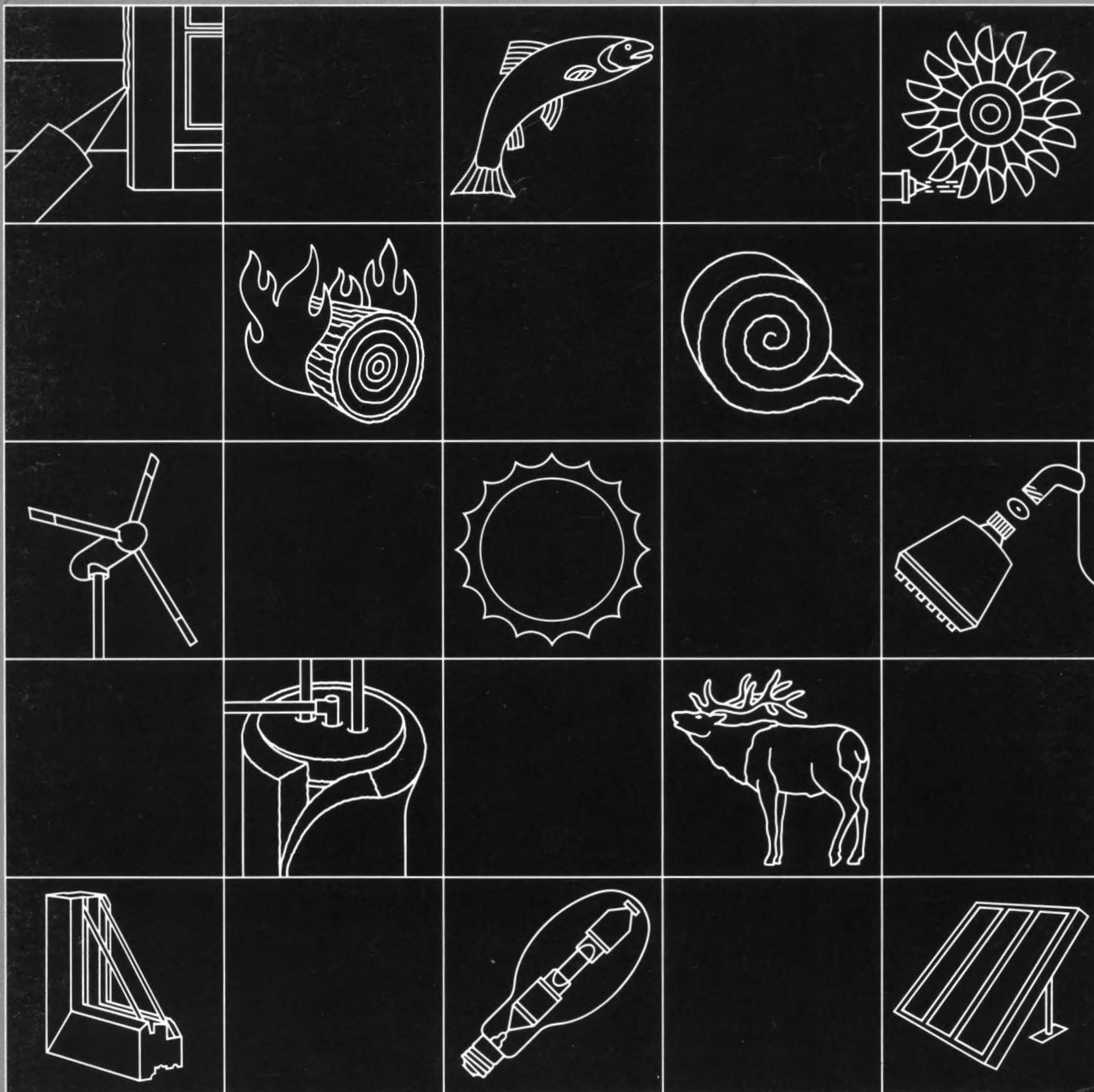
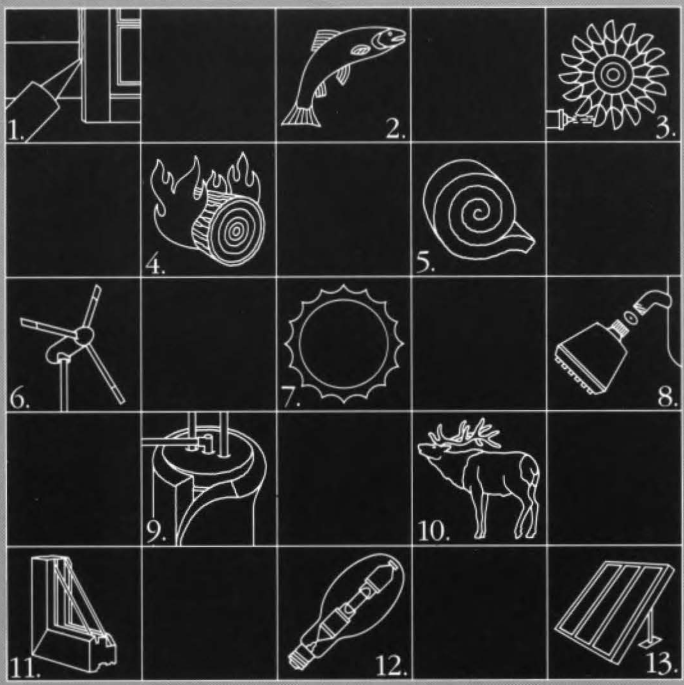
1981 Annual Report



Bonneville Power Administration
U.S. Department of Energy



Cover Illustration

The cover of this Annual Report depicts some of the new activities being undertaken by Bonneville Power Administration in carrying out the initiatives of the Pacific Northwest Electric Power Planning and Conservation Act of 1980. Among the salient programs prescribed in this landmark legislation are: a) energy conservation; b) fish and wildlife protection, mitigation and enhancement; and c) renewable resource development and acquisition.

1. Building weatherization
2. Fish mitigation
3. Small hydroelectric projects
4. Biomass generation
5. Insulation
6. Wind generation
7. Solar applications
8. Shower flow restrictors
9. Water heater wrapping
10. Wildlife protection
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1981 Annual Report
Federal Columbia River Power System

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Honorable James B. Edwards
Secretary of Energy
Washington, D.C. 20545

December 31, 1981

Dear Mr. Secretary:

This is the Bonneville Power Administration's 44th annual report on the Federal Columbia River Power System. It covers events of fiscal year 1981 plus significant developments since the fiscal year ended on September 30. This is also my first annual report since my appointment as BPA Administrator.

As noted in the first chapter of this report, the events of FY 1981 heralded a "new beginning" for Bonneville Power Administration. Enactment of the Pacific Northwest Electric Power Planning and Conservation Act on December 5, 1980, presented BPA with a host of new responsibilities as well as challenging opportunities. I am gratified to report that the entire organization has accepted its expanded role with a verve and a professional confidence bred from four decades of unique contribution to the region we serve.

Throughout its first year under the Regional Act, BPA has been intensively engaged in translating its congressional mandates into a cohesive set of action programs. The negotiation of new long-term contracts, mounting an aggressive energy conservation effort, designing a renewable resource development and acquisition program—these and other crucial tasks have been rewarded with solid accomplishment.

In formulating these programs, we have been keenly aware of our obligations to the ratepayers. It would be easy to embark upon hasty initiatives which might produce ineffective, wasteful or perhaps damaging programs that would ill-serve the goals of the Regional Act. Accordingly, BPA's actions in pursuit of these goals are being taken systematically, efficiently, and with a stern view to costs. Our success, and the success of the region in utilizing the tools offered by the Regional Act, will be measured not by the speed at which new programs are launched, but by their enduring quality.

Implementing the Regional Act, however, is not solely the responsibility of BPA. An array of other entities are being tested in the same energy crucible—our utility and industrial customers, State and local governments, fish and wildlife agencies, Indian tribes, public-interest groups and others. This year also saw the emergence of a new organization which will play a pivotal role in shaping the region's energy future. A key element of the Regional Act, the Pacific Northwest Electric Power and Conservation Planning Council was activated in April 1981. This 8-member body has made an impressive start in tackling its formidable task of developing a long-range plan to identify future power demands and the resources to meet them.

While BPA's attention over the past year has focused primarily upon our obligations under the Regional Act, we are gravely concerned about an issue of more ominous nature. During 1981 the mounting problems of the Washington Public Power Supply System (WPPSS) nuclear construction program culminated in a situation of serious proportions. By year-end the financial plight of two nuclear projects and their 88 utility sponsors was fraught with uncertainty. This could have an indirect impact on the three WPPSS net-billed projects which are largely financed through BPA revenues.

BPA has made a tough-minded response to this challenge. In order to carry out the regional legislation and to assure the timely completion of the net-billed projects, it is essential that BPA maintain and strengthen its fiscal integrity. In doing so, we are making major realignments in our organizational structure and are redirecting the way in which we conduct our business. First, we have taken a hard look at our internal costs and revenue potential with the intent of enhancing our financial position in every possible way. Second, we are making the necessary adjustments in our rate structure to assure meeting our operational and repayment obligations. This has resulted in the sizable increase in our wholesale power rates which took effect on July 1, 1981, with another substantial increase slated for October 1, 1982. And third, BPA is engaged in an intense and sophisticated process of long-range strategic planning. The major purposes of this effort are to establish clear direction for the agency and to develop cohesive strategies among our various components to maximize efficiency and results.

With respect to the net-billed nuclear projects, we are working closely with WPPSS management and others to assure the completion of these plants as quickly and economically as possible commensurate with safety and environmental standards. We have obtained a commitment from the WPPSS management to strive for the completion of these projects on or ahead of their published schedule with a 15-percent saving in projected construction costs. I am pleased to report that construction on two of the plants is now running ahead of the timetable shown in the WPPSS 1982 budget document.

In FY 1981 the Pacific Northwest enjoyed near-normal streamflow conditions, which enabled BPA to chalk up a new record in total sales of electric energy—81.2 billion kilowatthours sold to all classes of BPA customers. Based upon current snowpack and reservoir levels, we anticipate no problem in meeting our loads in FY 1982.

The past fiscal year was also one of the busiest in BPA history in terms of construction activity. By September 30 we had completed a total of 497 circuit-miles of high-voltage transmission lines and added 7 substations to the BPA grid. And thanks to the tireless efforts of our operation and maintenance force, the BPA system experienced no major electrical outages during this period.

In summary, fiscal year 1981 has been a period of profound change and rigorous challenge for Bonneville Power Administration. That we have continued to excel in our traditional functions while laying a solid foundation for implementing the Regional Act is a tribute to the BPA staff. With your continuing support and that of our partners in the Pacific Northwest, we can face the future with renewed confidence and pride.

Sincerely,

Peter T. Johnson

Administrator

BPA Mission Statement

BPA will act as a catalyst for achieving the electric energy 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 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 responsibilities with professional excellence.

September 1981

The First Year Under the Regional Act

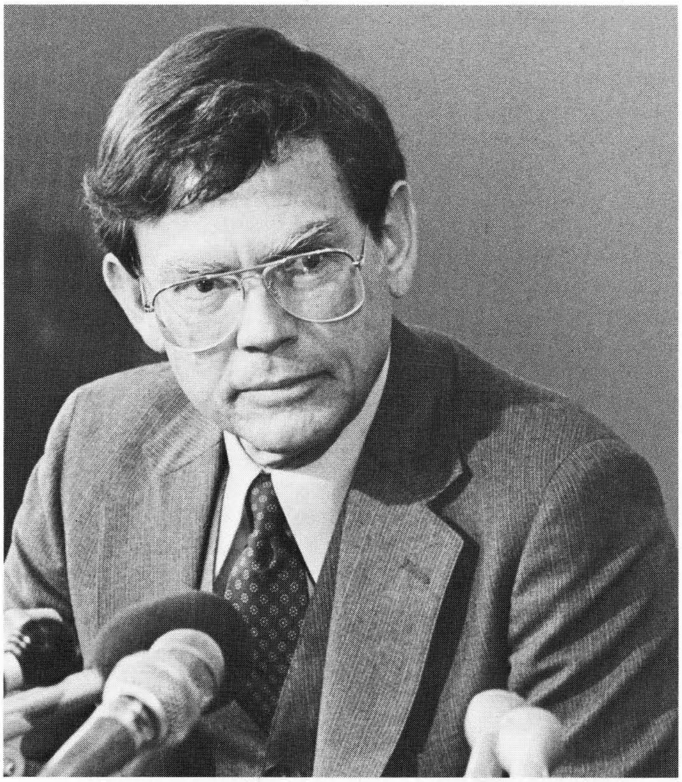
A New Beginning for BPA

Fiscal year 1981 will go down in the annals of Bonneville Power Administration as a year of profound change—not only with respect to BPA's mission and programs, but its relationships throughout the region. The paramount cause of this sweeping change was the enactment of Public Law 96-501, the Pacific Northwest Electric Power Planning and Conservation Act, on December 5, 1980. This legislation promises to leave an indelible imprint upon both BPA and the region which it serves. Just as the Bonneville Project Act of 1937 ushered in an era of regional development, so does the Regional Act of 1980 propel BPA and the Pacific Northwest into a new energy arena.

Following on the heels of the Regional Act was the change of National administration and a new hand on the BPA helm. Peter T. Johnson was sworn in as BPA's ninth Administrator on May 11, 1981, with Earl E. Gjelde serving as Deputy Administrator. They, together with a substantial portion of the BPA staff, immediately began tackling the multiple challenges of carrying out the agency's responsibilities under the Regional Act.

Following are some of the principal requirements of the legislation which had to be immediately addressed by BPA:

- Negotiation of new long-term power sales contracts with customers, including investor-owned utilities;
- Development of interim and long-term energy conservation contracts with utility customers;
- Negotiation of residential power exchange contracts with utilities;
- Formulation of standards and criteria with respect to BPA resource acquisition, including financial assistance to sponsors of renewable energy resources, cogeneration, and projects with high fuel conversion efficiency;
- Development of contract provisions and general guidelines related to the protection, mitigation, and enhancement of fish and wildlife resources on the Columbia River and its tributaries;
- Liaison with and assistance to the newly formed Pacific Northwest Electric Power and Conservation Planning Council;
- Expansion of the State and local government assistance program;



BPA Administrator Peter Johnson responds to questions at his first news conference after taking office.

- Development of methodologies with regard to billing credits, average system cost (of resources to be exchanged with utilities), and cost-effectiveness determinations;
- Quantification of the environmental effects posed by various BPA actions in carrying out the provisions of the Regional Act; and
- Refinement and expansion of public involvement strategies and procedures.

In order to accommodate the array of new and expanded programs mandated by the Regional Act, BPA also had to seek immediate revision of its fiscal year 1981 budget. The revision was completed and submitted to the Department of Energy (DOE) within a month of the legislation's enactment.

Concurrently, BPA was heavily involved in developing its wholesale power rate proposal which was scheduled to take effect in July 1981. Under the provisions of the Regional Act, this "rate case" was for the first time conducted as a formal hearing process.

The demands placed upon BPA staff in undertaking this volume of new or expanded activities were accepted with enthusiasm, dedication and professional competence. That these formidable tasks were undertaken with a confident, "can-do" spirit was also a tribute to the thoroughgoing preparation which preceded the passage of the Regional Act.

Starting in mid-1980, several score of BPA staff became intensively involved in laying the foundation to respond to the statutory requirements then evolving in Congress. A total of 34 task units were formed to address the array of new responsibilities to be imposed by the Regional Act.

To a considerable extent, the enactment of Public Law 96-501 was merely a signal to "shift gears" from a strategy matrix to vigorous implementation of the long-awaited congressional mandate. Once again, as demonstrated repeatedly throughout its 43 years of blazing new energy trails, Bonneville Power Administration was up to the challenge....

Power Sales Contracts

One of the principal challenges posed by the Regional Act was its requirement that BPA offer new long-term power sales contracts to all of its customers by September 5, 1981. Since it was decided early-on that these would be 20-year contracts, all parties to the contract negotiations were keenly aware of the magnitude of their task. The wording of virtually every clause had to be crafted with a view both to projected factors and to unforeseen developments which might occur over the 20-year contract term.

During 8 months of intensive negotiations, many non-customer entities had a say in the formulation of the contracts. Contract drafts were made available to the public in June 1981, and public comments were received and evaluated. The most tangible result of public and special-interest group comments is Section 44 of the General Contract Provisions. Under this section, the parties to the contracts agree to negotiate amendments—as necessary—to bring the contracts into conformance with the long-range regional power plan to be adopted by the Pacific Northwest Electric Power and Conservation Planning Council in early 1983.

On August 28, 1981, BPA offered 296 customer-specific contracts containing final provisions covering industrial sales, residential exchange sales with utilities, and sales to meet the load growth requirements of existing Federal agency and utility customers. As specified in the Regional Act, customers have 1 year from the date of the contract offers to accept the contracts.

In the interim, the offering of the contracts triggered a spate of lawsuits by various parties. Forelaws on Board, a public-interest group, challenged both the power sales contracts and the residential exchange contracts on the grounds that BPA failed to comply with the National Environmental Policy Act before offering the contracts.

In addition, a large number of BPA customers and other parties have filed a total of 7 lawsuits challenging the contracts on various grounds. These suits allege, among other things, violation of the preference clause of the Bonneville Project Act, inconsistency with the Regional Act, violation of BPA contracting authority, and discrimination with regard to power supply and rates. The National Wildlife Federation and others have also filed litigation alleging that BPA improperly offered a power sales contract to Alumax Pacific Corporation for service to a proposed aluminum reduction plant in northeastern Oregon.

The power sales contracts are the key to implementation of the Regional Act because they define the scope of utility and industry participation in regionwide planning and power programs. Both BPA and Northwest Power Planning Council planning efforts rely upon the contractual participation of the region's utilities and major industrial users to fulfill the promise of the Regional Act. When the flurry of litigation has settled, these contracts will govern the disposition of Federal power throughout the Pacific Northwest into the next century.

As of December 31, 1981, six utilities and Federal agencies had executed new power sales contracts.

Power Exchange Contracts

The Regional Act was written with a political awareness of the differential in the power rates paid by customers of investor-owned and publicly owned utilities in the Northwest. Accordingly, the Regional Act provides a mechanism to make the low-cost power of the Federal system available to domestic and farm customers of the investor-owned utilities. These firms may buy low-cost Federal power from BPA to serve their residential loads. In exchange, BPA purchases an equal block of power from each contracting investor-owned utility at the latter's "average system cost."

BPA recovers most of the additional expense incurred in this exchange from its direct-service industrial customers. Beginning in October 1981, 60 percent of the investor-owned utilities' residential load was exchanged, and the industrial rates were subject to a commensurate increase. An additional 10 percent of the eligible residential loads will be picked up each year until the full exchange is achieved in 1985. The Regional Act stipulates that the entire benefit of the exchange be passed on to the residential end-users.

Countless hours (and containers of coffee) were consumed in negotiating the various contracts required by the Regional Act.

While the power exchange provisions were included in the Regional Act primarily to benefit residential customers of the investor-owned utilities, they are also applicable to publicly owned systems.

One of the key issues in the negotiation of the power exchange contracts and the industrial sales contracts was the determination of the utilities' respective average system costs. A BPA task force was assigned to formulate a methodology for determining the costs, with participation from all customer categories, State public utility commissions, and various interested parties. The resultant methodology was disseminated for wide public review and comment before it was officially endorsed as being an equitable mechanism for determining the actual rates.

As of December 31, 1981, 15 of BPA's 16 industrial customers had signed power sales contracts, and 7 investor-owned utilities and one municipal system had executed power exchange contracts.

1981 Rate Increase

In mid-1980, formal notice was given that BPA would require a substantial rate increase in 1981 to accommodate the upward pressure on its revenue requirements. The major factors bearing upon this action were (1) the increasing cost of power acquisition (primarily the net-billed nuclear plants being constructed by the Washington Public Power Supply System), (2) the investment in additions to the Federal hydroelectric and transmission system, (3) the less-than-anticipated revenues generated by certain 1979 rate schedules, and (4) the overall increase in the cost of doing business, including continuing inflation.

Following several weeks of preliminary discussions between BPA and its customers, public hearings on the rate proposal got underway in February 1981. These required 23 days of formal testimony and cross-examination, produced some 5,000 pages of transcribed material, and resulted in more than 500 data requests which were responded to in 7,000 pages of material. After 4 months of public hearings under the formal hearing process mandated by the Regional Act, the final rate proposal was given interim approval by the Department of Energy and was submitted to the Federal Energy Regulatory Commission (FERC) for final review.

The new rates, which took effect on July 1, 1981, will produce estimated revenues of $1,308,506,000 in FY 1982. The rate package provides for a 78.5-percent increase in revenues, but with varying impacts on the different classes of customers. BPA preference customers and Federal agencies are experiencing an average 59-percent increase in wholesale rates, with investor-owned utilities paying comparable rates for their exchange blocks of residential power. BPA's direct-service industrial customers, whose rates facilitate the sale of lower-cost power to investor-owned utility residential customers, are paying an average 235 percent more for their power.

The interim rate package, now in the hands of FERC, has been legally challenged by three State agencies and by all classes of BPA customers, including Southwest utilities which purchase surplus power from BPA. Resolution by FERC may be a lengthy process, as evidenced by the fact that FERC is still reviewing BPA's 1979 interim wholesale power rates, as well as its 1976 transmission rate schedules.

Anticipated 1982 Rate Increase

In October 1981 the Federal Register published a BPA Notice of Intent to adjust its wholesale power rates in 1982. This notice gave BPA customers a 1-year advance warning to help them plan adjustments to their own rate schedules. Based upon a preliminary Repayment Study, a 42.8-percent increase in BPA revenues will be needed commencing October 1, 1982.

The principal reasons for BPA's higher revenue requirements, and hence the proposed increase in its wholesale power rates, are as follows.

1. Increases in the cost of thermal power acquisition, particularly with respect to the WPPSS net-billed nuclear projects, are a driving force. These costs will experience a sharp rise with the assumption by BPA of the WNP 3 debt service in July 1982.

2. Continuing high inflation coupled with unprecedented interest rates have driven up the costs not only of the WPPSS net-billed projects, but also the costs of operation, maintenance, repayment, and additions to Federal dams and the BPA transmission grid.

3. Investments in new programs mandated by the Regional Act also exert an upward pressure on BPA rates, although the long-range effect of these activities should benefit the ratepayer. These new programs include energy conservation, acquisition of renewable and alternative energy resources, fish and wildlife enhancement, and billing credits. With the exception of the fish and wildlife program, all of these activities should—over time—more than pay for themselves in terms of new conventional generation which will not have to be built.

4. Increasing revenue requirements have also resulted from a reduction in forecasted revenues, based upon revised assumptions as to the amount of revenue which certain rate schedules will produce. These revenue requirements became more difficult to project due to the new rate categories established by the Regional Act. The principal categories of rate schedules are:
   a. Priority Firm Rate (PF-1)—applicable to publicly owned utilities, Federal agencies and investor-owned utilities participating in the residential exchange contracts under the Regional Act;
   b. Industrial Power Rate (IP-1)—applicable to direct-service industrial customers; and
   c. New Resources Rate (NR-1)—applicable to investor-owned utility load growth and new large single loads of public agencies.

The rate development process for the 1982 wholesale rate filing will be similar to that used for the 1981 wholesale rate filing. BPA is currently conducting a repayment study as well as various cost and rate design studies to develop a proposal for the 1982 rate filing. The studies include a cost-of-service analysis, a long-run incremental cost analysis, a time-differentiated pricing analysis, and various rate design studies. An environmental impact statement of the effects of the proposed rate increase, including the cumulative effects of past and anticipated rate increases, also will be developed. An extensive review by the public will be made of the initial rate proposal, its associated studies, and rate schedules. After these have been revised, in accordance with comments received and any updated information, the final rate proposal will be submitted directly to FERC for interim and final confirmation.

Public Involvement
With the enactment of Public Law 96-501, BPA substantially broadened its public involvement activities. The Regional Act requires that BPA initiate comprehensive programs to inform the public with respect to regional power issues, and to obtain public input as an integral part of its decisionmaking process. In addition, certain provisions of the legislation identify specific groups which must be consulted on various program formulations.

Regionwide advertising was used to stimulate public response to new BPA programs.

Within a few weeks following the passage of the Regional Act, BPA held a series of 6 technical meetings with its customers and other special-interest groups, and 27 "town hall" meetings to explain the complex elements of the legislation and BPA's new responsibilities under the law. Throughout 1981 intensive efforts were made to engender public interest and involvement with regard to the negotiation of power sales and exchange contracts, new ratemaking procedures, the 1981 wholesale power and transmission rates, methodologies for determining average system cost, billing credits, quantification of environmental costs and benefits, and a number of other salient issues.

Public meetings are but one method of stimulating a public dialog on electric energy issues. "Rap sessions" and informal meetings with BPA staff are frequent events. In addition, toll-free telephone numbers are widely publicized to encourage people to seek information from BPA or to express their views. Nor is the BPA public involvement effort limited to its statutory responsibilities vis-a-vis designated issues. BPA also sponsors numerous workshops on energy-efficient lighting, solar design, and other conservation programs and issues. To assist in "tracking" these events and the array of BPA policy formulation exchanges, BPA distributes a "weekly calendar" to a large number of organizations and individuals.

Other methods besides formal public meetings are being used to communicate with and garner comments from the public. For example, BPA is using a new and unprecedented process to gain public input on billing credits. The uniqueness of the process is that the public has an opportunity to raise, shape, and refine issues and their resolutions *before* they are presented to BPA's Policy Committee. The public is kept informed as to when each issue is discussed and what action has been proposed. Subsequently there will be another opportunity for public input before the proposed policy is published in March 1982, and again after publication when formal public hearings are held.

In addition to expanding the interactions described above, BPA plans to (1) institute regularly scheduled educational seminars to give the public a greater understanding of the operation of the Federal Columbia River Power System and the BPA transmission system, (2) seek public guidance with respect to conservation initiatives and resource acquisitions, and (3) convene regular meetings with local government officials to discuss community energy management strategies.

Today's "postage stamp" policy of BPA wholesale rates evolved from a series of regionwide public meetings held in 1938. This tradition of heeding the public's concerns continues to permeate the fabric of BPA energy stewardship nearly half a century later.

State and Local Government Assistance
Even prior to the passage of the Regional Act, BPA had assembled the framework for involving State and local government entities in the planning of conservation and other community energy initiatives. This interaction was formalized in February 1981 when BPA held a series of five workshops to give State and local interests an opportunity to formulate guidelines for BPA financing of community energy projects.

An average of about 50 persons attended each of the workshops. State and local government agencies, Indian tribes, public and private utilities, consultants and others participated. By May 1981, the participants had formulated a set of standards and procedures which launched the BPA Community Energy Management Assistance Program.

In June 1981, a BPA solicitation was issued for specific projects in need of BPA financing. Over the next 3 months approximately 200 local governments and Indian tribes submitted 63 project applications totaling some $3 million. The funding requests ranged from $6,000 to $100,000 each.

The applications came from Montana, Idaho, Washington, and Oregon. Proposed activities included assessments of geothermal, wind, solar, hydro, and other resources, revision of local building codes and subdivision ordinances, and development of local conservation plans.

After painstaking review, BPA made awards totaling nearly $700,000 to 18 applicants representing approximately 100 local governments and 4 Indian tribes. The projects to be funded range from planning studies to action programs, and involve communities throughout the Pacific Northwest.

To integrate these efforts with BPA's own energy initiatives, BPA established a Community Energy Office as part of its Regional Operations function. In addition, State and local government liaison positions were established in each of BPA's four Area offices to deal specifically with the community assistance programs and to put community sponsors of energy projects in touch with appropriate BPA or utility experts in the areas of conservation and resource applications.

An informal discussion of regional energy issues brings together (from left) Governors Ted Schwinden of Montana, John Spellman of Washington, Victor Atiyeh of Oregon and BPA Deputy Administrator Earl Gjelde.

Fish and Wildlife Program

With the passage of the Regional Act, BPA's authority and responsibility for the protection, mitigation, and enhancement of fish and wildlife resources of the Columbia River and its tributaries were greatly expanded. BPA's ongoing fishery mitigation program, initiated in fiscal year 1978, had increased to approximately $1.5 million a year by FY 1981.

BPA's initial activity, after the passage of the Regional Act, was to develop a revised budget for FY 1981. The revised budget, including an additional $1.44 million for fish and wildlife activities, was approved in the spring of 1981. This increased the total amount available for BPA funded fish and wildlife research and development projects in FY 1981 to $2.94 million.

Following approval of the budget revision, BPA began evaluating the many proposals which it received following the enactment of the new legislation. Among these were a package of eight projects submitted by the Columbia River Fisheries Council; numerous proposals from universities; projects developed by Indian tribes; and proposals submitted independently by Federal and State fish and wildlife agencies. After reviewing more than 50 proposals, BPA signed 17 contracts for projects and activities to be initiated in FY 1981, representing a financial commitment of $2.25 million.

To facilitate BPA's involvement under the fish and wildlife provisions of the Regional Act, a Fish and Wildlife Program Manager's Office was established in BPA's Office of Power Management. Throughout 1981 the Fish and Wildlife Program Manager had numerous meetings with Federal and State fish and wildlife agencies, Indian tribes, fish and wildlife consultants, and interagency fish and wildlife coordinating bodies. The purpose of these meetings was to create a responsive BPA fish and wildlife program to protect, mitigate and enhance Columbia River fish and wildlife resources while still accommodating the region's power demands.

In June 1981 the newly formed Northwest Power Planning Council called for fish and wildlife recommendations as required by section 4(h) of the Regional Act. These recommendations were solicited primarily from the region's Federal and State fish and wildlife agencies and Indian tribes, but also from generating utilities and Federal water managers. The recommendations will be the basis for a fish and wildlife program to be adopted by the Northwest Power Planning Council in late 1982. BPA has followed this developmental process very closely and, where appropriate, has assisted in the formulation of fish and wildlife strategies by providing funding assistance to the agencies developing these recommendations.

The Regional Act substantially elevated the status of fish and wildlife in BPA's power planning and marketing operations. During the past year BPA played an active role in the protection, mitigation, and enhancement of fish and wildlife not only through its research and development funding activities, but also by including fish and wildlife concerns in its power sales contracts, its resource acquisition program, and in other aspects of its day-to-day operations. These activities are a springboard for assuring that Columbia River fish and wildlife resources are given equitable treatment in the operation of the Northwest power system as envisioned by the authors of the Regional Act.

Northwest Power Planning Council

A linchpin in the new machinery forged by the Regional Act is the Pacific Northwest Electric Power and Conservation Planning Council. Comprised of eight members—two appointed by each Northwest Governor—this body is responsible for drawing up a long-range plan upon which to key the region's electric energy future. The major elements in the evolving plan are a 20-year regional load forecast, a set of energy conservation standards and incentives, and a recommended matrix of energy resources to satisfy the region's future demand for power. Supplementing this plan will be a separate blueprint for the protection, mitigation, and enhancement of fish and wildlife resources along the Columbia River and its tributaries as a priority element in managing the river for power production. The fish and wildlife program, with input from Federal and State agencies, Indian tribes, and other concerned groups, is scheduled for adoption in November 1982.

The Northwest Power Planning Council was convened on April 28, 1981, with Daniel J. Evans, former Governor of Washington, elected as its chairman. This event set the time clock running to meet the statutory deadline for producing the regional power plan within 2 years of the Council's inauguration. Following the adoption of the plan, the Council is responsible for monitoring and updating the plan at minimum 5-year intervals.

As provided in the Regional Act, the activities of the Northwest Power Planning Council, its members and staff, and its regionwide advisory committee are financed out of BPA revenues. Other than that, the two entities are relatively independent and nonoverlapping in their responsibilities—although interaction and cooperation between the two are an essential ingredient in carrying out the provisions of the Regional Act. In essence, the Northwest Power Planning Council is the architect of tomorrow's power supply structure and BPA is the master builder. Chairman Evans set the tone for their relationship by referring to it as one of "creative tension" at the Council's initial meeting. BPA Administrator Peter Johnson has described the two entities as operating in "an atmosphere of constructive challenge."

Five of the eight members of the Northwest Power Planning Council are shown at an early meeting of the new regional body.

Outcome of the Role EIS and NRDC Lawsuit

On September 15, 1975, the U.S. District Court for the District of Oregon ruled that BPA was obliged to prepare an environmental impact statement (EIS) on the signing of its amended power sales contract with Alumax Pacific Corporation for service to a proposed aluminum reduction plant in northeastern Oregon. On July 1, 1977, the same court ruled on another suit filed by the Natural Resources Defense Council (NRDC), requiring that BPA prepare a comprehensive EIS on its role in long-range regional power planning. BPA subsequently prepared and filed a final "Role EIS" with the Environmental Protection Agency in January 1981, more than 5 years after the court's initial ruling.

Pending the completion and filing of the Role EIS, an injunction had been imposed by the court which hindered BPA in pursuing some of its salient activities. This injunction was finally vacated on May 15, 1981, after the U.S. Attorney for the District of Oregon had filed a brief on BPA's behalf, together with a motion for dismissal of the NRDC lawsuit.

Load Forecasting

It has become increasingly evident that regional load forecasting can "make or break" any scheme of orderly utility planning to meet future power requirements on an economical and environmentally acceptable basis. For an integrated power system such as that of the Pacific Northwest, the projection of future loads by individual utilities is not sufficient to guide the complex planning and the huge capital investments which depend upon such planning. Many utilities, especially the smaller ones, do not have the professional expertise to develop sophisticated forecasts. It is therefore essential that a regional mechanism be utilized for compiling and analyzing all of the complex factors which determine future electric energy use.

Almost since its inception, the Pacific Northwest Utilities Conference Committee (PNUCC), a planning body comprised of the region's utilities and BPA direct-service industrial customers, has taken the prime responsibility for forecasting regional loads. This task has become both more crucial and more controversial in recent years as multi-billion-dollar decisions can hinge upon a fraction of a percentage in a load-growth projection. Adding to this conundrum is the fact that the regional forecasts issued by the PNUCC in recent years have each shown a reduction in the rate of anticipated load growth. Just 5 years ago, the PNUCC 20-year forecast anticipated an average annual load growth of 5 percent. In 1981, the PNUCC forecast saw the region's electric energy load growing at a rate of 3.2 percent annually between now and 1992, with a peakload growth averaging 3.4 percent over the same period.

Various reasons are given for the steady decline in growth rate, and all of them are probably valid. A succession of mild winters, the sluggish economy, and the uptrend in electricity rates have all contributed to the leveling-off of the load growth curve. But what weight is to be assigned to each of these phenomena, and what other factors contribute to the puzzle?

BPA and the utilities are no longer "the only game in town" with respect to load forecasting. Spurred by skyrocketing rates and a growing concern about the region's energy future, many other entities are now involved in projecting future power needs. They include the States, universities, public-interest groups, economic and engineering consultants, and others. For example, a preliminary forecast issued by Washington State University in December 1981 projected an average annual regional load growth of only 1.7 percent between now and the year 2000. Other independent studies show a similar downtrend in regional load growth.

In refining its forecasting methodology, the PNUCC has introduced end-use data into its calculations. Preliminary end-use analysis indicates that over the next decade the region will install cost-effective measures for saving some 1,300 average MW of electric energy. These studies also indicate that other, more difficult to attain savings, could obviate the need for an additional 1,000 MW by the early 1990's.

But even with the rosy prospects for energy conservation, the sullen specter of shortage still remains. Under critical water conditions, potential deficits loom on the power supply horizon for the Pacific Northwest.

Although BPA has played an important role in shaping the PNUCC forecasts for many years, its expanded responsibilities under the Regional Act have sharpened its need to obtain a reliable fix on future load requirements. In 1981, BPA began preparing its first forecast of Federal power requirements throughout the region. To assure that its projections are as accurate as possible, BPA invited other utilities, State and local government agencies, and other interested parties to participate in the process.

In a sense, however, the BPA forecast evolving from this process will be an interim guidepost. The Regional Act gives prime responsibility to the Northwest Power Planning Council for preparing an umbrella projection of the region's future power needs. BPA acknowledges that this 20-year forecast will be the premier load forecast for the region once it is in place. It will still be essential, however, that BPA develop its own projections for operational and other purposes. The first of these forecasts is scheduled for completion by April 1982. It will provide the basis for making key decisions with respect to conservation, renewable and other resource acquisitions, import/export of electric energy and capacity, and in designing strategies for operating the region's hydroelectric reservoirs to accommodate week-to-week power requirements.

Even after the Northwest Power Planning Council adopts its regional forecast, BPA will need to continue making its independent projection of power needs in order to serve its own operational requirements. While the two forecasts are not expected to duplicate each other, it is anticipated that they will be generally compatible. As such, they will offer a needed balance and dual measuring stick which will provide a clearer vision of the region's energy future.

WPPSS Nuclear Construction Program

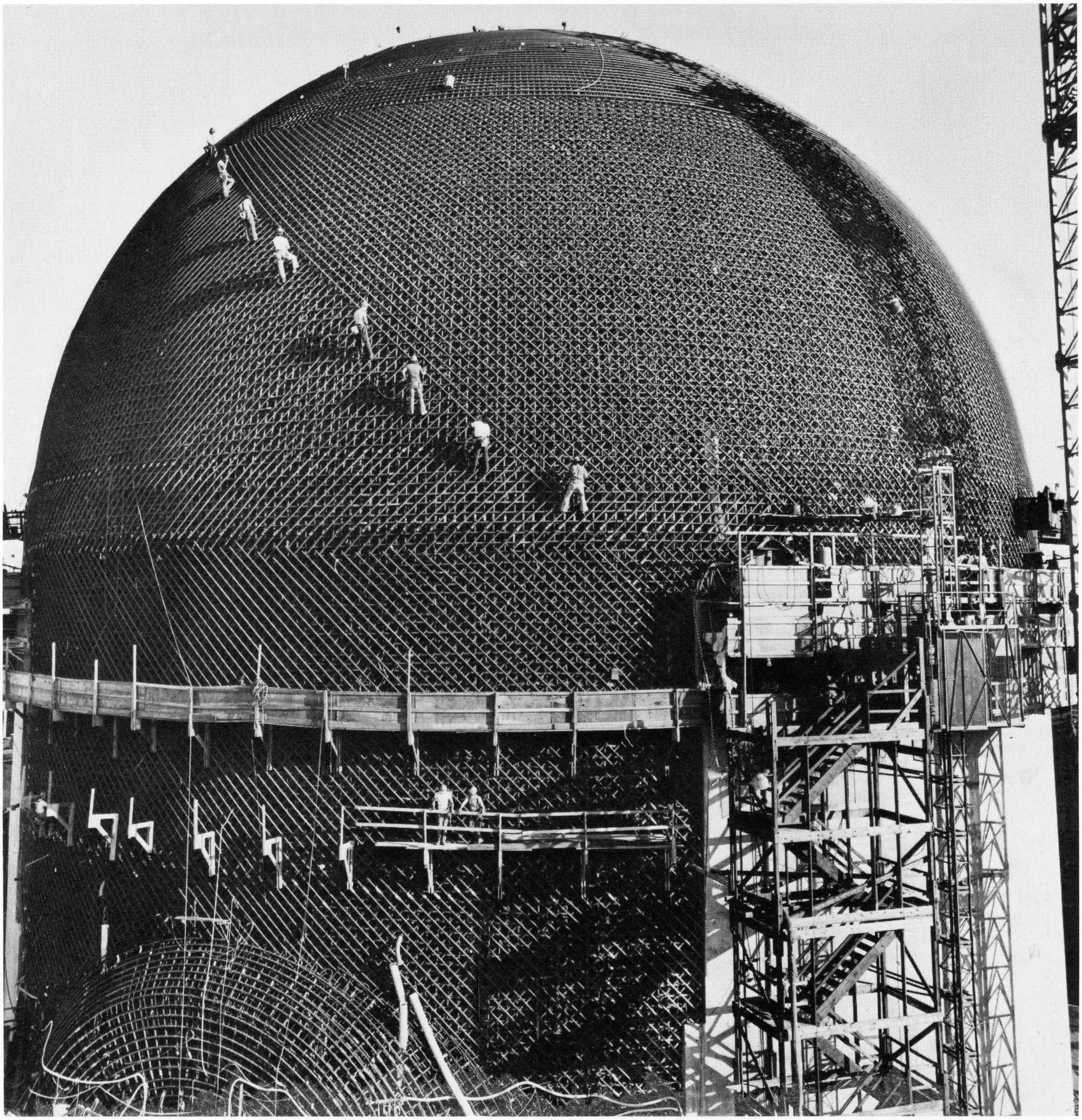
Together with the enactment of Public Law 96-501, events of the past year were largely dominated by the tribulations of the Washington Public Power Supply System (WPPSS) nuclear construction program.

In May 1981 the WPPSS managing director recommended to his governing body that construction be slowed on WPPSS Nuclear Projects (WNP) 4 and 5 because of financing difficulties and costs. A subsequent endorsement of this recommendation triggered a series of events which may have a profound effect upon the regional utility industry and, indirectly, upon Bonneville Power Administration.

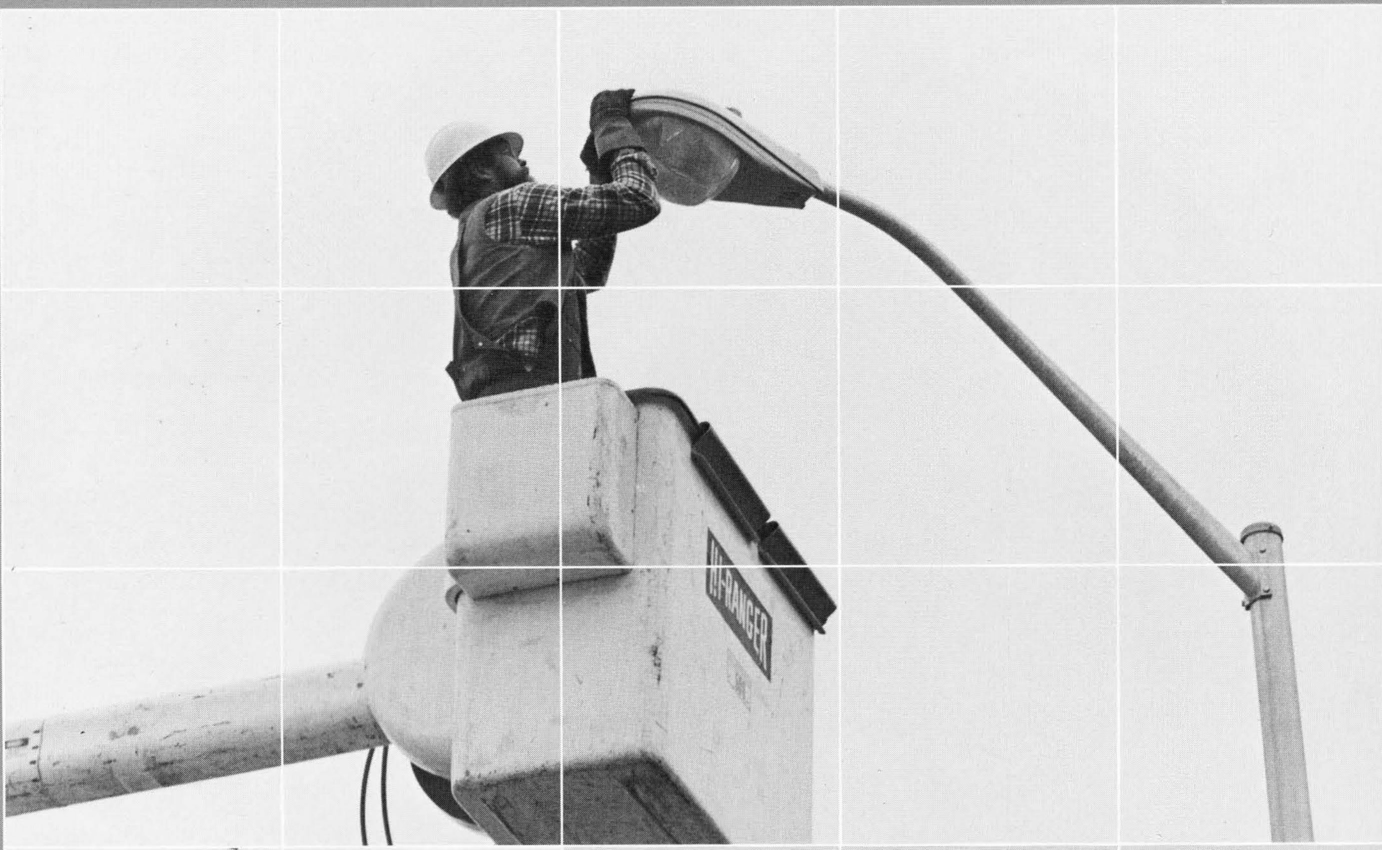
By the end of calendar year 1981 an effort was underway to "mothball" WNP 4 and 5 until mid-1983, when a number of related activities are expected to jell. Chief among these is the long-range regional power plan of the Northwest Power Planning Council, including a 20-year load forecast and recommendations with respect to the development of conservation and additional generating resources. In the interim, a study mandated by the Washington State Legislature will have scrutinized the outlook for continuing construction of the two jeopardized plants. Additionally, BPA is developing its own load/resource forecast of the power needs of the region. Both the State of Washington study results and the BPA projections are scheduled to be made public in early 1982. The interactions among these two studies and the plan to be adopted by the Northwest Power Planning Council in the spring of 1983 could determine the destiny of WNP 4 and 5.

Another complicating factor is that posed by the passage of Initiative 394 on the Washington State ballot in November 1981. This measure essentially provides that voters within the service areas of utilities which are sponsoring large energy facilities can decide whether or not revenue bonds may be issued to finance such projects. Initiative 394 is scheduled to take effect in July 1982, but it is currently being challenged in a Federal court. Should the measure be sustained, it will add to the uncertainties which surround all five of the WPPSS nuclear projects.

BPA has no direct responsibility for WNP 4 and 5, but through net-billing agreements it is committed to acquire the full capability of WNP 1 and 2, and 70 percent of WNP 3. Because of this commitment—and the upward pressure it exerts upon BPA rates—every effort is being made to complete these three net-billed projects in the most expeditious and cost-effective manner.



Ironworkers place steel reinforcing rods on the 175-foot-high containment structure of WNP 1 at Hanford, Washington. (Courtesy Washington Public Power Supply System)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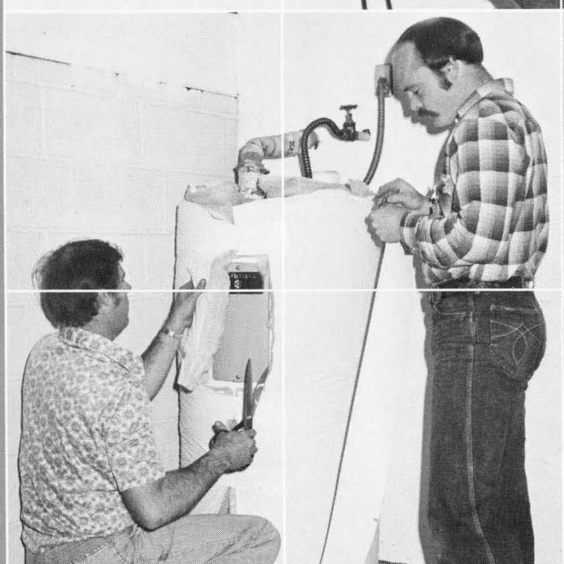


Programs Underway

Under the Regional Act, BPA is directed to give first priority to energy conservation in the acquisition of power resources. Planning began early in 1980 to implement the provisions of the Act, and within 2 weeks after the legislation was signed into law, BPA submitted budget requests for the 1981 regionwide conservation programs. Experience gained from pilot programs, planned and implemented in 1979-80, was used in designing the regionwide programs.

The following energy conservation programs now underway are presented in the order of their anticipated energy savings.

The Home Energy Efficiency Program is the most significant BPA conservation program to date, and the first comprehensive regionwide approach to home weatherization. Under a pilot program, BPA and 11 Northwest utilities have already weatherized 1,300 homes. Comprised of three parts—residential weatherization, water heater wraps, and shower flow restrictors—the program is being offered to all of BPA's Northwest utility customers.

In August 1981 contracts were offered to the utilities on measures to wrap electric water heaters and install shower flow restrictors in Northwest residences. Under this program, BPA will finance the insulation wrapping of 1-1/4 million water heaters over the next 3 years, at an estimated cost of $5.1 million. This project is expected to yield 435 kilowatthours in annual energy savings per water heater, or a total annual savings of 541 million kWh—enough energy to serve 32,000 all-electric homes for a year.

In addition, BPA will reimburse its utility customers for distributing shower flow restrictors to residences throughout the Northwest. It is expected that some 390,000 households will install the restrictors at an annual savings of about 464 kWh per residence, or a total potential energy savings of 180 million kWh each year.

By the end of 1981, nearly 80 Northwest utilities were wrapping water heaters and distributing shower flow restrictors under this BPA program. Additional flow control devices to encourage efficient water use and reduce water heating requirements will be added to the program next year.

The Home Weatherization Program is designed to reach some 300,000 electrically heated homes and multifamily residences throughout the region over the next 10 years. A financial first for the Northwest—cash payments to utilities for energy saved through weatherization, called an energy "buy-back"—is included in the agreement. Each utility can select one of two financing options for weatherizing: no-interest, deferred-payment loans for homeowners; or the buy-back plan.

By 1990, this program should be saving 160,000 average kilowatts at a cost of about 2 cents per kilowatthour (based on a weatherization 25-year life). Savings should attain 7 percent of that level in the first year. Home energy savings programs will be broadened in 1982-83 to include weatherization incentives to low-income householders. In total, some $490 million is projected to be spent on home weatherization over the 10-year period—an impressive sum, but less than one-third of what it would cost to build and operate equivalent power generation at today's prices.

The Commercial Conservation Program is aimed at commercial buildings in the Northwest, which consume about 20 percent of all the electric energy used in the region. This program is being offered by BPA to all public and investor-owned utilities. Initially it will seek energy savings in two major categories—commercial lighting and water heating. Participating utilities can offer to each commercial account as many free hot water flow restrictors as are needed; they may wrap, free of charge, all electric water heaters up to 125 gallons capacity used by the customer; and they may offer to reimburse an electric power consumer up to $1 per lamp for each standard fluorescent lamp replaced with an approved energy-efficient lamp. Utilities can also provide free conservation information to their customers under the program. Eligible commercial buildings include retail stores, warehouses, hotels, motels, and in some cases, multiple-family dwellings.

By 1987 the program will be saving some 32,000 average kilowatts at an estimated cost of $11 million—or about four-fifths of a cent per kilowatthour.

Commercial institutions offer other opportunities for energy savings—both through building weatherization and operational efficiencies. Beginning in 1982, BPA plans to offer, through its utility customers, comprehensive energy audits of commercial buildings. The audits will identify weatherization improvements and other cost-effective measures which could be taken by building owners and managers to improve energy efficiency. Yet another program will provide funding for energy audits and qualifying retrofit conservation projects in nonprofit institutional buildings. Schools, hospitals, public care institutions, and State and local government buildings would be eligible. BPA plans to sponsor the program jointly with four States—Oregon, Washington, Montana, and Idaho. It would complement an existing program funded by the Department of Energy.

The Street and Area Lighting Program was introduced by BPA in 1981 to assist State and local governments in shaving both their energy and dollar expenditures. This regionwide program provides incentives to encourage conversion to energy-efficient street and area lighting, while maintaining adequate illumination levels. The program applies to existing incandescent, fluorescent or mercury vapor systems which can be

BPA and utility conservation specialists inspect rooftop collector installed under solar water heater pilot program.

converted to high-pressure sodium or metal halide luminaires and will be expanded to include low-pressure sodium luminaires as an eligible conversion.

Approximately $18 million has been projected for each year of the 5-year program. It is estimated that 75 percent of the region's eligible street and area lights will be converted within that period, with an energy savings of 33,000 average kilowatts at a cost of less than 2 cents per kilowatthour (based on a 20-year life for the measure). Contracts were offered to the region's utilities in September 1981 and the initial response indicates wide acceptance of this conservation initiative.

The Solar Energy Program takes advantage of the Earth's oldest energy source to achieve reductions in electricity usage. BPA has devised a number of innovative projects whereby solar energy can augment conventional electric applications.

Under one pilot program, BPA and participating utilities are sponsoring a series of workshops in the region to instruct homeowners on how to build and install their own solar water heaters. Since water heating is the second largest user of electricity in the home, savings from the use of solar systems can be significant. Under the pilot program, the utilities, through BPA, will pay $500 to each customer who, after attending the 2-day workshop, installs a solar water heating system which meets utility requirements. The amount is approximately equal to the present value to BPA of the energy savings from each system over its life. To measure the cost-effectiveness of this "do-it-yourself" approach to solar water heating, a number of the systems will be monitored and their performance evaluated.

The first solar water heater workshop was cosponsored by BPA and two publicly owned Spokane-area utilities, the City of Cheney and Inland Power and Light Company. Initial response to the program has been good and about 70 more workshops are planned with the cooperation of utilities throughout the region.

Under another solar pilot program, BPA is planning to pay $750 toward the cost of each dealer-installed solar hot water system, and will also provide financing for the purchase and installation of the system. Five Northwest utilities have signed contracts and are already installing systems under this special incentives program. Initial BPA funding is limited to 600 systems.

One of the numerous conservation seminars cosponsored by BPA and its customer utilities.

To encourage further savings in water heating, BPA plans to offer in 1983 a regional consumer and builder incentive program for installation of heat pump or solar water heaters in the residential sector. The program would be available to single and multi-family residences in the Northwest, regardless of which space heating fuel is used. Both new and existing homes would be eligible.

In 1981 BPA also introduced its regionwide Solar Home Builders Program which it sponsors in cooperation with the Western Solar Utilization Network (Western SUN), a DOE grant entity. This program will provide technical and financial assistance to 65 home builder-designer teams chosen competitively to design and construct homes in 7 Northwest cities. In promoting affordable solar housing, the program has had excellent public response, as was demonstrated by the more than 600 persons who attended the announcement seminar in early 1981.

Participating cities include Portland and Spokane, with programs planned for Boise, Eugene, Seattle, Missoula and the Tri-City area. Completed homes will be open for viewing and publicized in a "Parade of Solar Homes," the first home preview to be held in Portland in the spring of 1982. Selected homes will be monitored for at least 1 year to provide energy data for use in planning future solar home construction.

In tandem with formulating the conservation programs described above, BPA prepared a Draft **Technical Assessment for Conservation and End-Use Renewable Resources**, which was completed in April 1981. The assessment indicated that about 2,900 megawatts of conservation and some 550 megawatts of small renewable resources are technically available within the region by 1990. An update of this study indicates the potential for an additional 1,600 megawatts from conservation alone. However, much of this added conservation potential lies outside BPA's jurisdiction. It assumes passage of appliance-efficiency laws and standards, enforcement of stringent building codes, and voluntary reductions in energy consumption by BPA's industrial customers.

Request for Information

In August 1981 BPA issued its first "Request for Information" (RFI) to gather program concepts and project ideas. The RFI was aimed at conservation, direct-application renewable, and small generation (less than 500 average kW) resources. This information is being used to identify and help design BPA programs for acquiring cost-effective resources which would:

1. Meet or reduce BPA's load requirements by increasing efficiency or by using renewable resources, and

2. Would not result in switching from electric energy to a nonrenewable energy source, or

3. Would generate new supplies of electric power.

More than 5,000 copies of the RFI were mailed to all Northwest utilities, BPA direct-service industrial customers, Federal and State agencies, various public-interest groups and members of the public who had expressed an interest in the program. In addition, the Request for Information was widely publicized throughout the region.

The response to the RFI is helping BPA to assess the potential of energy conservation, direct-use renewables, and small generating resources, to identify program needs, and to design future programs to meet those needs. The RFI also offered the first opportunity for preconstruction financing guarantees pursuant to the Regional Act, provided that the proposed projects are technically feasible, environmentally sound and cost-effective.

In response to this solicitation, which closed on October 20, 1981, BPA received 230 proposals covering a broad range of projects, ideas and energy management techniques. These proposals are currently being assessed.

Conservation Contracts

In line with its obligation to acquire resources under the Regional Act—including conservation—BPA began negotiating conservation contracts with its customers in early 1981. It soon became evident that several contested issues would hinder the development of such contracts and postpone the launching of the initial conservation programs described above. The problem issues involved the then-evolving terms of new power requirements contracts and the ratesetting process, plus an additional complication. A major disagreement arose concerning BPA's position on offering conservation contracts only to utilities which sign power requirements contracts.

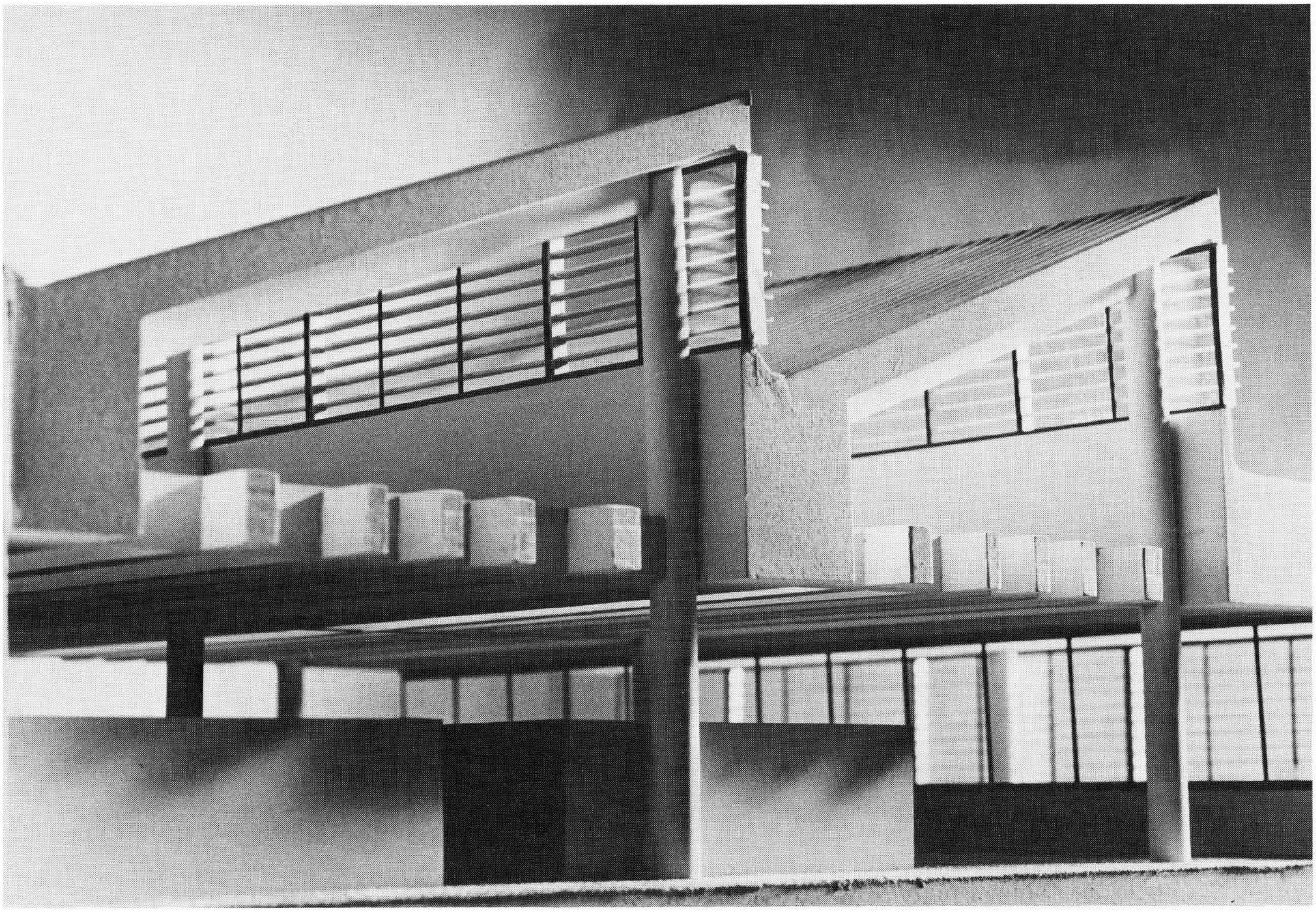
In order to sidestep these issues and get moving quickly with the conservation programs already at hand, the negotiators opted for proceeding with a short-term contract pending resolution of the contested issues. As a consequence, BPA offered its first short-term contracts for regionwide conservation programs to its utility customers in August 1981. Representatives of the Northwest Public Power Association, the Intercompany Pool, direct-service industrial customers, the States and public-interest groups all took part in the 4-month negotiation of these contracts.

The product was an umbrella contract and five specific attachments covering individual BPA programs. These programs include shower flow restrictors, water heater wraps, commercial lighting and water heating, street and area lighting, and home weatherization.

By December 1981 nearly 80 utilities had signed short-term contracts covering one or more of these conservation programs. These contracts will remain in force until September 8, 1982, or until the long-term (20-year) contracts are signed, whichever occurs first.

Having paved the way for launching the initial conservation effort on a regionwide basis, the negotiators returned to the table in September 1981. By that time, not only were the complex issues better understood, but those involved in the long-term contract negotiations also had a better understanding of each other's concerns, capacities and requirements. As a consequence, substantial progress has been made, and it is anticipated that the long-term conservation contract will be available for public review in mid-1982. BPA is determined to design a strong, workable, long-term contract and is willing to gain experience from current programs before completing the new contract.

The long-term contract will provide the basic mechanism for funding utility-operated regionwide conservation projects. It will feature a mechanism by which the utilities can conduct individual projects tailored to the needs of their respective service areas. Special programs which BPA may fund through targeted solicitations or other means can be attached to the long-term umbrella contract in the same manner that regionwide programs are attached.



Cross-section of the model of the energy-saving BPA Construction and Services Building.

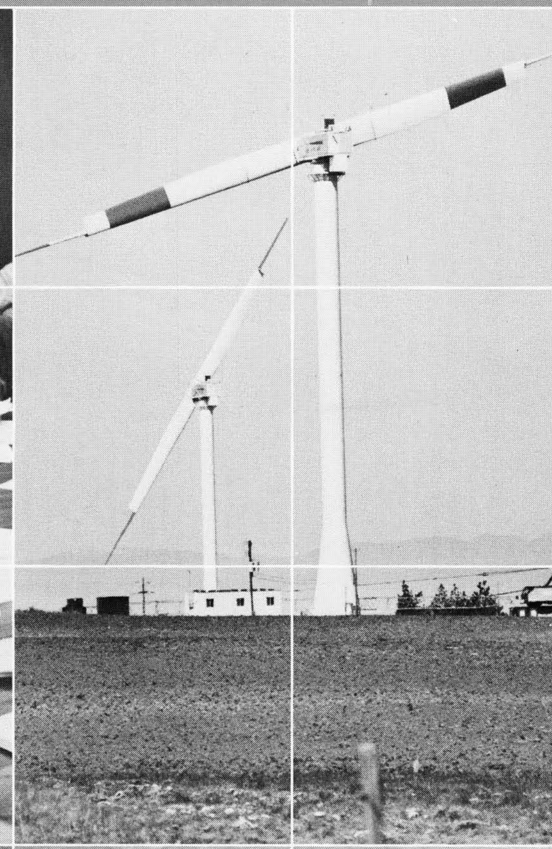
Energy-Efficient BPA Building
By the time this Annual Report is published, BPA will have begun construction of a passive solar building in the BPA Ross Complex in Vancouver, Washington. The structure will be a regional showplace for energy conservation design features. Called the BPA Construction and Services Building, it is scheduled for completion in 1983 at a cost of $5.7 million.

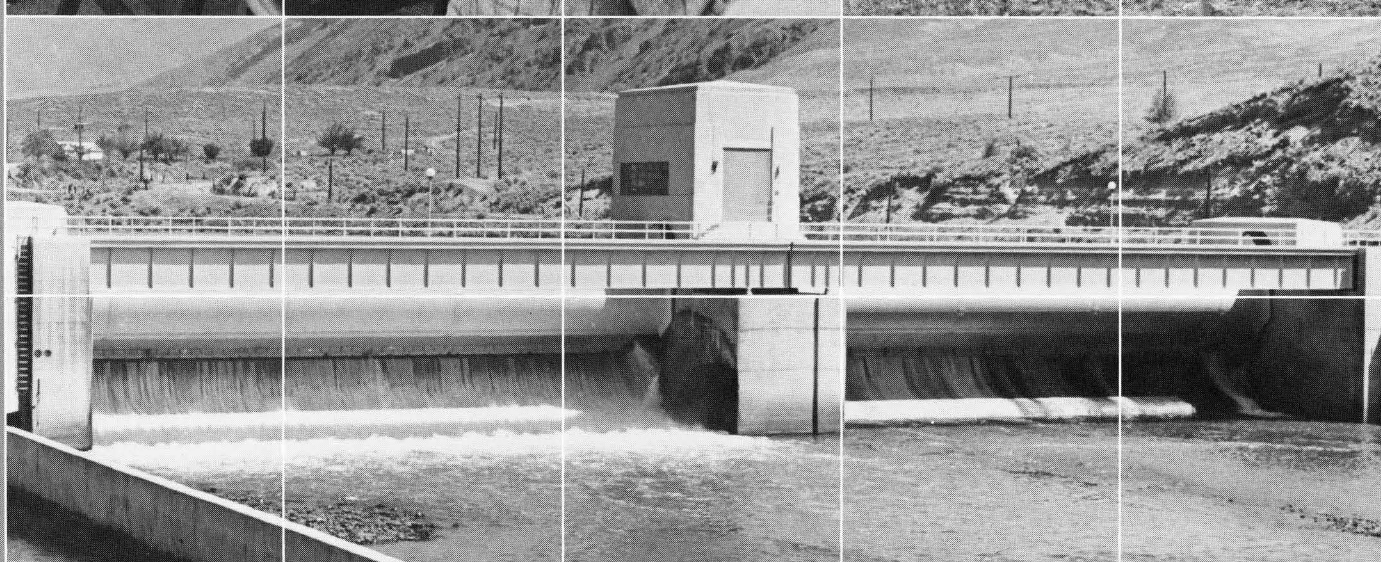
The building's design incorporates state-of-the-art conservation concepts—including solar—which will reduce the energy it uses by about 80 percent as compared with conventional structures. The concepts are expected to conserve 1.8 million kWh a year and save $800,000 in energy costs over 20 years.

The structure, which will be partially underground, will combine passive solar technology with sophisticated computer controls for heat and light. Active solar panels will supply the building's hot water, and louvers on the southern windows will let in sunlight in winter and keep it out in summer. Concrete will be used as thermal mass to store heat in winter for use later in the day. An atrium and windows will incorporate daylight with the interior lighting. Photoelectric cells will dim the interior lighting when the sun is bright.

The building will have a total floor area of 53,300 square feet. It will consolidate several BPA operational functions and free other space for maintenance activities. The building will also house BPA's central computer, which is now occupying prime, converted office space with less than adequate security. Waste heat from the central computer will be used to supplement space heating. Its redistribution will be governed by the building's energy management system.

Renewable Resources





Municipal garbage offers a widespread opportunity for biomass power generation.

Renewable Resource Assessments
BPA and the region are firmly committed to developing renewable resources. But just how much and what "mix" of generation can the Pacific Northwest expect to realize from these resources? BPA's assessments indicate that geothermal, biomass, hydro, wind, solar, and cogeneration can make a significant contribution toward meeting regional energy needs.

Biomass—In early 1982, BPA will contract for a study to determine the potential for using municipal and industrial solid waste as fuel for electrical generation in the Northwest. BPA also has two studies planned to determine the potential of biomass resources. The first is an examination of biomass species best suited for farming in the Northwest. Annual cropping, harvesting equipment, and farm economics are also part of this study. A second study examines the effects of changing practices in the logging industry on the future availability of forest residue.

Cogeneration—Present estimates indicate that the region can develop 800 megawatts of industrial cogeneration by the year 2000. More than 80 percent of this potential could be fueled by biomass resources. BPA's Cogeneration Resource Assessment will be refined and updated in 1982 using data gathered from several site-specific cogeneration projects throughout the region. Estimates of the potential for small cogeneration (under 5 megawatts) are now being developed.

Wind—Concerning wind power, a preliminary 1980 assessment showed a potential for large-scale development in the region in excess of 3,000 megawatts. In 1981, BPA completed an aerial survey of western Montana and southern Idaho as part of its ongoing Regional Wind Energy Assessment Program. The survey identified numerous sites with high wind energy potential. Currently, BPA has installed metering equipment at about 75 sites throughout the Pacific Northwest. Over the next 4 years, BPA anticipates that its entire service area will be surveyed under this program.

Hydro—In recent years, published studies of the region's hydroelectric sources indicate new potential generation of 20,000 megawatts or more. Interest in hydroelectric development has increased tremendously in recent years. By the fall of 1981, 43 Northwest hydroelectric projects of between 100 and 15,000 average kilowatts in size had been submitted to the Federal Energy Regulatory Commission for a license or exemption. Another 74 projects had been granted preliminary permits.

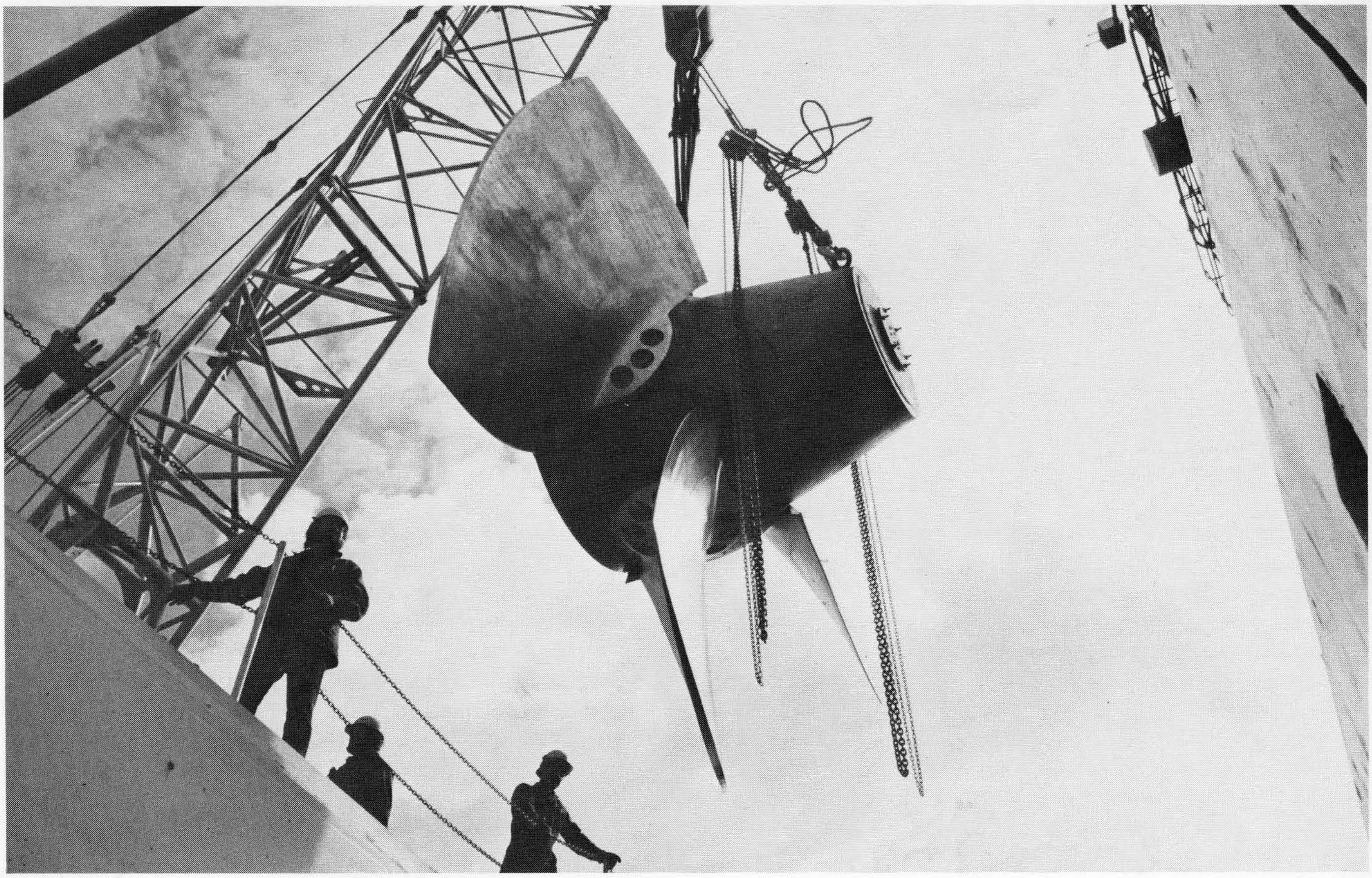
Applications to the States for permits and water rights are almost double those submitted at the Federal level. In all, these projects represent about 5,000 megawatts of installed capacity, with more applications continuing to pour in. Realistically, only about 10 percent, or 2,000 megawatts, of the region's theoretical potential 20,000 megawatts are expected to be developed because of environmental, social, and economic constraints.

Geothermal—Based on U.S. Geological Survey data, 14 reservoirs identified in the region with temperatures of 150 degrees Centigrade or greater have the combined technical capacity to produce about 3,700 megawatts of geothermal electric power. Because of environmental, institutional, economic, and other limitations which exist in the development of any resource, only about 750 megawatts of that capacity appears to be feasible for development by the year 2000. The most promising locales in BPA's service area for geothermal electric development are the Cascade Range and the Snake River Plain.

The above is only a brief summary of some of the various assessments being undertaken by BPA vis-a-vis alternative and renewable energy resources. It is anticipated that the volume of data being compiled will help to lessen the region's dependence upon fossil fuels and nuclear generation.

Resource Acquisition
Under the Regional Act, BPA is charged with assisting in the development and acquisition of power resources based upon its obligation to meet its firm contract requirements including its customers' load growth.

In August 1981 a Request for Resources (RFR) was issued by BPA. This solicitation asked for proposals on generating projects which could produce at least 500 average kilowatts, and which could be on line by June 30, 1987. The solicitation closed on October 20, 1981.



Crane lowers Idaho Falls bulb turbine into position.

BPA specified an interest in projects which were already constructed, under construction, ready for construction, or which had completed preconstruction studies including technical and environmental investigations or their reasonable equivalent. Although the Request for Resources did not exclude major resources (50,000 average kW or larger), it did state that special procedures were required under the Regional Act for BPA to acquire such major resources. These procedures are presently being formulated.

Of 74 responses to the RFR, 68 met the solicitation criteria. Fifty-four of these are for renewable resources, including hydro, wind, geothermal, and biomass. Fourteen are thermal resources or cogeneration, including an offering by the owners of 30 percent of the Washington Public Power Supply System Nuclear Project 3. A number of the 68 proposals appear to offer a potential for BPA acquisition, with the remainder being unacceptable for one reason or another. As of the end of the year, BPA was obtaining more detailed information from the sponsors of the high-potential projects. These will be subjected to a detailed technical, financial and environmental review, and the projects will be ranked for possible acquisition.

Under the Regional Act, BPA is authorized to fund or guarantee the funding of preconstruction studies for nonmajor resources on behalf of those sponsors whose customers would otherwise suffer "inequitable hardships." This program is still being ironed out, but BPA expects to issue a solicitation for proposals in June 1982 and make awards in the fall of 1982.

It is anticipated that another Request for Resources will be issued in the fall of 1982, when BPA contractual load requirements are better defined. Under the provisions of the Regional Act, BPA customers have 1 year to accept their 20-year power sales contracts, or until August 28, 1982. Thereafter BPA can make a customer-by-customer estimate of the load growth which it will be obligated to serve.

Proposed Hydro Acquisition

At the end of 1981, BPA was negotiating its first long-term power acquisition under the Regional Act, the output of three hydroelectric dams being built by the City of Idaho Falls, Idaho. Under the tentative terms of the contract, BPA would purchase 16 average megawatts of power generated by the dams for approximately $4.6 million a year. This acquisition would cost the region's ratepayers about 3.1 cents per kilowatthour, which compares favorably with the 4 to 6-cent cost of power from a recently constructed coal-fired or nuclear power plant.

The three dams, which are located on the Snake River, are being rebuilt as a result of damage incurred by the Teton Dam collapse and flood of 1976. Each of the dams has been fitted with an 8-megawatt bulb turbine, a type of generator designed to produce maximum power from low-head dams. One of the dams also has two existing 1.5-MW generators of conventional design.

It is expected that final contract terms will be worked out in early 1982. The three dams are expected to begin producing power in the same time frame.

Seattle Demonstration Project
BPA is encouraged under the Regional Act to assist in the development of conservation and renewable resource demonstration projects. One innovative example is a waste heat utilization project which BPA is co-sponsoring with the City of Seattle. This project will channel waste heat from electrical transformers at Seattle City Light's Broad Street Substation to the nearby Pacific Science Center for space and water heating.

When the project is completed in 1984, new transformers equipped with heat exchangers to heat water will provide about 90 percent of the Science Center's space heat and a substantial portion of its hot water requirements. The project is expected to save about 2 million kilowatthours a year of electric energy.

Billing Credits
The Regional Act outlines a number of strategies for encouraging the development of new resources. One of these is the granting of billing credits by BPA to its customers. Under the provisions of the Regional Act, BPA is required to grant billing credits to its customers for developing conservation, renewable and alternative resources, or retail rate structures which reduce the customers' loads and therefore BPA's obligation to acquire other resources to meet these loads. Such load reduction mechanisms can be initiated either by a customer or by a political subdivision served by a customer. Billing credits may be made either in the form of offsets to power bills or in cash.

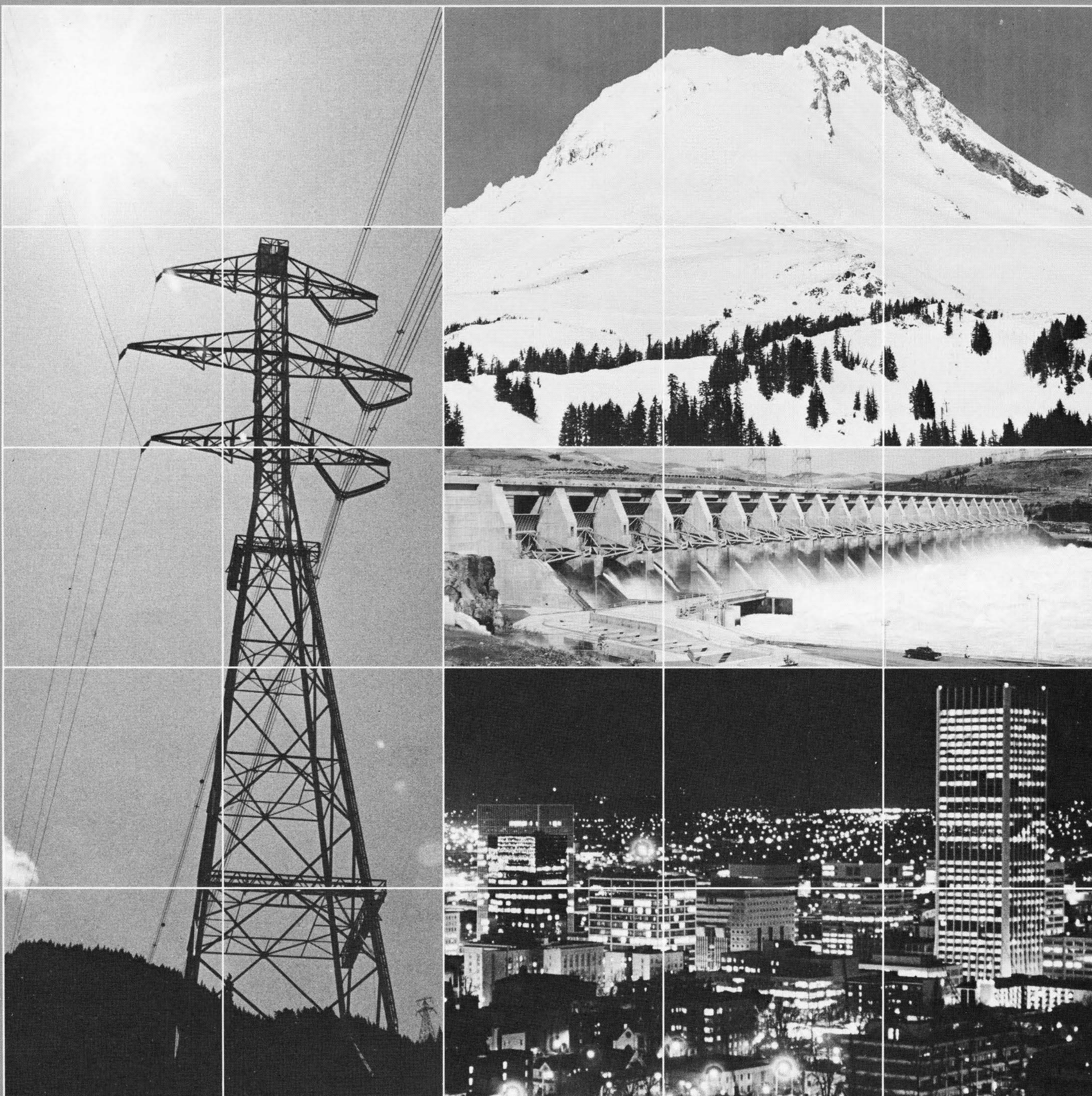
This is the statutory framework. To flesh it out, BPA assembled a task force of some 30 people from throughout its organization. The task force went to work in August 1981 to define the specific issues which must be resolved and to identify the alternative courses of action which the BPA Administrator can take with regard to each issue.

One key issue stems from the fact that the Regional Act provides BPA with another major mechanism which can compete with billing credits in spurring the development of resources by customers and others—the direct acquisition of resources by BPA. In making such direct acquisitions, BPA has a measure of control with respect to the resource development process, its scheduling and integration into the power system. Under the billing credit approach, the resource remains under the control of the BPA customer or political subdivision which sponsors the resource. The latter has more independence, but must assume the risks involved in developing the resource. Also, the resource sponsor must be responsible for administering the resource.

Cost also can become an important consideration. The Regional Act requires that billing credits for conservation be based upon BPA's alternative cost; that is, the cost BPA would otherwise incur to acquire another resource. To the extent that a customer may be able to implement its conservation program at less than BPA's alternative cost, that customer can make a profit. This provides a financial incentive for customers to install cost-effective conservation programs to obtain billing credits. With regard to resources other than conservation, billing credits are to be based upon the lesser of BPA's alternative cost or the actual net cost of the resource.

To reflect as many opinions as possible in developing the billing credits policy, the BPA task force set up several "rap" sessions early in the development stage. The participants included representatives of BPA customers, State public utility commissions, State energy departments, local governments, Indian tribes, fish and wildlife agencies, and public-interest groups.

In late 1981, with guidance from the BPA Administrator, the task force drafted a statement of proposed policies and procedures. This draft will be made available for formal review by all interested parties during January 1982. Revisions will then be made based upon the comments received, and BPA will publish its proposed billing credits policy in March 1982. Comments will be invited from the public. Following consideration of all comments received, the BPA Administrator will adopt a final billing credits policy by May 1982.



1981 Power Operations

As a result of heavy precipitation and record-setting warm temperatures, Coordinated System reservoirs were 4.9 billion kilowatthours above rule curves on December 31, 1980. All major Federal reservoirs except Hungry Horse Dam filled to the maximum extent permitted by their flood control limits. The natural streamflow of the Columbia River at The Dalles, Oregon, peaked on December 28 at 360,000 cubic-feet-per-second, which is 427 percent of historical median water conditions.

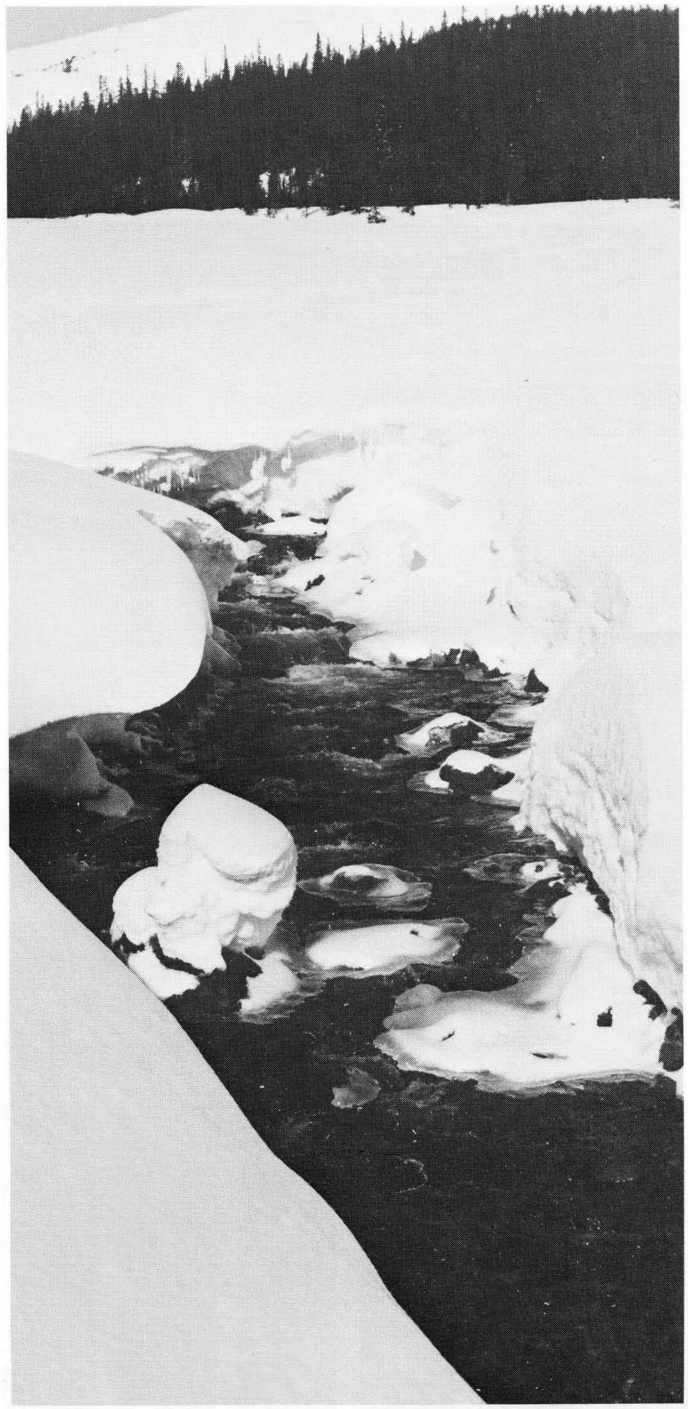
December's extremely high streamflows allowed BPA to offer surplus energy to the Pacific Southwest utilities beginning on December 26. This surplus condition continued through the early morning of January 5, 1981, and again during the 4-day period of January 9-12. Federal System surplus sales to California during the period December 26-January 12 totaled 790 million kilowatthours.

About 50 million kWh of surplus energy which could not be conserved in reservoirs was also delivered to Pacific Southwest utilities during February. BPA continued to supply secondary energy to all of its Pacific Northwest customers through March 27, 1981. From March 28 through April 27, 1981, BPA delivered special advance energy to its direct-service industrial customers from provisional releases from Grand Coulee reservoir.

Operations for the annual juvenile fish outmigration began on April 28. Secondary energy deliveries to Pacific Northwest and Pacific Southwest customers were resumed concurrently with the start of the fish operation. BPA also began storing excess energy in British Columbia reservoirs as a result of overgeneration on the Federal System.

Precipitation during May, June, and July was 170, 143, and 163 percent of normal, respectively, over the Columbia River Basin above The Dalles, Oregon. As a result, the January-July volume runoff of the Columbia River at The Dalles was 103.5 million acre-feet, or 94 percent of the 15-year average annual runoff.

During the first 7 months of calendar year 1981, BPA sold nearly 6.5 billion kWh of surplus energy to California utilities. Pacific Northwest generating utilities sold 10.7 billion kWh during the same period. It is estimated that the total surplus deliveries saved the Southwest utilities nearly $1 billion in oil purchases.



Thousands of snowfed creeks like this one fuel the Federal Columbia River Power System.

July-December 1981 Power Situation

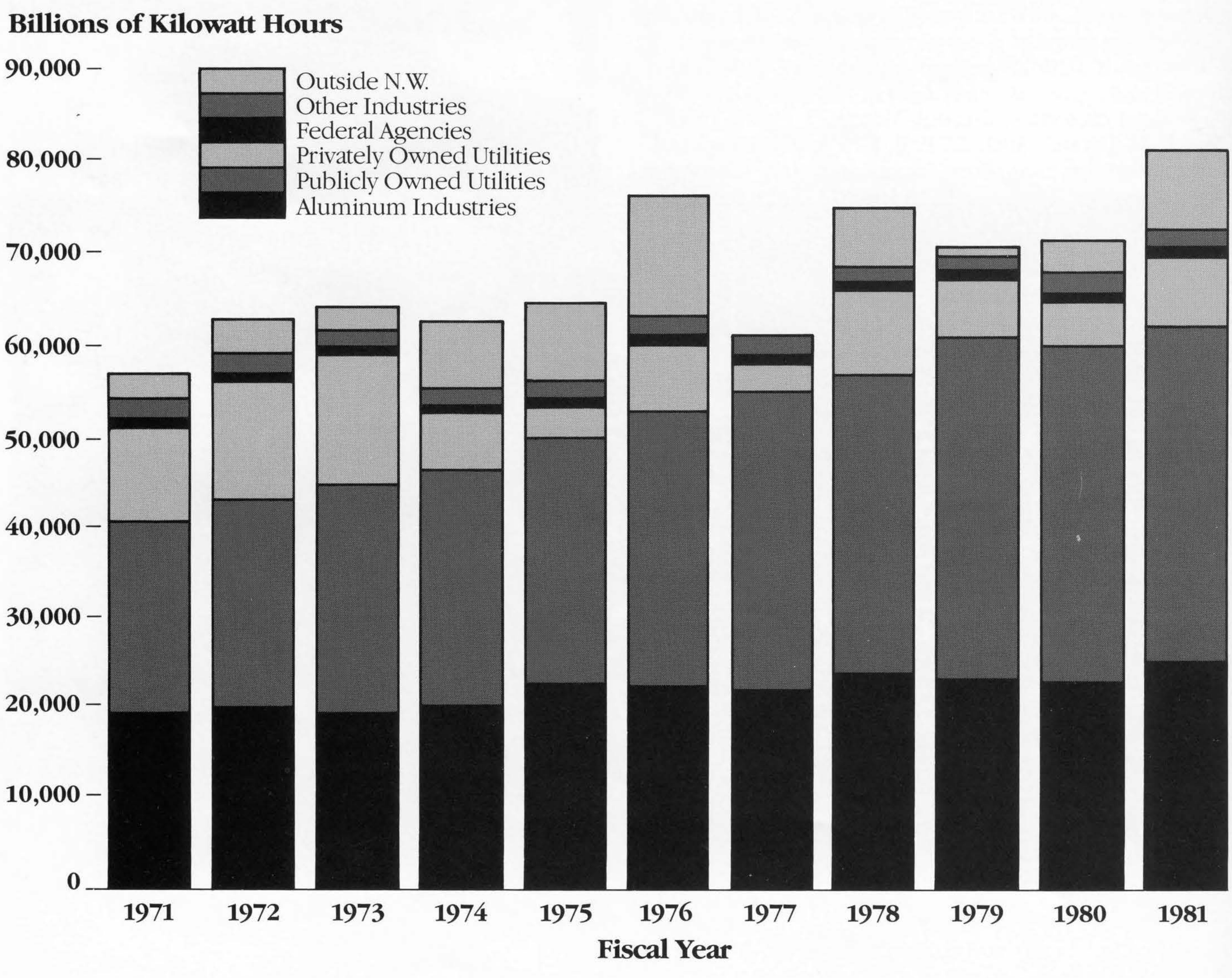
All Coordinated System reservoirs were full on July 31, 1981, the date on which reservoirs are programmed to refill. BPA continued to market surplus energy to Pacific Southwest utilities through mid-August. Secondary energy for Pacific Northwest markets was available through August 31.

The operating program developed for 1981-82 indicated that the Federal Columbia River Power System would have an estimated firm energy deficiency of about 320,000 average kilowatts under recurrence of critical water conditions. BPA began purchasing energy in September 1981 to cover this estimated deficiency, with purchases continuing through December. In addition, BPA withdrew the industries' 1981-82 Hanford energy and purchased their contracted power from Weyerhaeuser and Longview Fibre companies.

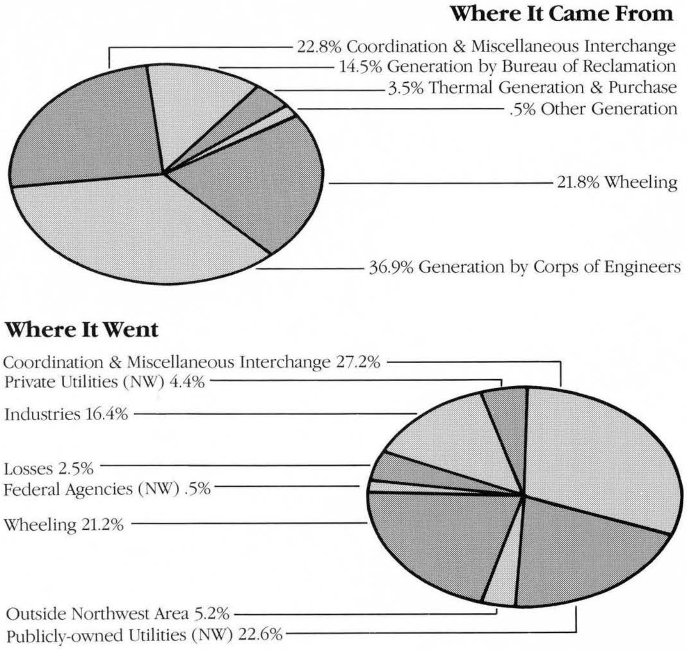
BPA served the industries' first quartile loads from July 1 through December 7, 1981, with energy BPA has contractual rights to secure. On December 8, 1981, due to load underruns and better than median streamflow conditions, BPA restored direct service to industrial loads and began marketing thermal purchases as nonfirm energy. Nonfirm energy sales are expected to continue for the next several months.

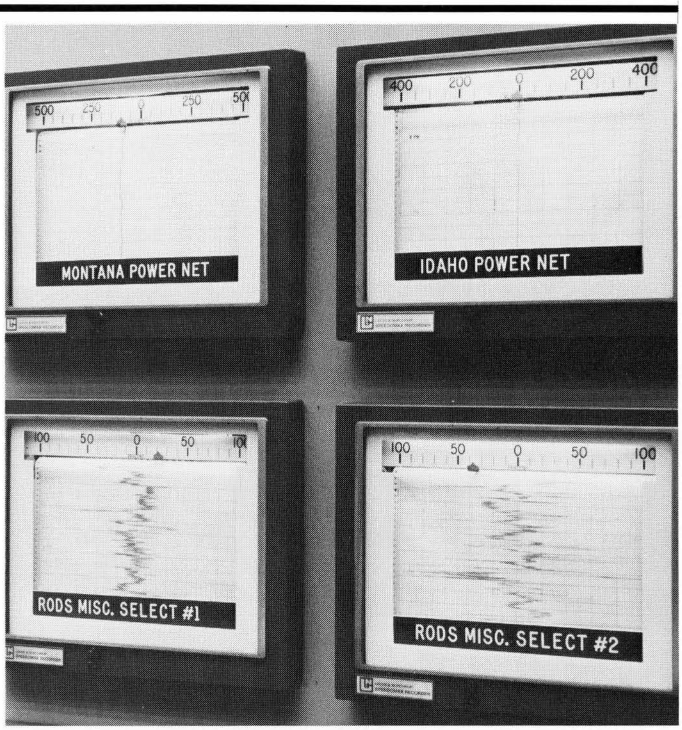
Earlier in the year, Northwest utilities and British Columbia Hydro & Power Authority agreed contractually to store an additional 2 feet of water in Arrow Lakes reservoir. All of the water was released by December 31, 1981. BPA realized 94.8 million kWh of energy from this special contract.

Streamflows, precipitation, and temperatures averaged above normal for the last several months of 1981. This, coupled with consistent firm load underruns, resulted in Coordinated System reservoirs being 2.1 billion kWh above rule curves on December 31, 1981.



Source and Disposition of Total Energy Handled by BPA, Fiscal year 1981 Total 163.9 Billion kWh





Computerized display panels at the BPA system control center monitor the second-by-second delivery of power to customer grids.

Power Sales

Despite the onset of a severe economic recession and continued energy conservation in the Pacific Northwest, improved water conditions resulted in record energy sales during FY 1981. Total BPA energy sales for the year were 81,222,174,000 kilowatthours, a 5-percent increase over the previous record set in FY 1976. The FY 1981 total sales also represented an increase of 8.7 billion kWh or 12 percent over those in FY 1980.

Revenue from energy sales totaled $619,538,357 (based upon actual billings), a hike of 38 percent over the previous year. Due to the interim rate increase which took effect on July 1, 1981, the average revenue from all sales rose to 7.16 mills per kWh from 5.74 mills in FY 1980. (Sale of capacity only and revenues from other services are not included in the above figures.)

The availability of nonfirm energy allowed utilities outside the region, most of them in California, to purchase 8.8 billion kWh of BPA power during the fiscal year. Representing about 11 percent of all sales, this was more than double the 4.3 billion kWh made available for purchase outside the Pacific Northwest in FY 1980.

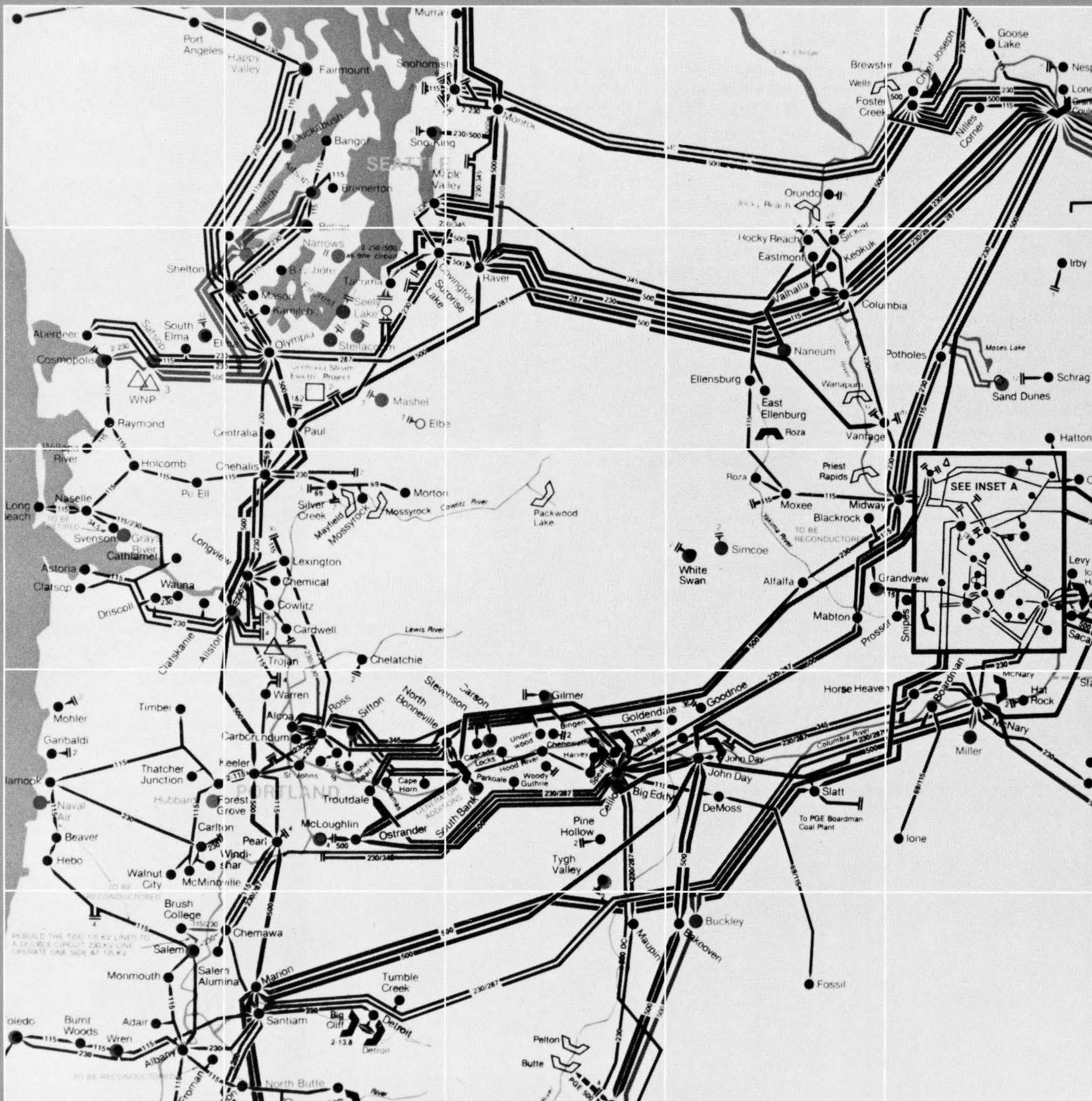
BPA sold 7.4 billion kWh to investor-owned utilities in the Pacific Northwest during FY 1981, or 9 percent of total BPA sales. This was 2.9 billion kWh more than was purchased by this class of customer in the previous year.

Once again BPA preference customers, comprised of municipalities, cooperatives, and public and people's utility districts, were the largest purchasers of BPA energy, accounting for 46 percent of total sales. The 37.1 billion kWh which they purchased in FY 1981 represented a 2-percent decline from the previous year.

Sales to Federal agencies in the Pacific Northwest were 886.4 million kWh, or about 1 percent of total BPA sales. This was a slight increase from the Federal purchases in FY 1980.

Sales to the aluminum industry in FY 1981 totaled 24.9 billion kWh, representing 31 percent of all sales. This was a 9-percent increase over the aluminum industry purchases in the previous year.

BPA's other direct-service industrial customers accounted for 2.1 billion kWh or 3 percent of total BPA sales in FY 1981. This was a slight decrease over the 2.2 billion kWh purchased in FY 1980.


Port Angeles
Happy Valley
Fairmount
Snohomish
Murray
Monroe
Bangor
Sno-King
SEATTLE
Bremerton
Maple Valley
Narrows
Shelton
Tacoma
Covington
Raver
Mason
Kamilche
Seely Lake
Sunrise Lake
Olympia
Stellacoom
South Elma
Aberdeen
Cosmopolis
WNP
Mashel
Elbe
Raymond
Centralia
Paul
Holcomb
Chehalis
Pe Ell
Morton
Silver Creek
Mayfield
Mossyrock
Packwood Lake
Naselle
Svenson
Gray River
Cathlamet
Astoria
Clatsop
Wauna
Driscoll
Longview
Lexington
Chemical
Cowlitz
Cardwell
Lewis River
Clatskanie
Allston
Trojan
Chelatchie
Warren
Mohler
Timber
Garibaldi
Alcoa
Ross
Sifton
North Bonneville
Stevenson
Carson
Gilmer
Carborundum
Keeler
Thatcher Junction
St Johns
Forest Grove
Hubbard
PORTLAND
Troutdale
Cape Horn
Cascade Locks
Hood River
Parkdale
Woody Guthrie
Bingen
Chenoweth
Harvey
The Dalles
Goldendale
Goodnoe
Naval Air
Beaver
Hebo
Carlton
Pearl
McLoughlin
Ostrander
South Bank
Pine Hollow
Tygh Valley
Celilo
Big Eddy
John Day
DeMoss
Slatt
To PGE Boardman Coal Plant
Walnut City
Windi-shar
McMinnville
Brush College
Chemawa
Salem
Salem Alumina
Monmouth
Marion
Tumble Creek
Santiam
Big Cliff
Detroit
Burnt Woods
Adair
Wren
Albany
Froman
North Butte
Pelton
Butte
Maupin
Bakeoven
Buckley
Fossil
Brewster
Chief Joseph
Goose Lake
Nespelem
Lone Pine
Wells
Foster Creek
Grand Coulee
Nilles Corner
Orondo
Rocky Reach
Sickler
Eastmont
Keokuk
Valhalla
Columbia
Irby
Naneum
Ellensburg
East Ellenburg
Potholes
Moses Lake
Sand Dunes
Schrag
Wanapum
Roza
Vantage
Hatton
Priest Rapids
Moxee
Midway
SEE INSET A
Blackrock
TO BE RECONDUCTORED
Simcoe
White Swan
Alfalfa
Grandview
Levy
Mabton
Prosser
Snipes
Horse Heaven
Boardman
McNary
Hat Rock
Miller
Ione

System Statistics
During the fiscal year BPA added 497 circuit-miles of transmission lines and 7 substations to its system. The circuit-mileage included 444 miles built to operate at 500 kilovolts, 40 miles at 230-kV, and 13 miles at 115-kV or lower voltages. Added transformer capacity totaled 2,875,800 kilovoltamperes.

These additions brought system totals as of September 30, 1981, to 13,291 circuit-miles of lines and 357 substations. Transformer capacity for the system totaled 55,923,671 kVA.

Projects presently in various stages of design and construction will add another 2,774 circuit-miles of transmission lines and 37 substations to the system. Of this, 1,298 miles are 500-kV, 1,012 miles are 230-kV, and 199 miles are 115-kV or lower voltages. The direct-current line (265 miles of which is within the BPA service area) will be converted from 800-kV to 1,000 kV. The transformer capacity being added totals 17,570,400 kVA.

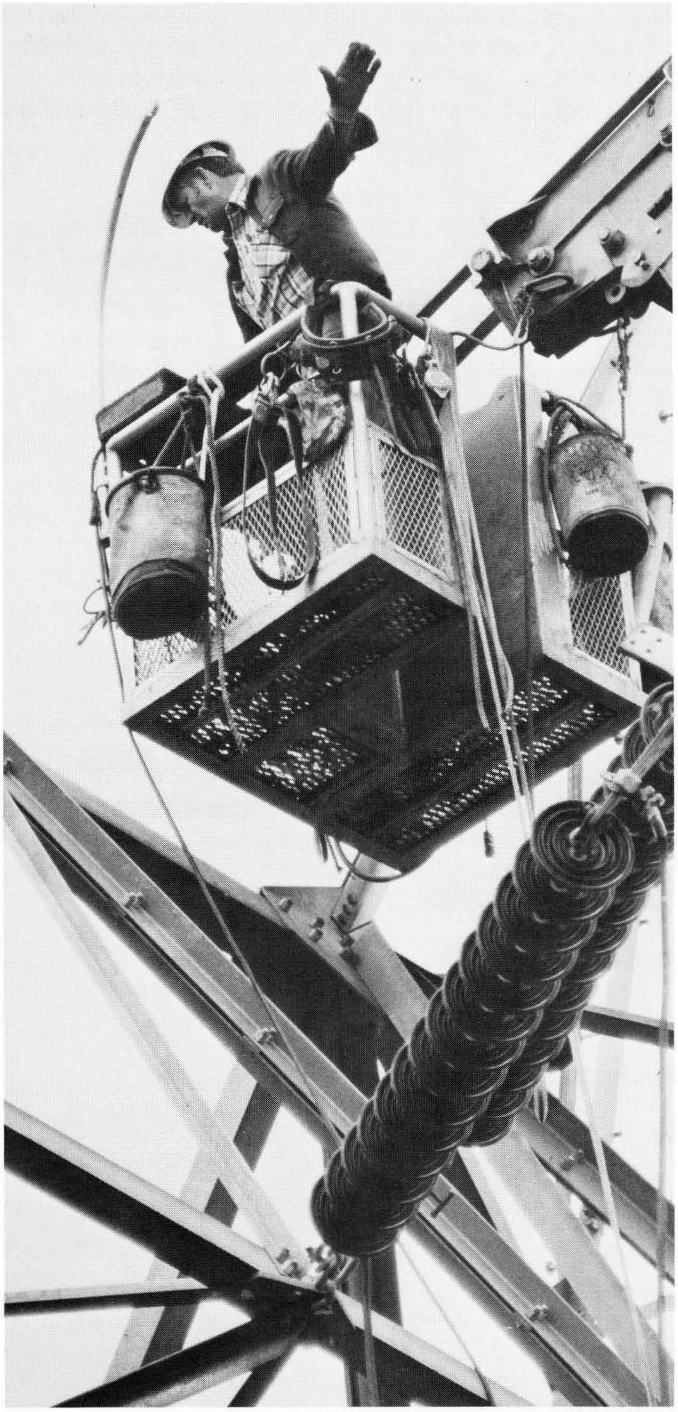
Busy Construction Year
Fiscal year 1981 was one of the busiest construction years in BPA's history, rivaling the peak years of 1968-70. During that earlier period, an average of 518 circuit-miles of transmission lines and 6 substations were added to the BPA high-voltage system each year. In FY 1981 a total of nearly 500 circuit-miles of transmission lines and 7 substations were completed.

This program was carried out with substantially fewer people than in previous peak years. In FY 1981, the BPA Office of Engineering and Construction employed an average of 1,440 employees. This figure compares with an average of 1,601 employees during the period 1968-70. E&C employment reached a high of 1,783 in 1974 and has steadily declined since then.

The decrease in employment has occurred despite:

- The substantial FY 1981 construction program and its engineering and design workload;
- Normal levels of O&M support and trust/reimbursable projects;
- Activities required to implement the Regional Act; and
- A general increase in the preconstruction workload, including surveying and land acquisition.

As an example of the latter, in 1974 a single mile of 500-kV transmission line required about 85 employee-days of design work. Today it requires some 130 employee-days or an increase of 53 percent.



A construction worker prepares to install the "jumper" cable of a newly erected dead-end transmission tower.

Much of this added workload can be attributed to more stringent environmental requirements and the need to coordinate more closely with concerned State and local government entities in locating transmission lines. Property owners and civic associations also demand and are entitled to a closer involvement in the planning and siting of transmission facilities than was previously the case.

Planning and building a transmission line in today's climate is more than an engineering problem. It is increasingly a "people process" whereby each segment of a proposed routing is subject to close public scrutiny and input. BPA is committed to satisfying these concerns while holding down costs and meeting its construction schedules.

Okanogan Area Service

A construction project in northcentral Washington which affects four utilities there proved to be one of the more difficult projects to complete in 1981. It included two 230-kV lines: the 34-mile, double-circuit Chief Joseph-East Omak line and the 21-mile Grand Coulee-Keller line, plus their terminals. It was no small feat that all were energized in time to meet increasing winter loads in the area.

The original schedule was tight, and it ran into a series of delays. The first of these resulted from the difficulty in identifying and contacting the numerous owners of Indian allotted lands. This difficulty caused delays in mapping, land acquisition, the ordering of materials, and construction.

BPA staff compensated for the delays by writing time incentives into construction contracts, incentives which attracted competitive bids from contractors capable of doing the work quickly and well. BPA acquired land rights, finished designs, and ordered and received materials during the construction period without delaying the contractors. BPA substation crews worked long and hard to complete the two new substations.

As a result of intense efforts, the entire project was completed nearly on schedule and a rather remote area is now being served with reliable electric power.

Buckley-Summer Lake Line

Construction of the 156-mile Buckley-Summer Lake 500-kV transmission line in central Oregon began in 1981. But completion of the line has been delayed until March 1983 to allow more time for the purchase of special equipment for Buckley Substation. It will be the first gas-insulated substation on the BPA transmission system.

The Buckley-Summer Lake line is the first segment of what could eventually become the Pacific Northwest-Pacific Southwest Intertie's third alternating-current line. Cross-rope suspension towers—a new technological application—will be erected on a 26-mile stretch of open sagebrush land. The cross-rope structures are simpler to manufacture, easier to erect, and cost less per mile of line than standard steel towers. But they require a wider right-of-way and are unsuited for areas where the land is used intensively.

The application is being used to gain experience in design and to develop construction and maintenance techniques which may be adapted later to higher voltage lines, such as 1,100-kV, where it is cost-effective.

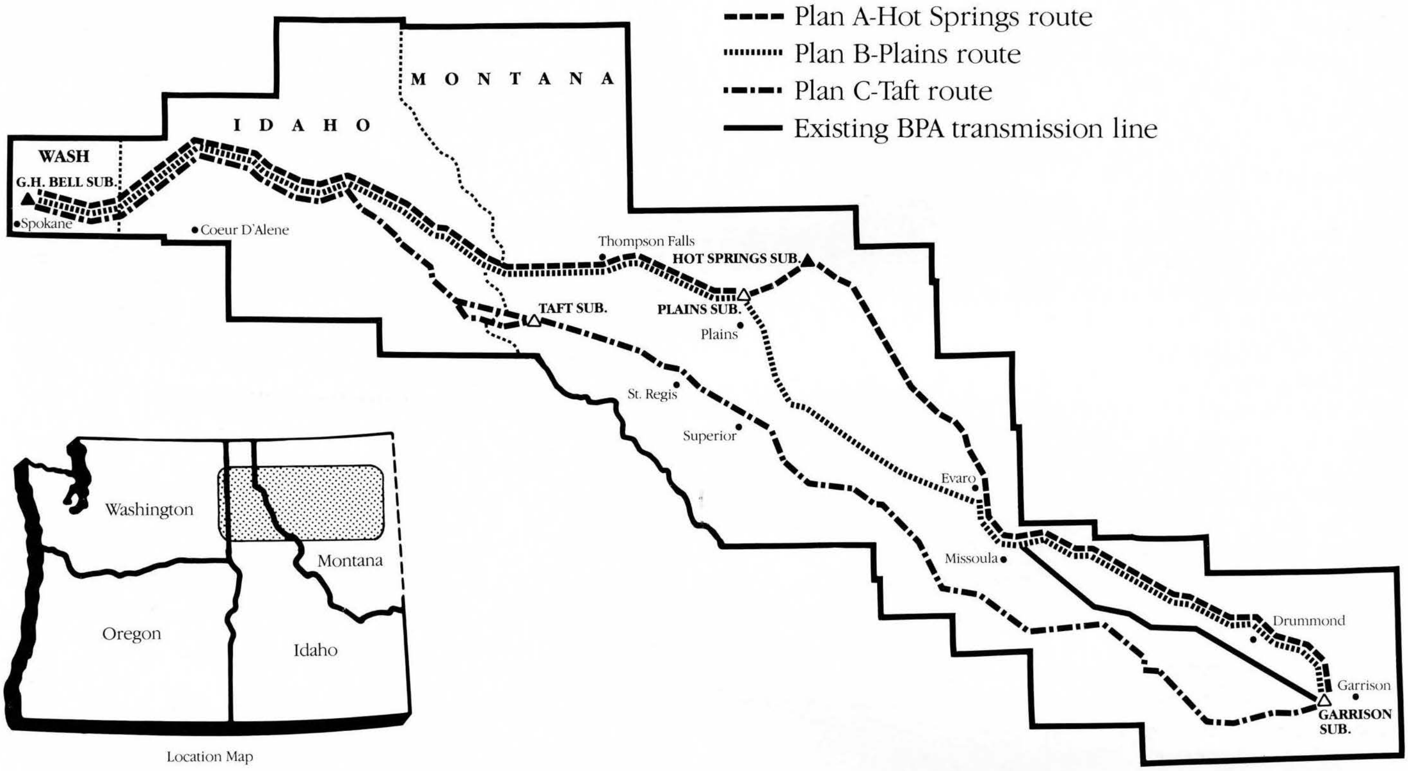
The Buckley-Summer Lake line will reduce electrical losses, reinforce southwest Oregon service, back up Pacific Power & Light Company's Midpoint-Malin line, and add capacity to serve BPA loads in southern Idaho.

Crow Butte Crossing

The difficulties described in last year's Annual Report with regard to a 500-kV transmission crossing of the Columbia River at Crow Butte Island have largely been resolved. In early 1981 the Department of the Interior withdrew its objections to an overhead crossing of Crow Butte Slough, thereby assisting BPA to comply with a congressional appropriations directive that no funds be spent for a proposed subsurface transmission facility.

BPA is now in the process of completing an environmental impact statement which will present the overhead crossing as the preferred plan. Upon completion and filing of the EIS, BPA will decide whether to complete the construction of the overhead line. Meanwhile a 3-year study of the impact of the river crossing lines on waterfowl is being carried out, with little evidence of adverse results to date. Should significant waterfowl mortality occur, BPA will undertake mitigation measures.

Garrison-Spokane 500-kV Transmission Project



Western Montana Transmission

A consortium of investor-owned utilities is constructing Colstrip generating Units 3 and 4, twin 700-MW plants in the coal fields of southeastern Montana. Unit 3 is scheduled to come on line in October 1983 and Unit 4 in 1985.

Power from these plants is to be integrated into BPA's grid and conveyed to load centers throughout the Pacific Northwest by constructing a 500-kV line from Colstrip, Montana, to a point near Spokane, Washington. The western portion of the line, originating near Townsend, Montana, will be built by BPA under multi-utility arrangements approved by Congress. The eastern segment of the line from Colstrip to Townsend will be built by The Montana Power Company.

At Garrison, Montana, the line will connect in a new 500/230-kV BPA switchyard with BPA's existing 230-kV Anaconda-Hot Springs line and a Montana Power Company 230-kV line to Missoula, Montana. This transmission will have sufficient capacity to integrate the output of Colstrip 3.

The transmission facilities which will be built west of Garrison need to be ready in 1985 when Unit 4 begins to produce electricity. Three alternative plans of service are presently being considered for the transmission line west of Garrison.

Plan A would take the line from Garrison Substation to Hot Springs, Montana. Plan B would go from Garrison to a new substation at Plains, Montana, which is somewhat south and west of Hot Springs. Plan C would run from Garrison to a new substation at Taft, Montana, which is south and west of Plains.

During 1981, BPA prepared a preliminary draft EIS for the transmission facilities west from Garrison to Spokane. This draft EIS shows the Taft plan (Plan C) to be the environmentally preferred route. This alternative would have less environmental impact than the other two plans, although it would be more costly.

During the past year, as preconstruction activities moved forward, considerable progress was made on siting the segment from Townsend to Garrison. The early months of 1981 were marked by a number of public meetings in Montana communities along the proposed route. These meetings were held to gather information and comments for the Townsend-Garrison supplement to the Colstrip EIS and to aid in the selection of a final route. The meetings led to several modifications of the preferred route and contributed substantially to the evaluation of alternative routes, especially in the Deer Lodge, Drummond, and Boulder areas of western Montana.

BPA opened a field office in Missoula, Montana, in May 1981. One of the functions of this office is to supply information to local groups and individuals. Its local accessibility has reduced opposition to the project and has had a positive effect with respect to land acquisition.

As the fiscal year came to an end, the job of surveying the Townsend-Garrison segment was completed. The project is still on schedule. Clearing and construction of the Townsend-Garrison segment will begin in the second quarter of FY 1982. The facilities along this stretch of the line are scheduled to be energized in October 1983 when Colstrip 3 enters service.

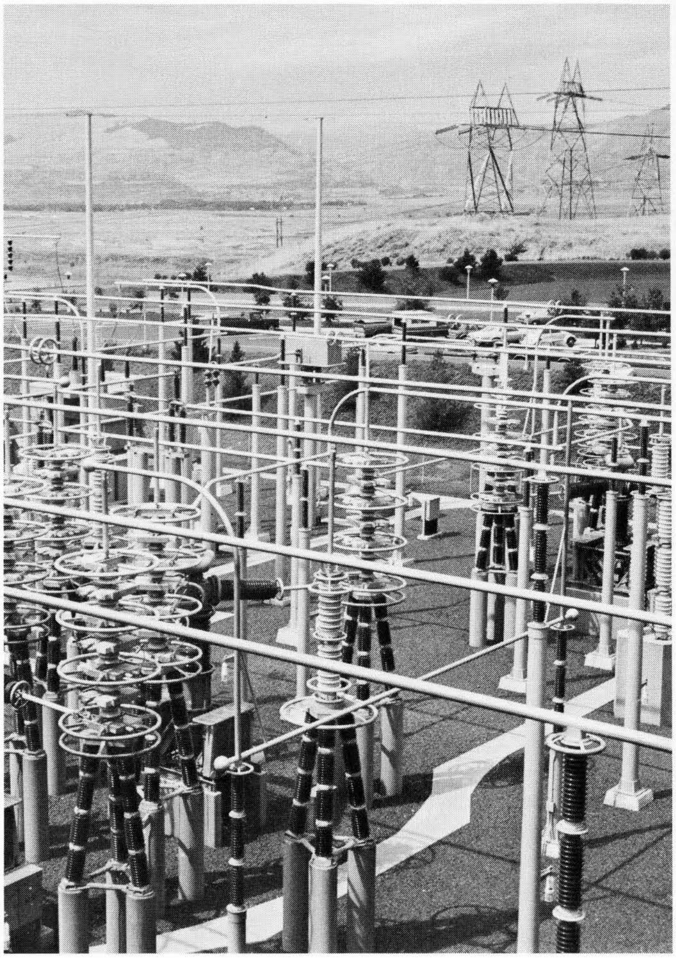
Portland Area Reinforcement
Five alternative construction plans for strengthening the BPA transmission system in the Portland, Oregon, area currently are being considered. All involve the construction of a 500-kV line from Longview, Washington, to Portland with a crossing of the Columbia River somewhere between the two cities.

This additional transmission will be required by 1988 to reinforce existing facilities in the Portland area which could become overloaded as the metropolitan Portland electrical demand increases. The new line will also serve to integrate the output from generating facilities being built near Satsop, Washington.

Because the proposed Longview-Portland reinforcement facilities will impact high-density areas and valuable timberland, their precise routing will require intensive environmental study and broad public involvement. A preliminary round of public meetings to explain the project and to obtain public input was held by BPA in October 1981.

Upgrading the Intertie
The direct-current line of the Pacific Northwest-Pacific Southwest Intertie was designed in the 1960's when experience with long-distance overhead d-c lines was limited. Its design, therefore, was conservative. Experience with the line—it has been operated since 1970—and advances in d-c technology now make it possible to increase the capacity of the line. The benefits to be gained will be substantial, the costs comparatively low.

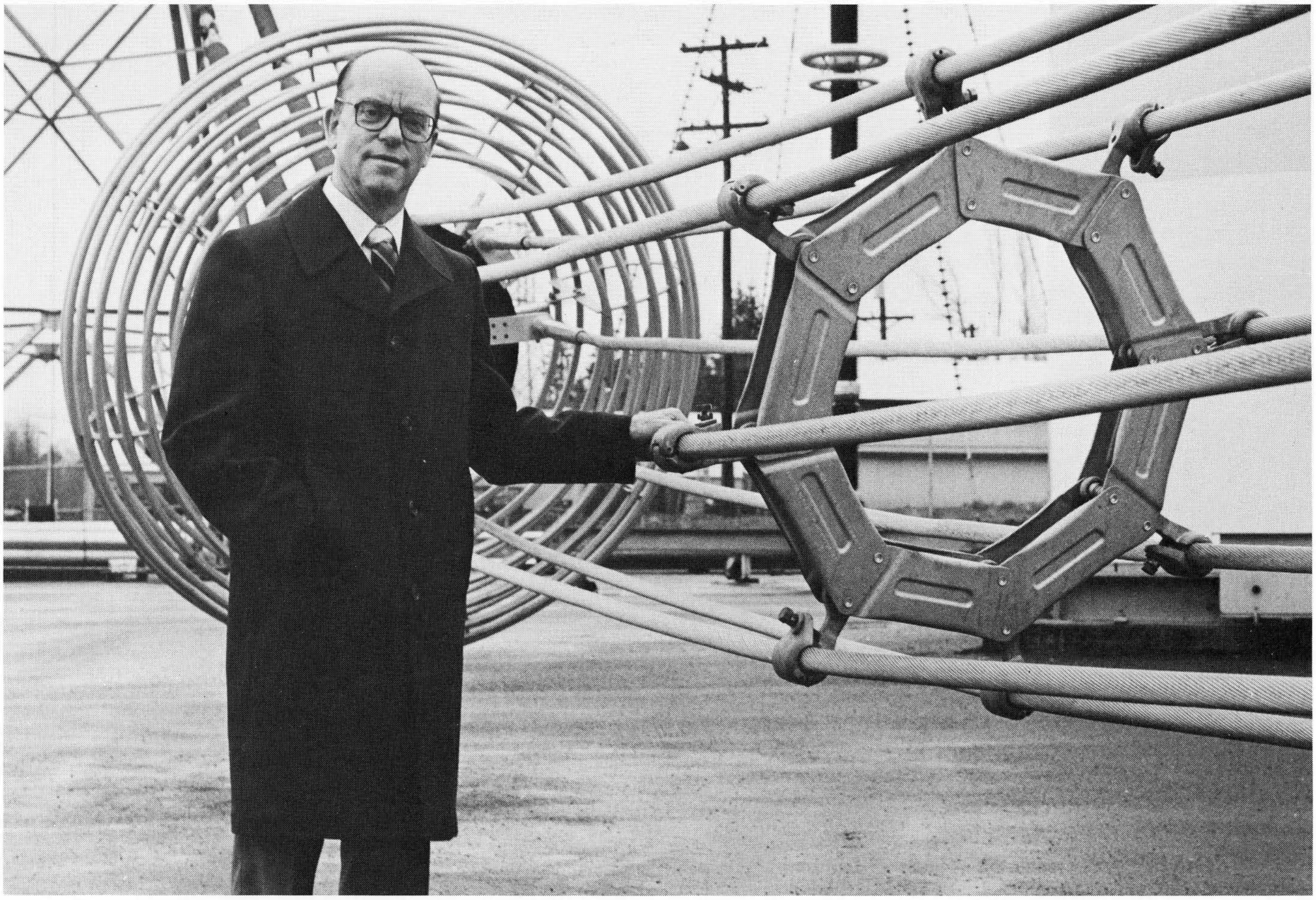
The voltage will be raised from 800-kV to 1,000-kV, increasing the capacity of the line from 1,600-MW to 2,000-MW. This will enhance the efficiency of the line and reduce electrical losses.



Upgrading the direct-current Intertie line will require extensive modification of the terminal facilities at the BPA Celilo Converter Station.

The increased capacity will be used to transmit to the Southwest seasonal surpluses of energy which cannot be marketed in the Northwest. During good water years in the Northwest, the upgraded transmission facilities can conserve an additional 2 million barrels of oil a year at Southwest generating plants.

The estimated cost of increasing the d-c Intertie capacity is $72 million, to be shared by BPA and a consortium of Southwest utilities. Construction of the overall project will begin in early 1982 and is scheduled for completion in 1985.



Director of Laboratories Stanley Capon demonstrates the size of an 8-bundle 1,100-kV conductor. This massive equipment is several times larger than a conventional 500-kV bundle of 3 conductors.

1,100-kV Transmission

BPA's 1,100-kV test program, which is preparing for the advent of commercial ultra-high-voltage transmission, will continue to focus on the present principal areas of study through 1986. They are: (1) electrical performance, (b) mechanical performance, and (c) environmental effects. The major design decisions will be made between now and 1987. The program will then move into the demonstration phase and the testing of equipment.

BPA is already laying the groundwork for the day when the program's emphasis will shift. Beginning in 1982, electrical studies at its Lyons, Oregon, prototype facility will put less emphasis on corona characteristics and more emphasis on substation equipment, particularly gas-insulated equipment. Corona studies have already led to the development of formulas that can be used to predict the performance of future designs. The next phase of the program will emphasize the development of reliable and cost-effective apparatus.

The environmental studies at Lyons will continue to evaluate the effects of electrical fields on natural vegetation, crops, mammals, birds, livestock and honey bees.

The mechanical test program at BPA's test facility near Moro, Oregon, will continue to evaluate the effects of high winds and severe icing on towers, conductors, conductor bundles, spacers, dampers and other hardware. New and different designs will be evaluated.

In the Mechanical Laboratory, the program will be expanded to include the development of tools and techniques that can be used to build and maintain 1,100-kV facilities. The mechanical tests will also continue to measure such factors as the strength of insulators and the fatigue of metal dampers due to vibration.

BPA initiated the 1,100-kV test program in 1977 after it became apparent that transmission capacity across the Cascade Mountains will have to be increased substantially by the end of this century. The optimum voltage for this increase in capacity appears to be 1,100-kV, a voltage higher than any used thus far in commercial application. The goal of the program is to verify the feasibility, design, and operating performance of 1,100-kV transmission.

Extensive BPA studies of 500-kV, 750-kV, and 1,100-kV for the next major expansion of the system have shown that 1,100-kV would provide the greatest long-range benefits. A preference for using 1,100-kV rather than a lower voltage is based on a number of apparent advantages—less right-of-way and lower cost per kilowatt transmitted, reduced environmental impacts, a 50-percent saving in electrical losses, and economies of scale. The studies show that 1,100-kV would be more economical than 500-kV when the capacity of a line exceeds 4,000 to 5,000 MW.

British Columbia Hydro & Power Authority has joined in financing the UHV test program, which is attracting worldwide attention. Engineers on six continents are monitoring its progress, and many of them have visited the two BPA prototype installations.

Reducing Customer System Losses

While innovative energy conservation programs involving the general public can effect significant electricity savings, the first place to begin trimming kilowatt waste is in the transmission and distribution of power.

Over a period of many years, BPA has sought to reduce transmission losses by improving its transformation and control equipment and power flow. For example, BPA engineers have introduced technical refinements on BPA's system which have cut average transmission losses from 2.9 to 2.3 percent over the past 5 years.

Building upon this savings foundation, BPA launched a program in 1980 to assist its customer utilities in improving the performance of their electrical systems. To find out how well these systems were performing, BPA went to the annual reports filed by each utility with the Federal Energy Regulatory Commission. (The latest figures available were for 1978.)

System losses for all of BPA's preference customers totaled about 2.7 billion kilowatthours in that year. Total system losses for its private utility customers came to about 5.2 billion kWh.

The electrical losses on the preference customer distribution systems averaged 5.8 percent of the power dispensed to retail customers. The losses ranged from a low of 1.1 percent to a high of 16.6 percent for individual utilities.

BPA calculates that if the effectiveness of both public and private systems could be improved to the point where no losses exceed 5 percent, some 2.7 billion kWh annually could be conserved. This is nearly one-half the output of a large thermal power plant.

Assisted by a consulting firm, BPA has developed a guidebook which will help its utility customers to analyze their systems and determine what measures to conserve energy would be cost-effective. This guidebook, which was distributed in December 1981, enables a nontechnical person using a pocket calculator to make a quick, simple approximation of cost-effectiveness. Precise and more sophisticated calculations can be made on a computer.

BPA is in the process of developing such a computer program, which will be made available to its customers in 1982. Those with BPA requirements contracts can qualify for billing credits by modifying their power systems to reduce energy losses. More importantly, nearly all end-users of electricity benefit from this process of reducing energy losses.

Research and Development

BPA is heavily involved in research and development work with the Electric Power Research Institute (EPRI) and the Department of Energy (DOE). EPRI, which is supported financially by a large number of public, private, and government utilities, tends to support R&D projects with terms of 5 to 15 years. DOE funds projects, such as fusion research, with a longer term. By contrast, BPA's in-house R&D program is relatively short-term in nature and focuses on power transmission technology.

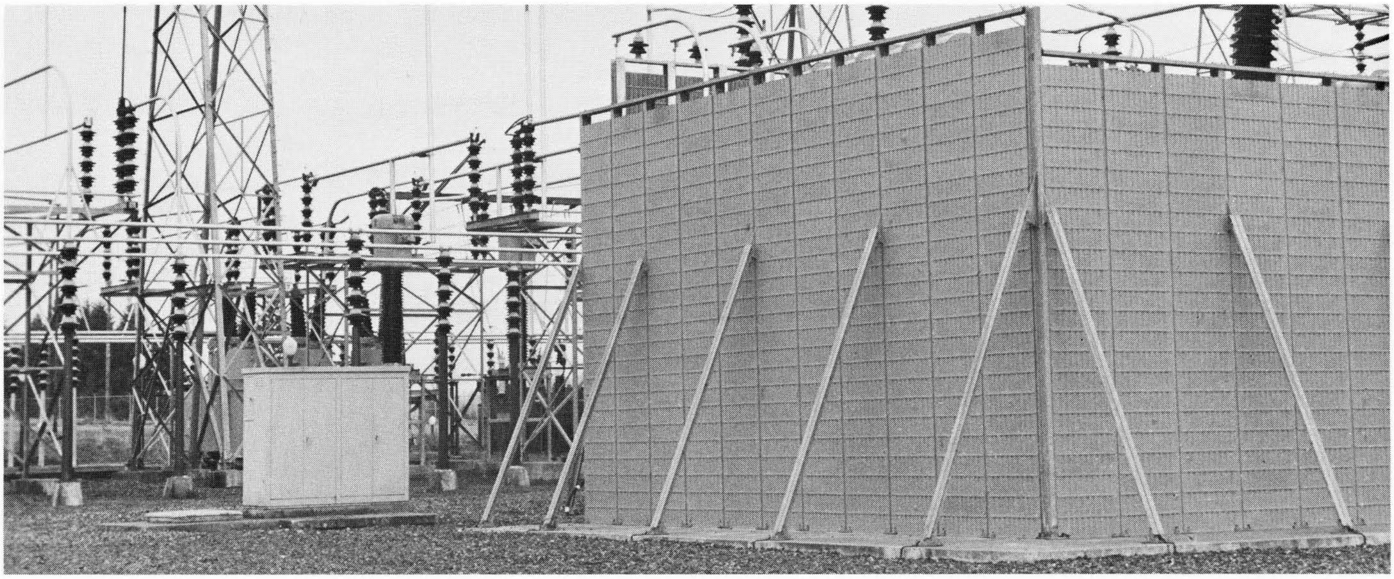
A major thrust of this R&D program relates to 1,100-kV transmission design and its possible integration into the BPA power grid within a decade, as described earlier in this Annual Report.

Other R&D activities being conducted by BPA include the following.

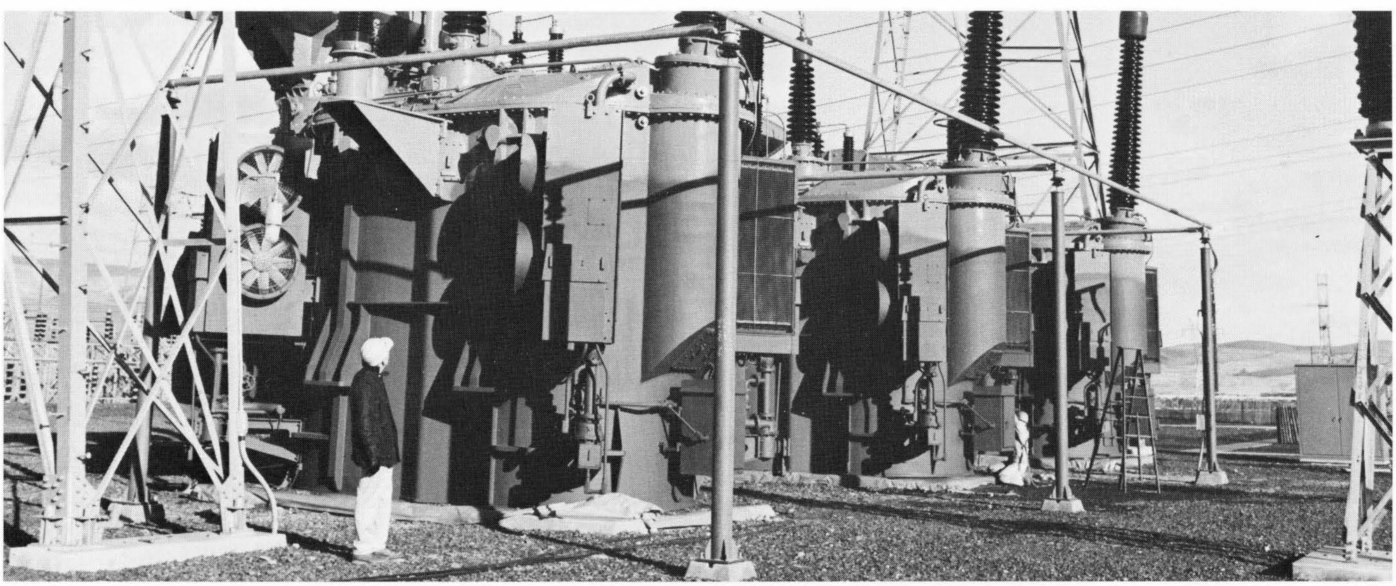
- Continuing studies of such environmental problems as noise abatement, esthetic designs, wildlife and bird behavior, improved line routing techniques, and new designs for river crossings are taking place.

- Advanced studies of the structural dynamics of transmission lines and towers are being conducted.

- Additional efforts are being made to improve power system control, communication techniques, substation technology, computer assisted substation operations, ultra-high-speed single-pole relaying, load dropping controls, gas-insulated substations, compact substations, and the life and efficiency of substation equipment.



One important facet of BPA's transmission R&D program deals with noise abatement for electrical facilities. The above photo shows the insulated shield which was devised to muffle the transformer sound at the BPA McLoughlin Substation near Oregon City, Oregon. By contrast, the unshielded transformers of the Big Eddy Substation near The Dalles, Oregon, appear in the photograph below.



- The possibility of electrical field effects on humans has become a subject of great interest. BPA is presently proceeding with the second phase of a study to ascertain the epidemiological effects of electrical fields on maintenance personnel and others who work around high-voltage facilities.

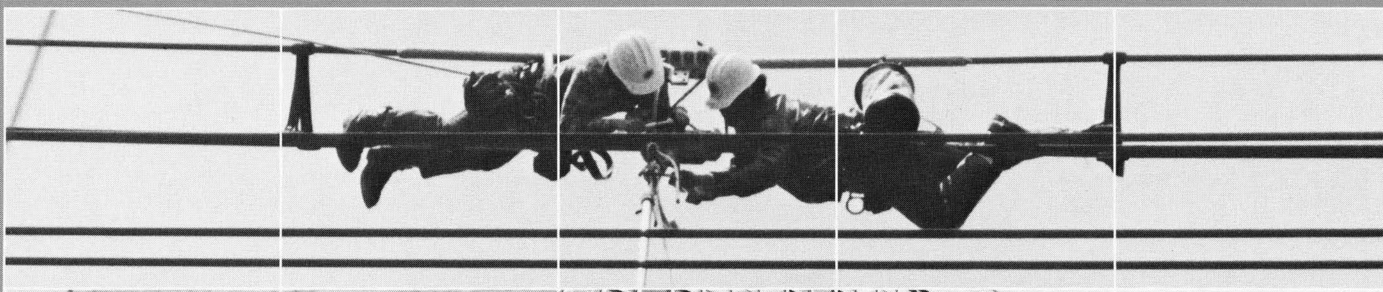
- BPA is installing several photovoltaic (solar cell) demonstration projects. They include a 10-kW pilot project for solar heating and cooling in a BPA control house at Redmond, Oregon. This unit will be connected to the building's electrical panel and also the BPA grid.

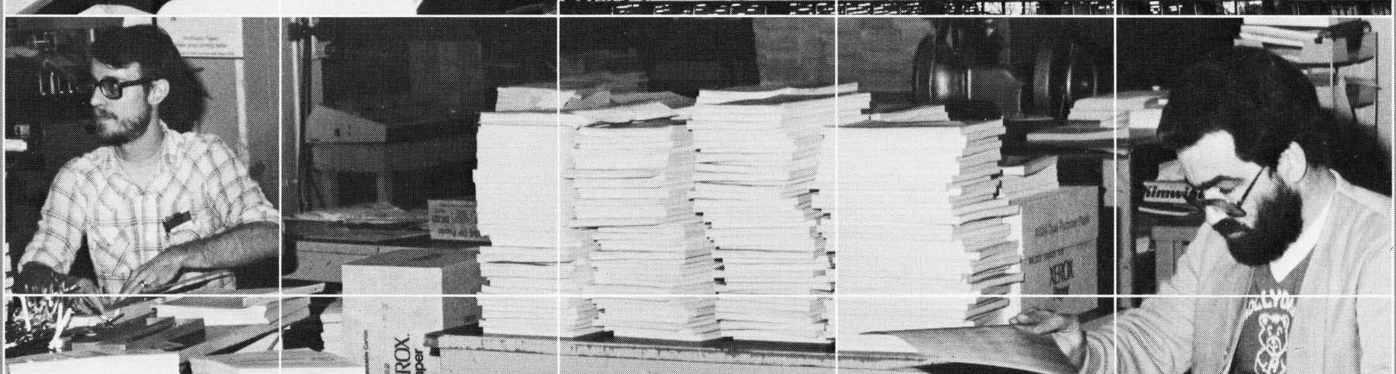
- Computer models are being developed and tested to identify transient stability problems and how to minimize their occurrence.

- System outages are a continuing subject of intensive investigation, including the technical criteria used to evaluate system reliability.

These and other R&D programs contribute to the BPA goal of designing, building, operating, and maintaining the world's most reliable, safest, most economical, and most environmentally acceptable high-voltage power grid—now and in the future.

Organization and Administration





BPA Chief Engineer Marvin Klinger (left) discusses a transmission project with Regional Operations Manager George Tupper.

Organizational Changes
In assuming its new responsibilities under the Regional Act, BPA realigned several of its organizational units during FY 1981. By the end of the calendar year an additional reorganization package was ready for introduction. It will further strengthen BPA's management and programmatic capabilities.

As noted in last year's Annual Report, the **Office of Financial Management** was created to upgrade BPA's budget, fiscal and financial planning functions. The new Assistant Administrator (Financial Manager) reports directly to the Administrator.

Concurrent with that change was the interim establishment of the **Division of Conservation** within the Office of Power Management. By February 1982, however, a new **Office of Conservation and Direct-Application Renewable Resources** will be formed to spearhead an aggressive, broad-based energy savings program. It will be headed by an Assistant Administrator with action-oriented authorities delegated by the Administrator.

The **Office of Regional Operations** is the new title of what was formerly the Office of Operation and Maintenance. The change in nomenclature is intended to reflect the new responsibilities vested in this organization and its Area offices, which are now heavily involved in energy conservation, renewable resource development and acquisition, and local government liasion. Regional Operations continues to oversee maintenance activities, aircraft services, and power system control.

BPA's four Area offices were renamed during FY 1981 to reflect more accurately their geographic coverage. The Seattle Area became the **Puget Sound Area**; the Spokane Area was renamed the **Upper Columbia Area**; the Walla Walla Area was designated as the **Snake River Area**; and the Portland Area became the **Lower Columbia Area**.

A new coordinating office was established in Helena, Montana, to perform State and local government liaison. With the exception of BPA's office in Washington, D.C., the Helena office is the first multipurpose component located outside the BPA service area.

Within the Office of Engineering and Construction, a new **Division of Land Resources** was created in order to consolidate land-use activities. This new Division will coordinate land acquisitions, reconnaissance and mapping, and the preparation of environmental materials with respect to transmission design and construction.

Strategic Planning
Commencing in mid-1981, BPA initiated a long-range strategic planning effort which involves more than 50 managers and their staffs. Utilizing the services of a top business consultant, the program is geared to advanced corporate management principles and decisionmaking techniques. It involves analyzing each BPA organizational component's present operations, strategic choices and decision areas, and critical action planning. The evolving management applications are intended to position BPA to capitalize on the opportunities afforded by its new role in the region's energy arena.

Official Organization Chart
U.S. Department of Energy
Bonneville Power Administration

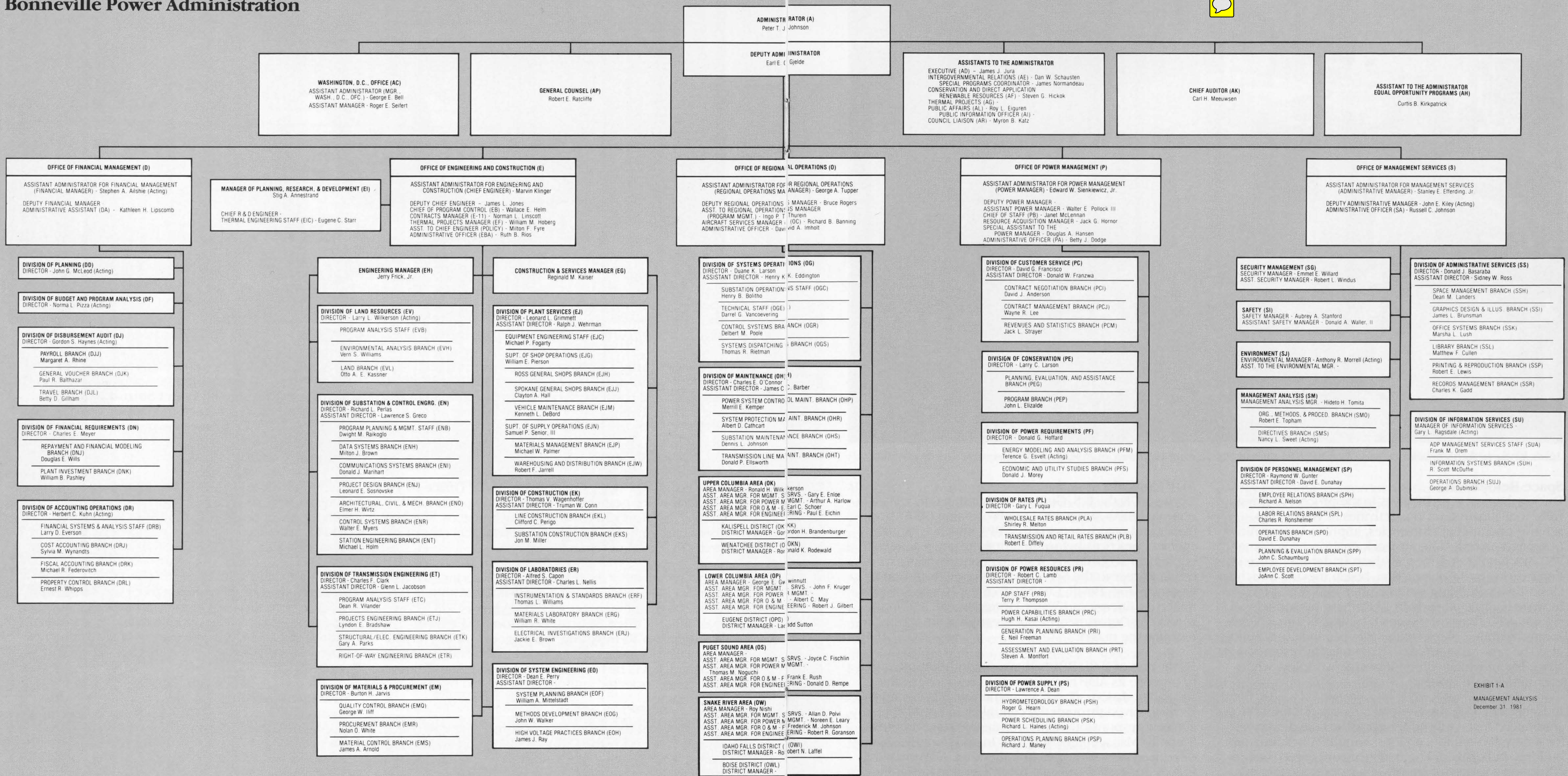


EXHIBIT 1-A

MANAGEMENT ANALYSIS
December 31, 1981

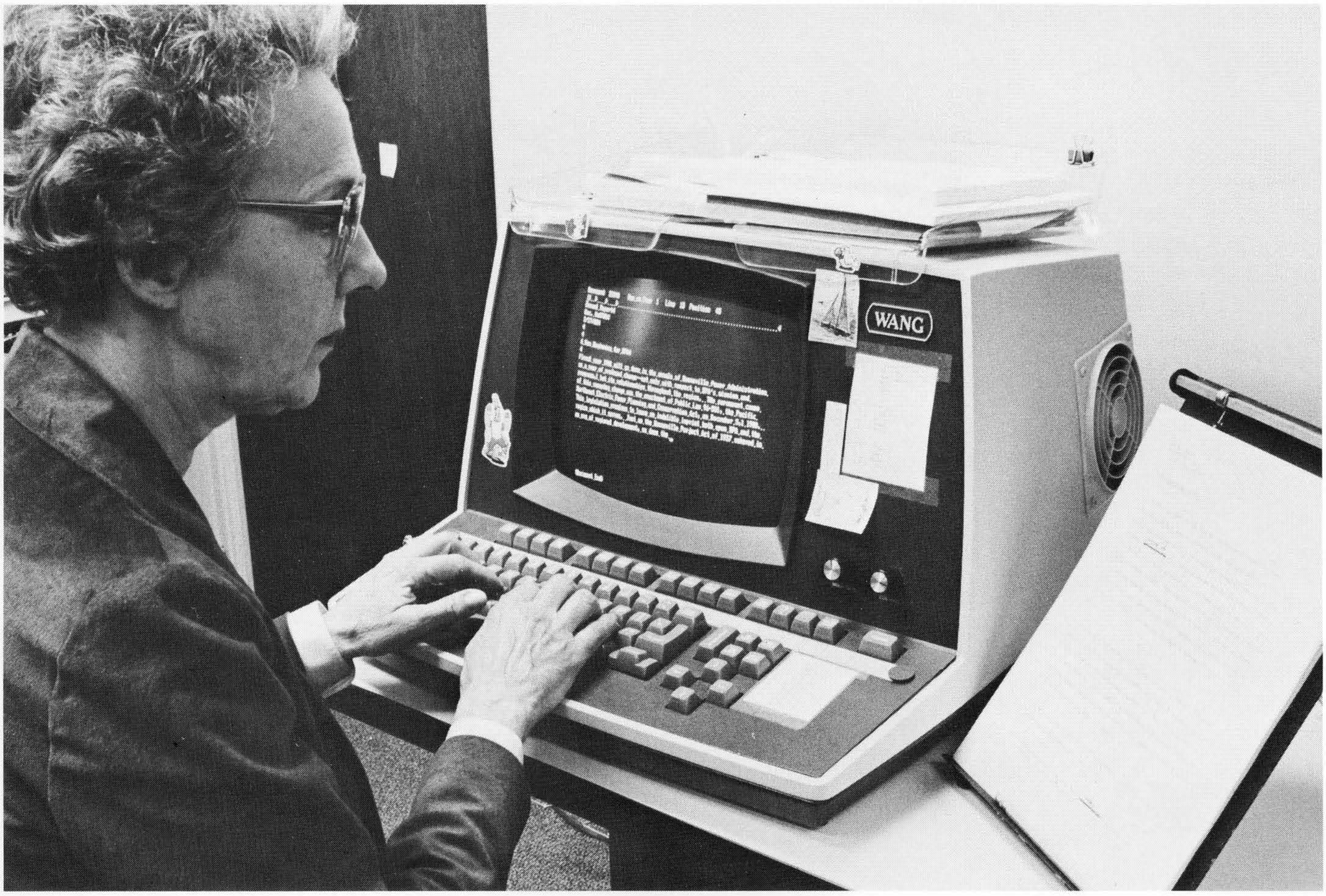
Modular furnishings provide a "new look" in BPA office space recently acquired in Portland, Oregon.

Space Relocation
During the past year, BPA was in the process of physically consolidating various activities in Portland to achieve operational efficiencies, improve communications, and provide a better work environment. Some 750 BPA employees, most of them under the Office of Engineering and Construction, began moving into the Lloyd Tower Building in December 1981. When the move is completed early in 1982, these personnel will occupy 4-1/2 floors of the newly built structure which is located within 2 blocks of the BPA headquarters building. The new quarters feature modular furnishings and space layout which will improve the workflow while economizing on space.

In December 1981 the General Services Administration announced that it was undertaking the final design work for a new $90 million, energy-saving BPA headquarters building in Portland. The new structure, which will incorporate a variety of energy-efficient design features, will be built on what is now a parking lot immediately south of the present BPA headquarters building. The new facility will have 535,000 square feet of usable space, which will be allocated in the most work-efficient manner. Construction is planned to commence in 1984 with completion scheduled for 1986.

ADP Upgrade
During 1978, the U.S. General Accounting Office (GAO) reviewed BPA's Automatic Data Processing (ADP) activities and recommended that BPA improve its management practices before undertaking any major equipment acquisitions. A similar concern was expressed in a letter to the Secretary of Energy from Congressman Tom Bevill, Chairman of the House Subcommittee on Energy and Water Development, and in the report of a Department of Energy study team formed to examine the matter.

By the end of 1981, BPA had taken significant measures to improve its ADP management in response to these recommendations. Top management at BPA became directly involved through the centralization of ADP management responsibilities under the Assistant Administrator for Management Services. In addition, BPA has developed new strategies in long-range ADP planning, in ADP budgeting and cost control, and in designing and utilizing automated systems.



Pat Mills in Intergovernmental Relations uses computerized word processing equipment to keep up with increased workload.

Along with improving ADP management in 1981, BPA prepared to upgrade its computer facilities after several years of scrutinizing new central computer systems to replace the obsolete and overburdened 13-year-old system now installed at BPA headquarters.

As an interim measure, BPA purchased five minicomputers to meet its continually growing computational requirements. ADP planning now calls for these minicomputers to be arranged in a "Technet" family to handle most technical computations. BPA is also planning to use separate minicomputers for special workloads such as office automation functions.

Current planning also foresees the acquisition of a new central computer system by late 1982. The new hardware will be used primarily for information storage and retrieval, and business types of applications.

BPA anticipates a growth in its computer workload over the next 3-4 years which will require about three times the present ADP hardware capacity.

Information Sharing

In August 1981, BPA's Office of Power Management offered access to its automated computer programs on energy planning to appropriate Northwest entities under its Cooperative Regional Information Sharing Program (CRISP).

CRISP gives regional planning groups such as the Pacific Northwest Utilities Conference Committee (PNUCC), State departments of energy, State public utility commissions, large industries and utilities access to computerized energy planning tools relating to load forecasting data, methods, and models; supply and demand models; load and resource information; end-use information; and economic models and data.

At present, the information made available through CRISP is largely BPA-generated. Models and data contributed by other energy planning organizations will be incorporated as they become available.

So far the response to CRISP has been favorable. The newly developed sharing program will help BPA respond to the Northwest Power Planning Council's request for ADP support. BPA is also utilizing CRISP in undertaking a joint effort with the PNUCC to develop a set of complex planning models by July 1982. In addition, CRISP is providing BPA reports, computer programs, and base data to various outside entities upon request.


BPA REVENUES
Revenue Increase
quired for FY 1981
current rates
$630,755,00
,125,893,00

The Financial Year

Federal Columbia River Power System (FCRPS) gross operating revenues totaled $705.3 million for FY 1981, an increase of $192.9 million (38 percent) compared to FY 1980. However, expenses for FY 1981 totaled $711.2 million, an increase of $139.3 million (24 percent) compared to FY 1980. This resulted in a deficit for FY 1981 of $5.9 million on a cost accounting basis.

The substantial increase in revenues was due primarily to the wholesale power rate increase which went into effect on July 1, 1981, and higher-than-anticipated surplus power sales in the last quarter of FY 1981. Revenues from power sales to publicly owned utilities increased by $57.8 million (22 percent), to investor-owned utilities by $78.1 million (103 percent), to Federal agencies by $7.8 million (97 percent), to aluminum industries by $35.0 million (30 percent), and to other industries by $1.7 million (14 percent) above FY 1980 levels.

Despite the increase in revenues, expenses also rose significantly, producing for FCRPS a deficit of $5.9 million on a cost accounting basis. This is the fifth consecutive year of deficits, which have reduced cumulative net revenues from a high of $385 million at the end of FY 1976 to $177 million at the end of FY 1981.

Continued inflation was the primary reason that operation and maintenance expense increased by $26.2 million (17 percent) over FY 1980. High interest rates on BPA borrowings and increased investment in existing generating projects combined to increase net interest expense by $22.7 million (12.4 percent). Purchase and exchange power expense increased the most significantly by $131.1 million (95 percent). This was due primarily to the increased costs for WPPSS Nuclear Projects 1 and 2.

BPA can adjust its rates annually. Beginning with the proposed rate increase in October 1982, the deficit trend should begin to be reversed.

Basis for Financial Reporting

BPA prepares financial statements for the FCRPS on a cost accounting basis to assess its financial condition from the viewpoint of a commercial enterprise. The financial statements are independently audited by the firm of Coopers & Lybrand, certified public accountants, in accordance with generally accepted auditing standards. The complete financial statements with the auditor's opinion appear on pages 55 through 67. A graphic portrayal of financial results on this basis appears on page 44.

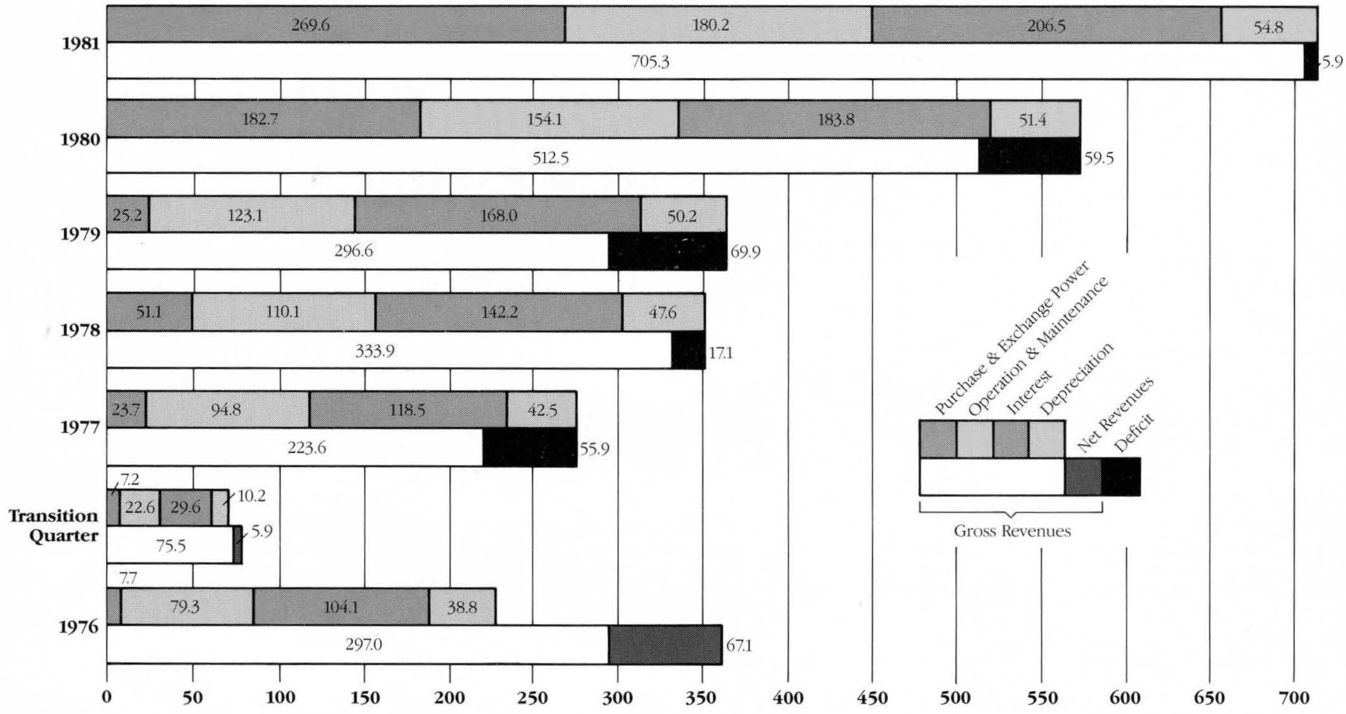
Power rates, however, are not set to recover costs as determined on the cost accounting basis, but are based upon what is called the repayment basis. This report also includes the FCRPS Repayment Study (Table 5, pages 50 and 51).

The cost accounting financial statements present financial results on an annual basis. The Repayment Study consists of long-range forecasts of future revenues and expenses and the repayment of the investment in power facilities. The two sets of financial reports measure two different things, current financial results in the cost-accounting statements and future financial requirements in the Repayment Study.

The cost accounting financial statements include depreciation of the power facilities over their expected useful lives, which extend up to 100 years in some cases. The repayment policy (see page 52), however, requires that the investment in all power facilities be fully repaid within 50 years of each facility being placed in service. The level of revenue required to meet the repayment requirement is higher than needed to cover costs on the cost accounting basis.

Another major difference between the two is that prior to December 20, 1979, estimated net billing advances were included as annual costs in the Repayment Study while on the cost accounting statements these costs were shown as deferred expenses until the plants start operating. However, beginning December 20, 1979, net billing advances were charged to expense on a current basis for cost accounting purposes. For a reconciliation of cost accounting results to the Repayment Study, see schedule B on page 68.

Revenue and Expense Trend



1) For FY 80 includes $44.2 million write-off of Trojan Nuclear Project net billing advances.

Repayment Study

The Repayment Study included in this report (Table 5, page 50) demonstrates that BPA needs to increase its revenues to $2.4 billion dollars in FY 1983 (as shown in Table 5 under Column 2), in order to meet all the FCRPS repayment requirements as forecasted for the next one-year rate period (October 1, 1982, to September 30, 1983). The results of these repayment requirements will be announced in January 1982, and discussed at a series of customer meetings during that month.

Under current rates, BPA's estimated revenues for FY 1983 are only $1.7 billion dollars. The required increase of more than $700 million represents a 42.8 percent increase over currently projected FY 1983 revenues. This Repayment Study will be included as part of an Initial Rate Proposal for a October 1, 1982, through September 30, 1983, wholesale power rate increase.

An Official Notice of the proposed rates will be published in the Federal Register in March 1982, and public hearings on the proposal will be conducted during the period April through June 1982.

A final Repayment Study, if required, will be prepared in June or July for the final Rate Filing to be submitted to the Federal Energy Regulatory Commission (FERC) by August 1982. The preliminary Repayment Study will be revised as necessary to reflect significant changes, if any, developed during the rate hearing process. A revised study could indicate a need for a revenue increase different from the 42.8 percent indicated by the preliminary study. To comply with the requirements of Public Law 89-448 for an annual report to the President and the Congress which includes all authorized Federal power facilities, a note to the Repayment Study (page 53) lists the authorized projects not specifically included in the Repayment Study, together with pertinent data thereof.

Table 1 **Electric Energy Account** Fiscal Year 1981

Energy Received (millions of kilowatthours)	
(Energy Generated for BPA)	
Bureau of Reclamation	23,723
Corps of Engineers	60,464
Hanford Steam Plant (NPR)	1,371
Centralia Thermal Project	2,313
Trojan Nuclear Plant	1,981
Other Generation	769
Power Interchanged In	73,332
Total Received	163,953
Energy Delivered (millions of kilowatthours)	
Sales	81,222
Power Interchanged Out	78,596
Used by Administration	63
Total Delivered	159,881
Energy Losses in Transmission	4,072
Total	163,953
Losses as a Percent of Total Energy Received	2.5
Maximum Demand on Generation (kilowatts)	15,437,000
(Date and Time) January 12, 1981, 0900	
Load Factor	67.0

Source and Disposition of Revenue Dollar Fiscal Year 1981 (In Thousands)

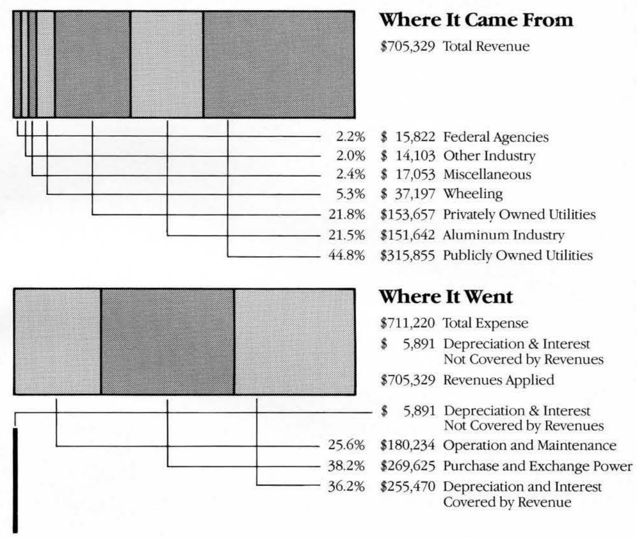


Table 2, **Generation by the Principal Electric Utility Systems of the Pacific Northwest** Fiscal Year 1981[1]

Utility	Total Generation (Billions of kWh)	(Percent)
Publicly Owned:		
Federal Columbia River Power System[2]	91.0	52.9
Grant County P.U.D.	11.4	6.6
Chelan County P.U.D.	9.7	5.7
Seattle City Light	6.6	3.8
Douglas County P.U.D.	4.6	2.7
Tacoma City Light	2.4	1.4
Eugene Water & Elec. Board	0.5	.3
Pend Oreille County P.U.D.	0.5	.3
Total Publicly Owned	126.7	73.7
Privately Owned:		
Pacific Power & Light	12.3	7.2
Idaho Power Company	11.5	6.7
Montana Power Company	7.0	4.1
Portland General Electric Co.	7.8	4.5
Washington Water Power Co.	4.8	2.8
Puget Sound Power & Light Co.	1.8	1.0
Total Privately Owned	45.2	26.3
Total Generation	171.9	100.0

[1]*Generation shown is for members of the Northwest Power Pool plus Pend Oreille County P.U.D. and 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 lie outside the Pacific Northwest.*

[2]*Includes generation from the Washington Public Power Supply System's Hanford steamplant (NPR), Okanogan P.U.D.'s share of Wells, the municipalities of Forest Grove, McMinnville, and Milton-Freewater share of Priest Rapids and Wanapum, the Kittitas share of Priest Rapids, and the Federal share of the Centralia steamplant and the Trojan Nuclear Plant.*

Table 3, Federal Columbia River Power System **General Specifications of Projects Existing, Under Construction, Authorized or Licensed, and Potential Nameplate Rating of Installations**

Project	Type	Operating Agency[1]	State	Stream (if H) City (if fuel)	Initial Date In Service	Existing: Number of Units	Existing: Nameplate Rating-kW
Minidoka	H	BR	Idaho	Snake	May 7, 1909	7	13,400
Boise River Div.	H	BR	Idaho	Boise	May 1912	3	1,500
Black Canyon	H	BR	Idaho	Payette	Dec. 1925	2	8,000
Bonneville	H	CE	Ore-Wash	Columbia	Jun. 6, 1938	13	717,900
Grand Coulee	H	BR	Washington	Columbia	Sep. 28, 1941	24-3	6,163,000
Anderson Ranch	H	BR	Idaho	S. Fk. Boise	Dec 15, 1958	2	27,000
Hungry Horse	H	BR	Montana	S. Fk. Flathead	Oct. 29, 1052	4	285,000
Detroit	H	CE	Oregon	N. Santiam	Jul. 1, 1953	2	100,000
McNary	H	CE	Ore-Wash	Columbia	Nov. 6, 1953	14	980,000
Big Cliff	H	Ce	Oregon	N. Santiam	Jun. 12, 1954	1	18,000
Lookout Point	H	CE	Oregon	M. Fk. Willamette	Dec. 16, 1954	3	120,000
Albeni Falls	H	CE	Idaho	Pend Oreille	Mar. 25, 1955	3	42,600
Dexter	H	CE	Oregon	M. Fk. Willamette	May 19, 1955	1	15,000
Chief Joseph	H	CE	Washington	Columbia	Aug. 28, 1955	27	2,069,000
Chandler	H	BR	Washington	Yakima	Feb. 13, 1956	2	12,000
Palisades	H	BR	Idaho	Snake	Feb. 25, 1957	4	118,750
The Dalles	H	CE	Ore-Wash	Columbia	May 13, 1957	22-2	1,807,000
Roza	H	BR	Washington	Yakima	Aug. 31, 1958	1	11,250
Ice Harbor	H	CE	Washington	Snake	Dec. 18, 1961	6	602,880
Hills Creek	H	CE	Oregon	M. Fk. Willamette	May 2, 1962	2	30,000
Cougar	H	CE	Oregon	S. Fk. McKenzie	Feb. 4, 1964	2	25,000
Green Peter	H	CE	Oregon	Middle Santiam	Jun. 9, 1967	2	80,000
John Day	H	CE	Ore-Wash	Columbia	Jul. 17, 1968	16	2,160,000
Foster	H	CE	Oregon	South Santiam	Aug. 22, 1968	2	20,000
Lower Monumental	H	CE	Washington	Snake	May 28, 1969	6	810,000
Little Goose	H	CE	Washington	Snake	May 19, 1970	6	810,000
Dworshak	H	CE	Idaho	N. Fk. Clearwater	Sep. 18, 1974	3	400,000
Grand Coulee PG[4]	PG	BR	Washington	Columbia	Dec. 30, 1974	2	100,000
Lower Granite	H	CE	Washington	Snake	Apr. 15, 1975	6	810,000
Libby	H	CE	Montana	Kootenai	Aug. 29, 1975	4	420,000
Lost Creek	H	CE	Oregon	Rogue	Dec. 1, 1977	2	49,000
Libby Reregulating	H	CE	Montana	Kootenai		—	—
Strube	H	CE	Oregon	S. Fk. McKenzie		—	—
Teton	H	BR	Idaho	Teton		—	—
Total Number of Units and Nameplate Rating						194-5	18,826,280
Total Number of Projects							30

[1]*CE-Corps of Engineers; BR-Bureau of Reclamation.*
[2]*Bonneville Second Powerhouse includes 8 units at 66,500 kW each, two fishway units at 13,100 kW each.*
[3]*McNary Second Powerhouse estimates includes 6 units of 107,500 kW each.*
[4]*PG-Pump Generation (Not counted in "Total Number of Projects").*
[5]*Teton Dam ruptured June 5, 1976. Future status unknown.*

Under Construction		Authorized		Potential		Project Totals	
Number of Units	Nameplate Rating-kW	Number of Units	Nameplate Rating-kW	Number of Units	Nameplate Rating-kW	Number of Units	Nameplate Rating-kW
—	—	—	—	—	—	7	13,400
—	—	—	—	—	—	3	1,500
—	—	—	—	—	—	2	8,000
5-2	[2]358,700	—	—	—	—	18-2	1,076,600
—	—	—	—	6	4,200,000	30-3	10,363,000
—	—	—	—	1	13,500	3	40,500
—	—	—	—	—	—	4	285,000
—	—	—	—	—	—	2	100,000
—	—	6	[3]645,000	—	—	20	1,625,000
—	—	—	—	—	—	1	18,000
—	—	—	—	—	—	3	120,000
—	—	—	—	—	—	3	42,600
—	—	—	—	—	—	1	15,000
—	—	—	—	13	1,573,000	40	3,642,000
—	—	—	—	—	—	2	12,000
—	—	—	—	2	135,000	6	253,750
—	—	—	—	—	—	22-2	1,807,000
—	—	—	—	—	—	1	11,250
—	—	—	—	—	—	6	602,880
—	—	—	—	—	—	2	30,000
—	—	1	35,000	—	—	3	60,000
—	—	—	—	—	—	2	80,000
—	—	4	540,000	—	—	20	2,700,000
—	—	—	—	—	—	2	20,000
—	—	—	—	—	—	6	810,000
—	—	—	—	—	—	6	810,000
—	—	3	660,000	—	—	6	1,060,000
4	200,000	—	—	—	—	6	300,000
—	—	—	—	—	—	6	810,000
1	105,000	3	315,000	—	—	8	840,000
—	—	—	—	—	—	2	49,000
—	—	3	76,400	—	—	3	76,400
—	—	1	4,500	—	—	1	4,500
—	—	3	[5]30,000	—	—	3	30,000
10-2	663,700	24	2,305,900	22	5,921,500	250-7	27,717,380
	0		3		0		33

Table 4 **Sales of Electric Energy** Fiscal Year 1981

Customer	KWH (000)	Sales
Northwest Area Publicly-Owned Utilities, Municipalities		
Albion, Idaho	3,152	$ 27,059
Bandon, OR	52,448	448,139
Blaine, WA	43,477	361,728
Bonners Ferry, ID	31,614	292,305
Burley, ID	110,739	897,189
Canby, OR	96,946	835,348
Cascade Locks, OR	26,422	220,862
Centralia, WA	105,704	1,006,926
Cheney, WA	96,783	776,124
Consolidated Irr. Dist., WA	1,973	23,034
Coulee Dam, WA	16,375	125,569
Delco, ID	2,924	24,634
Drain, OR	26,483	221,621
Eatonville, WA	15,233	136,508
Ellensburg, WA	143,181	1,151,329
Eugene, OR	1,441,572	10,435,033
Fircrest, WA	43,641	366,756
Forest Grove, OR	19,058	29,464[1]
Heyburn, ID	69,835	547,652
Idaho Falls, ID	450,600	3,677,632
McCleary, WA	35,759	306,921
McMinnville, OR	188,928	1,442,473[1]
Milton, WA	28,668	248,459
Milton-Freewater, OR	—11,493	—180,702[1]
Minidoka, ID	1,150	9,563
Monmouth, OR	53,931	456,945
Port Angeles, WA	715,267	5,621,226
Richland, WA	481,537	3,999,992
Rupert, ID	72,884	597,636
Seattle, WA	1,961,536	13,843,968[1]
Springfield, OR	674,215	5,421,731
Steilacoom, WA	37,882	319,725
Sumas, WA	7,049	59,367
Tacoma, WA	2,705,333	19,872,880[1]
Vera Irr. Dist., WA	139,362	1,148,288
Washington Public Power Supply	92,851	734,360
Total (36)	9,983,019	$75,507,744

Notes

[1]Includes capacity sales.

[2]Financial transactions resulting from exchanges of capacity and energy.

[3]See table at left, amounts estimated.

[4]Based on actual billings not including cost accounting accruals.

Customer	KWH (000)	Sales
Public Utilities Districts		
Benton County PUD #1	1,306,810	$ 10,641,630
Central Lincoln PUD	1,186,332	9,150,244
Chelan County PUD #1	216,710	1,797,578[1]
Clallam County PUD #1	399,233	3,457,972
Clark County PUD #1	2,561,072	20,569,334
Clatskanie PUD #1	728,952	5,441,220
Cowlitz PUD #1	3,420,855	24,538,467[1]
Douglas County PUD #1	253,581	1,935,430[1]
Ferry County PUD #1	61,308	488,653
Franklin County PUD #1	535,695	4,340,067
Grant County PUD #2	72,326	928,898[1]
Grays Harbor County PUD #1	1,218,554	9,537,534
Kittitas County PUD #1	22,432	177,678[1]
Klickitat County PUD #1	228,060	1,851,784
Lewis County PUD #1	648,929	5,001,955
Mason County PUD #1	54,400	441,196
Mason County PUD #3	385,736	3,170,531
Northern Wasco County PUD	217,781	1,784,513
Okanogan County PUD #1	350,034	2,660,664
Pacific County PUD #2	242,463	2,047,251
Pend Orielle County PUD #1	0	0
Skamania County PUD #1	108,404	887,660
Snohomish County PUD #1	4,826,071	38,641,188
Tillamook County PUD	333,378	2,796,905
Wahkiakum County PUD #1	39,270	319,442
Whatcom County PUD #1	122,014	908,468
Total PUD (26)	19,540,400	$153,516,262

Pro Rata Breakdown by Plant Location (Relates to Footnote 3)

Customer	MWH	Revenue
Aluminum Co. of America		
Addy	1,890,622	$11,173,936
Vancouver	1,689,492	9,985,220
Wenatchee	442,486	2,615,177
Kaiser Alum. & Chem. Corp.		
Spokane Reduction	3,927,743	24,366,174
Spokane Rolling	455,390	2,825,064
Tacoma Reduction	1,309,247	8,122,058
Reynolds Metals Co.		
Longview	3,522,285	21,073,594
Troutdale	2,251,952	13,473,282
Martin-Marietta		
Washington	1,707,143	10,271,667
Oregon	1,412,800	$ 8,495,312

Customer	KWH (000)	Sales
Cooperatives		
Alder Mutual Light Co.	2,088	$ 17,546
Benton Rural Electric Assn.	271,871	2,184,912
Big Bend Electric Coop.	387,366	3,082,114
Blachly-Lane Co. Coop Elec. Assn.	104,998	885,692
Central Electric Coop.	281,621	2,294,836
Clearwater Power Co.	144,149	1,205,552
Columbia Basin Elec. Coop.	117,910	932,520
Columbia Power Coop. Assn.	25,258	206,841
Columbia Rural Elec. Assn.	165,940	1,403,130
Consumers Power	328,743	2,686,782
Coos-Curry Elec. Coop.	223,258	1,840,970
Douglas Elec. Coop.	128,099	1,053,121
Elmhurst Mutual Power & Light Co.	180,079	1,507,972
East End Mutual Elec. Co. Ltd.	14,234	117,253
Fall River Elec. Coop.	117,432	1,012,137
Farmers Elec. Co.	8,398	72,118
Flathead Elec. Coop.	118,695	942,471
Glacier Elec. Coop.	145,468	1,096,095
Harney Elec. Coop.	164,016	1,298,507
Hood River Elec. Coop.	80,722	643,577
Idaho Co. Light & Power Coop. Assn.	34,563	282,263
Inland Power & Light Co.	419,485	3,405,114
Kootenai Elec. Coop. Inc.	144,462	1,179,224
Lakeview Light & Power Co., Inc.	210,487	1,719,870
Lane Elec. Coop.	241,525	2,004,406
Lincoln Elec. Coop. Montana	56,517	454,847
Lincoln Elec. Coop.—WA	115,460	905,843
Lost River Elec. Coop.	71,335	586,671
Lower Valley Power & Light Co.	253,663	2,071,427
Midstate Elec. Coop.	200,587	1,612,667
Missoula Elec. Coop.	108,917	870,024
Nespelem Valley Elec. Coop.	36,640	300,681
Northern Lights	144,835	1,151,493
Ohop Mutual Light Co.	31,865	273,234
Okanogan Co. Elec. Coop.	26,852	216,469
Peninsula Light Co.	284,888	2,423,058
Parkland Light & Water Co.	95,929	797,939
Orcas Power & Light Co.	106,601	888,213
Prairie Power Coop.	11,977	101,844
Raft River Elec. Coop.	232,733	1,853,519
Ravalli Elec. Coop.	71,994	593,424
Riverside Elec. Co.	8,321	69,993
Rural Elec. Co.	77,620	645,098
Salem Elec.	248,986	2,086,297
Salmon River Elec. Coop.	44,129	352,908
South Side Elec. Lines	33,833	284,764
Surprise Valley Elec. Coop.	121,966	988,942
Tanner Elec. Co.	23,922	203,592
Umatilla Elec. Coop. Assn.	757,129	5,937,937
Unity Light & Power Co.	54,588	464,967
Vigilante Elec. Coop.	105,377	868,271
Wasco Elec. Coop.	86,575	713,295
Wells Rural Elec. Co.	63,138	483,929
West Oregon Elec. Coop.	60,379	490,948
Total Cooperatives (54)	7,597,623	$ 61,767,317
Total Publicly-Owned Utilities (116)	37,121,042	$290,791,323

Customer	KWH (000)	Sales
Privately-Owned Utilities		
California-Pacific Utilities Co.	14,060	$ 80,183
Idaho Power Co.	924,452	7,015,944
Montana Power Co.	415,024	5,757,067[1]
Pacific Power & Light Co.	2,536,408	30,269,767[1]
Portland General Elec. Co.	1,527,812	25,946,161[1]
Puget Sound Power & Light Co.	927,733	9,041,219[1]
Utah Power Co.	755,036	4,525,092
Washington Water Power	312,086	2,542,297[1]
Total Privately-Owned Utilities (8)	7,412,611	$85,177,730

Customer	KWH (000)	Sales
Federal Agencies		
U.S. Department of Energy	387,623	$3,065,217
U.S. Bureau of Mines	5,236	52,053
Fairchild Air Force Base	26,147	214,232
Water & Power Resources Service—Roza Project	7,133	62,601
U.S. Bureau of Indian Affairs	142,855	1,287,531
U.S. Navy	317,386	2,497,613
Total Federal Agencies (6)	886,380	$7,179,247

Customer	KWH (000)	Sales
Aluminum Industries		
Alcoa (combined)[3]	4,022,600	$ 23,774,333
Anaconda Alum. Co.	2,786,129	17,323,991
Martin Marietta, WA (combined)[3]	3,119,943	18,766,979
Intalco Alum. Co.	3,506,868	21,135,716
Kaiser Aluminum (combined)[3]	5,692,380	35,313,296
Reynolds Metal Co. (combined)[3]	5,774,237	34,546,876
Total Aluminum Industries (6)	24,902,157	$150,861,191

Customer	KWH (000)	Sales
Other Industries		
Carborundum Co.	118,920	$ 830,732
Crown-Zellerbach	112,584	700,654
Georgia-Pacific	165,291	1,068,881
Hanna Nickel	770,504	5,015,722
Cominco American	0	0
Oregon Metallurgical	55,908	369,624
Pacific Carbide	66,219	409,026
Pennwalt Corp.	368,506	2,277,373
Stewart Elsner	18	1,126
Union Carbide	71,255	463,525
Stauffer Chemical	403,238	2,861,551
Total Other Industries (11)	2,132,443	$13,998,214
Total Northwest Region (147)	72,454,633	$548,007,705

Customer	KWH (000)	Sales
Outside Northwest Region		
Bountiful, Utah	5,449	$ 50,454
BC Hydro	0	0
Burbank, CA	142,516	1,081,978[2]
Glendale, CA	171,198	1,286,263[2]
Los Angeles, CA	1,818,873	13,483,164[2]
Pasadena, CA	113,611	868,510[2]
Sacramento, CA	0	0
Pacific Gas & Elec. Co.	2,571,998	26,254,470[1]
San Diego Gas & Elec. Co.	345,099	2,497,277
Sierra Pacific	5,134	27,079
So. Cal Edison Co.	2,518,628	17,952,741
State of California	0	0
WAPA—Mid-Pacific Region	1,075,035	8,028,716[1]
WAPA—Upper Colorado Region	0	0
WAPA—Upper Missouri Region	0	0
Total Outside Northwest Region (15)	8,767,541	$71,530,652
Total Sales of Electric Energy (162)	81,222,174	$619,538,357[4]

Table 5, Federal Columbia River Power System **Preliminary Repayment Study for the October, 1982 Initial Rate Filing** for the fiscal year ended September 30, 1983

In Thousands

Fiscal Year Ending Sept. 30	Revenues	Operation and Maintenance Expense	Purchase and Exchange Power	Interest Expense	Investment Placed in Service: Initial Project	Investment Placed in Service: Replacements	Investment Placed in Service: Total	Cumulative Investment in Service: Initial Project	Cumulative Investment in Service: Replacements	Cumulative Investment in Service: Total	Adjustment to Cash Amortization
Cumulative to Sept. 30 1981	$ 5,147,269	$ 1,531,373	$ 990,546	$1,918,972	$6,432.585		$ 6,432,585	$6,432,585		$6,432,585	$43,498[1]
1982	1,308,506	333,763	938,700	262,485	964,819		964,819	7,397,404		7,397,404	
1983	2,440,290	342,913	1,605,400	294,640	271,694		271,694	7,669,098		7,669,098	
1984	2,440,290	342,913	1,637,300	296,890		$ 49,153	49,153	7,669,098	$ 49,153	7,718,251	
1985	2,440,290	342,913	1,637,000	278,741		48,850	48,850	7,669,098	98,003	7,767,101	
1986	2,347,928	342,913	1,630,900	263,740		49,234	49,234	7,669,098	147,237	7,816,335	
1987	2,347,928	342,913	1,630,900	255,422		69,221	69,221	7,669,098	216,458	7,885,556	
1988	2,347,928	342,913	1,630,800	246,301		56,115	56,115	7,669,098	272,573	7,941,671	
1989	2,347,928	342,913	1,631,100	236,073		71,949	71,949	7,669,098	344,522	8,013,620	
1990	2,347,928	342,913	1,631,500	230,407		82,769	82,769	7,669,098	427,291	8,096,389	
1991	2,347,928	342,913	1,629,100	222,574		76,573	76,573	7,669,098	503,864	8,172,962	
1992	2,347,928	342,913	1,627,600	222,999		175,173	175,173	7,669,098	679,037	8,348,135	
1993	2,347,928	342,913	1,627,600	219,687		66,257	66,257	7,669,098	745,294	8,414,392	
1994	2,347,928	342,913	1,627,600	215,890		104,272	104,272	7,669,098	849,566	8,518,664	
1995	2,347,928	342,913	1,627,600	208,885		72,568	72,568	7,669,098	922,134	8,591,232	
1996	2,347,928	342,913	1,627,600	202,957		127,870	127,870	7,669,098	1,050,004	8,719,102	
1997	2,347,928	342,913	1,627,600	199,156		106,939	106,939	7,669,098	1,156,943	8,826,041	
1998	2,347,928	342,913	1,627,600	195,018		78,687	78,687	7,669,098	1,235,630	8,904,728	
1999	2,347,928	342,913	1,627,600	187,033		92,702	92,702	7,669,098	1,328,332	8,997,430	
2000	2,347,928	342,913	1,627,600	178,122		77,581	77,581	7,669,098	1,405,913	9,075,011	
2001	2,347,928	342,913	1,627,600	172,411		110,312	110,312	7,669,098	1,516,225	9,185,323	
2002	2,347,928	342,913	1,627,600	179,248		144,089	144,089	7,669,098	1,660,314	9,329,412	
2003	2,347,928	342,913	1,627,600	187,568		82,879	82,879	7,669,098	1,743,193	9,412,291	
2004	2,347,928	342,913	1,627,600	194,446		95,362	95,362	7,669,098	1,838,555	9,507,653	
2005	2,347,928	342,913	1,627,600	202,609		93,346	93,346	7,669,098	1,931,901	9,600,999	
2006	2,347,928	342,913	1,627,600	212,266		111,422	111,422	7,669,098	2,043,323	9,712,421	
2007	2,347,928	342,913	1,627,600	223,753		135,303	135,303	7,669,098	2,178,626	9,847,724	
2008	2,347,928	342,913	1,627,600	234,572		99,116	99,116	7,669,098	2,277,742	9,946,840	
2009	2,347,928	342,913	1,627,600	244,921		110,256	110,256	7,669,098	2,387,998	10,057,096	
2010	2,347,928	342,913	1,627,600	256,912		149,250	149,250	7,669,098	2,537,248	10,206,346	
2011	2,347,928	342,913	1,627,600	276,940		271,352	271,352	7,669,098	2,808,600	10,477,698	
2012	2,347,928	342,913	1,511,400	288,957		179,037	179,037	7,669,098	2,987,637	10,656,735	
2013	2,347,928	342,913	1,400,400	292,024		148,434	148,434	7,669,098	3,136,071	10,805,169	
2014	2,347,928	342,913	1,400,400	272,447		114,733	114,733	7,669,098	3,250,804	10,919,902	
2015	2,347,928	342,913	1,400,400	246,320		101,967	101,967	7,669,098	3,352,771	11,021,869	
2016	2,347,928	342,913	1,400,400	222,844		280,421	280,421	7,669,098	3,633,192	11,302,290	
2017	2,347,928	342,913	1,227,600	186,872		125,743	125,743	7,669,098	3,758,935	11,428,033	
2018	2,347,928	342,913	972,800	117,314		134,711	134,711	7,669,098	3,893,646	11,562,744	
2019	2,347,928	342,913	879,000	41,320		101,594	101,594	7,669,098	3,995,240	11,664,338	
2020	2,347,928	342,913	879,000	5,860		143,933	143,933	7,669,098	4,139,173	11,808,271	
2021	2,347,928	342,913	879,000	24,414-		128,640	128,640	7,669,098	4,267,813	11,936,911	
2022	2,347,928	342,913	879,000	52,195-		186,471	186,471	7,669,098	4,454,284	12,123,382	
2023	2,347,928	342,913	879,000	76,980-		102,066	102,066	7,669,098	4,556,350	12,225,448	
2024	2,347,928	342,913	879,000	76,292-		116,323	116,323	7,669,098	4,672,673	12,341,771	
2025	2,347,928	342,913	879,000	76,710-		107,297	107,297	7,669,098	4,779,970	12,449,068	
2026	2,347,928	342,913	879,000	74,803-		147,211	147,211	7,669,098	4,927,181	12,596,279	
2027	2,347,928	342,913	879,000	75,159-		139,454	139,454	7,669,098	5,066,635	12,735,733	
2028	2,347,928	342,913	879,000	76,521-		110,611	110,611	7,669,098	5,177,246	12,846,344	
2029	2,347,928	342,913	879,000	75,521-		131,415	131,415	7,669,098	5,308,661	12,977,759	
2030	2,347,928	342,913	879,000	76,844-		103,259	103,259	7,669,098	5,411,920	13,081,018	
2031	2,347,928	342,913	879,000	74,521-		152,017	152,017	7,669,098	5,563,937	13,233,035	
2032	2,347,928	342,913	879,000	72,695-		190,172	190,172	7,669,098	5,754,109	13,423,207	
2033	2,347,928	342,913	879,000	76,775-		103,989	103,989	7,669,098	5,858,098	13,527,196	
	$126,477,189	$19,353,699	$71,643,646	$9,486,166	$7,669,098	$5,858,098	$13,527,196				$43,498

[1]*Residual revenues available for amortization total $706,378, however, $43,498 of those revenues have been applied as working capital and other purposes. Therefore actual cash amortization at September 30, 1981 totals $662,880.*

Amortization	Unamortized Investment	Allowable Unamortized Investment: Initial Project	Allowable Unamortized Investment: Replacements	Allowable Unamortized Investment: Total	Irrigation Assistance: Cumulative Amount in Service	Irrigation Assistance: Amortization	Irrigation Assistance: Unamortized Amount	Irrigation Assistance: Allowable Unamortized Amount	Cumulative Surplus Revenues	Deferred Amort.	
$ 662,880[1]	$5,769,705	$6,355,118		$6,355,118	$596,060		$596,060	$596,060			1981
	6,734,524	7,316,834		7,316,834	596,060		596,060	596,060		$226,442	1982
197,337	6,808,881	7,578,770		7,578,770	605,977		605,977	605,977			1983
163,187	6,694,847	7,569,242	$ 49,153	7,618,395	640,306		640,306	640,306			1984
181,636	6,562,061	7,539,007	98,003	7,637,010	661,867		661,867	661,867			1985
110,375	6,500,920	7,518,701	147,237	7,665,938	670,124		670,124	670,124			1986
118,693	6,451,448	7,491,112	216,458	7,707,570	694,302		694,302	694,302			1987
127,914	6,379,649	7,422,559	272,573	7,695,132	821,134		821,134	821,134			1988
137,842	6,313,756	7,377,460	344,520	7,721,980	838,643		838,643	838,643			1989
143,108	6,253,417	7,352,168	427,235	7,779,403	860,420		860,420	860,420			1990
153,341	6,176,649	7,259,814	503,764	7,763,578	901,093		901,093	901,093			1991
154,416	6,197,405	7,201,325	678,811	7,880,136	922,349		922,349	922,349			1992
157,728	6,105,935	7,112,573	745,013	7,857,586	949,132		949,132	949,132			1993
161,525	6,048,682	7,062,393	849,191	7,911,584	993,119		993,119	993,119			1994
168,530	5,952,720	7,051,634	921,047	7,972,681	1,027,731		027,731	1,027,731			1995
174,458	5,906,132	7,029,204	1,048,670	8,077,874	1,056,242		1,056,242	1,056,242			1996
163,424	5,849,647	6,993,143	1,155,309	8,148,452	1,084,880	$ 14,835	1,070,045	1,070,045			1997
182,397	5,745,937	6,949,062	1,233,489	8,182,551	1,109,102		1,094,267	1,094,267			1998
190,382	5,648,257	6,906,655	1,325,375	8,232,030	1,133,426		1,118,591	1,118,591			1999
199,293	5,526,545	6,848,058	1,399,287	8,247,345	1,145,565		1,130,730	1,130,730			2000
194,750	5,442,107	6,773,669	1,508,546	8,282,215	1,183,370	10,254	1,158,281	1,158,281			2001
198,167	5,388,029	6,708,905	1,633,387	8,342,292	1,223,072		1,197,983	1,197,983			2002
189,847	5,281,061	6,493,717	1,714,035	8,207,752	1,246,932		1,221,843	1,221,843			2003
182,188	5,194,235	6,261,077	1,807,072	8,068,149	1,270,890	781	1,245,020	1,245,020			2004
174,806	5,112,775	5,905,889	1,898,022	7,803,911	1,294,652		1,268,782	1,268,782			2005
165,149	5,059,048	5,732,970	1,994,809	7,727,779	1,318,511		1,292,641	1,292,641			2006
153,662	5,040,689	5,533,644	2,128,933	7,662,577	1,351,179		1,325,309	1,325,309			2007
139,892	4,999,913	5,288,723	2,226,910	7,515,633	1,380,876	2,951	1,352,055	1,352,055			2008
126,196	4,983,973	5,144,758	2,334,766	7,479,524	1,419,637	6,298	1,384,518	1,384,518			2009
120,503	5,012,720	4,980,514	2,483,566	7,464,080	1,451,673		1,416,554	1,416,554			2010
100,475	5,183,597	4,888,574	2,752,719	7,641,293	1,484,135		1,449,016	1,449,016			2011
204,155	5,158,479	4,604,328	2,914,846	7,519,174	1,500,433	503	1,464,811	1,464,811			2012
274,564	5,032,349	4,513,834	3,060,356	7,574,198	1,525,277	38,027	1,451,628	1,451,628			2013
290,253	4,856,829	4,427,603	3,167,976	7,595,579	1,550,219	41,915	1,434,655	1,434,655			2014
312,198	4,646,598	4,379,560	3,263,154	7,642,714	1,585,644	46,097	1,423,983	1,423,983			2015
316,122	4,610,897	4,126,409	3,535,861	7,662,270	1,615,227	65,649	1,387,917	1,387,917			2016
534,844	4,201,796	3,867,709	3,653,980	7,521,689	1,644,854	55,699	1,361,845	1,361,845			2017
894,441	3,442,066	3,621,395	3,782,490	7,403,885	1,690,294	20,460	1,386,825	1,386,825			2018
1,022,622	2,521,038	3,328,462	3,838,639	7,167,101	1,725,908	62,073	1,360,366	1,360,366			2019
1,092,329	1,572,642	3,190,888	3,935,869	7,126,757	1,756,608	27,826	1,363,240	1,363,240			2020
1,131,466	569,816	3,063,461	4,002,130	7,065,591	1,790,383	18,963	1,378,052	1,378,052			2021
982,729		3,015,057	4,117,056	7,132,113	1,821,083	18,859	1,389,893	1,389,893	$ 176,622		2022
102,066		2,972,721	4,163,058	7,135,779	1,842,729	6,126	1,405,413	1,405,413	1,271,425		2023
116,323		2,861,060	4,209,641	7,070,701	1,864,375	18,163	1,408,896	1,408,896	2,339,246		2024
107,297		2,190,967	4,251,770	6,442,737	1,906,947	10,284	1,441,184	1,441,184	3,424,390		2025
147,211		1,750,009	4,335,592	6,085,601	1,936,113	21,073	1,449,277	1,449,277	4,456,924		2026
139,454		1,608,707	4,374,143	5,982,850	1,965,279	3,386	1,475,057	1,475,057	5,515,258		2027
110,611		1,269,166	4,419,799	5,688,965	2,006,417	21,511	1,494,864	1,494,864	6,585,672		2028
131,415		1,088,243	4,455,806	5,544,049	2,044,489	4,175	1,528,581	1,528,581	7,651,618		2029
103,259		910,093	4,489,319	5,399,412	2,081,329	2,460	1,562,961	1,562,961	8,748,758		2030
152,017		829,799	4,521,466	5,351,265	2,115,409	10,681	1,586,360	1,586,360	9,786,596		2031
190,172		98,732	4,561,935	4,660,667	2,147,640		1,618,591	1,618,591	10,795,134		2032
103,989			4,591,578	4,591,578	2,163,462		1,634,413	1,634,413	11,893,935		2033
$13,753,638						$529,049				$226,442	

Repayment Policy

The basis on which BPA establishes its revenue requirements, and hence its rate level, is the repayment policy. This policy, which is based upon the Department of Energy's interpretation of statutory requirements, provides that FCRPS revenues from power sales, wheeling service, and other miscellaneous sources must be sufficient to satisfy the following criteria:

1. Pay the cost of obtaining power through purchase and exchange agreements.

2. Pay the cost of operating and maintaining the power system.

3. Pay interest on and amortize 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. BPA transmission facilities constructed prior to BPA authorization to finance its construction program with sales receipts and revenue bonds were financed with appropriated funds.)

5. Repay, with interest, any outstanding unpaid annual expenses. (See discussion of deferral below.)

6. Repay each increment of the power investment in the Federal hydroelectric projects within 50 years after such increment becomes revenue-producing.

7. Repay each annual increment of the investment in the BPA transmission system previously financed with appropriated funds within the average service life of the transmission facilities (currently 35 years).

8. Repay the investment in each replacement of a facility at a Federal hydroelectric project within its service life. (In repaying the investment financed with appropriated funds, the investment 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.)

9. Repay the portion of construction costs at Federal reclamation projects which is beyond the ability of the irrigation water users, and which is assigned for repayment from commercial power revenues, within the same overall period available to the water users for making their repayments. These periods range from 40 to 66 years with 60 years being applicable to most of the irrigation repayment assistance.

Repayment of Deferral

BPA's cumulative deferral as of September 30, 1981, amounted to $108.5 million. BPA estimates an additional deferral of $117.9 million in FY 1982 which will increase the cumulative deferral to $226.4 million by September 30, 1982. BPA has made an administrative decision to increase revenues in FY 1983 to a level which is sufficient to fully repay the total $226.4 million deferral plus normal amortization over the three-year period FY 1983 through FY 1985.

As discussed in the previous section on Repayment Policy, all deferrals must be fully repaid before any amortization can be made. Therefore actual payments to the Treasury will be applied first to deferrals until they are fully repaid. However, for the purpose of making allocations in the Cost of Service Analysis, the deferral will be allocated over 3 years.

BPA also plans to fully meet its fiscal responsibility by repaying the normal required amortization that would have been scheduled during the FY 1983 through FY 1985 period if no deferral existed. These results are shown in the following table:

Estimated Repayments ($000)

FY	*Regular Amortization*		*Deferral*		*Total Repayment*
1983	123,878	+	73,459	=	197,337
1984	91,655	+	71,532	=	163,187
1985	100,186	+	81,450	=	181,636
Totals	315,719	+	226,441	=	542,161

Note to Federal Columbia River Power System Repayment Study (Table 5, page 00)

Note to Federal Columbia River Power System Repayment Study

(Table 5, page 50)

Section 2 of Public Law 89-448 (80 STAT 200) requires the submission to the President and the Congress of an annual financial statement which includes all projects authorized by Congress as components of the FCRPS. BPA previously fulfilled that requirement by publishing the FCRPS Repayment Study in its Annual Report and transmitting copies thereof to the President and the Congress. Through FY 1978 the FCRPS Repayment Study included the estimated costs of all authorized projects even though some were not yet in service or in some cases were not yet under construction. In determining revenue requirements for the purpose of establishing power rates, however, objections were raised by customers to the inclusion of projects in the Repayment 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 whereas P.L. 89-448 does, in fact, require the inclusion of all authorized projects in the annual financial statement to be submitted to the President and the Congress, the Repayment Study used as a basis for establishing rate levels should properly include only those projects which will be in service during the rate period. The FCRPS Repayment Study included in this report is the same proposed rate level Repayment Study that will be used in the upcoming March 1982 Initial Rate Proposal submittal for the October 1, 1982, wholesale power rate increase; i.e., it includes only those Federal power facilities expected to be in service during the rate period from October 1, 1982, through September 30, 1983.

The authorized projects not included in the Repayment Study, their estimated capital investments in 1983 dollars, and their estimated completion dates are set forth in the table below.

These projects will be included in future repayment studies for rate purposes as they are completed and placed in service, and will be reported pursuant to the requirement of P.L. 89-448 by inclusion in the BPA Annual Report.

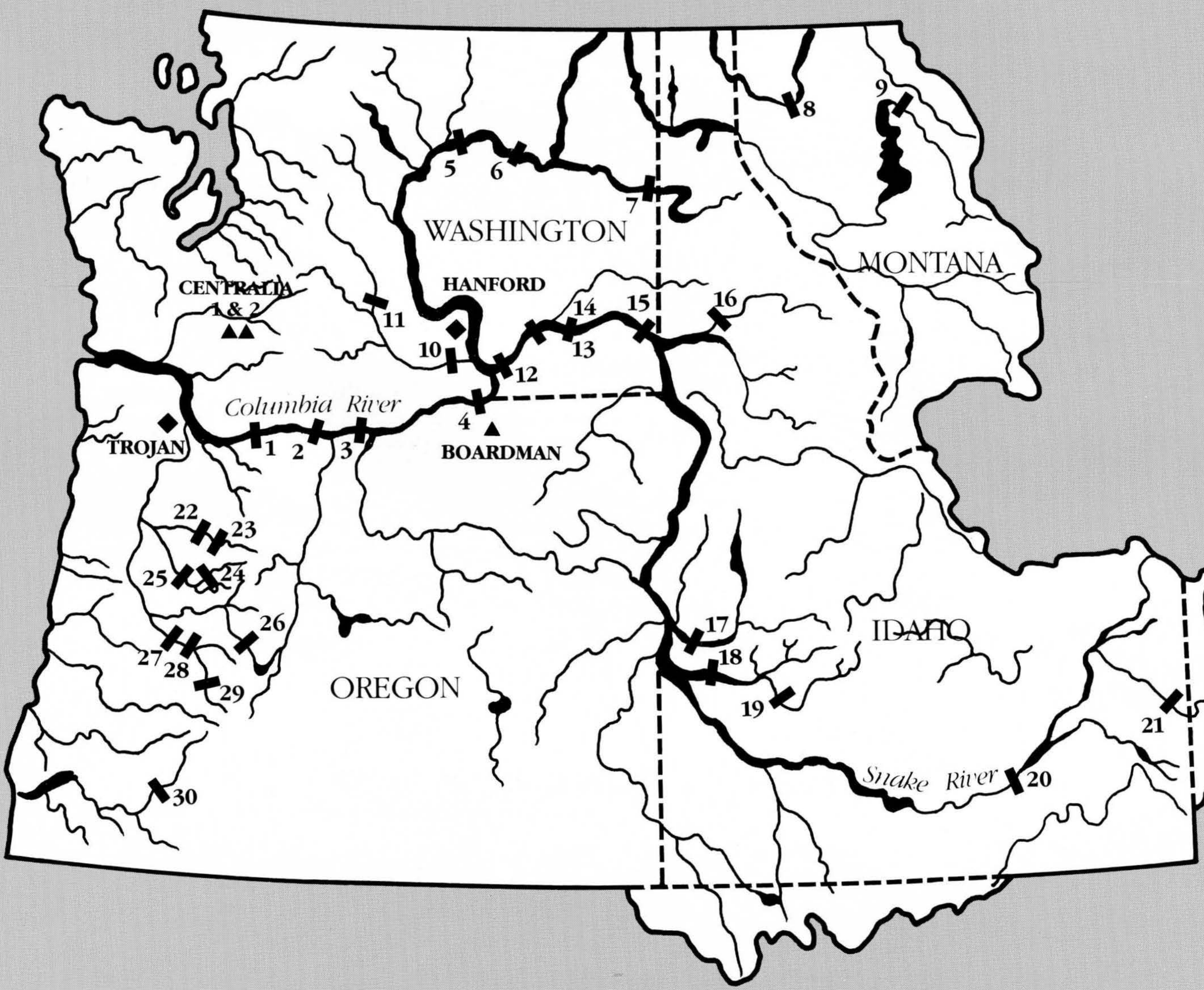
Libby Units		
No. 5 through No. 8	Nov. 1985	$ 66 million
Cougar Unit No. 3	June 1986	32 million
Strube Unit No. 1	June 1986	61 million
McNary Second Powerhouse	Aug. 1989	748 million
John Day additional units	July 1997	154 million

Thermal Plants

◆ Existing Nuclear Plant
▲ Existing Coal Plant

▬ Federal Dams

1. Bonneville
2. The Dalles
3. John Day
4. McNary
5. Chief Joseph
6. Grand Coulee
7. Libby
8. Albeni Falls
9. Hungry Horse
10. Chandler
11. Roza
12. Ice Harbor
13. Lower Monumental
14. Little Goose
15. Lower Granite
16. Dworshak
17. Black Canyon
18. Boise Diversion
19. Anderson Ranch
20. Minidoka
21. Palisades
22. Big Cliff
23. Detroit
24. Foster
25. Green Peter
26. Cougar
27. Dexter
28. Lookout Point
29. Hills Creek
30. Lost Creek



Accountants' Report

Coopers & Lybrand
Certified Public Accountants

Administrator
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, 1981 and 1980, and the related statements of revenues and expenses, changes in federal investment and source and use of funds for the fiscal 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.

Recorded revenues are based upon rates for service established in accordance with the Bonneville Project Act and related legislation which are intended to provide for the full recovery of all FCRPS costs and repayment to the U.S. Treasury of its investment in power facilities and assigned irrigation costs within repayment periods established pursuant to such statutory requirements. As discussed in Note 1 to the financial statements, revenues needed to recover the costs of generating facilities are based on required repayment periods which are shorter than the periods over which such facilities are depreciated. Under generally accepted accounting principles, revenues based upon cost recovery and the related costs should be included in the determination of net revenues in the same accounting period. Accordingly, the financial statements are not intended to present financial position and results of operations in conformity with generally accepted accounting principles. The financial statements are, however, appropriately presented in accordance with accounting principles required by or appropriate to applicable legislation and executive directives of other government agencies, as described in Note 1.

Contingencies discussed in Notes 12 and 13 arising from an initiative measure passed by voters of the State of Washington and from recent financing difficulties of Washington Public Power Supply System Nuclear Projects Nos. 4 and 5 (in which projects FCRPS has no direct interest or commitments) might affect FCRPS obligations under its net billing agreements, described in Note 7, for the Supply System's Nuclear Projects Nos. 1, 2 and 3.

As described in Note 5, the allocation of certain utility plant cost and operation and maintenance expenses relating to multi-purpose projects between power and nonpower purposes is subject to adjustment, and the amount of adjustments, if any, that may be necessary when allocations become firm is not determinable at this time.

As described in Notes 1 and 2, power rate increases which were placed into effect on an interim basis and wheeling rate increases which have been collected under temporary rate orders are subject to refund with interest in the event of regulatory disapproval.

In our opinion, subject to the effects, if any, on the financial statements of the resolution of the cost allocations and rate proceedings discussed in the two preceding paragraphs, the financial statements referred to above present fairly the assets and liabilities of the Federal Columbia River Power System at September 30, 1981 and 1980, and its revenues and expenses, changes in federal investment and source and use of funds for the fiscal years then ended, in conformity with accounting principles described in Note 1 applied on a consistent basis.

Supplemental Schedule A showing the amount and allocation of plant investment as of September 30, 1981 was subjected to the audit procedures applied in the examination of the basic financial statements and in our opinion, subject to the effects, if any, on Schedule A of the ultimate resolution of the cost allocations referred to above, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Coopers & Lybrand

Portland, Oregon
December 11, 1981

Federal Columbia River Power System **Statement of Revenues and Expenses** for the fiscal years ended September 30, 1981 and 1980

September 30, In Thousands	1981	1980
Operating Revenues (Notes 1 and 2):		
Sales of electric power:		
Publicly owned utilities	$315,855	$258,087
Privately owned utilities	153,657	75,567
Federal agencies	15,822	8,045
Aluminum industry	151,642	116,647
Other industry	14,103	12,374
	651,079	470,720
Other operating revenues:		
Wheeling	37,197	27,801
Other	17,053	13,945
	54,250	41,746
Total operating revenues	705,329	512,466
Operating Expenses:		
Operation	124,298	104,444
Maintenance	55,936	49,610
Purchase and exchange power (Notes 1, 7 and 13)	269,625	138,533
Depreciation	54,835	51,380
Write-off of Trojan Nuclear Project net billing advances (Note 7)		44,210
Total operating expenses	504,694	388,177
Net operating revenues	200,635	124,289
Interest Expense (Notes 3, 6 and 9):		
Interest on federal investment:		
On appropriated funds	196,313	190,464
On Transmission System Act borrowings	49,599	35,235
Allowance for funds used during construction	(39,386)	(41,920)
Net interest expense	206,526	183,779
Net Revenues (expense)	$ (5,891)	$(59,490)

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

Federal Columbia River Power System **Statement of Assets and Liabilities** at September 30, 1981 and 1980

September 30, In Thousands	1981	1980
Assets		
Utility Plant (Notes 3 and 5):		
Completed plant (Schedule A)	$6,235,586	$5,844,826
Accumulated Depreciation	(553,118)	(510,817)
	5,682,468	5,334,009
Construction work in progress (Schedule A)	923,905	1,000,164
Net utility plant	6,606,373	6,334,173
Current Assets:		
Unexpended funds (Note 6)	91,887	73,951
Accounts receivable	16,940	16,277
Accrued unbilled revenues	55,507	26,506
Materials and supplies, at average cost	30,900	26,168
Total current assets	195,234	142,902
Other Assets and Deferred Charges:		
Trust funds (Note 8)	6,293	12,957
Net billing advances, net of accumulated amortization ($10,625 in 1981 and $4,554 in 1980) (Note 1)	201,882	207,953
Investment in Teton and Libby Reregulating dams (Note 11)	33,337	13,774
Other	56,226	38,606
Total other assets and deferred charges	297,738	273,290
	$7,099,345	$6,750,365
Liabilities and Federal Investment		
Federal Investment:		
Net investment of U.S. Government in power facilities (Note 9)	$6,812,003	$6,462,386
Accumulated net revenues	176,748	182,639
Irrigation assistance (Schedule A and Note 10) $655 million and $646 million, respectively		
Total federal investment	6,988,751	6,645,025
Commitments and Contingencies: (Notes 2, 3, 4, 5, 7, 10, 11, 12 and 13)		
Current Liabilities:		
Accounts payable	87,513	78,984
Employees accrued leave	9,309	8,621
Total current liabilities	96,822	87,605
Deferred Credits:		
Trust fund advances (Note 8)	6,293	12,957
Other	7,479	4,778
Total deferred credits	13,772	17,735
	$7,099,345	$6,750,365

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

Federal Columbia River Power System **Statement of Changes in Federal Investment**
for the fiscal years ended September 30, 1981 and 1980

In Thousands	Balance September 30, 1979	Additions (Reductions)	Balance September 30, 1980	Additions (Reductions)	Balance September 30, 1981
Congressional appropriations	$6,722,661	$281,290	$7,003,951	$211,334	$7,215,285
U.S. Treasury transfers to Continuing Fund	7,005		7,005		7,005
Transfers from (to) other federal agencies, net	44,627	(791)	43,836	(625)	43,211
Federal Columbia River Transmission System Act borrowings (Note 3)	410,000	115,000	525,000	175,000	700,000
Interest on federal investment:					
On appropriated funds	1,860,094	176,643	2,036,737	200,256	2,236,993
On Transmission System Act borrowings	30,845	35,235	66,080	49,599	115,679
Unpaid annual expense (Note 9)	98,584	13,821	112,405	(3,943)	108,462
Less:					
Interest payments	(1,890,939)	(211,878)	(2,102,817)	(249,421)	(2,352,238)
Funds returned to U.S. Treasury	(1,207,143)	(22,668)	(1,229,811)	(32,583)	(1,262,394)
Net investment of U.S. government	6,075,734	386,652	6,462,386	349,617	6,812,003
Accumulated net revenues	242,129	(59,490)	182,639	(5,891)	176,748
Total federal investment	$6,317,863	$327,162	$6,645,025	$343,726	$6,988,751

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

Federal Columbia River Power System **Statement of Source and Use of Funds** for the fiscal years ended September 30, 1981 and 1980

September 30, In Thousands	1981	1980
Source of Funds		
Operations:		
Net revenues (expense)	$ (5,891)	$(59,490)
Charges not requiring funds:		
Depreciation	54,835	51,380
Amortization of net billing advances	6,071	8,994
Write-off of Trojan Nuclear Project net billing advances		44,210
Funds provided from operations	55,015	45,094
Increase in net investment of U.S. Government	349,617	386,652
Decrease (increase) in current assets:		
Unexpended funds	(17,936)	1,355
Receivables	(29,664)	(13,996)
Materials and supplies	(4,732)	297
Increase (decrease) in current liabilities	9,217	(6,827)
Total funds provided	$361,517	$412,575
Use of funds:		
Investment in utility plant, net	$327,035	$370,500
Increase in net billing advances		14,296
Other, net	34,482	27,779
Total funds used	$361,517	$412,575

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

Notes to Financial Statements

Note 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 representing 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. Schedule A lists the projects included in FCRPS and the allocation of plant investment to the various purposes. BPA may acquire power resources but cannot own or construct generating facilities. BPA resource acquisition priorities are: conservation, renewable resources, resources using waste heat or having high fuel conversion efficiency, other resources. Properties and income are exempt from taxation.

Accounts 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 a part of the Department of Interior and the Corps of the Department of Defense).

Revenues

Operating revenues are recorded on the basis of service rendered.

Rates established under requirements of 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 to the U.S. Treasury for debt service on borrowings and for its investment in power facilities and interest thereon, and costs of net billed thermal projects and assigned irrigation costs—see Notes 7, 9 and 10).

If revenues in any year are not sufficient to meet all required payments, the priority for use 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; interest on unpaid annual expense and on the federal investment in power facilities financed through appropriations; amortization of unpaid annual expense (see Note 9); amortization of the federal investment in power facilities financed through appropriations; irrigation repayment assistance. Presently no irrigation repayment assistance is required until 1997. If insufficient cash is available to meet all payment obligations, the priority order for the application of revenues 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 provide for recovery of the capital investment in transmission facilities within their average estimated useful service lives and within 50 years for power generating facilities. As set forth below, these assets are being depreciated in the accounts on a compound interest method over their estimated useful lives, which currently average approximately 35 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.

Regulatory Authorities
Effective January 1, 1979, the Secretary of Energy delegated authority to the Assistant Secretary for Resource Applications to develop, acting by and through the Administrator, and to confirm, approve and place in effect on an interim basis, power and transmission rates. This authority was exercised in approving BPA's 1979 wholesale power rates which became effective on December 20, 1979. At the same time, FERC was given authority to confirm and approve on a final basis, or to disapprove but not to modify, such rates. The Pacific Northwest Electric Power Planning and Conservation Act (the Regional Act) establishes authority in the Secretary of Energy to approve BPA's rates on an interim basis effective until July 1, 1982. The Secretary delegated this authority to the Assistant Secretary for Conservation and Renewable Energy and the Assistant Secretary acted under this authority in approving BPA's July 1, 1981 wholesale power and transmission rates on an interim basis. Refunds with interest are authorized if rates finally approved are lower than rates approved on an interim basis. Effective July 1, 1982, FERC has been given sole authority to approve interim 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. With minor exceptions, 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 based on the estimated service lives of the various classes of property using the compound interest method (rates from 2-1/2% to 3-1/4%). Service lives currently average approximately 35 years for transmission plant and 85 years for generating plant.

Depreciation provisions recorded in the accounts, expressed as a percent of the average cost of plant in service, approximated 1.9% in 1981 and 1980 for transmission plant and 0.4% in each such year for generating plant. The compound interest method adopted pursuant to executive directives of government agencies results in increasing depreciation charges in the later years of service lives.

Allowance for Funds Used during Construction
The practice of capitalizing an allowance for funds used during construction is followed. Rates used are based upon interest rates stipulated for certain generating projects (2-1/2% to 6-1/8%) and rates approximating the cost of borrowings from the U.S. Treasury for other construction (10.4% to 11.45% during the two years ended September 30, 1981).

Thermal Plant Net Billing Advances and Amortization
Net billing agreements provide that BPA make payments and/or grant billing credits prior to a nuclear project's date of commercial operation. Payments and billing credits totaling $212.5 million made prior to December 20, 1979 for Washington Public Power Supply System Nuclear Project No. 2 under construction are included as deferred charges under the caption "net billing advances" in the accompanying statement of assets and liabilities and, commencing December 20, 1979, are being amortized ratably over 35 years.

The increased power rates effective December 20, 1979 and July 1, 1981 provide for recovery of amortization relating to the deferred amount. Similar payments and billing credits made since December 20, 1979 have been charged directly to Purchase and Exchange Power expense since the increased power rates effective on an interim basis on those dates are intended to provide for their recovery on a current basis.

Research and Development
Research and development costs, including depreciation of the cost of facilities constructed for research and development activities, are charged to expense. Costs charged to expense totaled approximately $9.0 million in 1981 and $10.8 million in 1980.

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 equivalent to 7% of eligible employee compensation.

Note 2—Revenues Subject to Refund:

On December 20, 1979 and July 1, 1981 increased power rates were placed into effect on an interim basis. Wheeling rates charged for transmission of nonfederal power were placed into effect on July 1, 1977 and 1981 on an interim basis. In November and December 1980, FERC remanded the increased power and wheeling rates without prejudice for further development of the records in order to establish their conformity with applicable statutory standards. BPA has responded to both remandings. FERC has not yet acted on BPA's responses.

Related to Fiscal Years In Thousands	1981	1980	Prior to 1980	Total
Power Sales:				
Rate order dated December 20, 1979	$289,238	$195,775		$485,013
Rate order dated July 1, 1981	39,300			39,300
Total power sales subject to refund	328,538	195,775		524,313
Wheeling:				
Rate order dated July 1, 1977	6,000	6,000	$15,300	27,300
Rate order dated July 1, 1981	1,432			1,432
Total wheeling revenues subject to refund	7,432	6,000	15,300	28,732
Total revenues subject to refund	$335,970	$201,775	$15,300	$553,045

Note 3—Financing of FCRPS Construction Program:

The Federal Columbia River Transmission System Act (Act), approved October 18, 1974, authorized BPA to use its operating receipts and proceeds from sales of revenue bonds, which the Act authorized it to issue, to finance further construction of the federal transmission system in the Pacific Northwest. Prior to the enactment of this legislation, the transmission system construction program was financed through the appropriation process. Construction performed by the Corps and Bureau continues to be financed through annual Congressional appropriations. In order to assist in financing the construction, acquisition and replacement of the transmission system, the Act authorizes BPA to issue to the U.S. Treasury and have outstanding at any time up to $1.25 billion of bonds, notes or other evidences of indebtedness bearing interest and having terms and conditions comparable to those prevailing in the market for similar bonds issued by government corporations.

Following is a summary of borrowings and repayments under the Act during the two years ended September 30, 1981 and outstanding indebtedness:

	Notes		Bonds		
	Borrowings (Repayments)		Borrowings		
Date	Millions	Rate	Millions	Rate	Maturity
9/30/78			$ 50	8.95%	9/30/2013
6/30/79			75	9.45	6/30/2014
9/30/79	$235	10.5 %	50	9.90	9/30/2014
9/30/80			115	13.00	9/30/2015
9/30/81	(235)				
9/30/81	235	16.85	175	16.60	9/30/2016
Outstanding at 9/30/81	$235		$465		

Prior to passage of the Regional Act (see Note 4), BPA's borrowing authority within the aforementioned $1.25 billion maximum was limited at any one time to its cumulative expenditures for transmission plant (including capitalized interest and any unspent approved construction budget amounts) which have not been financed from appropriations. At September 30, 1981, BPA had borrowed substantially all funds available within this limitation other than the approved 1982 construction budget. The $235 million note outstanding is payable by September 30, 1982.

BPA's construction budget for fiscal year 1982 is $165 million, for which substantial commitments have been incurred. Fiscal 1982 construction appropriations for power facilities have been authorized by Congress for the Corps and the Bureau totaling $72 million and $36 million, respectively.

Note 4—Financing of BPA Conservation and Renewable Resources Acquisition Programs:

The Regional Act, effective December 5, 1980, expanded BPA's borrowing authority under the Transmission System Act to include borrowings to implement the Administrator's authority under the Regional Act (including his authority to provide financial assistance for conservation measures, renewable resources, and fish and wildlife, but not including the authority to acquire electric power from a generating facility having a planned capability of greater than 50 average megawatts). Additionally, beginning October 1, 1981 BPA's borrowing authority under the Transmission System Act was increased from $1.25 billion to $2.5 billion, as provided in advance in annual appropriation acts. The entire increase is reserved for the purpose of providing funds for conservation and renewable resource loans and grants. BPA's energy conservation and resource acquisition budget for fiscal year 1982 is $192 million, for which substantial commitments have been incurred.

Note 5—Cost Allocations:

Allocations of plant cost and operation and maintenance expenses between power and nonpower purposes for six system projects are presently based on tentative allocations. At September 30, 1981, total costs for these six projects approximated $2.2 billion of which $1.6 billion was tentatively allocated to power and subject to adjustment. In prior years, adjustments were made to plant cost and to accumulated net revenues (for adjustments relating to operation and maintenance, interest or depreciation) when final allocations were adopted. The amount of adjustments that may be necessary when the allocations for these six projects become final is not determinable at this time.

Under certain circumstances, final cost allocations can be changed, but Congressional approval may be required for any significant change. As set forth above, retrospective adjustments to the financial records are performed when a final cost allocation differs from the tentative cost allocation. If a change in a final cost allocation were made, any related adjustments would most likely be prospective unless the affected project never functioned as intended.

Note 6—Unexpended Funds:

In Thousands	1981	1980
Corps and Bureau unexpended appropriated funds	$43,880	$48,400
BPA cash balances with U.S. Treasury	48,007	25,551
	$91,887	$73,951

FCRPS receives credit for interest on unexpended appropriated funds by deducting them from the unamortized federal investment in determining the required interest payable on the federal investment. The Treasury gives BPA credit for its cash balances in determining interest charges. The interest expense on Treasury borrowings reflects reductions of $6.5 million in 1981 and $5.9 million in 1980 arising from credits for cash balances.

Note 7—Purchase and Exchange Power Expense and Commitments to Exchange Power and Acquire Project Capability:

Existing net billing and exchange agreements provide that BPA will acquire all or part of the generating capability of the nuclear power plants listed in the table below. BPA is obligated to make payments, exchange power, or apply credits (net billings) to participating customers equal to the customers' portions of the annual project costs, including annual debt service requirements, whether or not the projects are completed, operable, or operated. Annual project budgets have not included provisions for any future costs associated with spent fuel reprocessing, off-site storage of spent fuel or plant decommissioning.

BPA's commitment period under the net billing agreements extends for the life of the projects, except that the terms of the Trojan Nuclear Project net billing agreements under which Eugene Water & Electric Board (Eugene) assigned its 30% share of the project capability to BPA and other participants, contained a provision allowing Eugene to withdraw the project capability for use in its own system beginning in 1984. Had Eugene exercised its withdrawal rights, settlement for BPA's prepaid Trojan costs would have been negotiated at withdrawal dates and, accordingly, BPA included such prepaid costs as net billing advances in its balance sheet. On July 1, 1980, Eugene's right to withdraw expired, Eugene confirmed that it did not intend to request withdrawal, and the balance of prepaid costs existing at that date ($44,210,186) was charged to expense. No such withdrawal options exist for the WPPSS projects. See Note 1 for further information concerning net billing advances.

The "Present Termination Commitment" represents the outstanding debt issued to finance the projects (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, plus interest, over the varied financing repayment periods if the projects were terminated as of September 30, 1981:

In Thousands Project and % Capability Acquired	Projected in Service Date	Capacity in Megawatts	Present Termination Commitment	Additional Estimated Financing Requirements for Projects under Construction	Estimated BPA Portion: Estimated Annual Project Costs	1982	1983	1984	1985	1986
WPPSS* Hanford Project (100%)	Operational	860	$ 43,130		Debt Service	$ 4,218	$ 4,220	$ 4,239	$ 4,254	$ 4,168
					Operations	19,282	20,580	25,361	27,646	27,732
Net billed projects:										
Trojan Nuclear Project (30%)	Operational	339	145,325		Debt service	10,563	10,556	10,562	10,556	10,562
					Operations	34,537	36,244	37,738	40,844	40,838
WPPSS* Nuclear Project #1 (100%)	June 1986	1,250	1,766,305	$1,420,000	Debt service	141,600	230,400	276,700	312,000	324,400
					Operations					58,100
WPPSS* Nuclear Project #2 (100%)	February 1984	1,100	1,669,000	811,000	Debt service	150,000	234,400	235,300	234,400	234,600
					Operations			76,100	123,000	132,200
WPPSS* Nuclear Project #3 (70%)	December 1986	868	1,130,000	1,327,900	Debt service	20,000	164,100	199,200	238,400	249,100
			$4,753,760	$3,558,900		$380,200	$700,500	$865,200	$991,100	$1,081,700

**Washington Public Power Supply System.*
Amounts shown for WPPSS projects are from WPPSS 1982 budgets adjusted for a $750 million bond issue in September 1981.

The costs to complete and operate WPPSS Nuclear Projects Nos. 1, 2 and 3 are currently being reviewed and are subject to significant adjustment. See Notes 12 and 13 for further discussion concerning the financing of these projects.

BPA has also entered into an agreement with a group of utilities to exchange an agreed amount of power annually for their rights to a portion of the Canadian Entitlement (one-half of the additional power benefits realized by downstream U.S. projects from three Canadian Treaty dams for a 60-year period). The portion of the Canadian Entitlement was purchased for a 30-year period from the completion of each dam (the last dam was placed in service in 1973) by 41 Pacific Northwest utilities. BPA furnishes specified amounts of power to the utilities regardless of entitlement power generated. BPA's minimum average energy commitment to the utilities declines annually from approximately 583 megawatts currently to approximately 100 megawatts in the last year of the exchange agreement (2003).

Following is an analysis of amounts included in purchase and exchange power expense:

In Thousands	1981	1980
Trojan Nuclear Project:		
Share of annual generation costs	$ 40,678	$ 32,382
WPPSS Nuclear Projects:		
Project No. 1	99,390	22,901
Project No. 2	106,246	70,571
Other purchase and exchange power costs	23,311	12,679
	$269,625	$138,533

Note 8—Trust Funds and Trust Fund Advances:

These balance sheet amounts comprise funds received by BPA from customers and others for the purchase of nonfederal power for customers' benefit and for construction to be done for others.

Note 9—Net Investment of U.S. Government:

The federal investment in each of the generating projects and for each year's investment in the transmission system is being repaid to the U.S. Treasury within 50 and 35 years, respectively, from the time the facility is placed in service. Although no mandatory repayments are due within the next five years, some amortization payments are expected to be made during such period.

Amounts are normally expected to be paid annually for interest on outstanding federal investment, net of interest capitalized on projects financed through appropriations, and for operating expenses of the Corps and Bureau funded by annual appropriations. To the extent that funds are not available for payment, such amounts become payable from subsequent years' revenue prior to any payment for amortization of federal investment. Revenues were not sufficient to pay all these annual amounts and payment of $13.8 million and $98.6 million of interest on appropriated funds was deferred in 1980 and 1979, respectively. $3.9 million of the previously deferred amount was paid in 1981.

Interest rates (other than on Transmission System Act borrowings) range from 2-1/2% to 8-1/2% (the weighted average rate was approximately 3.3% in 1981 and 1980). The rates have been set either by law, by administrative order pursuant to law, or by administrative policies, and have not necessarily been established to recover the interest costs to the U.S. Treasury to finance the investment. See Note 1—Revenues and Notes 10 and 11 for additional information concerning repayment requirements and policies.

Note 10—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. The use of power revenues for such repayment represents a payment for irrigation assistance to the benefiting water users and, while paid by power ratepayers, such costs do not represent a regular operations cost of the power program and are not included therein. The $655 million in irrigation assistance payments shown as returnable from power revenues in Schedule A will be reflected as reductions of accumulated net revenues at the time future payments are made. The first payment is scheduled to be made in 1997. The $655 million does not include any portion of $21 million of costs allocated to irrigation at six Corps projects located within Oregon where completion of irrigation facilities is not yet authorized. If completion is authorized, a determination of water users' repayment ability will probably be made which might result in additional irrigation assistance being payable from accumulated net power revenues.

Note 11—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, a breach occurred in the Teton Dam and the project was extensively damaged. The total investment in the project at September 30, 1981 (excluding interest totaling approximately $2,244,000 subsequent to June 1976 which has been charged to expense) was $78.9 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 $46.5 million. Disposition of the project's costs and final decision as to the repayment obligation are dependent upon Department of the Interior administrative action and/or Congressional action. If repayment is not required, the cost associated with the investment in power facilities (and recovery of the related $2.2 million interest) will be charged off against the investment of 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 applicable irrigation assistance is included in the total of other irrigation costs described in Note 10.

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. Subsequent appeals by the Corps for removal of the injunction were denied. The total investment in the reregulating dam was $19.5 million at September 30, 1981. 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.

Note 12—Litigation:

In September 1981, Central Lincoln Peoples' Utility District, et al., filed suit in the U.S. Court of Appeals, Ninth Circuit, alleging that certain sections of BPA's new contracts with direct-service industrial (DSI) customers under section 5(g)(1) of the Regional Act violated the preference clause of the Bonneville Project Act and certain provisions of the Regional Act, that the Administrator acted arbitrarily and capriciously and beyond his jurisdiction in offering the initial contracts to DSI's which provided them a greater amount of power than their 1975 contracts, and that the initial contracts violate certain provisions in the Pacific Northwest Coordination Agreement. A request for preliminary relief was denied by the court and the case is set for hearing by the Ninth Circuit in January 1982. In the opinion of the BPA General Counsel, BPA should prevail in this litigation. In the event, however, that the court should find any specific sections of the contracts affecting rates to be invalid and direct BPA to renegotiate them, the customers involved would be billed on the basis of the former contracts. This could have a substantial adverse short-term impact on FCRPS' revenues until the renegotiations were completed. Six cases have been filed by the major classes of BPA's customers to preserve the court's jurisdiction to adjudicate any rights that would remain unresolved in a decision in the Central Lincoln Peoples' Utility District litigation discussed above. These cases were filed immediately before expiration of the 90-day limitation set in Section 9(e)(5) of the Regional Act, after which the contracts offered by BPA to its customers would not be subject to judicial challenge.

In September 1981, Central Lincoln Peoples' Utility District, et al., filed suit in the U.S. Court of Appeals, Ninth Circuit, alleging that BPA's final proposed 1981 rates, adopted on June 24, 1981, (1) violate applicable statutory provisions in both the level and design of the rate schedules, and (2) that BPA has denied plaintiffs meaningful due process and protection guaranteed by the Regional Act and the Administrative Procedures Act. The suit seeks an order (1) declaring the final proposed rates invalid, (2) enjoining collection of revenues based on these rates, and (3) refund of any revenues collected allegedly in excess of the rate schedules allowed by law. In the opinion of the BPA General Counsel, BPA should prevail on those issues having a significant impact on BPA's revenues. If the court should find that BPA's rate structure is improper, any future rates will have to be structured to take into account any shortfall in BPA's revenues due to the court's decision.

Seven cases have been filed by the major classes of BPA's customers alleging substantially the same issues discussed in the preceding paragraph. They have joined in the litigation to protect their rights as they may be affected by the main litigation. All of the cases have been consolidated by the court. The court has raised on its own motion the question whether it has jurisdiction until FERC has entered a final order approving BPA's rates.

On November 3, 1981, the voters of the State of Washington passed Initiative 394, which provides that no public body "may issue or sell bonds to finance the cost of construction or the cost of acquisition of a major public energy project, or any portion thereof, unless it has first obtained authority for the expenditures of the funds to be raised by the sale of bonds for that project at an election conducted in the manner provided in this chapter." The initiative also requires a cost-effectiveness study of the major public energy project under consideration which shall be subject to public comment before the vote by eligible voters on the bond issue is held at the time of the next statewide general election. The Bond Fund Trustees for WPPSS Projects Nos. 1, 2 and 3 have instituted litigation challenging the constitutionality of the initiative. They allege, among other things, that the initiative impairs the validity of the contracts between WPPSS and the bondholders and violates the supremacy clause of the U.S. Constitution. The defendants are the Governor, Attorney General, and Secretary of State for the State of Washington and the Benton County, Washington, Auditor. If the initiative were not declared invalid and a bond issue were not to be approved by the voters, it could require cessation of construction of the project involved. In the event the project(s) were terminated and WPPSS was unable to raise the funds necessary to pay its debts, the related outstanding bonds (totaling $4.565 billion at September 30, 1981 as set forth in Note 7) might be declared immediately due and payable. In the opinion of the BPA General Counsel, the Bond Fund Trustees should prevail in this litigation, if the case is properly prosecuted.

Certain other claims, suits and complaints have been filed or are pending against entities of FCRPS, including litigation relating to the installation of additional generating capacity at Bonneville and Libby dams and construction of certain transmission lines. In the opinion of counsel and management, these actions are either without merit, involve amounts which are not significant to FCRPS' financial position or results of operations, or primarily affect the overall cost of construction projects which will be capitalized and recovered through future power rates.

Note 13—Contingencies Related to Recent Financing Difficulties of WPPSS Nuclear Projects Nos. 4 and 5:

WPPSS Projects Nos. 1 and 4 are being constructed on the same site near Richland, Washington; WPPSS Project No. 2 is being constructed on a site approximately one mile away. WPPSS Projects Nos. 3 and 5 are being constructed on the same site near Aberdeen, Washington. The projects on each of the two dual sites are being designed and constructed as twin plants and will share some common facilities.

BPA is not committed to take or pay for any of the output of Projects Nos. 4 and 5. However, a construction moratorium is currently in effect for these projects and financing arrangements for costs of a mothballing program have not yet been finalized. In the event that these projects should have insufficient funds to pay all valid claims, their creditors might seek, through legal process, to reach funds or revenues of Projects Nos. 1, 2 and 3. The outcome of any such litigation would be uncertain.

WPPSS and BPA are presently negotiating with respect to the allocation of costs for services and facilities common to Projects Nos. 1, 2 and 3 and Projects Nos. 4 and 5 during the construction moratorium of Projects Nos. 4 and 5. The negotiations could result in additional costs for Projects Nos. 1, 2 and 3. A termination of Projects Nos. 4 and 5 could cause the cost of certain services and facilities which are to be shared with Projects Nos. 1 and 3, respectively, to be borne in whole or in part by Projects Nos. 1 and 3. In addition to these possible increased costs of shared services and facilities, there could be claims that Projects Nos. 1 and 3 should reimburse Projects Nos. 4 and 5 for all or a portion of the costs of such services and facilities already paid by Projects Nos. 4 and 5. Additional costs for Projects Nos. 1, 2 and 3 which might result from resolution of the above mentioned negotiations and contingencies are undetermined and could be substantial in amount.

As set forth in Note 1, all costs of FCRPS, including any which might occur as a result of the above mentioned contingencies, are to be recovered by BPA from its customers. Although it does not currently have the ability to borrow for purposes other than those enumerated in Notes 3 and 4, BPA can defer certain payments due to the U.S. Treasury in order to meet its short-term cash needs. BPA management estimates that such deferrals, together with borrowings for transmisson construction and Regional Act purposes, will be sufficient during fiscal year 1982 to fund its obligations including those under the net billing agreements for Projects Nos. 1, 2 and 3 as currently budgeted by WPPSS. Although contingencies discussed in this and the preceding note on litigation could conceivably result in acceleration of debt service payments required of BPA under the net billing agreements and bond resolutions for Projects Nos. 1, 2 and 3, in the opinion of BPA General Counsel, the possibility of any such acceleration is remote.

(In Thousands)

Project	Total	Commercial Power: Completed Plant	Commercial Power: Construction Work in Progress	Commercial Power: Total Commercial Power	Irrigation: Returnable from Commercial Power Revenues	Irrigation: Returnable from Other Sources	Irrigation: Total Irrigation	Nonreimbursable: Navigation	Nonreimbursable: Flood Control	Nonreimbursable: Fish and Wildlife	Nonreimbursable: Recreation	Nonreimbursable: Other	Percent of Total Returnable from Commercial Power Revenues
Projects in service:													
Transmission facilities (BPA)	$2,295,311	$2,095,668	$199,643	$2,295,311									100.0%
Albeni Falls (CE)	33,779	32,147		32,147				$ 135	$ 174		$ 1,323		95.2%
Boise (BR)	74,736	5,670	2,186	7,856	$ 11,928	$ 38,586	$ 50,514		16,213			$ 153	26.5%
Bonneville (CE)	721,242	170,036	505,963	675,999				42,051			1,229	1,963	93.7%
Chief Joseph (CE)	465,795	460,807		460,807	739		739				1,047	3,202	99.1%
Columbia Basin (BR)	1,474,668	694,497	155,160	849,657	489,771	83,092	572,863	1,000	48,175	$ 2,446		527	91.0%
Cougar (CE)	60,533	18,439	1	18,440		3,072	3,072	547	38,266			208	30.5%
Detroit-Big Cliff (CE)	66,964	40,641	16	40,657		4,794	4,794	221	21,002			290	60.7%
Dworshak (CE)	346,067	292,649	3	292,652				9,293	33,306		10,816		84.6%
Green Peter-Foster (CE)	90,538	49,865	143	50,008		5,838	5,838	366	30,409		1,856	2,061	55.2%
Hills Creek (CE)	48,975	17,449		17,449		4,321	4,321	626	26,307			272	35.6%
Hungry Horse (BR)	101,649	76,971	21	76,992					24,657				75.7%
Ice Harbor (CE)	188,419	132,478	7,220	139,698				46,190			2,531		74.1%
John Day (CE) (a)	530,104	387,156	1,555	388,711				88,594	14,937		11,452	26,410	73.3%
Libby (CE) (a) (d)	572,592	419,581	27,982	447,563					86,654		5,383	32,992	78.2%
Little Goose (CE) (a)	244,178	179,503	7,182	186,685				50,838			4,051	2,604	76.5%
Lookout Point-Dexter (CE)	97,664	46,535	13	46,548		1,373	1,373	733	48,395		521	94	47.7%
Lost Creek (CE) (a)	148,485	26,689		26,689		1,984	1,984		52,853	24,268	28,897	13,794	18.0%
Lower Granite (CE) (a)	396,252	314,207	7,231	321,438				54,720			12,252	7,842	81.1%
Lower Monumental (CE) (a)	264,128	205,105	7,215	212,320				48,569			2,822	417	80.4%
McNary (CE)	342,444	272,033	2,132	274,165				65,970			2,309		80.1%
Minidoka-Palisades (BR)	191,353	13,999	20	14,019	10,292	100,747	111,039		60,597	112	5,586		12.7%
The Dalles (CE)	324,532	278,844	208	279,052				43,376			2,082	22	86.0%
Yakima (BR)	69,732	4,617	11	4,628	7,643	55,327	62,970		744	1,152	238		17.6%
Irrigation assistance at 12 projects having no power generation	113,721				78,121	35,600	113,721						68.8%
Plant Investment	9,263,861	6,235,586	923,905	7,159,491	598,494	334,734	933,228	453,229	502,689	27,978	94,395	92,851	83.7%
Repayment obligation retained by Columbia Basin Project	2,211	1,352		1,352(b)	859		859						100.0%
Other repayment obligations	9,303				9,303		9,303						100.0%
Investment in Teton and Libby Projects (d)	98,418		33,337	33,337	46,505	4,065	50,570		12,204		2,307		81.1%
	$9,373,793	$6,236,938	$957,242	$7,194,180	$655,161	$338,799	$993,960	$453,229	$514,893	$27,978	$96,702	$92,851(c)	83.8%

BPA—Bonneville Power Administration
CE—Corps of Engineers
BR—Bureau of Reclamation

(a) Projects in service that have tentative cost allocations at September 30, 1981.

(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 $83.7 million.

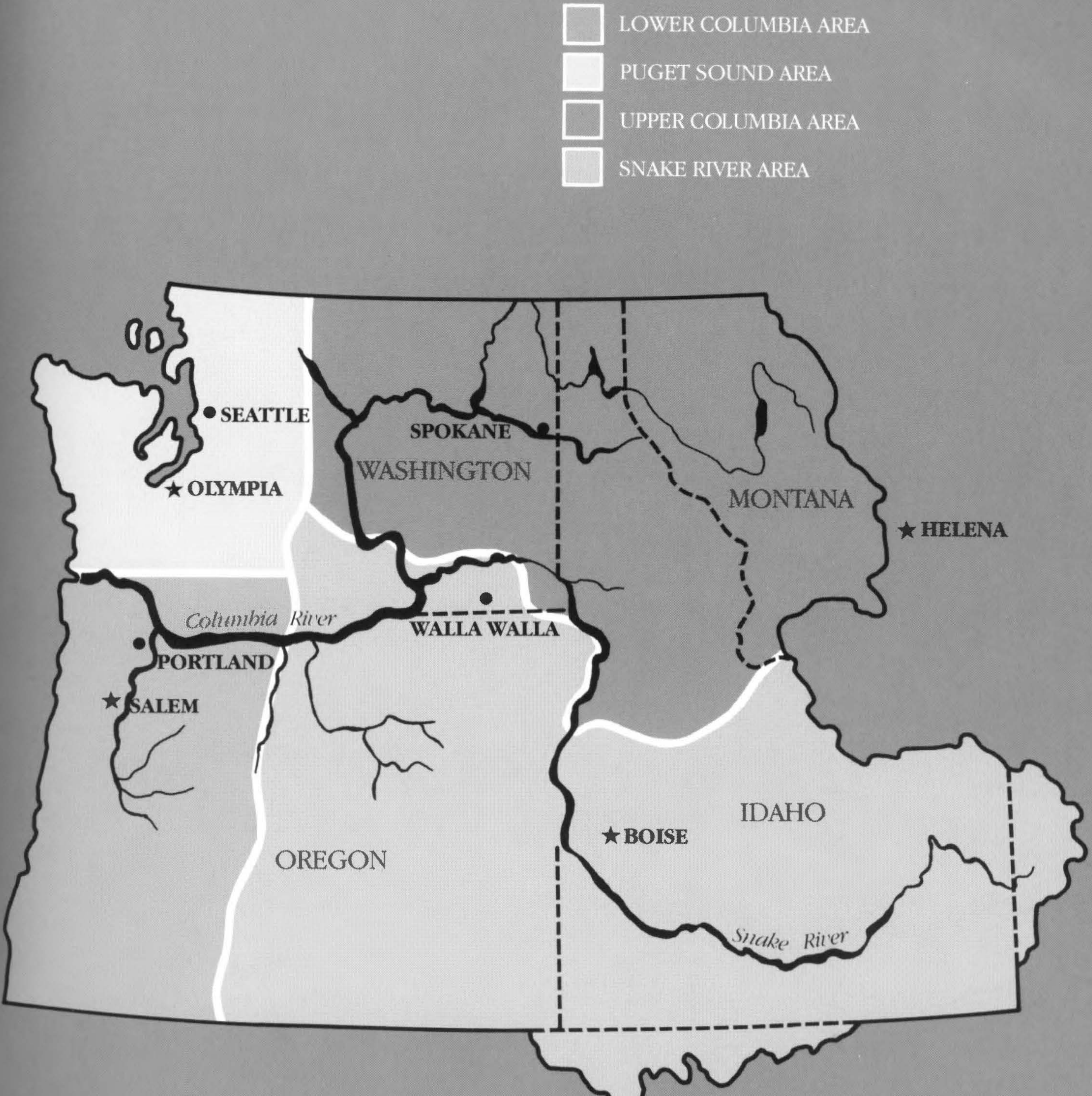
(d) The $13,837,000 commercial power portion of the Teton Dam and $19,500,000 portion of Libby related to the reregulating dam are included in other assets and deferred charges in the accompanying statement of assets and liabilities. Teton amounts exclude interest totaling approximately $2,244,000 subsequent to June 1976 which has been charged to expense.

(Schedule B)

Federal Columbia River Power System **Reconciliation of Cost Accounting Financial Statements to the Repayment Study**
for the fiscal year ended September 30, 1981 (unaudited)

In Thousands	Cumulative Balance 9/30/80	Fiscal Year 1981 Operations	Cumulative Balance 9/30/81	Cumulative Adj. to Repayment Basis	Cumulative Data Thru 9/30/81 on Repayment Study
Operating Revenues	$4,441,940	$705,329	$5,147,269		$5,147,269
Expenses:					
Purchase and Exchange Power	519,039	269,625	788,664	$201,882	990,546
Operation and Maintenance Expense	1,351,139	180,234	1,531,373		1,531,373
Interest Expense	1,714,691	206,526	1,921,217	(2,245)	1,918,972
Depreciation	674,432	54,835	729,267	(729,267)	—
Total Expense	4,259,301	711,220	4,970,521	(529,630)	4,440,891
Net Revenues	$ 182,639	$ (5,891)	$ 176,748		
Reconciliation to Cumulative Revenues Available for Amortization			$ 176,748	$529,630	$ 706,378(a)
Plant Investment:					
Completed Plant			$6,235,586		
Retirement Work in Progress			21,147		
Repayment Obligation Retained by Columbia Basic Project (Schedule A)			1,352		
Investment in Libby Reregulating dam			19,500		
Net Retirements				$155,000	
			$6,277,585	$155,000	$6,432,585
Less Revenues Available for Amortization					706,378(a)
Plus Adjustment to Cash Amortization					43,498
Unamortized Plant Investment					$5,769,705
(a) Changes in Cumulative Revenues Available for Amortization:					
Cumulative Revenues Available for Amortization through September 30, 1980					$ 650,929
Fiscal Year 1981:					
Depreciation					54,835
Net Revenues (Expenses)					(5,891)
Purchase and Exchange Power Adjustment to Cash Basis					6,071
Interest Adjustment for Teton Project					434
Revenues Available for Amortization for the year					55,449
Cumulative Revenues Available for Amortization through September 30, 1981					706,378
Less Adjustment to Cash Amortization					43,498
Cumulative Amortization through September 30, 1981					$ 662,880

Customer Service Areas



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Bonneville Power Administration
Portland, Oregon

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