6 million, which exceeded the amount required by $552 million. The following table indicates the planned and required repayment of the remaining net federal investment as of September 30, 1984. See Note 1 (Revenues) and Notes 7 and 8 for additional information concerning repayment requirements and policies.

Year	Investment Planned to be Repaid	Investment Required to be Repaid
In thousands of dollars		
1985	$ 263,945	$ —
1986	92,320	—
1987	99,781	—
1988	112,107	54,116
1989	117,974	45,099
1990	118,343	25,292
1991-1995	622,107	210,018
1996-2000	331,707	114,197
2001-2005	735,061	1,098,776
2006-2010	674,236	840,930
2011-2015	408,777	615,805
2016-2020	521,734	1,093,859
2021-2025	2,258,791	882,892
2026-2030	898,588	1,442,713
2031-2035	—	805,094
After 2035	—	26,680
	$7,255,471 (a)	$7,255,471 (a)

(a) The difference between these totals and the net investment of U.S. Government on the statement of assets and liabilities is primarily amounts funding construction work in progress which are not planned or required to be repaid until the related plant is placed in service. Such amounts are therefore not included in this table.

4. Cost Allocations:

Allocations of plant cost and operation and maintenance expenses between power and nonpower purposes for five Corps projects were based on tentative allocations in 1983. Four of the five had final cost allocations approved by the end of 1984, and the financial records have been adjusted to reflect the revised allocations. At September 30, 1984, the only project with a tentative cost allocation was Lost Creek, with total assets allocated to power of $26 million. Accordingly, management believes any adjustments that may be necessary when the allocation for this project is completed would not be material to the FCRPS financial statements.

Under certain circumstances, final cost allocations can be changed, but Congressional approval may be required for any significant change. If a change in a final cost allocation was made, any related adjustments would most likely be prospective.

5. Purchase and Exchange Power Expense and Commitments to Exchange Power and Acquire Project Capability:

BPA has acquired from a group of utilities (participants) under net billing agreements all or part of the generating capability of the nuclear power plants listed in the following table. The agreements require that BPA pay the participants' portions of the annual project budgets, including debt service, whether or not the projects are completed or operable.

BPA's commitment under the net billing agreements extends for the life of the projects. BPA's estimated annual costs related to these projects for the next five years, the present termination commitments, and the additional estimated financing to complete construction of WNP Nos. 1, 2 and 3 are presented in the following table.

Construction of WNP Nos. 1 and 3 has been delayed. While restart of construction and the need for additional financing will depend on factors such as the forecasted power needs in the Pacific Northwest and the cost effectiveness of these projects relative to other available resources, the following table assumes restart of construction of WNP No. 3 in fiscal year 1988 and WNP No. 1 in fiscal year 1989. See Note 9 for further discussion concerning the financing of these projects.

					Estimated BPA Portion					
						Estimated Annual Project Costs (c)				
Project and % Capability Acquired	Projected in Service Date	Capacity in Megawatts	Present Termination Commitment (a)	Additional Estimated Financing Requirements (b)		1985	1986	1987	1988	1989
In thousands of dollars										
Hanford Generating Project (50%)	Operational	430	$ 37,205	–	Operations	$ 52,600	$ 55,000	$ 57,400	$ 60,600	$ 64,100
Trojan Nuclear Project (30%)	Operational	339	137,715	–	Debt Service	11,950	11,950	11,950	11,950	11,950
					Operations	35,850	37,650	39,650	42,150	44,750
WNP No. 1 (100%)	September 1993	1,250	2,134,200	$2,570,000	Debt Service	205,500	208,700	208,500	214,200	258,900
					Preservation (d)					
WNP No. 2 (100%)	Operational	1,100	2,298,920	700	Debt Service	212,400	216,400	215,900	216,000	216,000
					Construction	9,900	(9,200)	–	–	–
					Operations	147,400	152,500	151,500	160,000	169,300
WNP No.3 (70%)	March 1992	868	1,596,535	1,610,000	Debt Service	140,300	153,200	171,800	192,800	242,200
					Preservation	48,800	21,700	16,800	–	–
			$6,204,575	$4,180,700		$864,700	$847,900	$873,500	$897,700	$1,007,200

(a) The "Present Termination Commitment" represents the outstanding debt issued to finance the projects as of September 30, 1984 (without inclusion of costs and credits which would be associated with termination of construction, salvage of assets and utilization of unspent construction funds) which would be payable over the varied financing repayment periods if the projects were terminated.

(b) These are estimates of amounts needed to complete construction as of September 30, 1984, based on information provided by the Washington Public Power Supply System. Construction of WNP Nos. 1 and 3 has been delayed.

(c) Debt service for BPA portion of Hanford Generating Project is paid by WNP No. 1 participants and therefore included in WNP No. 1 debt service. The amounts shown for WNP Nos. 1 and 3 debt service assume restart of construction and related financing beginning in fiscal years 1989 and 1988, respectively.

(d) WNP No. 1 will require no funds from BPA through September 1988 to pay preservation costs as it has sufficient monies in its Construction Fund to pay those costs.

6. Residential Energy Exchange:

As provided for in the Pacific Northwest Electric Power Planning and Conservation Act (Regional Act), Section 5(c), BPA entered into residential energy purchase and exchange sales contracts effective October 1, 1981 with several electric utilities. These contracts provide for sales of electric power to BPA not in excess of a portion of each utility's residential load (the load increases ratably from 50% to 100% over five years) at the average system costs of each utility's resources in each year. In exchange, BPA is required to sell the utilities electric power not in excess of the utilities' residential loads at BPA's priority firm power rates. Purchases and sales of electric power by BPA during fiscal years 1984 and 1983 under these contracts were as follows:

In thousands of dollars	**1984**	1983
Residential energy purchased (included in operating expenses)	**$835,254**	$549,469
Residential energy sold (included in operating revenues)	**650,958**	400,071
Net residential exchange costs	**$184,296**	$149,398

The Regional Act provides that the net residential exchange costs projected in each rate period before July 1, 1985 be included in the direct service industrial rates to the extent such costs are not allocated to rates applicable to other customers. Therefore, operating revenues include amounts covering net residential exchange costs to the extent such net costs have been projected and recovered in revenues.

The Regional Act also provides that, in the event an overall net revenue surplus or deficiency exists for the period ending June 30, 1985, the portion of such surplus or deficiency caused by (1) a difference between projected and actual power deliveries to the direct service industrial customers during that period and (2) an underrecovery or overrecovery of the net residential exchange costs resulting from such differences, be recovered from or repaid to customers, over a reasonable period of time, on the basis of sales of power during that period.

The methodology for determining the overall net revenue surplus or deficiency for the period through June 30, 1985 has not been completed or agreed to by the affected parties. In the opinion of BPA management, the amount will not have a material effect on the FCRPS financial statements.

7. Repayment Responsibility For Irrigation Costs:

Legislation requires that FCRPS net revenues will be used to repay to the U.S. Treasury that portion of the cost allocated to irrigation of any Pacific Northwest project authorized by Congress and determined by the Secretary, Department of Interior, to be beyond the ability of the irrigation water users to repay. Using power revenues for such repayment is a payment for irrigation assistance to the benefitting water users. Although paid by power ratepayers, such costs do not represent a regular operations cost of the power program and are not included therein. Irrigation assistance payments of $748 million, which have not been recorded in these financial statements, are returnable from future power revenues. No amounts for irrigation assistance will be collected from power rate payers until 1997, the year the first irrigation assistance payment is scheduled to be made.

8. Investment in Teton Dam and Libby Reregulating Dam:

On June 5, 1976, before the project had been completed and turned over for the use of FCRPS, Teton Dam was extensively damaged. The total investment in the project at September 30, 1984 (excluding interest totaling $2.2 million after June 1976 which has been charged to expense) was $79.1 million. The amount of investment allocated to power was $13.8 million, and the amount of investment allocated to irrigation but repayable from power revenues was $47.0 million. Disposition of the project's costs and final decision about the repayment obligation depend on Congressional action. If repayment is not required, the investment in power facilities (and recovery of the related $2.2 million of interest) will be paid by the U.S. Government. Should FCRPS be directed to repay, the costs will be recovered through rates. Until a decision is made, the investment allocated to power is included as a deferred charge in the statement of assets and liabilities and the cost of irrigation assistance is included in the total of other irrigation costs described in Note 7.

On September 8, 1978, the Corps was enjoined from continuing construction of a reregulating dam at Libby, Montana because of a lack of specific Congressional authority. Later appeals by the Corps to remove the injunction were denied. Investment in the reregulating dam was $18.6 million at September 30, 1984. If authority to complete the dam is not granted by Congress and repayment is not required, the federal investment will be reduced by the unrecovered amount of the investment. Should FCRPS be directed to make repayment, the investment will be recovered through rates. Until a decision is made, the investment is included as a deferred charge in the statement of assets and liabilities.

9. Contingencies:

Litigation Involving the Regional Act

BPA is involved in litigation concerning various Regional Act matters. This litigation includes (a) various challenges to BPA's determination of the average system cost of certain utilities participating in the residential energy exchange (see Note 6); (b) an agency of the State of California contending that certain provisions of BPA's power sales and residential exchange contracts are illegal and void because they conflict with requirements of the Regional Act and result in practices discriminatory to California utilities; and (c) an agency of the State of Oregon alleging that BPA was biased in developing the average system cost methodology. While the outcome of these individual cases is uncertain, in the opinion of BPA General Counsel and management, the resolution of such cases will not have a material effect on the FCRPS financial statements.

Certain other cases have been filed against BPA involving Regional Act matters. In the opinion of BPA General Counsel and management, either the likelihood of success by the filing party is remote or the ultimate outcome will not have a material effect on the FCRPS financial statements.

In 1984, final judgments were rendered in BPA's favor with respect to cases brought by public preference and direct service industrial customers of BPA alleging the violations of certain statutory provisions in the level and design of BPA's 1981 and 1982 rate schedules, and the denial of meaningful due process and protection guaranteed by the Regional Act and the Administrative Procedure Act.

Litigation Involving the Washington Public Power Supply System (the Supply System)

On January 22, 1982, the Supply System stopped construction of two nuclear projects: WNP No. 4 at Hanford and WNP No. 5 at Satsop. After the termination, the Supply System defaulted on $2.25 billion of outstanding WNP Nos. 4 and 5 bonds for which FCRPS has no obligation, and delayed construction of WNP Nos. 1 and 3. The above actions of the Supply System have led to a number of lawsuits which involve BPA.

The primary issues resulting from the termination of WNP Nos. 4 and 5 that involve BPA include the allocation of costs between WNP Nos. 1 and 4 and WNP Nos. 3 and 5 which share certain common facilities. The participants of the terminated projects have demanded that the heretofore equitably shared costs be reallocated retroactively to WNP Nos. 1 and 3. If the participants are successful, this could result in these two projects assuming additional costs of $192 to $400 million. Because of the net billing agreements discussed in Note 5, which require BPA to pay the participants' portion of the annual project costs for WNP Nos. 1, 2, and 3, BPA might be required to fund judgments against the Supply System affecting the terminated projects. Various other suits have been filed by, or on behalf of, holders of the $2.25 billion bonds defaulted upon by the Supply System in an attempt to transfer the debt service obligation from the Supply System to BPA.

The major issue resulting from the construction delay of WNP No. 3 surrounds the 30% investment in that project by four investor-owned utilities (IOUs). On November 23, 1984, a United States District Court judge held that 1) the Ownership Agreement, the Net Billing Agreement and the Project Agreement were breached by the construction delay; 2) the construction cost for the Supply System's 70% share are net billable to BPA; 3) the IOU owners are third party beneficiaries of the Project and Net Billing Agreements; 4) any claims or judgments in favor of the IOUs against the Supply System as a result of the construction delay cannot be net billed by the Supply System to BPA; and 5) that the issue of materiality of the breach is a question of fact reserved for trial.

As an outgrowth of this order three of the IOU owners have filed administrative claims against BPA ranging from a total of approximately $809 million alleged immediate damages to about $1.9 billion prospective damages. An administrative claim from the fourth IOU owner is anticipated.

At the present time representatives of the IOUs and BPA are engaged in an effort to reach a settlement of the issues involved in the litigation which, if successful, would result in termination of the litigation and a withdrawal of the administrative claims.

The cases and legal issues involving the above matters have not been fully developed and involve legal questions for which there are no precedents. BPA and the U.S. Department of Justice intend to continue the vigorous defense of these cases; however, the ultimate effect on FCRPS, if any, cannot be determined at this time.

During 1984, the Supply System entered into a settlement agreement pursuant to a $53.6 million judgment against the Supply System from an alleged breach of contract to purchase uranium from the plaintiff. The agreement required the Supply System to pay the plaintiff $25 million and was funded by BPA under the net billing agreements.

Other Matters

Certain other claims, suits and complaints have been filed or are pending against entities of FCRPS. In the opinion of counsel and management for those entities, these actions are either without merit or involve amounts which are not material to the FCRPS financial statements.

Federal Columbia River Power System

Schedule of Amount and Allocation of Plant Investment

September 30, 1984

Schedule A

Project	Total	Commercial Power			Irrigation			Nonreimbursable					Percent of Total Returnable From Commercial Power Revenues
		Completed Plant	Construction Work in Progress	Total Commercial Power	Returnable From Commercial Power Revenues	Returnable From Other Sources	Total Irrigation	Navigation	Flood Control	Fish and Wildlife	Recreation	Other (c)	
In thousands of dollars													
Projects in Service:													
Transmission facilities (BPA)	$ 2,882,298	$2,548,418	$333,880	$2,882,298	$ –	$ –	$ –	$ –	$ –	$ –	$ –	$ –	100.0%
Bureau projects–													
Boise	78,340	7,251	2,413	9,664	16,364	35,453	51,817	–	16,859	–	–	–	33.2%
Columbia Basin	1,613,893	845,259	94,944	940,203	537,078	83,206	620,284	1,000	48,432	3,294	154	526	91.5%
Hungry Horse	101,808	76,986	129	77,115	–	–	–	–	24,693	–	–	–	75.7%
Minidoka–Palisades	204,417	14,123	26	14,149	10,291	112,319	122,610	–	60,865	1,202	5,591	–	12.0%
Yakima	114,077	4,717	447	5,164	10,815	95,789	106,604	–	905	1,166	238	–	14.0%
Total Bureau projects	2,112,535	948,336	97,959	1,046,295	574,548	326,767	901,315	1,000	151,754	5,662	5,983	526	76.7%
Corps projects–													
Albeni Falls	33,858	32,226	–	32,226	–	–	–	135	174	–	1,323	–	95.2%
Bonneville	781,654	693,631	39,934	733,565	–	–	–	44,738	–	–	1,289	2,062	93.8%
Chief Joseph	504,327	479,376	17,366	496,742	746	–	746	–	–	–	2,115	4,724	98.6%
Cougar	60,743	18,443	186	18,629	–	3,073	3,073	547	38,286	–	–	208	30.7%
Detroit–Big Cliff	67,452	40,691	262	40,953	–	5,122	5,122	222	21,155	–	–	–	60.7%
Dworshak	355,506	299,157	211	299,368	–	–	–	9,446	34,015	–	12,677	–	84.2%
Green Peter–Foster	90,627	50,042	16	50,058	–	5,848	5,848	367	30,441	–	1,855	2,058	55.2%
Hills Creek	49,067	17,526	11	17,537	–	4,321	4,321	627	26,310	–	–	272	35.7%
Ice Harbor	207,604	140,376	18,193	158,569	–	–	–	46,194	–	–	2,841	–	76.4%
John Day	551,427	396,604	10,699	407,303	–	–	–	86,128	20,108	–	11,479	26,409	73.9%
Libby (d)	587,898	411,046	52,647	463,693	–	–	–	–	87,102	–	5,594	31,509	78.9%
Little Goose	281,752	205,634	18,375	224,009	–	–	–	51,088	–	–	4,051	2,604	79.5%
Lookout Point–Dexter	98,483	46,811	139	46,950	–	1,385	1,385	739	48,793	–	522	94	47.7%
Lost Creek (a)	149,695	26,957	11	26,968	–	2,005	2,005	–	53,173	24,404	29,308	13,837	18.0%
Lower Granite	423,734	329,440	18,757	348,197	–	–	–	55,061	–	–	12,634	7,842	82.2%
Lower Monumental	292,594	222,370	18,387	240,757	–	–	–	48,598	–	–	2,822	417	82.3%
McNary	350,581	273,143	6,343	279,486	–	–	–	68,099	–	–	2,996	–	79.7%
The Dalles	327,022	280,076	1,081	281,157	–	–	–	43,761	–	–	2,082	22	86.0%
Total Corps projects	5,214,024	3,963,549	202,618	4,166,167	746	21,754	22,500	455,750	359,557	24,404	93,588	92,058	79.9%
Irrigation assistance at 12 projects having no power generation	161,312	–	–	–	114,303	47,009	161,312	–	–	–	–	–	70.9%
Total plant investment	10,370,169	7,460,303	634,457	8,094,760	689,597	395,530	1,085,127	456,750	511,311	30,066	99,571	92,584	84.7%
Repayment obligation retained by Columbia Basin Project	4,639	2,836	(b) –	2,836	1,803	–	1,803	–	–	–	–	–	100.0%
Other repayment obligation	9,245	–	21	21	9,224	–	9,224	–	–	–	–	–	100.0%
Investment in Teton and Libby Projects (d)	97,722	–	32,449	32,449	47,028	3,684	50,712	–	12,241	–	2,320	–	81.3%
Total	$10,481,775	$7,463,139	$666,927	$8,130,066	$747,652	$399,214	$1,146,866	$456,750	$523,552	$30,066	$101,891	$92,584	84.7%

(a) Project in service that has tentative cost allocations at September 30, 1984.

(b) Joint facilities transferred to Bureau of Sport Fisheries and Wildlife. This portion is included in other assets and deferred charges in the accompanying statement of assets and liabilities.

(c) Included in this amount are nonreimbursable road costs amounting to $77.1 million.

(d) The $13,834 commercial power portion of the Teton dam and the $18,615 portion of Libby related to the reregulating dam are included in other assets and deferred charges in the accompanying statement of assets and liabilities. Teton amounts exclude interest totaling approximately $2.2 million subsequent to June 1976 which has been charged to expense.

Reconciliation of Cost Accounting Financial Statements to the Revenue Requirement Study

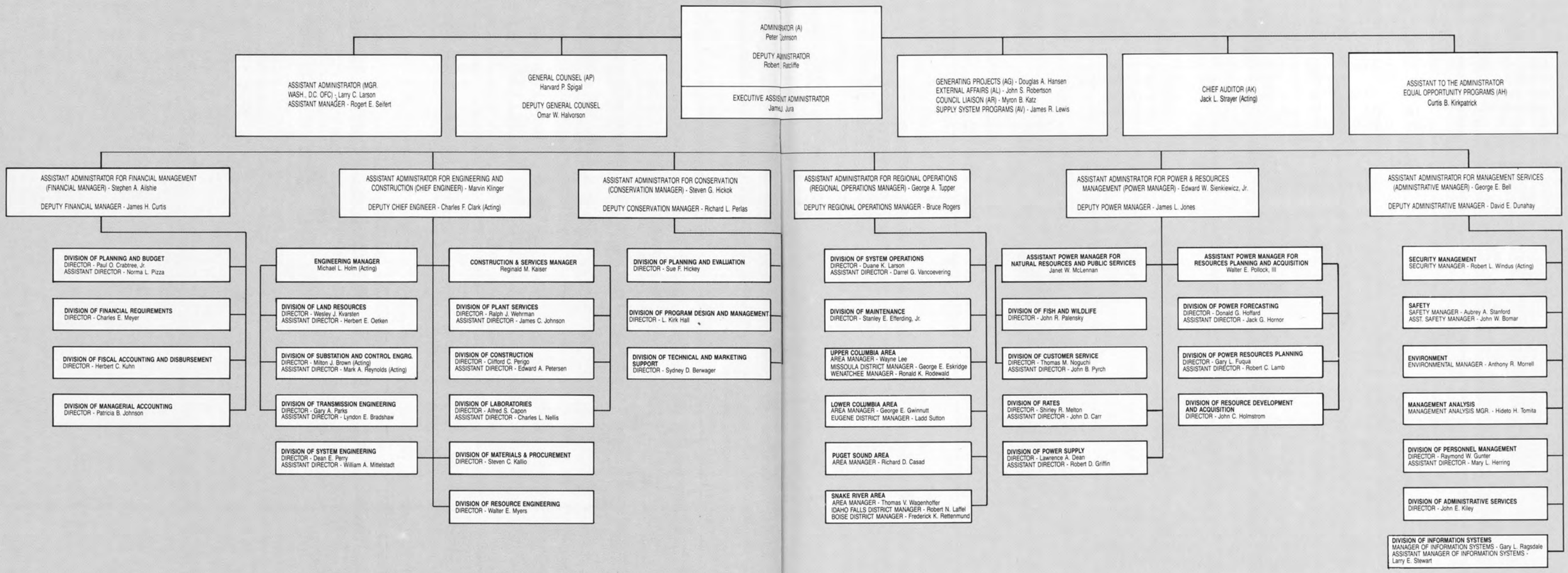
for the fiscal year ended September 30, 1984

Schedule B

In thousands of dollars	Cumulative Balance 9/30/83	Fiscal Year 84 Operations	Cumulative Balance 9/30/84	Cumulative Adjustment to Repayment basis	Cumulative Data thru 9/30/84 on Revenue Requirement Study
Operating Revenues	$ 8,329,454	$ 2,666,475	$ 10,995,929	($ 473,812)	$ 10,522,117
Expense:					
Purchase and exchange power	2,989,916	1,897,306	4,887,222	0	4,887,222
Operation and maintenance expense	1,959,429	263,465	2,222,894	(20,218)	2,202,676
Depreciation	853,731	74,949	928,680	(928,680)	0
Interest expense	2,465,048	329,725	2,794,773	(2,244)	2,792,529
Total Expense	8,268,124	2,565,445	10,833,569	(951,142)	9,882,427
Net revenues	$ 61,330	$ 101,030	$ 162,360	$ 477,330	$ 639,690
Adjustment to cash amortization					473,812
Cumulative revenues available for amoritzation					1,113,502
Construction and Conservtion Financed from Revenues					(257,022)
Current Assets Financed from Revenues					(206,327)
Other Assets Financed from Revenues					(8,219)
Teton Interest Expense					(2,244)
Cumulative Amortization thru September 30, 1984					$ 639,690
Plant Investment:					
Completed Plant					$ 7,460,303
Retirement Work-in-Progress					27,770
Repayment Obligation Retained by Columbia Basin Project (Schedule A)					2,836
Net Retirements					178,502
Conservation Investment					332,232
Total					8,001,643
Less: Cumulative Amortization through September 30, 1984					(639,690)
Unamortized Plant Investment					$ 7,361,953

Official Organization Chart

U.S. Department of Energy
Bonneville Power Administration



Bonneville Power Administration Offices

BPA Headquarters
Public Involvement Office
1002 NE Holladay
Sixth Floor
P.O. Box 12999
Portland, Oregon 97212
503-230-3478
Toll-free lines:
Oregon—800-452-8429
Other Western States—
800-547-6048

Lower Columbia Area
1500 Plaza Building, Suite 288
1500 NE Irving Street
PO Box 3621
Portland, OR 97208
(503) 230-4551

Eugene District Office
US Federal Building
Room 206
211 E 7th Street
Eugene, OR 97401
(503) 687-6958

Upper Columbia Area
US Court House, Room 561
W 920 Riverside Avenue
Spokane, WA 99201
(509) 456-2515

Wenatchee District
Morris Building, Suite 117
23 S Wenatchee Avenue
PO Box 741
Wenatchee, WA 98801
(509) 662-4377

Montana District
800 Kensington
Missoula, MT 59801
(406) 329-3060

Puget Sound Area
415 First Avenue N, Room 250
Seattle, WA 98109
(206) 442-4131

Snake River Area
W 101 Poplar
Walla Walla, WA 99362
(509) 522-6225

Idaho Falls District
531 Lomax Street
Idaho Falls, ID 83401
(208) 523-2706

Boise District
Owyee Plaza, Suite 245
1109 Main Street
Boise, ID 83707
(208) 334-9137

Washington, DC Office
Bonneville Power
Administration
Forrestal Building
Room 8G033
Washington, DC 20585
(202) 252-5640

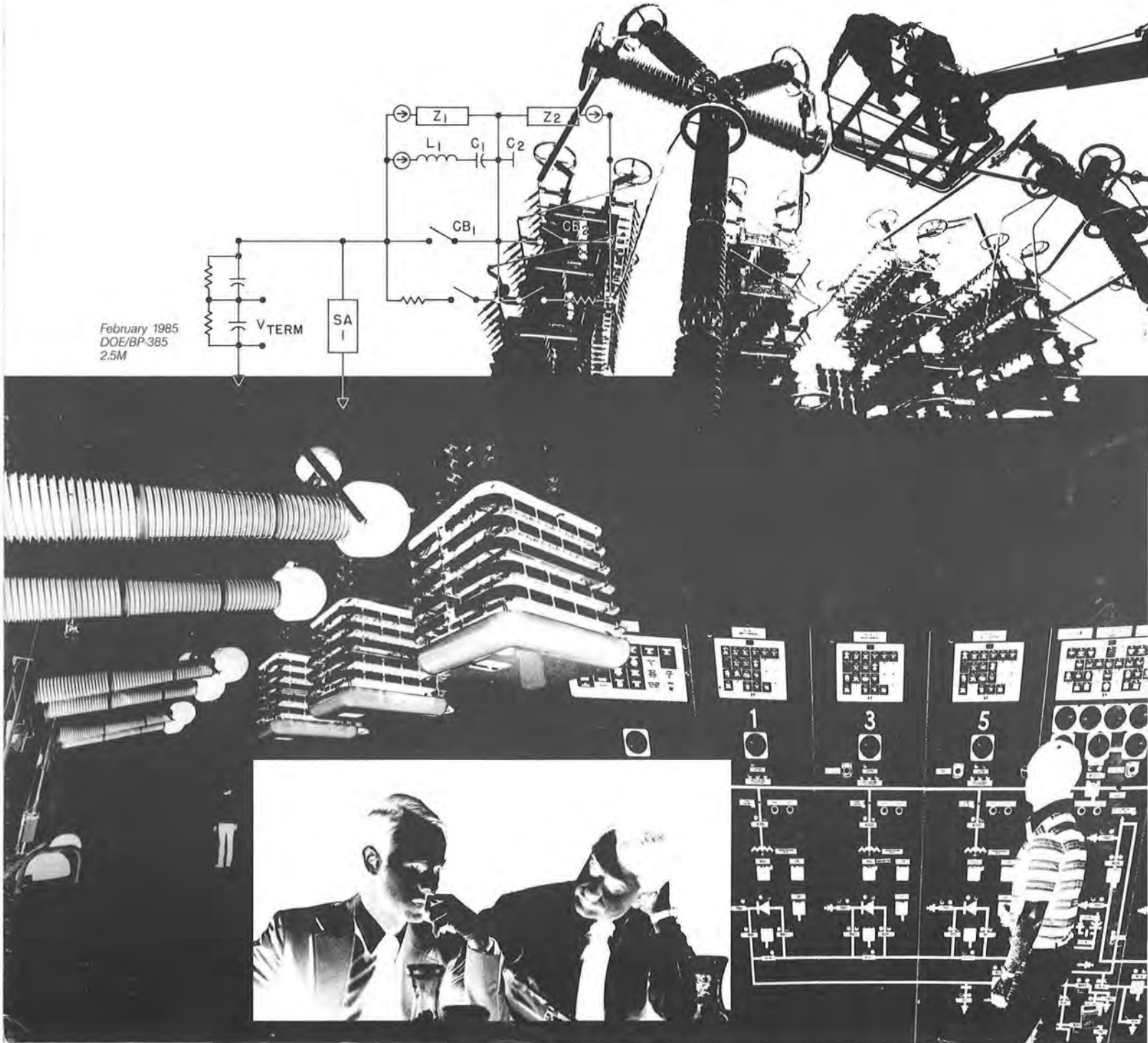
Washington Public Power Supply System Office
3040 George Washington Way
PO Box 968
Richland, WA 99352
(509) 372-5750

☆ U.S. GOVERNMENT PRINTING OFFICE: 1985—574-996 REGION NO.

BPA Mission Statement

BPA will act as a catalyst for defining and achieving the electric power and conservation objectives of the Pacific Northwest. We will work to assure the region an adequate, economical, reliable, efficient, and environmentally acceptable power supply. We will do so in an open and businesslike way, consistent with our responsibilities to fish and wildlife and with our obligations as a Federal agency, and responsive to citizens' concerns for their well-being and the quality of their environment. BPA will provide leadership in the region, fulfilling our responsiblities with professional excellence.

September 1983



February 1985
DOE/BP-385
2.5M