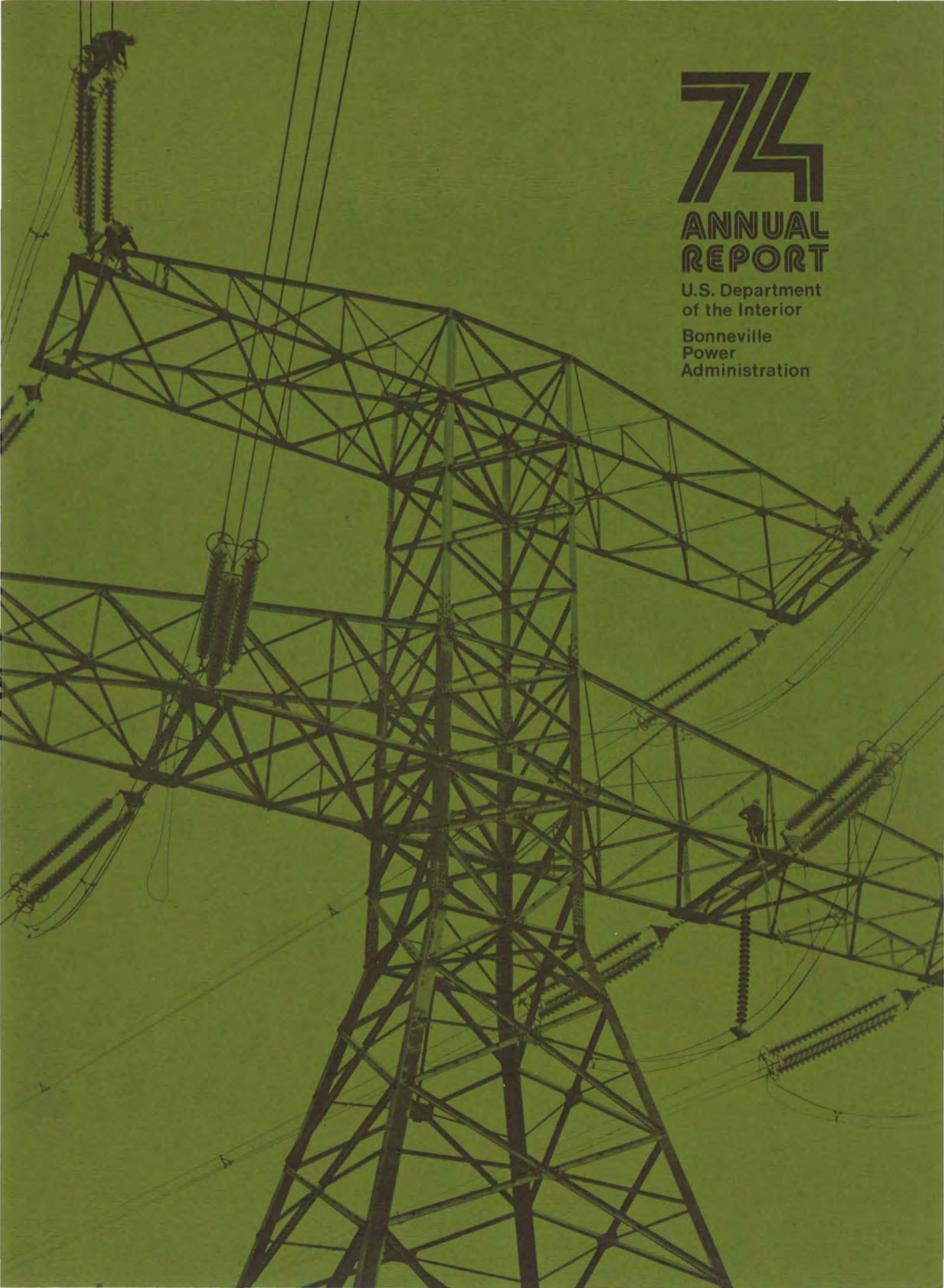

74 ANNUAL REPORT

U.S. Department of the Interior

Bonneville Power Administration

(Cover Photo)

Dwarfed by the huge structure, four BPA linemen perform maintenance on 500-kV double-circuit tower north of Tacoma, Washington.

Federal Columbia River Power System

December 31, 1974

1974 ANNUAL REPORT

U.S. Department of the Interior

Rogers C.B. Morton
Secretary

Bonneville Power Administration

Donald Paul Hodel
Administrator

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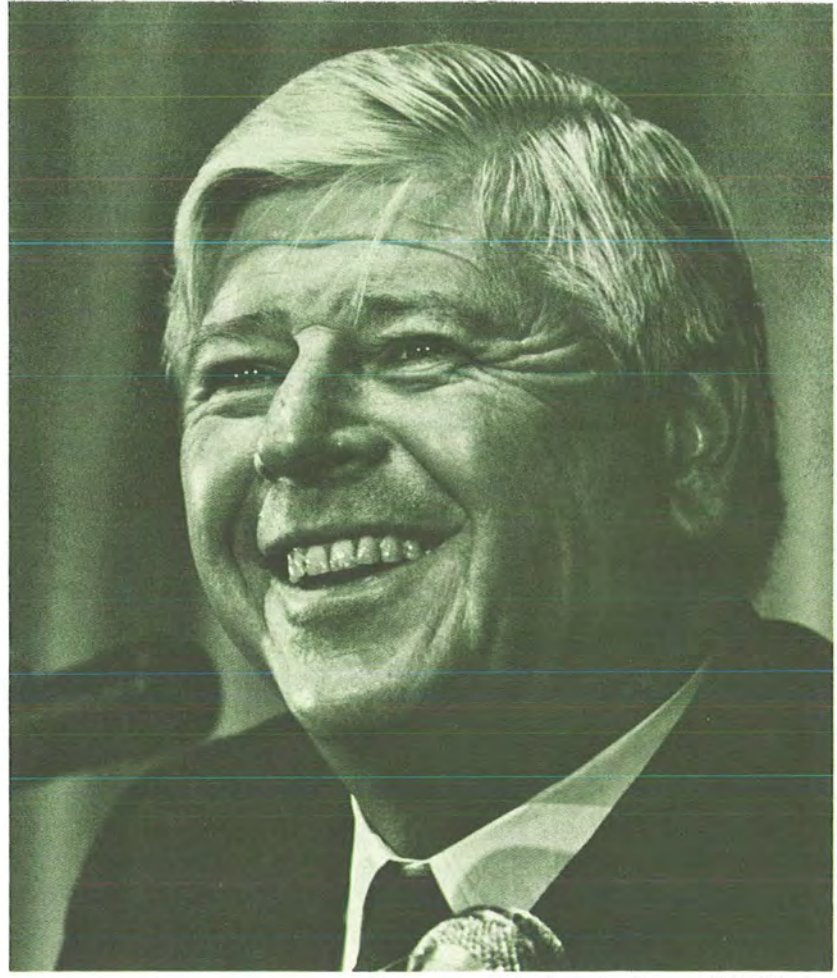

Secretary of the Interior Rogers C.B. Morton

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Letter to the Secretary

December 31, 1974

Honorable Rogers C. B. Morton
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

This is the Bonneville Power Administration's 37th Annual Report on the Federal Columbia River Power System. It covers events of Fiscal Year 1974 and significant developments since June 30.

The most significant development during the period was the passage of the Federal Columbia River Transmission System Act which was signed by President Ford on October 18, 1974. This legislation enables us to use our revenues and to sell revenue bonds to the Treasury Department to finance our transmission system, which gives greater assurance that the Federal Government will meet its commitments under the regional Hydro-Thermal Power Program. By alleviating our need for appropriated funds, the Act also helps to lessen the pressure on the Federal budget.

Last year we reported an agreement reached in December 1973 among the region's utilities and major industrial customers to embark upon Phase 2 of the Hydro-Thermal Power Program. We can announce no dramatic achievements during Fiscal Year 1974 but solid progress is being made. The agreements and contracts being negotiated are extremely complex, and must reflect the disparate interests of more than 100 utilities and almost a score of industrial customers. In our next Annual Report, we hope to report that these negotiations have been successfully concluded.

The energy situation in the Pacific Northwest is but a microcosm of that confronting the Nation as a whole. In our case, the successful negotiation of Phase 2 agreements is only the prelude to the herculean task of translating them into physical facilities. The leadtimes for construction of thermal powerplants--both coal-fired and nuclear--have not diminished. Costs continue to escalate and the ability of the utilities to finance thermal plants is becoming increasingly impaired. Nevertheless, the regional partnership concepts embodied in the Hydro-Thermal Power Program appear to offer us the best chance of averting a power supply catastrophe.

Gross revenues in Fiscal Year 1974 amounted to $185 million, an increase of 4.3 percent over the previous year. Nevertheless, spiralling expenses resulted in a deficit on a cost accounting basis of almost $38 million--substantially less than the $45.3 million deficit which had been forecast.

To reverse the deficit trend, Bonneville Power Administration on December 20, 1974, instituted its first major rate increase which averages 27 percent. In addition, we are amending our power sales contracts as they are renewed, revised or extended so that we may adjust our rates more frequently than once every 5 years as is presently the case.

Unlike the drought experienced in 1973, the Pacific Northwest had abundant precipitation in calendar year 1974. As a result, the region was able to sell some 10 billion kilowatt-hours of surplus energy to the Pacific Southwest. This not only helped the BPA revenue picture, but it saved the Southwest utilities approximately 16½ million barrels of oil which otherwise would have been consumed in meeting their loads.

Along these lines, the regionwide energy conservation program initiated by BPA and the utilities in 1973 continues to pay off. BPA's internal economies yielded a 15 percent reduction in energy use during FY 1974 as compared to the previous fiscal year. Periodic reports issued by the Northwest Power Pool show a continuing trend toward lower electricity consumption than was forecast for the region as a whole.

One of the most bizarre episodes in BPA history took place in the Autumn of 1974. I refer, of course, to the dynamiting of 11 BPA transmission towers and the subsequent extortion demand for $1 million. We promptly and publicly rejected the demand, and offered a $100,000 reward for information leading to the arrest and prosecution of those responsible. The community support and mobilization of emergency services were outstanding. Our rejection received not one word of criticism, thereby showing the extortionists that there would be no community pressures to change our decision. Thanks to excellent work on the part of the Federal Bureau of Investigation, the extortionists were soon apprehended, pleaded guilty and received stiff prison sentences.

The spirit of cooperation between Bonneville Power Administration and its customers continues to produce solid dividends. We are as always most grateful for your support, Mr. Secretary, and for that of other Department officials. In closing, I should note that much of our progress may be attributed to the unstinting help which we have received from the Northwest Congressional delegation.

Sincerely yours,

Donald Paul Hodel
Administrator

Bonneville Power Administrator Don Hodel

Dedication of William A. Dittmer BPA System Control Center, August 1974.

Milestones

The Bonneville Power Administration observed 3 milestones during the past year. These will have significant legislative, economic and technological impacts upon BPA programs and policies.

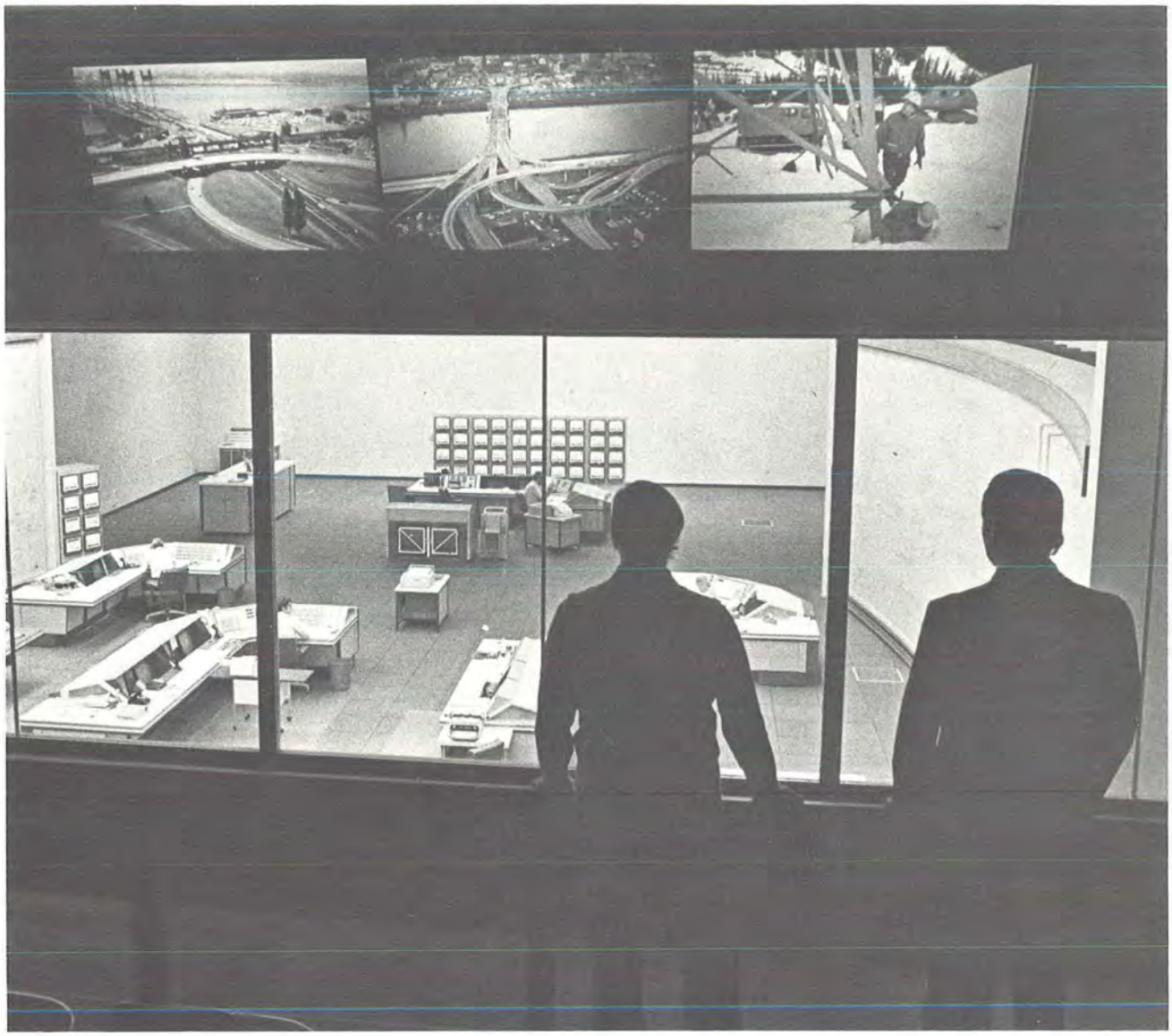
BPA SELF FINANCING LEGISLATION SIGNED BY PRESIDENT FORD

On October 18, 1974, President Ford signed into law the Federal Columbia River Transmission System Act. Enactment of this legislation, which culminated nearly 2 years of intensive negotiations in the Pacific Northwest and subsequent careful deliberation in the Congress, will have a far-reaching impact upon the operations of Bonneville Power Administration.

In early 1973 BPA began exploring with the utilities in the region a plan to extend the Hydro-Thermal Power Program and thereby provide for an adequate future power supply in the Pacific Northwest. Concurrently, the Department of the Interior directed BPA to devise a means of alleviating its need for Congressional appropriations.

Those involved in this planning recognized that the traditional process of year-to-year BPA financing through Congressional appropriations had its drawbacks. Because of competing pressures for the Federal appropriation dollar, especially within the Executive Branch, this process had impeded orderly long-range planning by BPA and on occasion had delayed construction of transmission facilities needed for delivery of power. The viability of the regional Hydro-Thermal Power Program, now being extended beyond 1981, depends to a substantial degree upon meeting the schedule of added generation with the transmission to serve it. Expanding the transmission system is BPA's prime responsibility under this unique arrangement involving more than 100 utilities, industrial customers and the Federal Government.

Accordingly, BPA entered into discussions with regional entities and the Department of the Interior to develop an alternative method of financing that would provide greater flexibility and remove BPA from the Congressional appropriations process. The result was the Federal Columbia River Transmission System Act, which was



Visitors gallery at Dittmer Control Center provides view of dispatch room while audio-visual presentation (top) depicts BPA operations.

introduced in both houses of Congress in April 1974.

Scope of The Legislation

Under the legislation BPA will continue to obtain Departmental, Office of Management and Budget, and Congressional approval with regard to its annual budget and major projects therein. BPA retains its statutory responsibility to repay to the Federal Treasury the power-related investment in multipurpose Federal projects and their operation, plus the costs of the transmission system and irrigation assistance.

Under the provisions of the Act, BPA will utilize its receipts to assure this repayment, as well as to operate and maintain its transmission grid. These receipts may also be used for construction purposes. In addition, BPA bonding authority provides that up to $1.25 billion in revenue bonds may be outstanding at any one time to assist in expanding and upgrading the transmission system.

It is worth noting, however, that these bonds, which may be sold by BPA only to the U.S. Treasury, will carry a higher interest rate than is charged for appropriated funds. As specified in the Act, the revenue bonds will bear interest determined by the Secretary of the Treasury to be "comparable to the rates prevailing in the market for similar bonds."

This stipulation was discussed in testimony given by Jerome Katzin, a partner of Kuhn, Loeb & Co. and financial consultant to BPA, who made the following statement before the Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs of the United States Senate. "... *the closest market probably in the market today are the TVA bonds, which are set up pretty much the way Bonneville is being set up. It is a Government investment being repaid over the years that constitutes the equity, yet, the gross revenues, after system operating charges, can be used to service the public debt. For various reasons in the analysis of what the Bonneville security will look like, we think we should, over a period of time, be better quality than TVA because our ratio of debt equity will be better, our rate schedule more attractive, and for a number of other reasons. TVA sells pretty much at the triple A utility rate today, more or less. Therefore, it is our conclusion that in looking for the similarity we will be somewhere in the neighborhood of good quality Government agency bonds.*" (Such Government agency bonds have borne an interest rate slightly less than the prevailing TVA rate.)

In addition to these provisos, the Federal Columbia River Transmission System Act must be administered in general compliance with the provisions of the Government Corporation Control Act, and the financial transactions of Bonneville Power Administration remain subject to audit by the Comptroller General.

Upon signing the legislation, President Ford stated, *"In an era of deepening concern over the Nation's energy well-being, this bill is a solid step forward in meeting our energy requirements on an orderly, planned basis."* It is now the task of BPA to fulfill the President's confidence, as well as that of the Congress and those in the region who supported passage of the measure.

BPA RATE INCREASE TAKES EFFECT

On December 19, 1974, the Federal Power Commission issued an order confirming and approving the BPA proposal for a general rate increase and a revision of its rate schedule. The FPC order, however, stated that the approval was for a period of not more than one year and was subject to FPC hearings and possible refunds or credits to BPA customers.* The interim rate increase approval took effect on December 20, 1974. It provided for in excess of a $60 million average annual revenue increase over the next five years, or a 27 percent average increase in wholesale electric power rates.

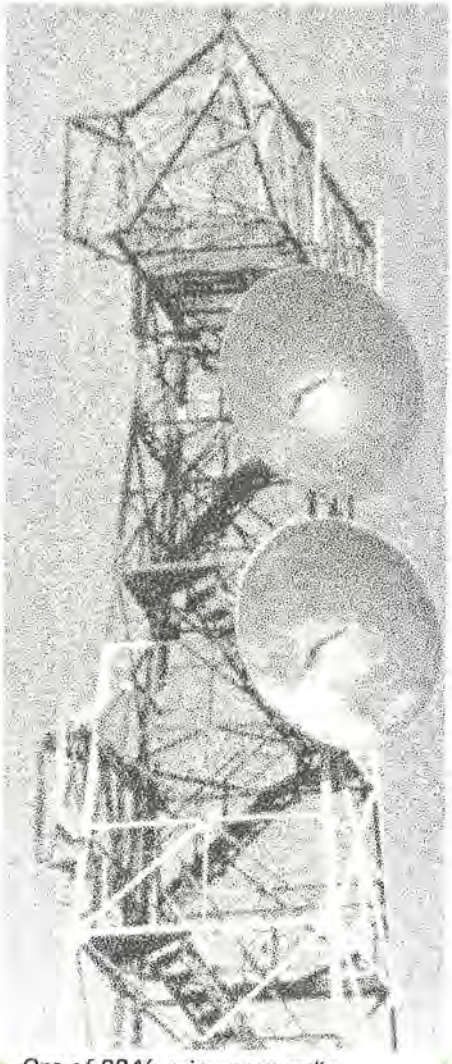
The 1974 rate increase is only the second in BPA history. The other was a 3 percent average increase in rates approved in 1965. General inflation, steeper interest rates and the added costs of acquiring thermal generation all contributed to the need for the current rate increase. During the past 2 years BPA has incurred substantial deficits, and its ability to meet its repayment obligation has been impaired.

A rate review was undertaken in early 1972, and in December of that year BPA held a meeting with its customers to outline the magnitude of its rate increase and rate structure studies, and to propose procedures for involving customers in the rate review process. Shortly thereafter BPA began meeting with customer rate committees to discuss rate features which should be investigated. These meetings were continued through mid-1974.

Concurrently a draft Environmental Impact Statement was filed with the Council on Environmental Quality in March 1974, and was circulated to more than 600 Federal, State and local agencies, organizations and individuals. Eight public meetings were held throughout the region and more than 70 written comments were received. The final statement was filed with the CEQ in August 1974. Its conclusions were that no significant environmental impact would result from the proposed rate increase and revisions to the rate schedules.

During the spring of 1974 intensive discussions continued with the customer rate committees, and special meetings were held with the public utility commissions of Idaho,

**The questions posed by this order had not been resolved when this report went to press.*



One of BPA's microwave radio communications towers.

Oregon and Washington. On August 9 the final rate increase proposal was forwarded to the Department of the Interior, which in turn transmitted it to the Federal Power Commission on August 15.

Main Features of the Rate Increase and Rate Schedule Revisions

Because of the scope of its activities, the number of its utility and direct-service customers, and the variety of its services, BPA's rate schedule provisions are quite complex. A detailed explanation of the rate increase and rate schedule revisions in this report is therefore not practicable. The following is a brief summary of the main features of the new BPA rate package.

1. It establishes a single rate schedule for the sale of firm power, including both demand and energy charges, for all utility customers.
2. It eliminates irrigation and developmental discounts previously allowed. However, the transition will be softened by a declining credit allowance over the next 5-year period.
3. It includes winter-summer rate differentials in some rate schedules to reflect the higher cost of winter energy and capacity. During the winter period (September - March) the power system depends more heavily upon higher-cost thermal generation and hydro storage.
4. It requires that utility customers pay a charge for deliveries where BPA provides stepdown transformers at substations.
5. It includes a rate schedule which covers the purchase of reserves for meeting unanticipated loads. This rate is higher than the anticipated cost of new thermal generation to encourage utilities to participate in the construction of new thermal plants.

Control Engineering Chief Donald E. Johannsòn describes Control Center functions to Deputy Under Secretary William W. Lyons (right).

6. It establishes a new industrial firm power rate, under which BPA will make available to its industrial customers a new class of lower grade power. This will provide needed additional reserves for utility loads.

Discontinued under the new rate schedules is a rate designed for mainline electrified railroads. No application had been made under this rate since it was established in 1948. Concern about this discontinuance has been expressed by a number of parties interested in electrified urban mass transit. Should power become available for such use and should there be an application, it would not be difficult to establish a suitable rate within a reasonable period of time.

A separate schedule of BPA wheeling rates will be submitted to the Federal Power Commission for approval in 1975 as required under the Federal Columbia River Transmission System Act.

SYSTEM CONTROL ENTERS NEW ERA

A third milestone during 1974 was the dedication of the William A. Dittmer BPA System Control Center in Vancouver, Washington, and the subsequent transfer of system control functions to this space-age facility. It became operational on December 1, 1974, which date marked the closure of the control center in the BPA Portland headquarters building. The latter was in service for 20 years, a remarkable longevity in this fast-moving era of electronic technology.

The Dittmer Control Center represents some of the most advanced electric utility control-dispatch concepts in the world. Many of these concepts, as well as much of the

Libby Dam on the Kootenai River in northwestern Montana.
Photo courtesy of U.S. Army Corps of Engineers

Dittmer computer and communication technology, have been adopted from the innovations of the aerospace program. Extensive data acquisition equipment centering in 15 digital computers supplies information to 22 operator consoles which are capable of producing hundreds of different displays. Dittmer personnel carry on extensive input-output dialogs with the computers by means of special keyboards and push buttons on these consoles. The computerized manipulation of voluminous data is quickly translated into human decisions. These decisions are then utilized to carry out the four major control functions at Dittmer -- system surveillance, remote command, equipment dispatch, and generation/load forecasting and scheduling.

More than 1,500 people were on hand for the dedication of the new facility on August 19, 1974. Deputy Under Secretary of the Interior William W. Lyons represented Secretary Morton and gave the latter's dedication address. In addition to the ceremonies, BPA staff conducted tours of the control center and other facilities located at the J.D. Ross Complex in Vancouver. Special features which attracted wide interest were the historical exhibit installed in the Dittmer lobby and a multi-projector audio-visual display in the visitor gallery overlooking the dispatch concourse.

During November and December 1974, nearly 100 power supply and system operations personnel moved to the Dittmer building, which now houses its full complement of some 260 employees.

Eastern Control Center

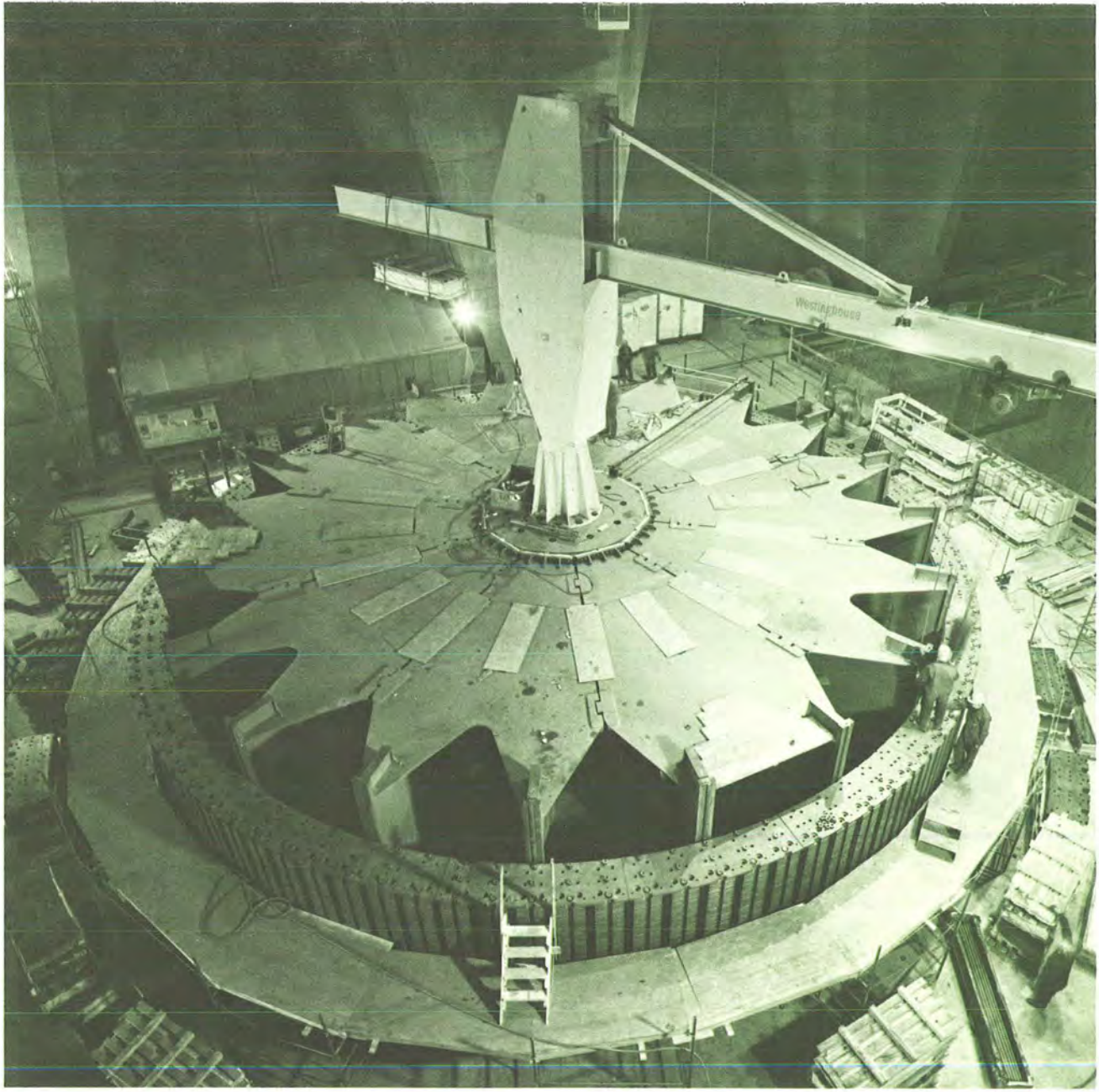
The BPA Eastern Control Center near Moses Lake, Washington, will occupy some 14,500 square feet of the Federal Center Building which was formerly an Air Force facility and is now managed by the General Services Administration. With outstanding cooperation from GSA, the space to be occupied by BPA is being completely remodeled to accommodate system control computer equipment. The facility will house a computer-directed supervisory control and data acquisition system with a number of supporting systems. Operation is scheduled for July 1976.

When completed, the control center will house the supervisory control master station providing direct control of 35 substations throughout the eastern segment of the BPA service area. These substations serve all the major subtransmission east of the Cascade Mountains. In addition to remote control of substation equipment, this system will provide telemetering of voltage, power and reactive data, and split-second reporting of abnormal conditions on the subtransmission system. The Eastern Control Center will also serve as a backup for the Dittmer Control Center in the event of an emergency.

Substation Integrated Control System

Another development to improve control system reliability and lower substation design and construction costs is the Substation Integrated Control System (SICS). This system utilizes standardized software and hardware to establish a common data base for integrating many systems into a single modular control system. These systems include a Supervisory Control and Data Acquisition remote unit, a high-speed events recorder, operator control and display, and other equipment for load shedding and dropping generation.

The first SICS installation will be at the 500-kV Hatwai Substation near Lewiston, Idaho, which is scheduled for energization in September 1975.



Two workmen (right center) install steel plating for a gigantic new rotor in the Grand Coulee Dam third powerhouse.
Photo courtesy of Bureau of Reclamation

Hydro-Thermal Power Program

During the past year many of the Nation's electric utilities have announced cutbacks in their capital construction programs. Escalating costs, record-high interest rates and lagging utility revenues all have had a negative effect upon the utilities' ability to raise funds in the money market. Many utilities also experienced less-than-forecasted loads as a result of energy conservation and a slackening in business activity. Together these factors have tended to discourage the building of new power facilities. Except for the energy conservation factor, continuation of this trend has ominous implications for the Nation's power supply systems.

By contrast, the Hydro-Thermal Power Program of the Pacific Northwest has moved forward under the added impetus of the Phase 2 agreement on concepts announced in December 1973. Once again the public and investor-owned utilities in the region joined with major industrial customers and the Federal Government to develop plans for the financing and construction of

additional generation and transmission facilities beyond 1981. While the complex negotiations on Phase 2 proceeded during calendar year 1974, considerable progress was achieved in developing the Phase 1 projects.

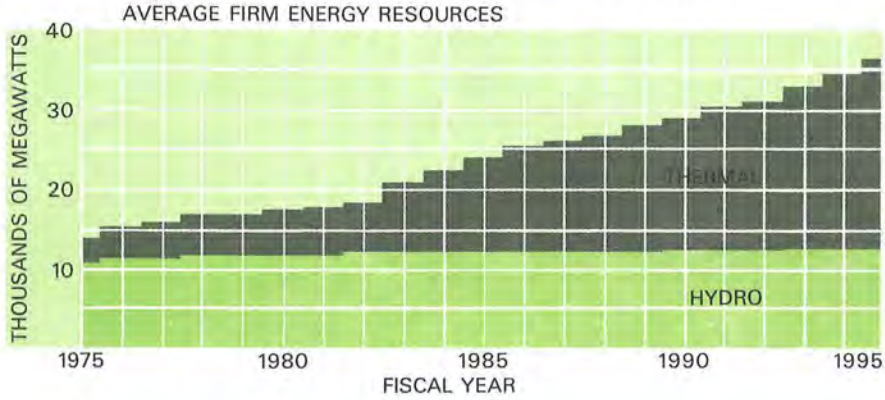
THERMAL PROJECTS SHOW MIXED GAINS

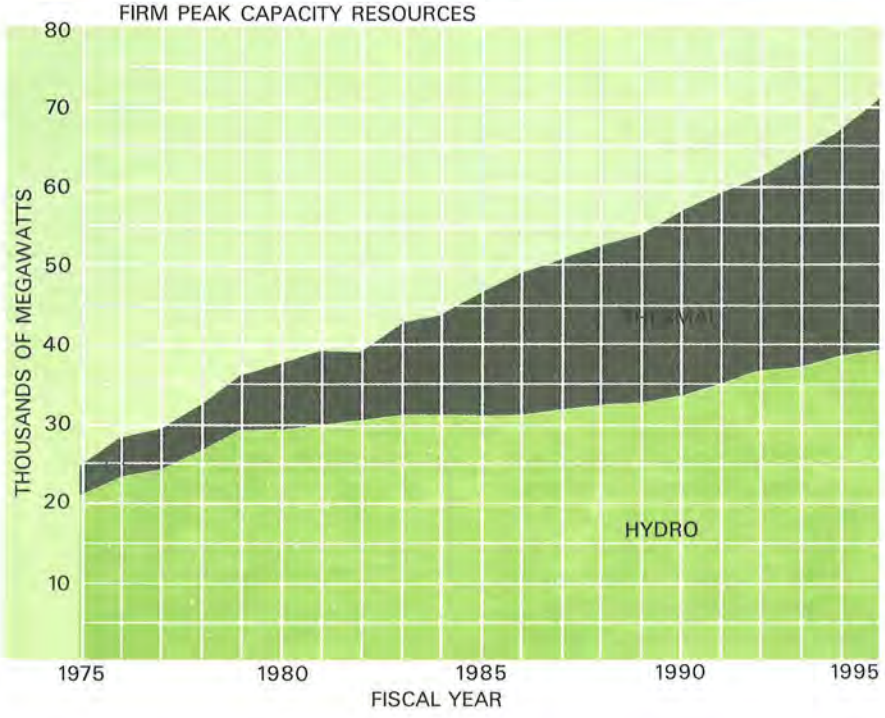
Technical problems continue to plague the Centralia coal-fired plant. Although placed in commercial operation in late 1973, its two units have not been able to meet their combined rated capacity of 1,400 megawatts. In order to conform with air quality standards, major precipitator additions were installed during 1974. These may have to be augmented by modifications to the induced draft system in order to increase the plant's output.

As of October 1974 the Trojan nuclear plant near Rainier, Oregon, was 85 percent completed. The nominal plant output of this first commercial nuclear facility in the Pacific Northwest will be 1,130 megawatts. Completion of construction of the plant, whose main sponsor is Portland General Electric Company, is now scheduled for November 1975.

A major planning change occurred during the year with regard to the Hanford Electric Generating Project (formerly called the New Production Reactor). Originally this project was slated for conversion into a new plant, which would have increased its capacity from 840 megawatts to approximately 1,220 megawatts. Under the revised plan, the HEGP will remain in operation until at least October 1977. Sponsored by the Washington Public Power Supply System, a separate new facility will be constructed on the Atomic Energy Commission's Hanford Reservation. This plant - - WPPSS Nuclear Project No. 1 - - will provide capacity of approximately 1,250 megawatts. It is scheduled for completion in September 1980.

PACIFIC NORTHWEST AREA CRITICAL HYDRO CONDITIONS





The WPPSS Nuclear Project No. 2, also located on the Hanford Reservation, is scheduled for completion in September 1978. Construction underway includes that of containment substructures, turbine-generator building foundations, spray ponds and excavation for a radioactive waste building. As of December 1974 plant construction was 12 percent completed.

The Washington Public Power Supply System is also building a 1,240-megawatt facility, WPPSS Nuclear Project No. 3, near Satsop, Washington. Thirty percent of the ownership of this plant is divided among 4 investor-owned utilities. The power plant is scheduled for completion in September 1981.

Because of a 1973 decision by the Oregon Nuclear and Thermal Energy Council denying a siting permit to Portland General Electric Company for building a nuclear facility at the Carty Reser-

Jim Bridger coal-fired powerplant under construction near Rock Springs, Wyoming.
Photo courtesy of Pacific Power & Light Company

voir near Boardman, Oregon, an alternative site has been selected. Public hearings will be conducted in early 1975 by the Nuclear Regulatory Commission with regard to the proposed site at Pebble Springs, four miles southeast of Arlington, Oregon. The plant will have a capacity of approximately 1,260 megawatts and has a tentative completion date of July 1982.

Construction is proceeding on the Jim Bridger coal-fired plant near Rock Springs, Wyoming. This facility is sponsored by Pacific Power & Light Company and jointly owned by PP&L and Idaho Power Company. It will include four 500-megawatt units, the first of which is in commercial operation. The second, third and fourth units are scheduled for completion in June 1976, March 1977 and September 1979.

An eighth powerplant which will add to the regional electric capability is the coal-fired plant now under construction near Colstrip, Montana. This facility is sponsored by The Montana Power Company and Puget Sound Power & Light Company. The first two 350-MW units (rated 330-MW) are scheduled for completion in September 1975 and July 1976.

Under Phase 1 of the Hydro-Thermal Power Program, BPA has acquired through net billing arrangements all of the generating capability of the WPPSS Nuclear Projects Nos. 1 and 2, as well as the generating capability of WPPSS' 70 percent ownership share of its Nuclear Project No. 3 and the generating capability of Eugene Water and Electric Board's 30 percent ownership share of the Trojan project.

NEW HYDRO PROJECTS AUTHORIZED

The past year saw Congressional authorization of an additional hydroelectric project in the Pacific Northwest, a reregulating powerplant to be located approximately 5 miles downstream of Libby Dam in northwestern Montana. It will have 4 generating units with total capacity of 50 megawatts. This brings to 34 the total number of Federal hydro projects in the region which are operating, under construction and authorized.

The 93rd Congress also authorized a study of a second powerhouse at McNary Dam, and the U.S. Army Corps of Engineers began holding a series of public hearings on the project in December 1974.

The 220-megawatt unit at Dworshak

Washington Public Power Supply System Nuclear Project No. 2 under construction on Hanford Reservation.
Photo courtesy of Washington Public Power Supply System

Dam went into commercial service in September 1974, the 27th operating project in the Federal Columbia River Power System. The two smaller units at Dworshak will become operational in early 1975.

In preparation for the construction of the second powerhouse at Bonneville Dam, the Corps of Engineers received permission to relocate the town of North Bonneville to a site several miles downstream from its present location. Planning is underway for building the new town and relocating its inhabitants.

Construction of the third powerhouse at Grand Coulee Dam proceeded approximately on its revised schedule. Despite the problem created by high streamflows during the winter months, the drawdown to permit excavation of the third powerhouse forebay and the subsequent refilling of Roosevelt Lake managed to meet the schedule. The first two 50-megawatt reversible pump-turbine units to improve Coulee irrigation deliveries went into commercial service in late 1974.

Installation of 11 additional units is now underway at Chief Joseph Dam. When completed, they will more than double the peaking capacity of the project.

The Corps of Engineers has scheduled joint dedications of Little Goose, Lower Granite and Lower Monumental Dams in June 1975. A dedication of Libby Dam is scheduled for August 1975. It is anticipated that President Ford may officiate at one or both of the events.

At the end of calendar year 1974, the 27 Federal Columbia River Power System projects in commercial operation had a total nameplate capability of 11,046 megawatts.

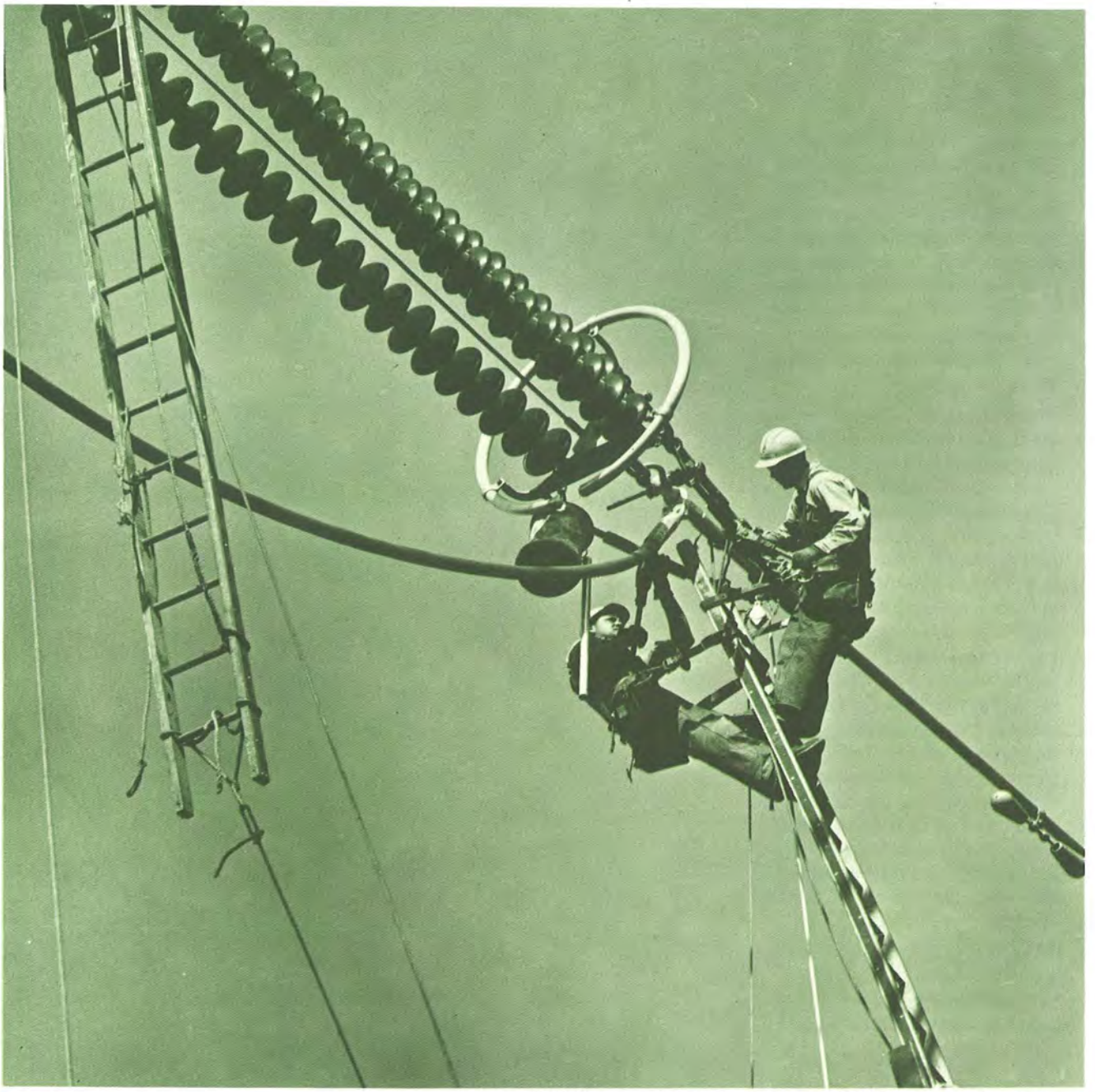
NEGOTIATIONS PROCEED ON PHASE 2

By early 1973 it was evident that certain procedures necessary to implement Phase 1 of the Hydro-Thermal Power Program - - net billing, in particular - - would no longer be feasible after 1983. In addition, the estimated leadtime for planning and construction of nuclear power generation has nearly doubled over the past decade. Finally, the costs of all projects - - thermal and hydro alike - - have increased substantially. In view of these factors, intensive discussions were undertaken during 1973 among the region's utilities, BPA and its major industrial customers to explore alternative methods of

Steel tower erection underway.

continuing the Hydro-Thermal Power Program. In December 1973 an agreement on concepts was announced. From it evolved a general blueprint for carrying on the program beyond 1981. This Phase 2 planning involves the financing, construction and operation of some 830 megawatts of additional coal-fired generation, about 6,330 megawatts of nuclear generation, and additional hydro peaking capacity.

Negotiations are continuing between BPA and its utility and industrial customers to develop contracts for Phase 2 implementation. One consideration is that of converting industrial modified firm power contracts to a lower grade of power in order to provide the necessary reserves to meet slippages in new generation or for failure of new plants to operate satisfactorily once they come on line. Another mechanism under discussion is a Trust Agency Agreement authorizing BPA to negotiate contracts on behalf of a group of preference customers whereby each would agree to purchase a block of power from a new thermal plant. Under the proposed Trust Agency Agreement, BPA would take this power into its system, wheel it over BPA transmission lines, and provide reserves, load factoring and other services.



BPA linemen replace insulators on 500-kV transmission tower.

Building the Transmission System

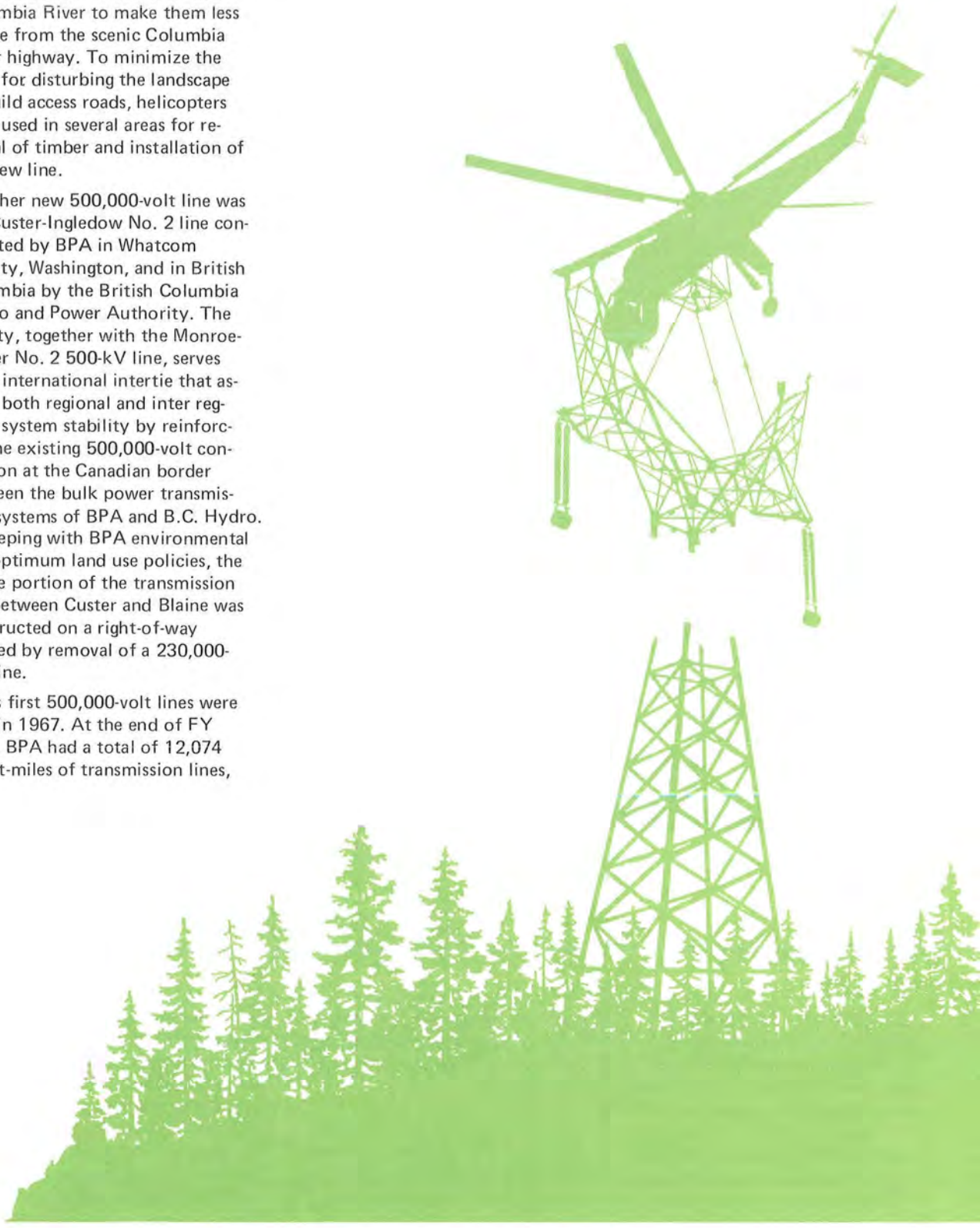
During FY 1974 BPA energized 322 circuit miles of transmission line while removing 298 miles of line. About 189 miles of the newly constructed transmission were 500,000-volt facilities. These large lines can transmit greater amounts of power per acre of right-of-way than multiple low-capacity lines. For example, a standard 500,000-volt transmission line can carry 5 times as much power as a 230,000-volt line, occupying only slightly more land.

One of the major lines energized by BPA in FY 1974 was the 180-mile 500,000-volt transmission line between Hanford Substation in Benton County, Washington, and Ostrander Substation in Clackamas County, Oregon. The line was constructed largely on right-of-way vacated by removal of the 230,000-volt North Bonneville-Midway line and the 115,000-volt Bonneville-Oregon City double-circuit line. The line transmits supplemental power from the mid-Columbia area to the Portland metropolitan area. Con-

struction techniques involved such environmental considerations as special paint on towers near the Columbia River to make them less visible from the scenic Columbia River highway. To minimize the need for disturbing the landscape to build access roads, helicopters were used in several areas for removal of timber and installation of the new line.

Another new 500,000-volt line was the Custer-Ingledow No. 2 line constructed by BPA in Whatcom County, Washington, and in British Columbia by the British Columbia Hydro and Power Authority. The facility, together with the Monroe-Custer No. 2 500-kV line, serves as an international intertie that assures both regional and inter regional system stability by reinforcing the existing 500,000-volt connection at the Canadian border between the bulk power transmission systems of BPA and B.C. Hydro. In keeping with BPA environmental and optimum land use policies, the 9-mile portion of the transmission line between Custer and Blaine was constructed on a right-of-way vacated by removal of a 230,000-volt line.

BPA's first 500,000-volt lines were built in 1967. At the end of FY 1974, BPA had a total of 12,074 circuit-miles of transmission lines,



with 2,457 miles of that total being 500,000-volt--just over 20 percent of the total BPA grid. Five new substations were energized during the fiscal year, bringing the total to 335 as of June 30, 1974.

MAJOR CONTRACTS AWARDED

In July and August, 1974, the awarding of 5 of the largest construction and material contracts in its history was announced by Bonneville Power Administration. These contracts cover a major portion of the 500-kV, double-circuit Grand Coulee-Raver line which will strengthen the transmission link between Grand Coulee Dam and the Puget Sound area.

The total amount of the original contracts was $36.2 million, although price adjustment provisions could increase this figure substantially.* The entire Grand Coulee-Raver transmission facility is scheduled for energization in October 1977.

**See second paragraph of "Inflation, Shortages Pose Problems."*

Two of the contracts, totaling $17.7 million, are for construction of 101 miles of the 174-mile line. One of these covers erection of towers along the western 51 miles of the route, which the contractor has elected to accomplish by helicopter. The construction contracts also included the dismantling of two existing 230-kV lines in order to utilize essentially the same right-of-way for the higher capacity line.

The procurement of some 15.5 million feet of conductor for the Grand Coulee-Raver line was negotiated under 3 contracts totaling $18.5 million as a base price, subject to adjustment for cost escalation. Some 3,000 miles of conductor is needed for the 174-mile route because it will be strung in triple-bundles consisting of 3 strings of conductor to each of the 3 phases on the alternating-current line. Since Grand Coulee-Raver is a double-circuit line, 6 triple-bundles will be strung.

Another major contract, this one for $4.3 million, was awarded in September 1974 for the purchase of 4 high-capacity, high-voltage 500/230-kV transformers. The capacity of each of the giant transformers will be 533,000 kilovolt/amperes. Three of the units will be installed in a 1,600,000-KVA transformer bank at the BPA Maple Valley Substation near Renton, Washington. The fourth transformer will serve as a system spare.

INFLATION, SHORTAGES POSE PROBLEMS

Fiscal Year 1974 proved to be a "sellers' market" with regard to many of the materials used in the construction and maintenance of the transmission system. Not only was there an upswing in prices, but shortages occurred for the first time since the Korean War, and delivery leadtimes lengthened. An increasing number of suppliers took exception to BPA procurement requirements, especially with regard to delivery and pricing provisions. As a result, many contracts had to be negotiated rather than relying upon standard bidding procedures.

The lifting of price controls on many items in April 1974 added to the uncertainty as to future prices. Since many BPA procurement contracts call for special manufacture and deliveries scheduled over sev-

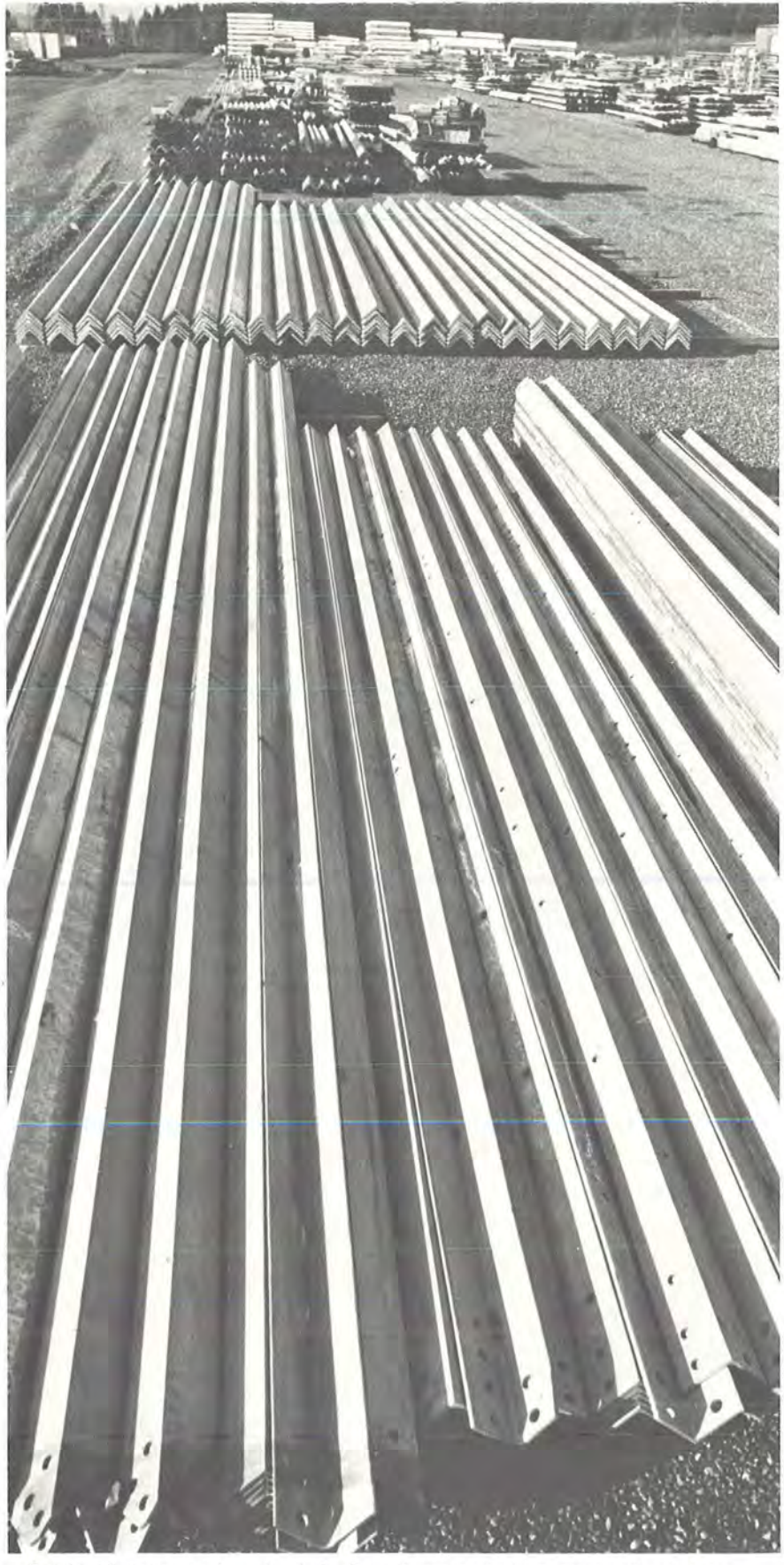
eral years, it was necessary to include price adjustment provisions in order to compete for materials. As of September 30, 1974, BPA had some 50 contracts containing price adjustment clauses and totaling nearly $34 million. Based upon escalation to date, additional payments in the order of $5 million are anticipated.

The market price levels for major items of BPA procurement have shown a dramatic upswing over the past 3 years. Using FY 1971 as the base year, the cost of 500-kV transformers has risen by 80 percent. The price of insulators has nearly tripled during the same period, while tower steel prices have more than doubled. During just the past 2 years the average cost of various sizes of conductor has approximately doubled. Not only does this price escalation have a direct impact upon construction costs, but it poses substantial budgetary problems under the annual appropriations process. Hopefully the recently enacted BPA self-financing legislation will provide greater flexibility in budgeting and obligating funds during periods of severe price fluctuation.

The strong trend in previous years toward foreign procurement has been substantially reversed. Until FY 1973 foreign manufacturers of major electrical equipment and materials supplied about 50 percent of BPA requirements. During the past 2 fiscal years, however, domestic suppliers have accounted for approximately 70 percent of these purchases. The future outlook is for a period of fluctuation in which both foreign and domestic firms compete strongly for BPA and other U.S. utility business.

RESEARCH AND DEVELOPMENT PROJECTS UNDERWAY

Long range system planning studies show the need for ultra high voltage (UHV) transmission lines to accommodate load growth and ad-



Stacks of tower steel at the J. D. Ross Complex in Vancouver, Washington, are part of the BPA material inventory.

BPA technician inspects section of the CGITS installation near Ellensburg, Washington.

ditional generation in the Pacific Northwest. It is expected that the optimum voltage level to succeed the 500-kV grid now in use will be in the 1,000 to 1,200-kV range. Such UHV transmission should be operational by the late 1980's if regional power supply needs are to be met within environmentally acceptable limits. Because of the many technical problems posed by UHV transmission, a development period of up to 10 years will be required.

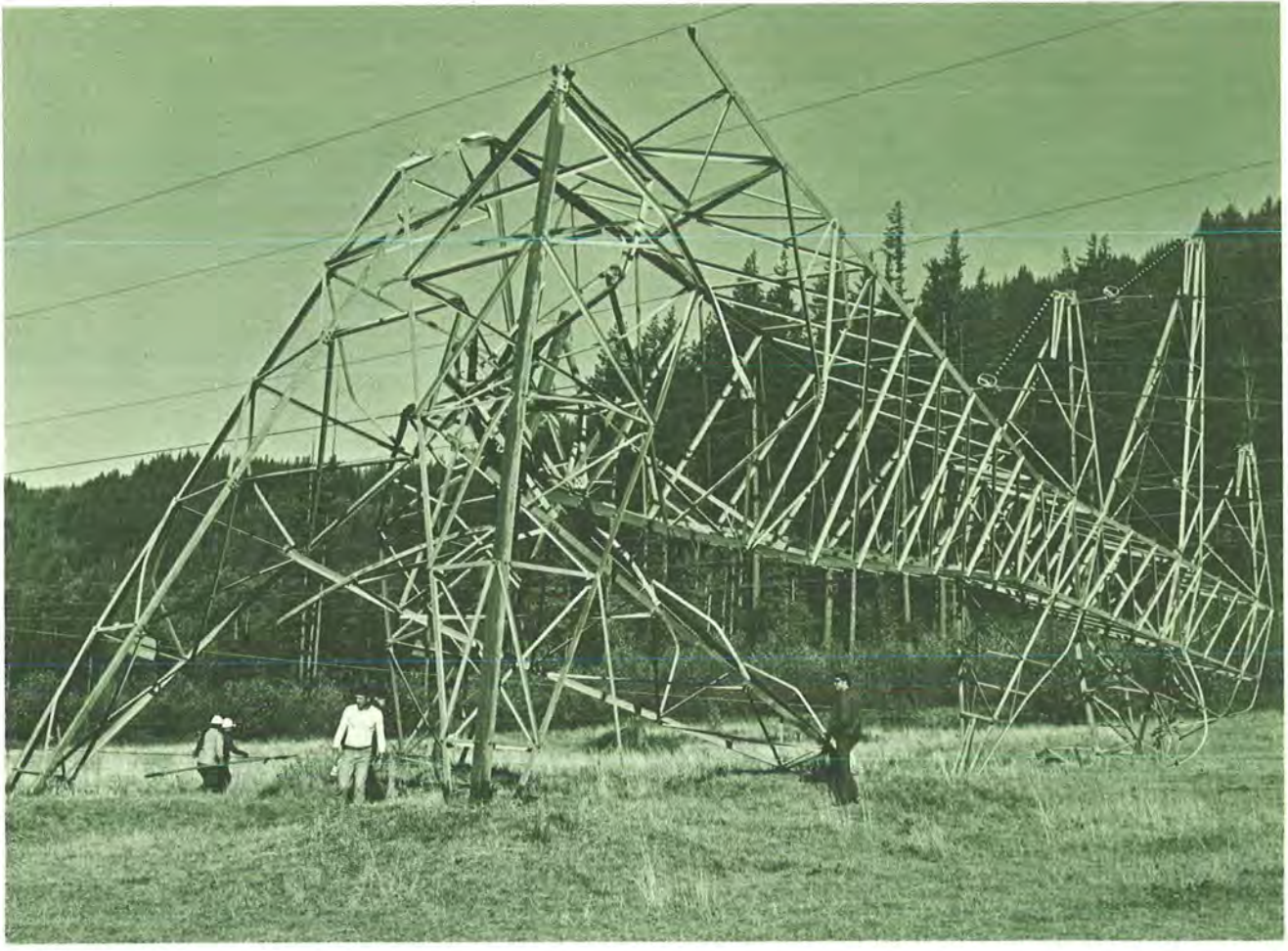
BPA accordingly submitted a proposal in early 1974 to initiate a project for the design, construction and evaluation of prototype 1,100-kV transmission and substation facilities. Approved by the Department of the Interior and the Congress, this project will have FY 1975 funding of approximately $5.5 million under the Department's Research and Development budget. Overall costs are estimated at $10.6 million for design and construction, and $2.0 million for a 5-year test program.

Under the project plan, two prototype 1,100-kV lines will be built. The first of these, a 1-mile line near Moro, Oregon, will be used to study UHV structural and mechanical phenomena under severe weather conditions. The second, a 1.4-mile line near Lyons, Oregon, will provide information as to the electrical characteristics of 1,100-kV transmission. Current planning calls for the two test installations to be operational by late 1976.

Underground Transmission Facility Nears Completion

Construction got underway early in the fiscal year on a prototype Compressed Gas Insulated Transmission System (CGITS) near Ellensburg, Washington. The 600-foot length of isolated phase cable will be the first such 500-kV system in commercial operation when it is completed in early 1975. Each of the system's three phases consists of a 7-inch diameter aluminum pipe, which serves as the conductor, within a 22-inch outer pipe sheathing each phase. The center conductor is held in place in the pipe by epoxy spacers, and insulation is provided by sulfur hexafluoride gas (SF_6) under 60 pounds of pressure.

The CGITS project is part of BPA's involvement in the Electric Power Research Institute study of underground transmission. While undergrounding of low-voltage distribution lines is becoming quite common, this installation marks a significant advance in high-voltage transmission technology.



Twisted steel of this 230-kV line tower near Brightwood, Oregon, was the handiwork of "J. Hawker."

The Operating Year

Fiscal Year 1974 saw no major system disturbances as a result of natural forces such as earthquakes, windstorms or avalanches. Two series of incidents with potentially crippling consequences did occur, one of them caused by equipment failure and the other man-inspired. In both cases, prompt action on the part of BPA operation and maintenance personnel forestalled the threat of major service interruptions.

The first of these took place on January 13, 1974, when the BPA Roosevelt Microwave Repeater Station near Roosevelt, Washington, failed due to an explosion and fire caused by a leak in a liquid propane gas line. This failure caused the loss of the Automatic Generation Control System and forced several important transmission protection circuits out of service. While the BPA Dispatch Center maintained powerplant regulation and tie line loading via voice communication, maintenance crews swung into action. A heavy snowpack at the site required access to be provided by helicopter and sno-cats. Despite these conditions and the extensive equipment loss, critical control and protection services were restored within 25 hours.

BPA GRID A REPEATED TARGET FOR SABOTAGE

In common with other utilities, BPA is plagued by vandalism which results in substantial manpower and material costs, as well as occasional power outages. During calendar year 1974, however, the BPA transmission system became the target for repeated acts of major sabotage. These occurred in two widely separated areas with seemingly no connection between the two.

Towers Near Spokane Attacked

On the night of June 7, 1974, two 230-kV steel towers a few miles northeast of Spokane, Washington, were downed. One of these had its legs sawed through and the other collapsed when the bolts securing its structural members were removed.

Eight days later another 230-kV

tower northwest of Spokane was observed by a local resident to be leaning. A closer inspection by BPA line crewmen showed that all but four main bolts had been removed. As with the previous incident, local authorities and the Federal Bureau of Investigation were notified, and an intensive investigation was launched.

The third act of sabotage in the Spokane area occurred shortly after midnight on June 19, when 15 guy wires supporting a lattice-type 230-kV tower were severed and the structure collapsed. The downed line relayed out, disrupting service to a major industrial load.

A few nights following the third incident, someone pasted a crude, hand-lettered message on the door of the BPA Glenn H. Bell Substation, which is served by all of the vandalized transmission lines. The note, signed "The Vandales," demanded $30,000, but appeared to be a hoax.

To date, an ongoing FBI investigation has apparently yielded no material evidence pointing to the identity of those responsible for the Spokane area assaults. There has been no further extortion communication.

Despite the extensive damage incurred, BPA line crews effected speedy repairs and kept service interruption to a minimum. The cost of re-erecting the downed towers exceeded $100,000.

Oregon Tower Bombing and Extortion Attempt

An even more bizarre episode began on Friday, October 4, 1974, with the discovery that three BPA transmission towers near Maupin, Oregon, had been bombed. Routine line patrols detected the damage to the 230-kV steel structures, which had sizable sections of their legs blown away. Two of the four legs of each tower had been vandalized, although one demolition charge was still intact. Only the cross bracing members of the towers prevented them from buckling.

Map showing locations of four bombing sites in the general vicinity of Mt. Hood, Oregon.

Following an inspection by Federal Bureau of Investigation personnel and removal of the unexploded dynamite charge, temporary repairs were made. No outages resulted from this first series of bombings.

On Wednesday, October 16, three towers were downed by demolition blasts near Brightwood, Oregon, on the western slope of Mt. Hood. On this occasion line outages did occur, as well as grass fires which were extinguished by State of Oregon fire fighting personnel and local residents.

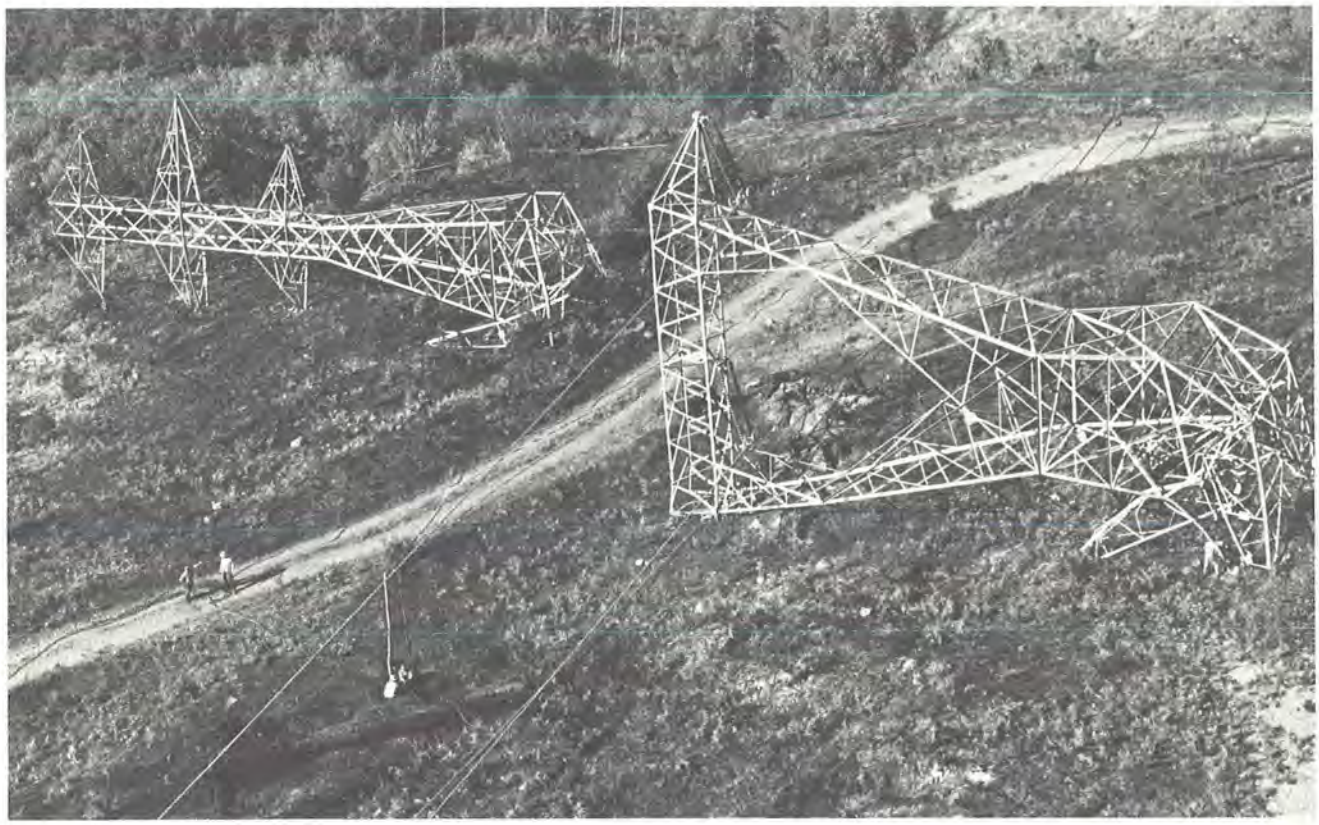
Five more bombed towers were discovered on October 17 and 18, three of them in the vicinity of Parkdale, Oregon, and two near Dodge Park, Oregon. All of these structures remained standing and there was no interruption of service due to light load conditions and the availability of parallel lines. The similarity in the placement of the dynamite charges and other evidence led to the conclusion that all 11 Oregon tower bombings had been instigated by the same person or persons.

On the evening of Friday, October 18, an extortion letter addressed to Bonneville Power Administration was received through the mail by the Portland Division of the FBI. At a meeting the following morning with law enforcement officials, BPA was advised that the extortionist, who signed the letter "J. Hawker," was demanding $1 million, with detailed instructions as to radio equipment and communication procedures for arranging payment. He threatened, unless payment were forthcoming, to cause major blackouts in the Portland, Oregon, area. Details provided in the letter appeared to tie the writer to the bombings, which was not the case in the earlier Spokane area blackmail incident.

The BPA Administrator rejected the extortion demand.

At a news conference held later in the day, he announced this decision, as well as offering a $100,000 reward for information leading to the arrest and prosecution of those responsible. This firm response was based in part upon the premise that to accede to the blackmail threat would inevitably place utilities and other public services throughout the United States in jeopardy.

Further, at the time it appeared



Crumpled transmission towers give credence to extortion threat.

entirely possible that the blackout threat could be carried out. Local emergency services, hospitals, nursing homes, and the general public had to be alerted to the risk of a sudden and prolonged outage.

Disclosure of the extortion demand and BPA's reaction generated a barrage of publicity throughout the nation. The Secretary of the Interior strongly endorsed the BPA stand, as did the Attorney General and other Government officials, news media editorials, and correspondence from many private citizens. None of these suggested, either directly or indirectly, that BPA should comply with the extortion demand. Particularly heartening was the response of the State of Oregon, the City of Portland and other local authorities, who immediately initiated emergency service preparations to cope with possible blackouts and other service disruptions.

The entire BPA system was placed on an emergency alert, and both ground and aerial surveillance of the transmission grid were drastically intensified. FBI agents and Oregon State Police officers accompanied BPA helicopter patrols, and public appeals were issued asking people to report suspicious activity near transmission towers and other electrical facilities.

Concurrent with these events, BPA line crews and other personnel labored tirelessly to repair the damaged towers and to restore full service. Due to their unstinting efforts, all of the structures were rebuilt by October 27. Backup facilities maintained normal service during the repair period.

A second extortion letter was received by the FBI on October 22. Repeating his demand for $1 million, the writer this time threatened to ignite fires in the forested area around Bull Run Reservoir, which supplies the City of Portland and several suburban communities with water. Security precautions were immediately taken by Federal, State and local authorities to protect the Bull Run watershed. There were indications in the letter that the extortionist's change of target may well have been influenced by his failure to impair the power supply and by BPA's unwavering rejection of the original demand. Another apparent factor was the publicized fact that Portland General Electric Company's Harborton combustion turbine generator located within the City of Portland could supply about one-quarter of the city's load.

An intensive investigation by the FBI culminated in the arrest of a Portland area husband and wife on November 8. They subsequently entered guilty pleas to the bombings and extortion attempt in the Federal court. On December 16,

the man was sentenced to two 10-year prison terms to run successively, and his wife drew two 5-year prison terms to run successively.

In all, the direct costs to BPA for the Oregon tower repairs totaled $190,000, and for additional surveillance, $40,000. To date there is no indication that any of the numerous leads referred to the FBI qualify for the reward offered by the BPA Administrator.

As a result of the Spokane and Portland area sabotage incidents, BPA and the utilities are reviewing their security programs. In the case of BPA, it is impossible to maintain total surveillance of a 12,000-mile grid, but special precautions are taken around key facilities.

EMPHASIS CONTINUES ON ENERGY CONSERVATION

As a result of last year's acute water shortage in the Pacific Northwest, this region became a bellwether in what is now a national commitment to energy conservation. Bonneville Power Administration's energy conservation program, which was officially launched in July 1973, was designed to provide leadership and assistance to all Northwest utilities in stimulating a broad-based conservation effort.

At a Seattle news conference in August 1973, the Secretary of the Interior said, *"It now becomes apparent that the Pacific Northwest faces the first real test of whether we as a nation can and will exercise the self-discipline to ward off the looming energy crisis. The contest begins right now, and the name of the game is energy conservation."*

The public's response to the Secretary's challenge has been extremely gratifying. The news media in particular did an outstanding job of publicizing the need for electric energy conservation and how to achieve economies in the home, office and factory. During the period September - December 1973 consumers of electricity throughout the region achieved a 7.1 percent average reduction below the forecasted load.

Administrator Hodel receives Outstanding Service Award for his leadership in energy conservation from Interior Assistant Secretary James T. Clarke (right).

The heavy precipitation which ensued effectively eliminated the short-term power squeeze. Based upon current forecasts, however, the Pacific Northwest faces a series of substantial energy deficits over the next decade. And these forecasts do not take into account the trend toward greater dependence upon electricity because of skyrocketing prices and fears of shortages of oil and natural gas. Also, the possibility of additional slippages in construction of new generation which are being experienced throughout the Nation will worsen the situation. This gloomy outlook calls for a continuing emphasis upon energy conservation.

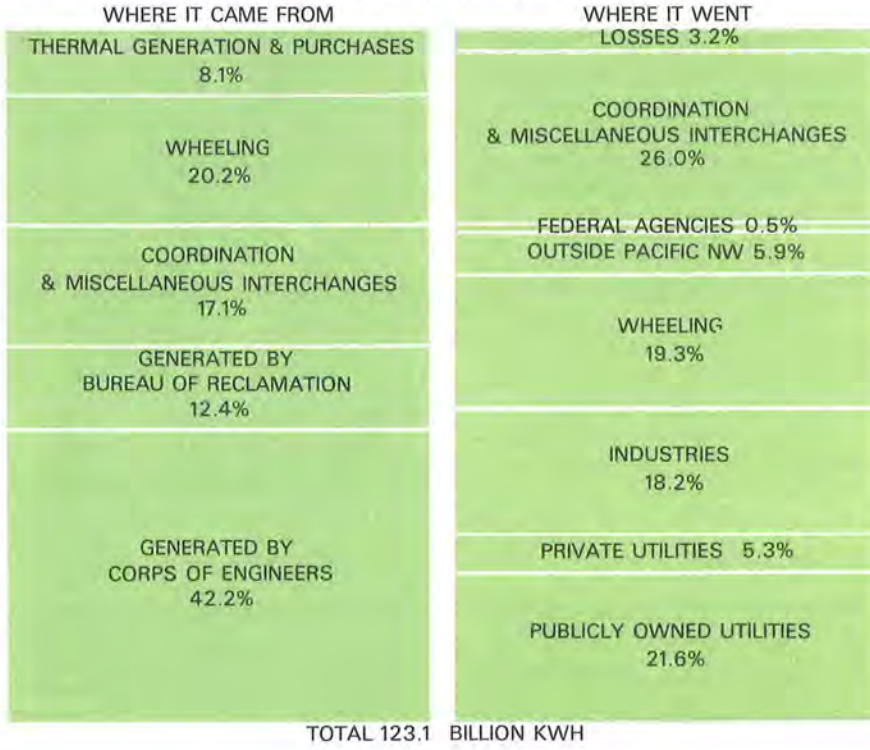
The good water conditions of the past year have understandably lessened the urgency of "crisis" conservation. However, regional loads during calendar year 1974 have averaged 4 percent below those forecast. During the critical period in 1973, many users learned and applied a variety of techniques to lower their electric energy consumption without any real sacrifice in comfort. Also, the economic recession has caused some industry cutbacks and plant closures.

BPA's continuing energy conservation program is directed at eliminating waste and using elec-

tricity more efficiently. The BPA internal energy conservation program has been particularly successful. During Fiscal Year 1974, it yielded total savings of 15 percent as compared to FY 1973. Major economies were achieved in the consumption of electricity, fuel oil and gasoline.

In October 1974 all BPA customers were notified that shortages in peaking capacity could occur in the winter months during periods of prolonged cold weather or loss of major generation. A contingency plan has been developed for notifying all customers through the BPA Area Offices if such a situation becomes imminent. The utilities in turn will issue public appeals to their customers as to when and how they should cut back on their power usage.

SOURCE AND DISPOSITION OF TOTAL ENERGY HANDLED BY BPA
Fiscal Year 1974



ENVIRONMENTAL SUITS FILED

During Fiscal Year 1974 three environmental suits were brought against Bonneville Power Administration. One of these has been resolved in BPA's favor, one has been appealed by the plaintiffs after the court ruled for BPA, and the third is still pending.

In December 1973, the Sierra Club, the Washington Environmental Council and the Colville Valley Environmental Council filed a request for an injunction seeking to prevent BPA from serving a proposed magnesium plant near Addy, Washington. In their suit, the three environmental groups contended that a BPA power sales contract signed in 1970 with Aluminum Company of America was not legal. They alleged that BPA had not fulfilled its responsibilities under the National Environmental Policy Act of 1969 (NEPA) in entering into the contract, and that obligating itself to deliver power to Alcoa was in violation of the Clean Air Act.

The Federal District Court judge in Seattle dismissed the suit in June 1974. He found that BPA had carried out its NEPA responsibilities by giving thorough consideration to the environmental effects of the transmission line needed to serve the proposed plant, and that BPA is not obligated by NEPA to assume responsibility for regulating or monitoring private activities resulting from the use of its power. With regard to the Clean Air Act claim, the court found that responsibility for administering the Act resides with the Federal Environmental Protection Agency and appropriate State and local authorities.

The plaintiffs subsequently moved for reconsideration of the case and sought an injunction against further construction of transmission facilities pending an appeal. In denying the motion for reconsideration, the court stated, *". . . the contract itself is not in violation of public policy or statute. Precedent to the sale of power, Bonneville demanded that Alcoa meet all environmental standards. Two separate environmental studies were made on the probable effect of the facility. The project passed the rigorous scrutiny of the Washington Department of Ecology and was thereby approved. It is clear that all environmental factors were thoroughly considered by Bonneville."*

The court subsequently denied the plaintiffs' motion for an injunction, and an appeal is now before the 9th Circuit Court of Appeals.

The second case involved a proposed cloud seeding program in the Flathead drainage area of western Montana. Planning for this program got underway in the fall of 1973 when the region was faced with a severe electric energy shortage as a result of a prolonged drought. The cloud seeding was to be activated only if

Chief Engineer George S. Bingham (left) and assistants check model used at public environmental hearings to depict alternate transmission routes.

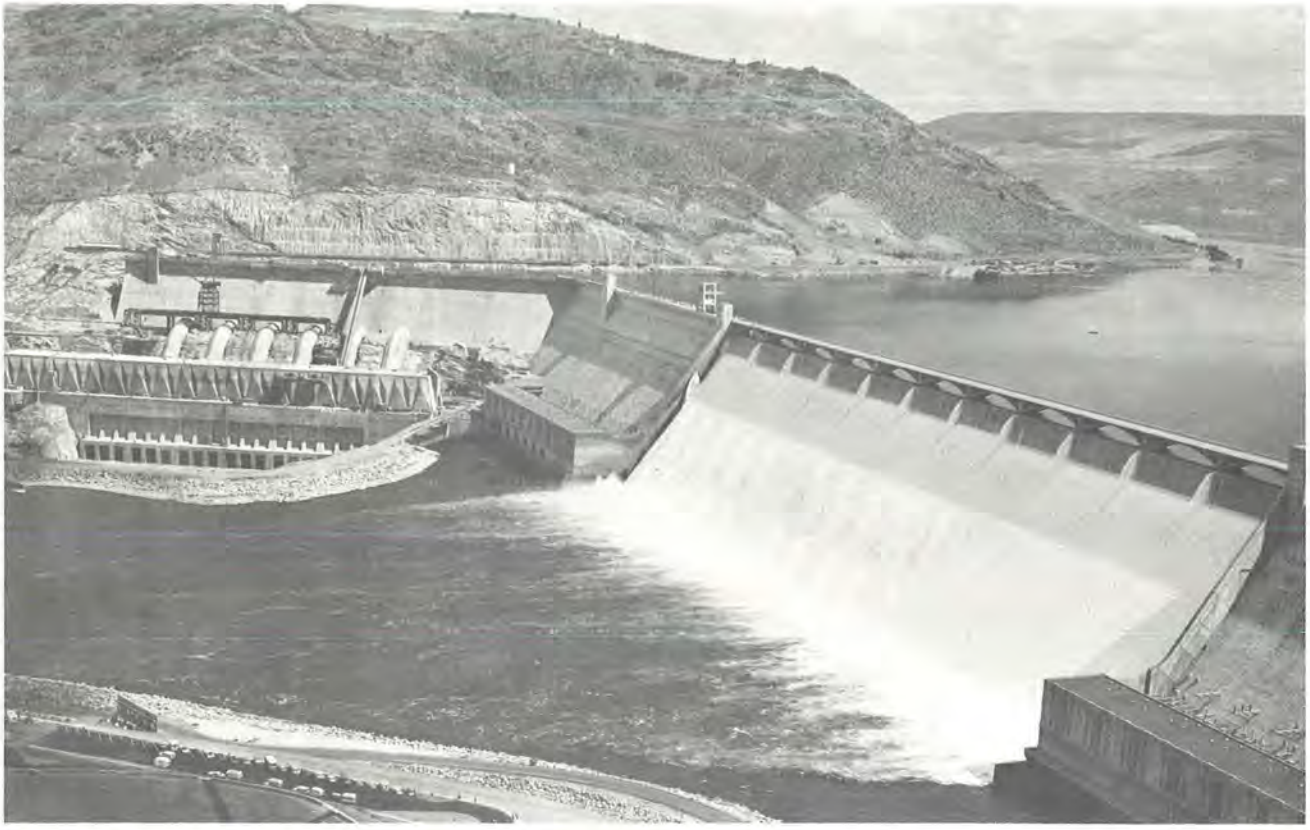
the early winter snowfall in the Flathead area was below normal, thereby jeopardizing the reservoir storage at Hungry Horse Dam.

Based upon such a contingency, BPA prepared and submitted an environmental statement, held public hearings, and was awarded a cloud seeding permit by the Board of Natural Resources and Conservation of the State of Montana. It also negotiated a contract with North American Weather Consultants to carry out the cloud seeding program if it were needed.

On January 30, 1974, the Montana Wilderness Association and the Wilderness Society of Washington, D.C., filed a suit to prevent BPA from engaging in any cloud seeding in the subject area. By that time an above-normal snowpack seemed likely, and BPA publicly announced on January 31 that it no longer needed the 1974 cloud seeding project. On February 4 the contract with North American Weather Consultants was cancelled.

The plaintiffs nevertheless continued to press their suit in an attempt to prohibit future cloud seeding in the Flathead area. In August 1974 the Federal District Court in Great Falls, Montana, dismissed the suit, ruling that BPA's discontinuance of the program in question rendered the case moot. The court noted that it could not make a finding as to future cloud seeding *"because no matter what is said here the procedure taken when cloud seeding next threatens is the procedure which must be examined."*

BPA's power sales contract with AMAX Pacific Corporation to serve a proposed aluminum reduction plant in Warrenton, Oregon, was the target for a third suit. In March 1974, the Clatsop Environmental Council filed a complaint challenging the legality of an amendatory agreement to the AMAX contract on the ground that it violates the National Environmental Policy Act and the Clean Air Act. The Government



Grand Coulee Dam and third powerhouse (left). Completion of new units will enable spilling water to produce power.
Photo courtesy of Bureau of Reclamation

filed an answer in May 1974, and discovery proceedings have been underway. No date has yet been set for a hearing on the matter.

INTERAGENCY COOPERATION CONTINUES

Since hundreds of circuit miles of the BPA transmission grid cross public lands managed by the U.S. Forest Service and the Bureau of Land Management, close liaison is maintained with these agencies. Memoranda of Understanding which facilitate these working relationships were updated and signed during FY 1974. Periodic joint meetings continue to be held to assure close coordination at the operating staff level. Techniques to facilitate the exchange of information, such as a common map base and scale, were generally agreed upon.

BPA is of course dependent upon hour-to-hour coordination with the U.S. Army Corps of Engineers and the Bureau of Reclamation in regulating the latters' dams to satisfy power requirements as well as other river management functions. The transition to a more highly automated control system during FY 1974 proceeded smoothly because of the solid cooperation of all concerned parties.

With the completion of the 3 storage projects in British Columbia (Duncan, Keenleyside and Mica Dams), hydroelectric and flood control operations are being implemented consistent with the terms of the Columbia River Treaty. As in the winter of 1971-72, the huge storage capacities of the Canadian projects - - together with those downstream in the United States - - again helped to prevent costly floods resulting from this year's near-record high water conditions.

BPA WINS NATIONAL SAFETY AWARD

In February, 1974, the Bonneville Power Administration won a first place award in the American Public Power Association's annual safety contest. The award was based upon BPA's extremely low incidence of injuries and accidents compared to man-hours of exposure. During calendar year 1973 the organization established its best work injury record in history. With more than 6 million man-hours of exposure, only 18 disabling injuries were incurred. BPA employees also lowered their vehicle accident rate to only 4.7 accidents per million miles driven, down from 6.5 accidents in 1972.

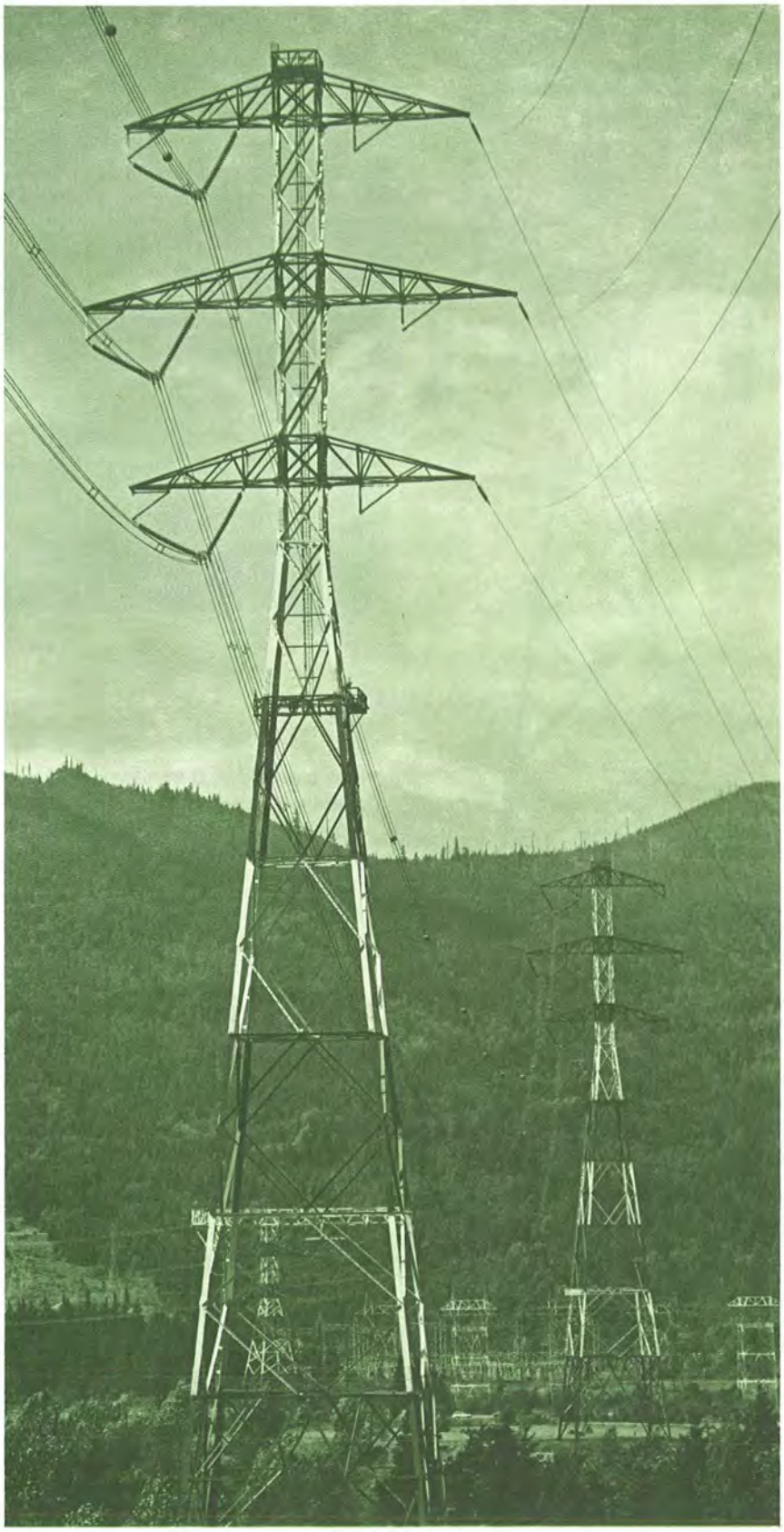
Power Sales for the Year

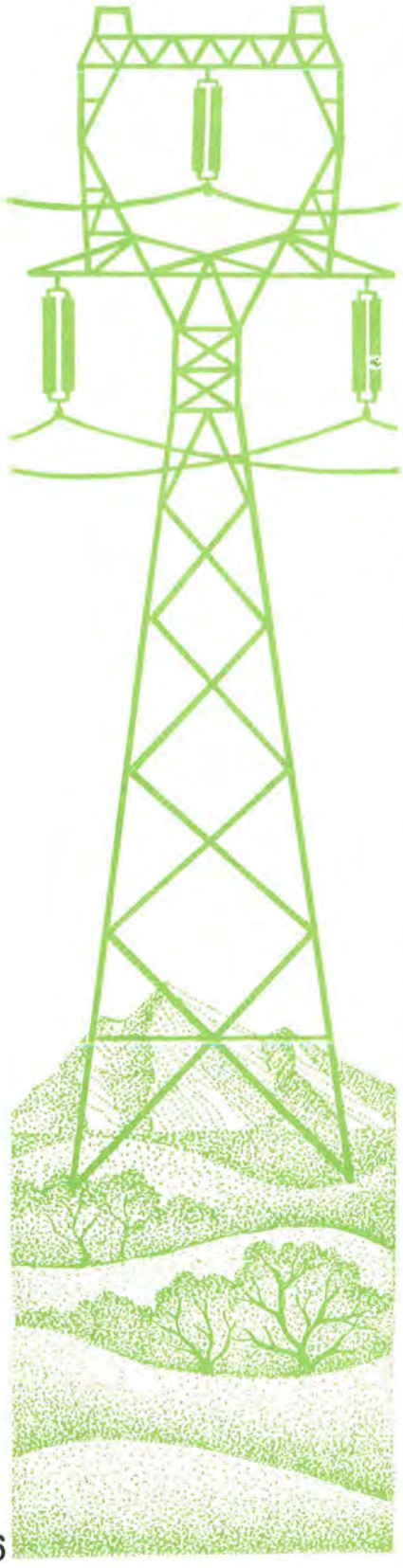
As described in last year's Annual Report, the Pacific Northwest experienced one of its most severe droughts on record during the first 10 months of calendar year 1973. This situation was dramatically reversed by the heavy rain and snowfall which began in late autumn and continued throughout the winter and spring of 1974. On one day, January 18, 1974, the natural streamflow at Grand Coulee Dam reached 317,000 cubic feet per second, or nearly 10 times the median streamflow for that time of year.

By late winter many areas of the region were reporting the heaviest snowpack on record. As a result, the January through July runoff at The Dalles, Oregon, was 155.6 million acre-feet, which was the highest runoff in the past 46 years. By the end of July all Federal reservoirs in the Pacific Northwest were full for the first time in 2 years. Barring major generation outages or prolonged cold spells, the region seemed assured of an adequate energy supply at least through the winter of 1974-75.

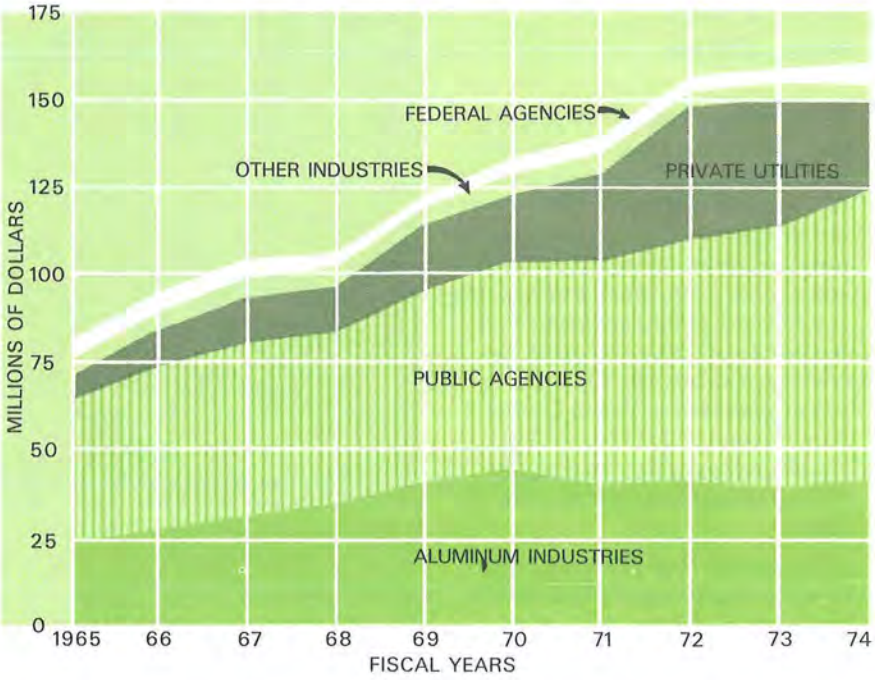
SURPLUS POWER TO SOUTHWEST SAVES FUEL

With storage reservoirs rapidly filling, surplus hydroelectric energy became available in the Pacific Northwest commencing in mid-December 1973. Bonneville Power Administration and the Northwest utilities began shipping this surplus energy south over the Pacific Northwest-Pacific Southwest Intertie, which helped to relieve the fuel shortage experienced by the Southwest utilities during the winter of 1973-74. While the fuel shortage itself was alleviated in the spring of 1974, the utilities in the Pacific Southwest continued to purchase Northwest surplus energy





BPA SALES OF ELECTRIC ENERGY



over a period of 8 months both as a fuel conservation measure and to defer the high costs of petroleum products needed to generate power.

During the period December 1973 - August 1974, when BPA discontinued surplus energy deliveries to the Southwest, it and the Northwest utilities exported a total of nearly 10 billion kilowatt-hours of electrical energy. This is the equivalent of some 16.5 million barrels of oil saved by the Southwest utilities, enabling them both to conserve their fuel inventories and minimize the environmental impact of burning fossil fuels. The estimated dollar savings in fuel expenditures were $230 million, with a resultant favorable effect upon the U.S. balance-of-payments deficit.

CUSTOMER LOAD GROWTH SLOWS

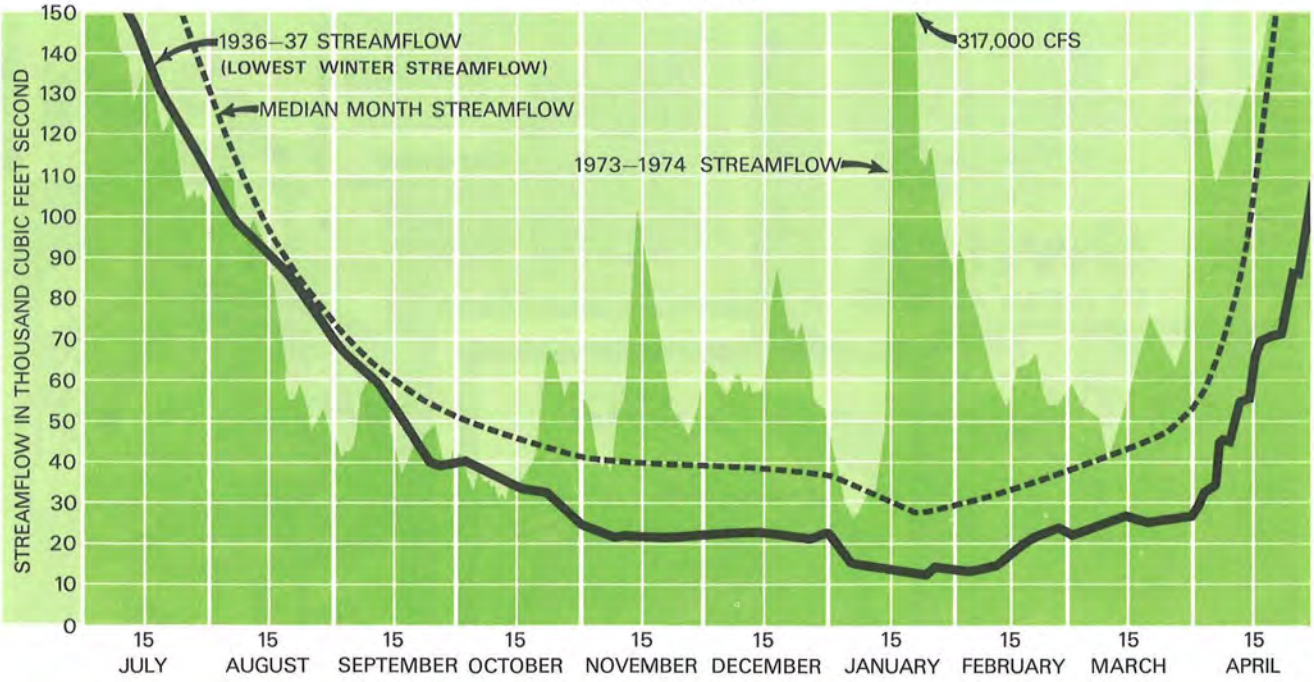
Energy sales during Fiscal Year 1974 totaled 63.3 billion kilowatt-hours, or a 2.6 percent decline from FY 1973 sales. Firm power sales decreased by 7.3 percent, which was partially offset by a 39.7 percent rise in nonfirm energy sales.

The net sales decline was the first since FY 1961, and only the second downturn in BPA history. By comparison, energy sales in kilowatt-hours had grown at an average rate of 8 percent per year over the past decade.

The drop-off in firm energy sales can be attributed to several factors. First, BPA contracts for firm power sales to most investor-owned utilities expired on August 31, 1973, just two months into the fiscal year. Second, regionwide energy conservation which was initiated during the 1973 power shortage is continuing to pay off. A third factor is the general economic slowdown which, especially in the forest products industry, has resulted in plant closures and fewer work shifts.

The average revenue from the sale of energy to all classes of customers

HYDROGRAPH OF NATURAL STREAMFLOW AT GRAND COULEE 1973-1974



was 2.44 mills per kilowatt-hour, excluding sales of capacity and revenues from other services.

Sales of capacity during FY 1974 totaled $4.4 million, a 56 percent increase over FY 1973. The energy associated with the delivery of this capacity is returned to BPA during the recipients' off-peak hours. Investor-owned utilities increased their purchases of capacity by 97 percent, taking some 68 percent of the total. The remainder was purchased by public agencies and by the Bureau of Reclamation, Mid-Pacific (California) Region, as forced outage reserves.

Public agencies, including public and peoples' utility districts, cooperatives and municipal systems, purchased 26.6 billion kilowatt-hours during the fiscal year. This accounted for 42.0 percent of total BPA energy sales and amounted to a 4.6 percent increase over the previous year.

BPA sold 6.6 billion kilowatt-hours of energy to investor-owned utilities during FY 1974, a decrease of

Eye-catching posters contribute to the success of BPA's energy conservation program.

55.7 percent from the prior year as a result of the expiration of the 20-year contracts between BPA and the private utilities. As a result of adverse hydro conditions, less than 400 million kilowatt-hours of BPA nonfirm energy was sold to the investor-owned utilities in FY 1974 as compared to nearly 600 million kilowatt-hours in FY 1973. Although the 20-year contracts between BPA and most investor-owned utilities expired on August 31, 1973, sales of nonfirm energy, capacity, and some modest amounts of firm energy sales continue.

Energy sales to Federal agencies in the Pacific Northwest continued to decline in FY 1974. The Federal purchase of 576 million kilowatt-hours was 4.2 percent less than FY 1973 and amounted to less than 1 percent of total BPA sales.

Sales to the aluminum industry totaled 20.3 billion kilowatt-hours, or 32.1 percent of all BPA energy sales. Modified firm energy sales were up some 14.3 percent over FY 1973 because of contractual agreements providing restoration of modified firm power which had been curtailed in 1971 and 1972. Nonfirm sales decreased by 63.1 percent compared to FY 1973. However, total sales to the aluminum industry were up 1.9 percent.

Direct-service industries, other than aluminum firms, purchased 2.1 billion kilowatt-hours in FY 1974, about the same as in FY 1973. However, firm energy sales increased by 8.4 percent and nonfirm sales decreased by 52.1 percent. These sales amounted to 3.3 percent of total BPA energy sales.

Surplus energy sales to the Pacific Southwest rose to 7.2 billion kilowatt-hours, an increase of 225 percent over FY 1973. This represented 11.4 percent of total FY 1974 energy sales.

During FY 1974 the Federal Columbia River Power System set two generating records. On January 9, 1974, with regionwide temperatures well below normal, the system produced 11,967,000 kilowatts during a one-hour period. A new 24-hour record of 257,580,000 kilowatt-hours was established on February 11.

Chief Joseph Dam on the Columbia River in northcentral Washington. Generating units are being installed in the 11 empty bays (right).

The Financial Year

Gross revenues of the Federal Columbia River Power System totaled $185 million for FY 1974, a 4.3 percent gain over the previous year. Continuing the trend of recent years, however, expenses increased even more substantially, resulting in a cost accounting deficit of $37.9 million. (This was substantially below the $45.3 million deficit anticipated for FY 1974.) Although revenues were sufficient to cover all costs for purchased power, and for operation and maintenance of the power system, the deficit was of such magnitude that not all of the interest expense was covered. This necessitated capitalizing the unpaid interest expense (adding it to the unamortized investment), thus resulting in a negative amount of amortization of the capital investment in power facilities for the fiscal year. This was the first such negative amortization in BPA history.

This trend is expected to be reversed in FY 1975 as a result of the additional revenues BPA should derive from the approximately 27 percent power rate increase which was provisionally approved by the Federal Power Commission and took effect on December 20, 1974. Assuming average streamflow conditions and normal load growth, the increased rates, together with an expected reduction in power purchase costs, should produce net revenues of around $20 million in FY 1975. (See chart on page 33.)

BPA's power sales contracts specify the dates on which rates may be adjusted. The earliest permissible date was December 20, 1974. Hence, it was not possible to avoid the FY 1974 deficit by increasing rates earlier.

BASIS OF FINANCIAL REPORTING

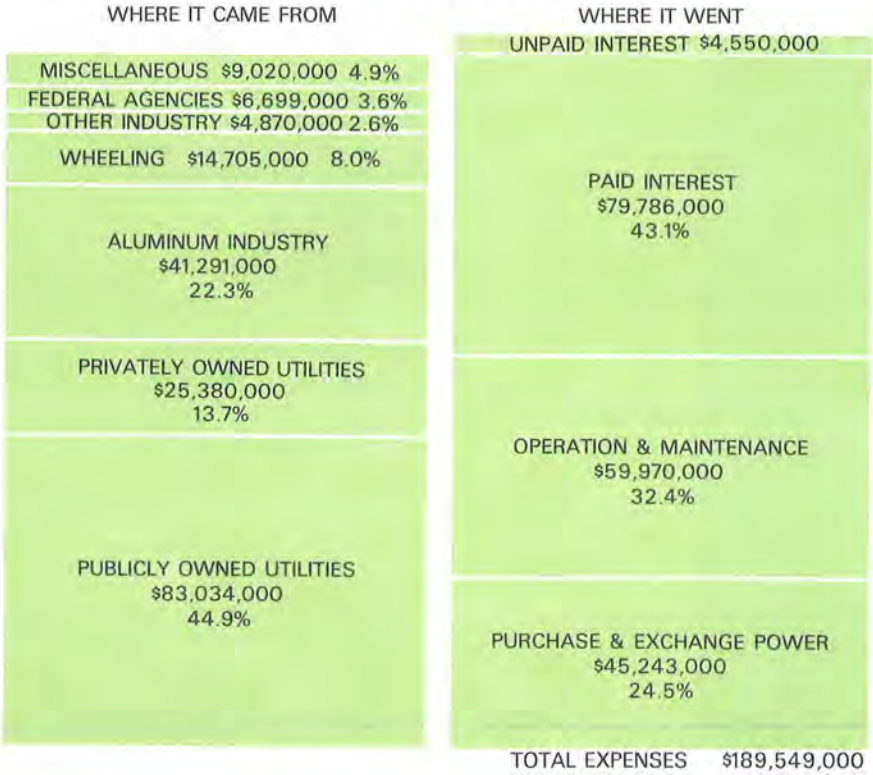
To comply fully with all legal requirements, BPA prepares two types of financial statements. These are (1) the cost accounting financial statements (adjacent to the Comptroller General's opinion on pages 37 through 46) which present historical financial results similar to the statements used by business organizations to measure their profit or loss, and (2) the repayment study (pages 52 and 53) which begins with cumulative historical results through

PACIFIC NORTHWEST POWER SYSTEM

Major Facilities Existing and Under Construction

As of December 31, 1974

SOURCE AND DISPOSITION OF THE REVENUE DOLLAR
Fiscal Year 1974



TOTAL REVENUE	$184,999,000

TOTAL EXPENSES	$189,549,000
UNPAID INTEREST	(4,550,000)
EXPENSES PAID	$184,999,000

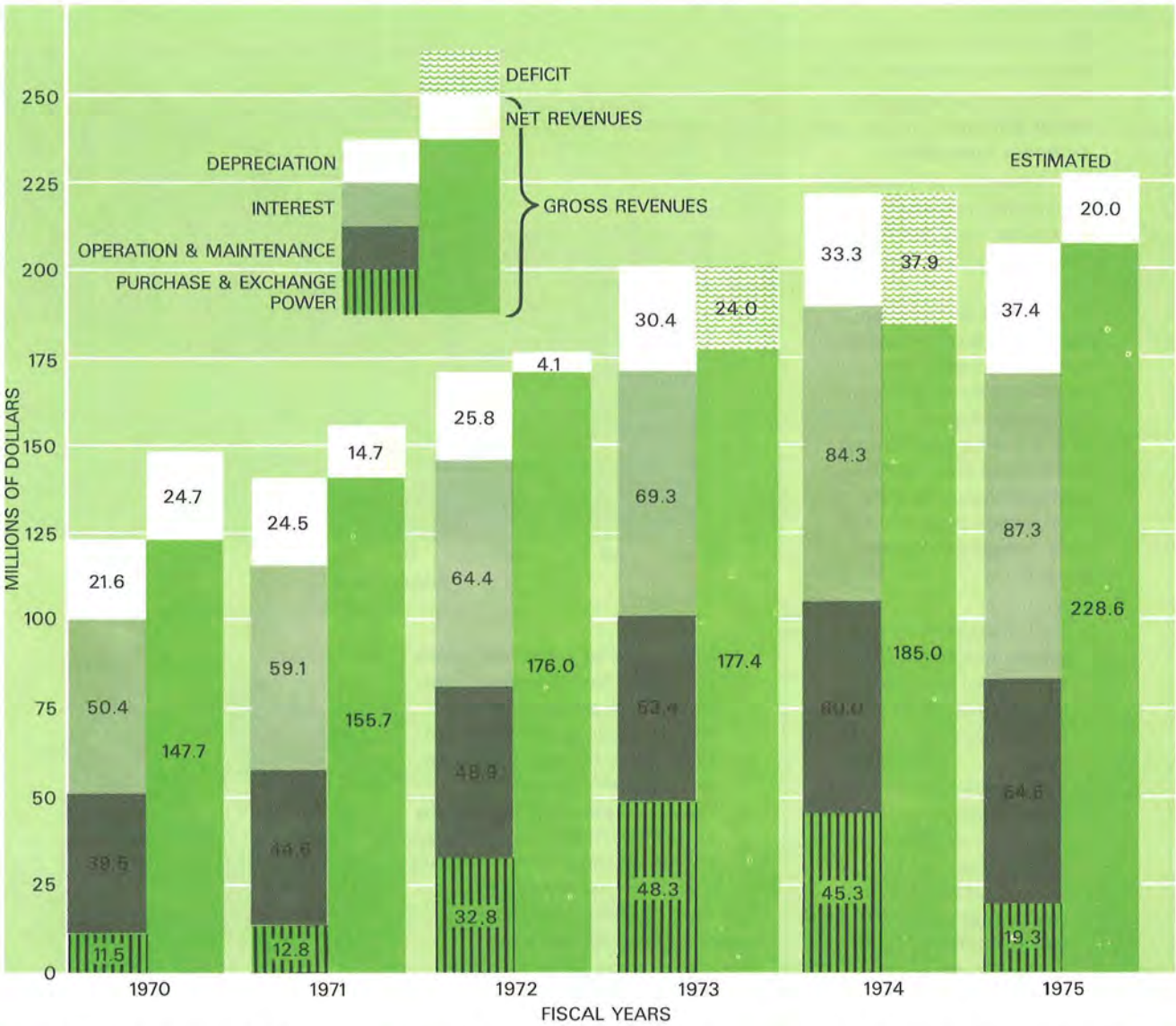
the latest fiscal year and forecasts future revenues and costs for the purpose of determining the adequacy of power rate levels to repay the Federal investment in power facilities as required by Congress. (A reconciliation between the two types of statements is provided by Schedule B, page 44).

COST ACCOUNTING RESULTS

The Statement of Revenues and Expenses, page 37, shows that gross revenues during FY 1974 totaled $185 million, an increase of $7.6 million, or 4.3 percent, as compared to FY 1973. Sales to publicly owned utilities again produced the largest share of total revenues, and increased by 11 percent, but this gain was partially offset by a 32 percent decline in sales to investor-owned utilities following the termination of contracts for the sale of firm power to such utilities. Sales to industry, the FCRPS's second largest source of revenue, increased by 4.9 percent. Among the sources of revenues, wheeling produced an additional $3.4 million compared to the previous year, which amounted to nearly a 31 percent increase.

With respect to expenses, system operation and maintenance expense increased by $6.5 million, an increase of slightly over 12 percent compared to the previous year. This was partially offset, however, by a $3 million decline in purchase and exchange power costs. Total interest expense increased by $10.8 million, but due to a decrease in the amount of interest charged to construction, net interest expense increased by $15 million, which was a 22 percent increase over the prior year level. (The amount of interest charged to construction, i.e., capitalized as a part of the cost of new facilities, varies from year to year in relation to the amount of construction work in progress and the timing of new facilities being placed in service.)

REVENUE AND EXPENSE TREND



The inevitable result of these revenue and expense trends was the FY 1974 deficit of $37.9 million. However, this was substantially less than the $45.3 million deficit forecast in the FY 1973 Annual Report. The improvement is primarily attributed to near-record streamflows during the last half of the year, with a consequent upswing in revenues.

The increasing expense trend is due primarily to three factors: (1) inflation, which has increased virtually all cost elements, (2) higher interest rates on new investment, and (3) the purchase of increasing amounts of thermal power, which, because it is inherently more expensive than hydro generation, increases the average cost of total generation for hydro and thermal combined. The sum of these factors has steadily increased the average cost per unit of power sold, which is illustrated graphically by the chart on page 34. As can be seen from this chart, the average cost per kilowatt-hour sold surpassed revenue per kilowatt-hour in FY 1973. This cost/revenue gap widened during FY 1974, thus producing the sizable deficit. The 27 percent rate increase, of course, will alleviate this situation.

REPAYMENT STUDY RESULTS

To test the adequacy of the power rate level, BPA is required by law to prepare annually and submit to the President and the Congress a consolidated financial statement on the repayment basis (Table 6, pages 52 and 53).

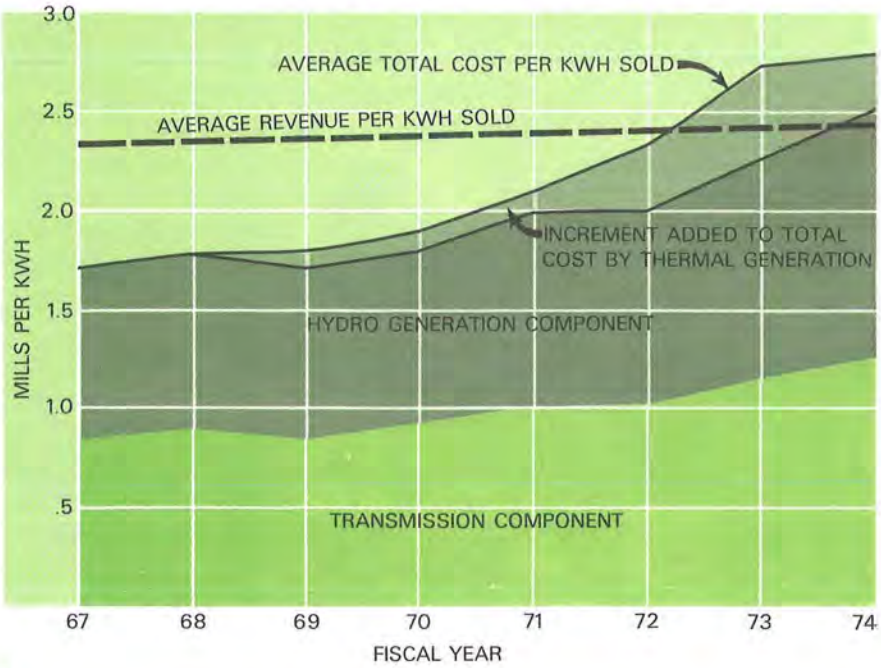
For the rate level to be judged adequate, the repayment study must

show that future revenues will be sufficient to satisfy the following repayment criteria:

1. Pay the cost of operating and maintaining the power system.
2. Pay the cost of obtaining power through purchase and exchange agreements.
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 and BPA transmission facilities constructed prior to BPA's authorization to finance its construction program with sales receipts and revenue bonds).
5. Repay:
   a. Each increment of the power investment at the Federal hydroelectric projects within 50 years after it becomes revenue producing.
   b. 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 40 years).
   c. 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.)
6. 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.

AVERAGE COST AND REVENUE PER KWH SOLD

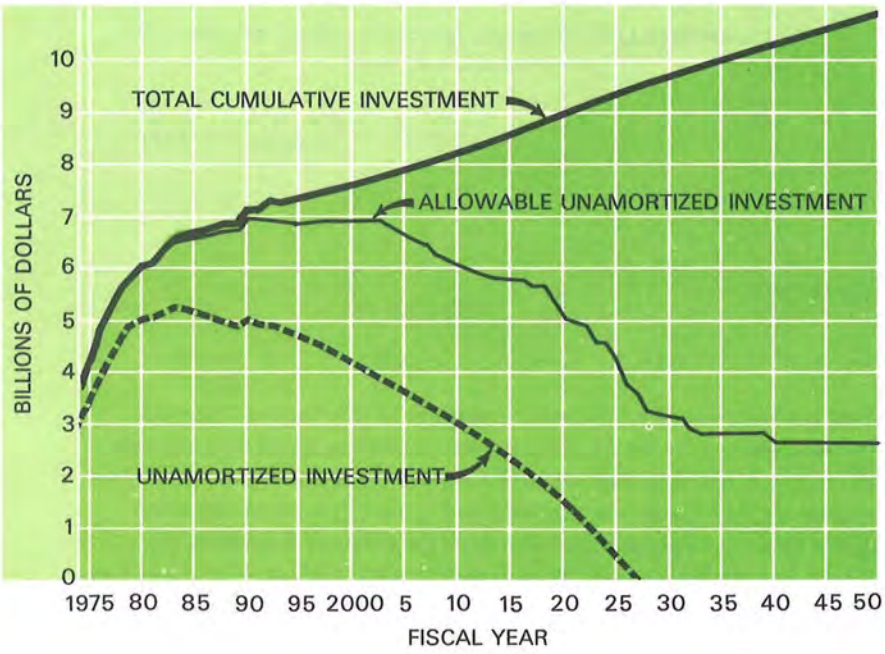


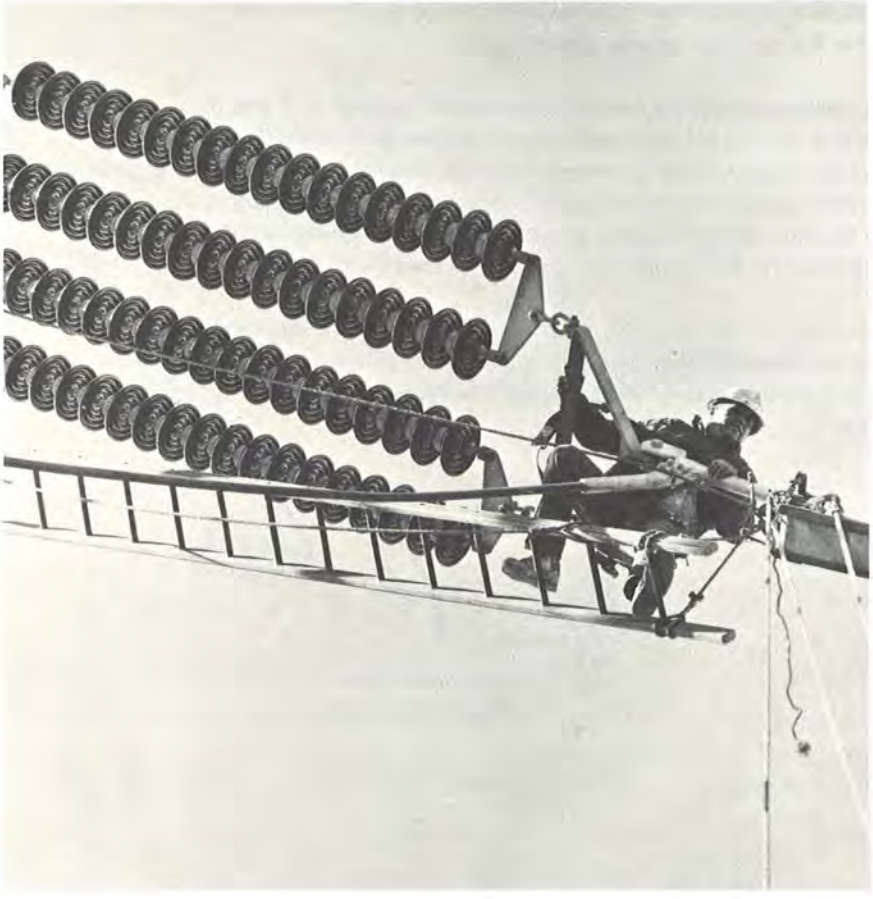
The FY 1974 Repayment Study (Table 6, pages 52 and 53), prepared in accordance with the foregoing criteria, shows that cumulative revenues through June 30, 1974, totaled $2.47 billion. These have been applied to pay purchase and exchange power costs of $199.2 million, operation and maintenance costs of $695.4 million, interest costs of $879 million, with the remaining $691.8 million having been applied to amortization of the investment in power facilities. Cumulative investment in power facilities totaled $3.68 billion with the unamortized balance totaling $2.99 billion.

Starting with these cumulative results, the repayment study forecasts future revenues and costs over

FEDERAL COLUMBIA RIVER POWER SYSTEM

REPAYMENT STUDY FOR FISCAL YEAR 1974





the balance of the repayment period. Costs and revenues are included for all Federal hydroelectric projects which are (1) currently in service, (2) under construction, and (3) authorized by Congress and scheduled for construction by the constructing agency, plus the costs of the transmission facilities necessary to market the output of these projects as well as handle the other sources of power transmitted by BPA. The repayment study also includes BPA power purchase costs which will commence within the 5-year period beginning December 20, 1974.

Similarly, this repayment study projects revenues based upon the new rates approved by the Federal Power Commission effective December 20, 1974. The study demonstrates that with these revenues all of the repayment criteria are met. This result is illustrated graphically on this page. The format of the repayment study, however, does not yet reflect the future use of revenue bond financing which was authorized by the Federal Columbia River Transmission System Act, i.e., the study does not show either interest on or amortization of the revenue bonds which BPA will sell to the Treasury to finance future transmission system construction. Since the Federal Columbia River Transmission System Act was enacted on October 18, 1974, time did not permit this adjustment before the date of this publication. These elements will be itemized in future repayment studies.

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

B-114858

December 17, 1974

The Honorable
The Secretary of the Interior

Dear Mr. Secretary:

We have examined the Statement of Assets and Liabilities of the Federal Columbia River Power System (see note 1 to the financial statements) as of June 30, 1974, and the related Statements of Revenues and Expenses and of Changes in Financial Position for fiscal year 1974. Our examination was made in accordance with generally accepted auditing standards and included tests of the accounting records of the Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power Administration and such other auditing procedures as we considered necessary in the circumstances.

The accompanying financial statements were prepared on a cost-accounting basis which included depreciation. The statements do not present the financial results on a basis designed to show whether power rates are adequate to repay the Federal investment in the System, either for the fiscal year or cumulatively.

In our opinion, the accompanying financial statements (exhibits 1, 2, and 3), subject to the financial effects of future adjustments related to the adoption of firm cost allocations, as explained in note 3, present fairly the financial position of the System at June 30, 1974, the financial results of its power operations, and the changes in financial position for the year then ended, in conformity with accounting principles and standards prescribed by the Comptroller General of the United States.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairman, Federal Power Commission; the Administrator, Bonneville Power Administration; the Commissioner of Reclamation; the Secretary of the Army; and the Chief of Engineers.

Sincerely yours,

Elmer B. Staats

Comptroller General
of the United States

Enclosures — 5

RED-75-312

Federal Columbia River Power System

STATEMENT OF REVENUES AND EXPENSES
FOR THE FISCAL YEARS ENDED JUNE 30, 1974 AND JUNE 30, 1973

Exhibit 1

	1974	1973
	(In thousands)	
OPERATING REVENUES:		
Bonneville Power Administration		
Sales of electric energy:		
Publicly owned utilities	$ 83,034	$ 74,670
Privately owned utilities	25,380	37,147
Federal agencies	6,699	3,083
Aluminum industry	41,291	39,361
Other industry	4,870	4,653
Total	161,274	158,914
Other operating revenues:		
Wheeling revenues	14,705	11,263
Other revenues	6,074	4,316
Total	20,779	15,579
Total Bonneville Power Administration revenues	182,053	174,493
Associated projects		
Other operating revenues	2,946	2,881
Total power system operating revenues	184,999	177,374
OPERATING EXPENSES:		
Operation and maintenance expense:		
Operation expense (Note 9)	37,774	31,466
Maintenance expense	22,196	21,972
Total operation and maintenance expense	59,970	53,438
Purchase and exchange power	45,243	48,255
Depreciation	33,309	30,418
Total operating expenses	138,522	132,111
Net operating revenues	46,477	45,263
INTEREST EXPENSE:		
Interest on Federal investment	111,387	100,552
Interest charged to construction	27,051*	31,234*
Net interest expense	84,336	69,318
NET (LOSS) (Schedule B)	($ 37,859)	($ 24,055)

*Denotes deduction

"Notes to the Financial Statements" are an integral part of this statement.

Federal Columbia River Power System

STATEMENT OF ASSETS AND LIABILITIES
AS OF JUNE 30, 1974
AND JUNE 30, 1973

Exhibit 2

ASSETS

	June 30 1974	June 30 1973
	(In thousands)	
FIXED ASSETS:		
Completed plant (Schedule A)	$3,580,636	$3,466,817
Retirement work in progress	20,677	25,805
	3,601,313	3,492,622
Less accumulated depreciation	320,689	295,455
	3,280,624	3,197,167
Construction work in progress (Schedule A) (Note 8)	1,068,043	897,213
Total fixed assets (Note 9)	4,348,667	4,094,380
CURRENT ASSETS:		
Unexpended funds	132,146	139,092
Special funds	8,893	12,336
Accounts receivable	35,721	24,733
Materials and supplies	17,054	14,907
Total current assets	193,814	191,068
OTHER ASSETS AND DEFERRED CHARGES:		
Trust funds	18,184	14,649
Other assets and deferred charges	13,918	6,693
Total other assets and deferred charges	32,102	21,342
TOTAL ASSETS	$4,574,583	$4,306,790

*Denotes deduction

"Notes to the Financial Statements" are an integral part of this statement.

LIABILITIES

	June 30 1974	June 30 1973
	(In thousands)	
PROPRIETARY CAPITAL:		
Investment of U.S. Government in power facilities:		
Congressional appropriations	$5,198,240	$4,888,238
Revenues transferred to Continuing Fund	7,005	4,390
Transfers from other Federal agencies, net	36,604	33,056
Interest on Federal investment (Note 7)	1,160,501	1,049,149
Gross Federal investment	6,402,350	5,974,833
Less funds returned to U.S. Treasury	2,227,492	2,086,170
Net investment of U.S. Government	4,174,858	3,888,663
Accumulated net revenues:		
Balance at beginning of year	328,546	354,155
Net revenues – current year (Exhibit 1)	37,859*	24,055*
Prior years adjustment (Note 10)	99*	1,554*
Balance at end of year	290,588	328,546
Total proprietary capital in power facilities before irrigation assistance	4,465,446	4,217,209
Irrigation assistance (1974, $474 million; 1973, $439 million) (Schedule A) (Note 4)		
Total proprietary capital	4,465,446	4,217,209
COMMITMENTS AND CONTINGENCIES (Notes 5 and 6)		
CURRENT LIABILITIES:		
Accounts payable (Note 8)	65,560	62,998
Employees accrued leave	6,320	5,473
Total current liabilities	71,880	68,471
OTHER LIABILITIES AND DEFERRED CREDITS:		
Trust fund advances	18,184	14,649
Other deferred credits	19,073	6,461
Total other liabilities and deferred credits	37,257	21,110
TOTAL LIABILITIES	$4,574,583	$4,306,790

Federal Columbia River Power System

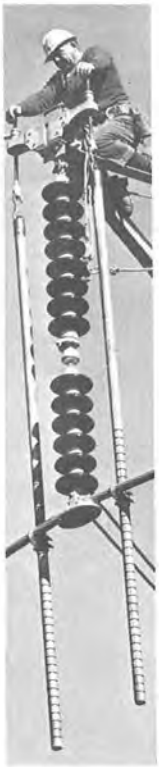
STATEMENT OF CHANGES IN FINANCIAL POSITION
FOR THE FISCAL YEARS ENDED JUNE 30, 1974 AND JUNE 30, 1973

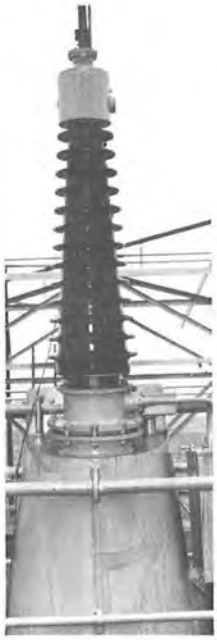
Exhibit 3

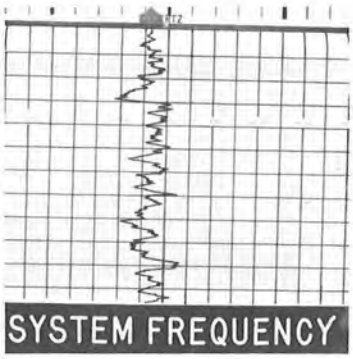
	1974	1973
	(In thousands)	
SOURCE OF FUNDS:		
Federal investment:		
Congressional appropriations	$310,002	$312,763
Transfers from other Federal agencies, net	3,548	1,782
Interest on Federal investment (including $35 thousand prior years adjustment in FY 1974)	111,352	100,552
Transfers to Continuing Fund	2,615	103
Total funds from Federal investment	427,517	415,200
Other sources:		
Decrease in current assets net of current liabilities	663	854
Decrease in other assets net of other liabilities	5,387	5,144
Total other sources	6,050	5,998
Total source of funds	$433,567	$421,198
APPLICATION OF FUNDS:		
Operations:		
Power system operating revenues	$184,999*	$177,374*
Less: applications for current year operations		
Operations and maintenance	59,970	53,438
Purchase and exchange power	45,243	48,255
Interest	84,336	69,318
Prior years adjustment (Note 10)	99	1,554
Total applications for operations	189,648	172,565
Net applications for operations	4,649	4,809*
Other applications:		
Investment in electric utility plants and facilities, net	287,596	296,985
Funds returned to U.S. Treasury	141,322	129,022
Total other applications	428,918	426,007
Total application of funds	$433,567	$421,198

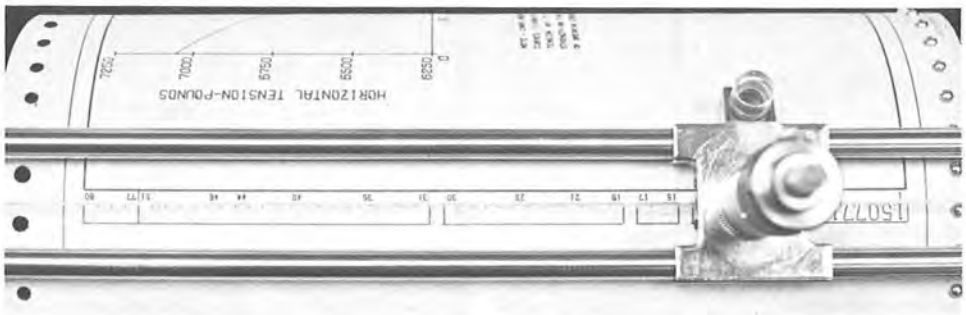
*Denotes deduction

"Notes to the Financial Statements" are an integral part of this statement.






SYSTEM FREQUENCY


HORIZONTAL TENSION-POUNDS
7250
7000
6750
6500
6250
0

Federal Columbia River Power System

AMOUNT AND ALLOCATION OF PLANT INVESTMENT AS OF JUNE 30, 1974

Schedule A

(All dollar amounts in thousands)

Project	Total	COMMERCIAL POWER: Completed Plant	COMMERCIAL POWER: Construction Work in Progress	COMMERCIAL POWER: Total Commercial Power	ALLOCATED TO: 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)	$1,491,616	$1,334,358	$ 157,258	$1,491,616									100.0
Albeni Falls (CE)	33,179	32,022		32,022				$ 134	$ 173		$ 850		96.5
Boise (BR)	66,039	4,969	222	5,191	$ 10,672	$ 35,214	$ 45,886		14,962				24.0
Bonneville (CE)	115,544	61,734	21,666	83,400				31,289			844	$ 11	72.2
Chief Joseph (CE)	162,339	155,006	6,313	161,319	710		710				255	55	99.8
Columbia Basin (BR)	976,742	186,915	302,199	489,114	372,475	68,092	440,567	1,000	45,534			527	88.2
Cougar (CE)	57,930	17,841		17,841		2,916	2,916	521	36,444			208	30.8
Detroit-Big Cliff (CE)	66,558	40,440		40,440		4,758	4,758	219	20,851			290	60.8
Dworshak (CE) (a)	304,042	274,095		274,095				8,708	18,030		3,209		90.2
Green Peter-Foster (CE)	89,551	49,525	26	49,551		5,760	5,760	362	30,033		1,784	2,061	55.3
Hills Creek (CE)	48,715	17,293	12	17,305		4,304	4,304	624	26,210			272	35.5
Hungry Horse (BR)	102,111	77,479		77,479					24,632				75.9
Ice Harbor (CE)	164,014	95,289	22,684	117,973				44,275			1,766		71.9
John Day (CE) (a)	503,523	372,598	6	372,604				82,226	14,107		8,255	26,331	74.0
Little Goose (CE) (a)	170,710	117,934	329	118,263				46,368			3,493	2,586	69.3
Lookout Point-Dexter (CE)	94,888	45,795		45,795		1,322	1,322	708	46,721		248	94	48.3
Lower Monumental (CE) (a)	198,422	149,205	91	149,296				47,143			1,566	417	75.2
McNary (CE)	310,560	256,866	546	257,412				52,143			1,005		82.9
Minidoka-Palisades (BR)	96,973	13,359	3	13,362	10,038	43,381	53,419		29,725		172	295	24.1
The Dalles (CE)	317,714	273,296	735	274,031				42,020			1,641	22	86.3
Yakima (BR)	64,006	4,617		4,617	8,763	49,381	58,144		92	$ 1,153			20.9
Projects Under Construction (a)													
Libby (CE)	456,051		340,734	340,734					75,270			40,047	74.7
Lost Creek (CE)	65,493		9,531	9,531		1,031	1,031		26,678	12,078	10,042	6,133	14.6
Lower Granite (CE)	255,733		199,944	199,944				49,803			565	5,421	78.2
Teton (BR)	35,168		5,744	5,744	19,556	3,637	23,193		5,738		493		71.9
Irrigation Assistance at 11 Projects Having No Power Generation	51,414				51,414		51,414						100.0
Subtotal Plant Investment	6,299,035	3,580,636	1,068,043	4,648,679	473,628	219,796	693,424	407,543	415,200	13,231	36,188	84,770 (c)	81.3
Repayment Obligation Retained by Columbia Basin Project (b)	2,211	1,352		1,352	859		859						100.0
Total	$6,301,246	$3,581,988	$1,068,043	$4,650,031	$474,487	$219,796	$694,283	$407,543	$415,200	$13,231	$36,188	$84,770 (c)	81.3

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

(a) Projects in service that have tentative cost allocations at June 30, 1974. Projects under construction have tentative cost allocations (Note 3).

(b) Joint facilities transferred to Bureau of Sport Fisheries and Wildlife. Power portion is included in Exhibit 2 as a Deferred Item.

(c) Included in this amount are nonreimbursable road costs amounting to $76.2 million.

"Notes to the Financial Statements" are an integral part of this schedule.

Federal Columbia River Power System

Schedule B

RECONCILIATION OF COST ACCOUNTING FINANCIAL STATEMENTS TO REPAYMENT STUDY FOR THE FISCAL YEAR ENDED JUNE 30, 1974

(All dollar amounts in thousands)

	Cumulative Balance June 30, 1973	Fiscal Year 1974 Operations	Prior Years Adjustment	Cumulative Balance June 30, 1974	Adjustment to Repayment Basis	Cumulative Data Through June 30, 1974 on Repayment Study
		(Exhibit 1)	(Note 10)		(Note 1)	
OPERATING REVENUES	$2,280,707	$184,999		$2,465,706		$2,465,706
EXPENSES:						
Purchase and exchange power	156,793	45,243		202,036	$ 2,828*	199,208
Operation and maintenance expense	635,334	59,970	$134	695,438		695,438
Interest expense	794,982	84,336	35*	879,283		879,283
Depreciation	365,052	33,309		398,361	398,361*	
Total expenses	1,952,161	222,858	99	2,175,118	401,189*	1,773,929
NET REVENUES (Exhibit 2)	$ 328,546	$ 37,859*	$ 99*	$ 290,588		
RECONCILIATION TO CUMULATIVE AMORTIZATION				$ 290,588	$401,189	$ 691,777 (a)

(a) CHANGES IN CUMULATIVE AMORTIZATION:

Cumulative amortization through June 30, 1973	$ 693,598
Fiscal Year 1974	
Depreciation	33,309
Net revenues	37,859*
Prior years adjustment	99*
Purchase and exchange power – adjustment	2,828
Amortization for the year	1,821*
Cumulative Amortization through June 30, 1974	$ 691,777

*Denotes deduction

"Notes to the Financial Statements" are an integral part of this schedule.

Federal Columbia River Power System

NOTES TO THE FINANCIAL STATEMENTS

Note 1. Major Accounting Considerations

The Federal Columbia River Power System (FCRPS) consists of the Bonneville Power Administration (BPA) and the generating facilities of the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) for which BPA is the power marketing agent. Each entity is separately managed and financed but the facilities are operated as an integrated power system with the financial results consolidated under the FCRPS title.

These financial statements are prepared on a cost accounting basis including compound interest depreciation and interest on the unamortized Federal investment.

Costs of multi-purpose 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. Schedule A lists the projects included in FCRPS and the allocation of plant investment to the various purposes.

BPA wholesale power rates are established by using a separate repayment analysis. The differences between the financial statements and the historical data on the repayment analysis are the treatment of fixed assets and purchased power. In the accompanying statements, the depreciation life for fixed assets allocated to power averages about 60 years, with the transmission system averaging 41 years and generating projects averaging 85 years. However, the repayment periods used to establish power rates are 50 years for the generating projects and 40 years for the transmission system for an average of 46 years. The cost of purchase and exchange power in the cost accounting financial statements is recorded on the accrual basis, while the figure in the repayment study is based on consummated settlements.

Schedule B provides a correlation between the accompanying cost statements and cumulative totals shown in the first line of the separate repayment analysis.

Note 2. Subsequent Events

On October 18, 1974, President Ford signed the "Federal Columbia River Transmission System Act." This act enables BPA to use its revenues to pay all system costs including capital investment and to issue bonds to finance construction of future transmission facilities. Any changes resulting from this act will be reflected in future financial statements.

Application has been made to the Federal Power Commission for approval of a wholesale power rate increase averaging 27% for BPA commencing on December 20, 1974.

Note 3. Tentative Cost Allocations

Plant cost and operation and maintenance expenses based on tentative allocations between power and nonpower purposes are included for eight of the projects listed in Schedule A. In the past, adjustments have been made to plant cost and accumulated net revenues when firm allocations were adopted. At June 30, 1974, total joint plant costs for these eight projects are about $1.3 billion of which $1.0 billion are tentatively allocated to power and subject to retroactive adjustment. The amount of adjustments that may be necessary when the allocations become firm is not determinable at this time.

Note 4. Repayment Responsibility For Irrigation Costs

Legislation requires that FCRPS net revenues be used to repay to the U.S. Treasury the cost of Bureau irrigation facilities which benefiting water users are unable to repay. Investment made through June 30, 1974, results in estimated irrigation assistance of $474,487,000. The estimated current and future assignments of FCRPS net revenues to irrigation assistance and all scheduled payments are disclosed in the FCRPS repayment studies which are used to establish BPA's wholesale power rates. The repayment studies show that the first payment for the assistance will be made in 1997. Beginning at that time the amount of irrigation assistance paid will be disclosed in the cost based financial statements. (Prior to this year the irrigation assistance was reflected in the "Statement of Assets and Liabilities" as a deferred charge and as a liability. For fiscal year 1974 the statement format has been changed to include this information in the proprietary capital section.)
Congress may also authorize additional repayments from FCRPS revenues up to $20,091,000 for existing investment allocated to irrigation at six Corps projects.

Note 5. Commitments to Exchange Power and Acquire Project Capability

BPA has made commitments to acquire all or part of the generating capability of various thermal power plants. BPA is obligated to pay its share of the project costs whether or not the project is completed, operable or operated. The table below shows significant statistics regarding these projects. The "Present Termination Commitment" represents those costs (without credit for assets) which would be payable if the project were to terminate at this time.

Project Name	Commitment Period	Estimated BPA Portion: Capacity	Annual Cost	Total Capital Cost	Present Termination Commitment
		(Megawatts)	(In Thousands)	(In Thousands)	(In Thousands)
Hanford	1974-1978	800	$ 11,000	$ 80,000	$ 60,000
Trojan Nuclear Plant	1976-2011	339	15,500	123,000	122,500
WPPSS* Nuclear Project #1	1982-2017	850	104,400	990,000	77,000
WPPSS Nuclear Project #2	1979-2014	1100	67,800	567,000	230,000
WPPSS Nuclear Project #3	1982-2017	868	84,200	738,000	29,000

*Washington Public Power Supply System

BPA has also entered into agreements with 41 utilities to exchange an agreed amount of power for their rights to the Canadian Entitlement. The Canadian Entitlement is one-half of the additional power benefits realized from three Canadian Treaty dams. It was purchased for a 30-year period by the 41 utilities with a $314.1 million bond issue. BPA furnishes a specified amount of power regardless of the actual additional power generated.

Note 6. **Contingent Liabilities**

Contingent liabilities total approximately $76.4 million of which $68.7 million represent various contractor claims and $7.7 million represent claims under the Federal Tort Claims Act.

Note 7. **Interest Rates**

Rates of interest applied to the unamortized Federal investment for each generating project and for each year's investment in the transmission system range from 2-1/2% to 5-7/8%. The rates have been set either by law, by administrative order pursuant to law, or by administrative policies. They have not necessarily been designed to recover the interest costs to the U.S. Treasury to finance the investment.

Note 8. **Unbilled Contractor Performance**

The amounts shown in Construction Work in Progress and Accounts Payable on the comparative "Statement of Assets and Liabilities" include BPA's estimate of $12,672,000 for fiscal year 1973 for unbilled contractor performance. This estimate relates to items being built to government specifications which have not been billed. A similar adjustment was not made by BPA for fiscal year 1974 because of deletion of the mandatory requirement to record it and of the impracticality to estimate such unbilled contractor performance. The Corps and the Bureau continue to record unbilled contractor performance.

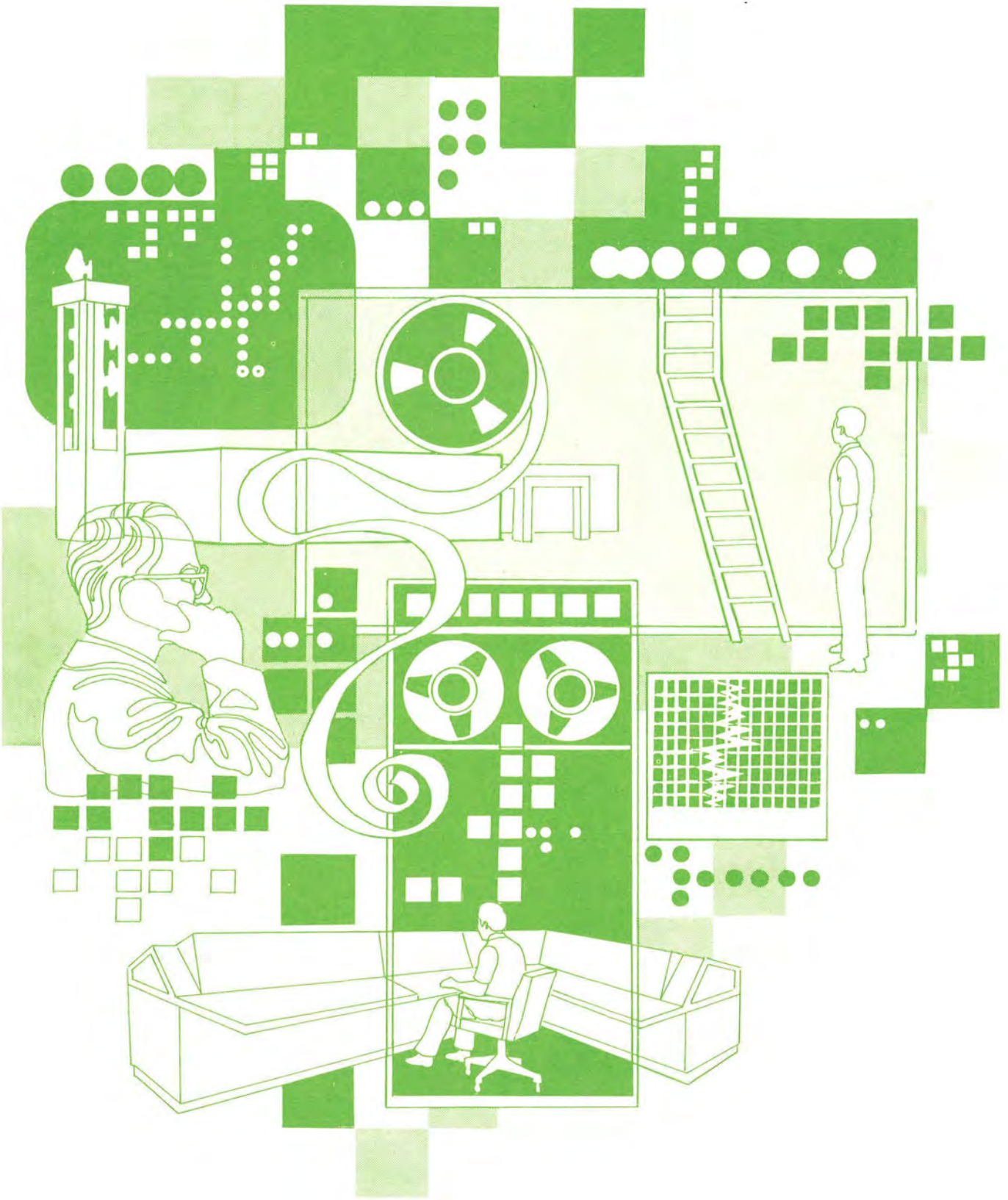
Note 9. **Imputed Rent**

The General Services Administration provides facilities to BPA, the Corps and the Bureau. Although the Bureau and BPA impute a rent cost on these facilities, the Corps has not because they believe the costs are insignificant. The Corps has estimated these rental costs at $1.7 million for fiscal years 1972-74, of which $.5 million would be expensed and $1.2 million capitalized.

Note 10. **Adjustments to Accumulated Net Revenues**

The following table lists the adjustments which have caused the net decrease in Accumulated Net Revenues of $99,000 shown in Exhibit 2 and Schedule B.

	(In thousands)
1. Retroactive pay increase affecting prior year's funds	$223
2. Capitalization of plant previously expensed	(89)
3. Reduction of interest expense, net	(35)
Total	$ 99



SALES OF ELECTRIC ENERGY FISCAL YEAR 1974

Table 1

Customer	Energy Delivered for Year (000) KWH	Revenue from Sales of Energy
NORTHWEST AREA		
Publicly Owned Utilities		
Municipalities		
Albion, Idaho	2,724	$ 9,253
Bandon, Oregon	45,961	159,174
Blaine, Washington	28,324	93,014
Bonners Ferry, Idaho	26,009	100,263
Burley, Idaho	81,784	255,778
Canby, Oregon	57,868	207,142
Cascade Locks, Oregon	25,416	87,036
Centralia, Washington	59,357	310,271
Cheney, Washington	87,785	284,857
Consolidated Irrigation District, Washington	1,154	4,230
Coulee Dam, Washington	23,426	84,631
Declo, Idaho	1,954	6,643
Drain, Oregon	26,195	91,476
Ellensburg, Washington	133,273	430,436
Eugene, Oregon	1,522,248	3,873,360[1]
Forest Grove, Oregon	124,146	425,763
Heyburn, Idaho	60,944	186,862
Idaho Falls, Idaho	248,445	805,870
McCleary, Washington	31,537	105,420
McMinnville, Oregon	227,294	763,911
Milton-Freewater, Oregon	89,318	292,113
Minidoka, Idaho	817	2,784
Monmouth, Oregon	52,471	189,481
Port Angeles, Washington	414,098	1,167,089
Richland, Washington	355,758	1,177,823
Rupert, Idaho	48,116	154,412
Seattle, Washington	1,708,220	3,685,874[1]
Springfield, Oregon	226,969	713,742
Sumas, Washington	5,144	17,806
Tacoma, Washington	1,678,915	3,758,544[1]
Vera Irrigation District, Washington	99,950	321,361
Washington Public Power Supply System	8,880	26,356
Total Municipalities (32)	7,504,500	$ 19,792,775
Public Utility Districts		
Benton County PUD No. 1	735,767	$ 2,151,603
Central Lincoln PUD	932,074	2,799,631
Chelan Co. PUD No. 1	344,828	744,575
Clallam Co. PUD No. 1	297,077	967,900
Clark Co. PUD No. 1	1,918,202	6,207,583
Clatskanie PUD	656,714	1,639,030
Cowlitz Co. PUD No. 1	2,205,660	5,533,953[1]
Douglas Co. PUD No. 1	292,503	848,805
Ferry Co. PUD No. 1	38,206	119,962
Franklin Co. PUD No. 1	362,515	1,089,988
Grant Co. PUD No. 2	607,118	1,796,160[1]
Grays Harbor Co. PUD No. 1	973,638	2,982,563
Kittitas Co. PUD No. 1	34,178	114,403
Klickitat Co. PUD No. 1	186,003	550,325
Lewis Co. PUD No. 1	453,617	1,409,472
Mason Co. PUD No. 1	39,414	127,622
Mason Co. PUD No. 3	312,428	933,018
Northern Wasco Co. PUD	63,935	212,618
Okanogan Co. PUD No. 1	351,582	1,056,932
Pacific Co. PUD No. 2	220,226	740,852
Pend Oreille Co. PUD No. 1	1,411	3,528
Skamania Co. PUD No. 1	80,515	268,641
Snohomish Co. PUD No. 1	3,364,705	10,317,290
Tillamook PUD	290,484	985,039
Wahkiakum Co. PUD No. 1	40,036	134,479
Whatcom Co. PUD	113,238	304,343
Total Public Utility Districts (26)	14,916,074	$ 44,040,315
Cooperatives		
Benton Rural Electric Assn.	135,367	$ 406,973
Big Bend Electric Coop.	240,868	640,761
Blachly-Lane Co. Coop.	94,568	317,703
Central Electric Coop.	139,064	420,748
Clearwater Power Co.	119,119	387,337
Columbia Basin Electric Coop.	93,841	270,513
Columbia Power Coop. Assn.	33,549	114,140
Columbia Rural Electric Assn.	109,114	310,616
Consumers Power	223,043	737,134
Coos-Curry Electric Coop.	231,414	800,184
Douglas Electric Coop.	109,367	375,395
East End Mutual Electric Co. Ltd.	7,493	23,927
Fall River Electric Coop.	67,655	213,377
Farmers Electric Co.	5,274	18,417
Flathead Electric Coop.	68,937	206,270
Harney Electric Coop.	95,655	241,340
Hood River Electric Coop.	67,174	213,672
Idaho Co. Light & Power Coop. Assn.	31,268	102,216
Inland Power & Light Co.	288,791	921,535
Kootenai Electric Coop.	94,691	296,876
Lane Co. Electric Coop.	259,798	876,309
Lincoln Electric Coop.–Montana	44,032	142,854
Lincoln Electric Coop.–Washington	87,781	$ 241,482
Lost River Electric Coop.	31,420	89,201
Lower Valley Power & Light Co.	138,964	449,360
Midstate Electric Coop.	94,640	282,888
Missoula Electric Coop.	63,293	193,196
Nespelem Valley Electric Coop.	27,483	88,144
Northern Lights	102,056	322,497
Okanogan Co. Electric Coop.	18,603	57,969
Orcas Power & Light Co.	75,983	256,343
Prairie Power Coop.	3,268	10,755
Raft River Electric Coop.	128,032	337,551
Ravalli Co. Electric Coop.	53,335	170,502
Riverside Electric Co.	4,823	16,422
Rural Electric Co.	46,326	146,929
Salem Electric	178,347	589,532
Salmon River Electric Coop.	23,247	65,756
South Side Electric Lines	18,047	57,069
Surprise Valley Electric Corp.	51,774	153,302
Tanner Electric	11,424	37,719
Umatilla Electric Coop. Assn.	241,481	685,200
Unity Light & Power Co.	32,169	104,081
Vigilante Electric Coop.	52,083	152,841
Wasco Electric Coop.	68,461	225,330
West Oregon Electric Coop.	52,172	175,033
Total Cooperatives (46)	4,165,294	$ 12,947,399
Total Publicly Owned Utilities (104)	26,585,868	$ 76,780,489
Federal Agencies (6)	576,414	1,739,161
Privately-Owned Utilities		
California-Pacific Utilities Co.	24,602	$ 53,506
Idaho Power Co.	0	0
Montana Power Co.	870,242	1,971,862[1]
Pacific Power & Light Co.	1,649,289	5,641,131[1]
Portland General Electric Co.	2,104,384	5,203,481[1]
Puget Sound Power & Light Co.	1,438,801	3,068,366
Utah Power Co.	0	0
Washington Water Power Co.	466,410	1,065,639
Total Privately-Owned Utilities (8)	6,553,728	$ 17,003,985
Aluminum Industries		
Aluminum Co. of America		
Vancouver Plant	2,107,025	$ 4,336,979
Wenatchee Plant	1,364,838	2,838,918
Anaconda Aluminum Co.	2,478,036	4,676,406
Intalco Aluminum Co.	2,628,640	5,434,447
Kaiser Aluminum & Chemical Corp.	4,588,573	9,575,359
Martin-Marietta Aluminum Inc.		
The Dalles Plant	1,154,106	2,011,470
Goldendale Plant	1,434,293	2,541,582
Reynolds Metals Co.		
Longview Plant	2,987,527	6,149,440
Troutdale Plant	1,508,574	3,123,701
Other Industries		
Carborundum Co.	194,548	413,881
Cominco American Inc.	0	0
Crown Zellerbach Corp.		
Port Angeles Plant	6,968	14,035
Port Townsend Plant	69,654	191,409
Georgia-Pacific Corp.	150,804	338,586
Hanna Mining Co.	83,861	181,667
Hanna Nickel Smelting Co.	716,292	1,573,617
ITT Rayonier, Inc.	30,170	83,873
Oregon Metallurgical Corp.	0	0
Pacific Carbide & Alloys Co.	48,369	107,631
Pennwalt Corporation	301,021	655,360
Stewart Elsner	48	313
Stauffer Chemical Works	436,483	1,008,010
Union Carbide Corp.	82,567	185,983
Total Industries (19)	22,372,397	$ 45,442,667
OUTSIDE NORTHWEST REGION		
British Columbia Hydro	10,095	$ 20,190
Sacramento, California	0	0
Glendale, California	107,552	215,104
Burbank, California	132,785	347,198
Los Angeles, California	1,430,173	3,927,750
Pasadena, California	108,860	307,896
Pacific Gas & Electric Co.	1,537,213	3,074,426
San Diego Gas & Electric Co.	268,180	536,360
Southern California Edison Co.	2,031,520	4,614,982
USBR–Lower Colorado Region	0	0
USBR–Mid-Pacific Region	1,396,111	4,674,722[1]
State of California	222,392	444,784
Total Outside Northwest (12)	7,244,881	$ 18,163,412
Total Sales of Electric Energy (149)	63,333,288	$159,129,714[2]

[1] Includes capacity sales.
[2] Includes statistical adjustments.

Federal Columbia River Power System

GENERAL SPECIFICATIONS, PROJECTS EXISTING, UNDER CONSTRUCTION AND AUTHORIZED NAMEPLATE RATING OF INSTALLATIONS AS OF JUNE 30, 1974

Table 2

					Existing		Under Construction		Authorized		Other Potential		Total	
Project	Operating Agency[1]	Location	Stream	Initial Date in Service	Number of Units	Total Capacity Kilowatts	Number of Units	Total Capacity Kilowatts	Number of Units	Total Capacity Kilowatts	Number of Units	Total Capacity Kilowatts	Number of Units	Total Capacity Kilowatts
Bonneville	CE	Ore.-Wash.	Columbia	June 1938	10	518,400	8	544,000	–	–	–	–	18	1,062,400
Grand Coulee	BR	Washington	Columbia	Sept. 1941	18-3	2,195,000[2]	6	3,985,000[3]	–	–	6	3,600,000	36-3	10,080,000
Grand Coulee (Pump Generator)		Washington	Columbia – Banks Lake		–	–	2	100,000	4	200,000	–	–		
Hungry Horse	BR	Montana	S. Fk. Flathead	Oct. 1952	4	285,000	–	–	–	–	–	–	4	285,000
Detroit	CE	Oregon	North Santiam	July 1953	2	100,000	–	–	–	–	–	–	2	100,000
McNary	CE	Ore.-Wash.	Columbia	Nov. 1953	14	980,000	–	–	–	–	6	420,000	20	1,400,000
Big Cliff	CE	Oregon	North Santiam	June 1954	1	18,000	–	–	–	–	–	–	1	18,000
Lookout Point	CE	Oregon	M. Fk. Willamette	Dec. 1954	3	120,000	–	–	–	–	–	–	3	120,000
Albeni Falls	CE	Idaho	Pend Oreille	Mar. 1955	3	42,600	–	–	–	–	–	–	3	42,600
Dexter	CE	Oregon	M. Fk. Willamette	May 1955	1	15,000	–	–	–	–	–	–	1	15,000
Chief Joseph	CE	Washington	Columbia	Aug. 1955	16	1,024,000	11	1,045,000	–	–	13	1,573,000	40	3,642,000
Chandler	BR	Washington	Yakima	Feb. 1956	2	12,000	–	–	–	–	–	–	2	12,000
The Dalles	CE	Ore.-Wash.	Columbia	May 1957	22-2	1,807,000[4]	–	–	–	–	–	–	22-2	1,807,000
Roza	BR	Washington	Yakima	Aug. 1958	1	11,250	–	–	–	–	–	–	1	11,250
Ice Harbor	CE	Washington	Snake	Dec. 1961	3	270,000	3	332,880	–	–	–	–	6	602,880
Hills Creek	CE	Oregon	M. Fk. Willamette	May 1962	2	30,000	–	–	–	–	–	–	2	30,000
Minidoka[5]	BR	Idaho	Snake	May 1909	7	13,400	–	–	–	–	–	–	7	13,400
Boise Diversion[5]	BR	Idaho	Boise	May 1912	3	1,500	–	–	–	–	–	–	3	1,500
Black Canyon[5]	BR	Idaho	Payette	Dec. 1925	2	8,000	–	–	–	–	–	–	2	8,000
Anderson Ranch[5]	BR	Idaho	S. Fk. Boise	Dec. 1950	2	27,000	–	–	–	–	1	13,500	3	40,500
Palisades[5]	BR	Idaho	Snake	Feb. 1957	4	118,750	–	–	–	–	2	135,000	6	253,750
Cougar	CE	Oregon	S. Fk. McKenzie	Feb. 1964	2	25,000	–	–	1	35,000	–	–	3	60,000
Green Peter	CE	Oregon	Middle Santiam	June 1967	2	80,000	–	–	–	–	–	–	2	80,000
Foster	CE	Oregon	South Santiam	Aug. 1968	2	20,000	–	–	–	–	–	–	2	20,000
John Day	CE	Ore.-Wash.	Columbia	July 1968	16	2,160,000	–	–	4	540,000	–	–	20	2,700,000
Lower Monumental	CE	Washington	Snake	May 1969	3	405,000	–	–	3	405,000	–	–	6	810,000
Little Goose	CE	Washington	Snake	May 1970	3	405,000	3	405,000	–	–	–	–	6	810,000
Lower Granite	CE	Washington	Snake		–	–	6	810,000	–	–	–	–	6	810,000
Teton	BR	Idaho	Teton		–	–	3	30,000	–	–	–	–	3	30,000
Lost Creek	CE	Oregon	Rogue		–	–	2	49,000	–	–	–	–	2	49,000
Dworshak	CE	Idaho	N. Fk. Clearwater		–	–	3	400,000[6]	3	660,000	–	–	6	1,060,000
Strube	CE	Oregon	S. Fk. McKenzie		–	–	–	–	1	4,500	–	–	1	4,500
Libby	CE	Montana	Kootenai		–	–	4	420,000	4	420,000	–	–	8	840,000
Libby Reregulating	CE	Montana	Kootenai		–	–	–	–	4	43,800	–	–	4	43,800
Asotin[7]	CE	Wash.-Ida.	Snake		–	–	–	–	4	540,000	–	–	4	540,000
Total installed capacity						10,691,900		8,120,880		2,848,300		5,741,500		27,402,580
Total number of projects						26		5		3		0		34

[1] CE–Corps of Engineers; BR–Bureau of Reclamation.
[2] Includes three service units and increase of 17,000 kw each for 13 rewound main units.
[3] Includes an increase of 17,000 kw each for 5 units to be rewound, three 600,000 kw units and three 700,000 kw units being installed at the Third Powerplant.
[4] Includes two fishway units of 13,500 kw each, 14 units of 78,000 kw and 8 units of 86,000 kw at The Dalles Powerplant.
[5] U.S. Bureau of Reclamation project incorporated into the Federal Columbia River Power System, effective July 1, 1963.
[6] Three Dworshak units have been operating at reduced capability since March 1973, but are not acceptable for commercial operation pending manufacturer's correction of overheating problems.
[7] Authorized, but not under active consideration.

ELECTRIC ENERGY ACCOUNT FISCAL YEAR – 1974

Table 3

Energy Received (millions of kilowatt-hours)	
Energy Generated for BPA	
Bureau of Reclamation	15,257
Corps of Engineers	51,930
Washington Public Power Supply System (Hanford)	4,382
Centralia Thermal Project	2,324
Power Interchanged in	49,173
Total Received	123,066
Energy Delivered (millions of kilowatt-hours)	
Sales	63,333
Power Interchanged Out	55,778
Used by the Administration	67
Total Delivered	119,178
Energy losses in transmission and transformation	3,888
Total	123,066
Losses in percent of total received	3.2
Maximum demand on Federal plants (kilowatts) (Date and Time) January 9, 1974 9 A.M. excludes Packwood Power Plant	11,957,000
Load factor in percent of total generated for BPA	70.5

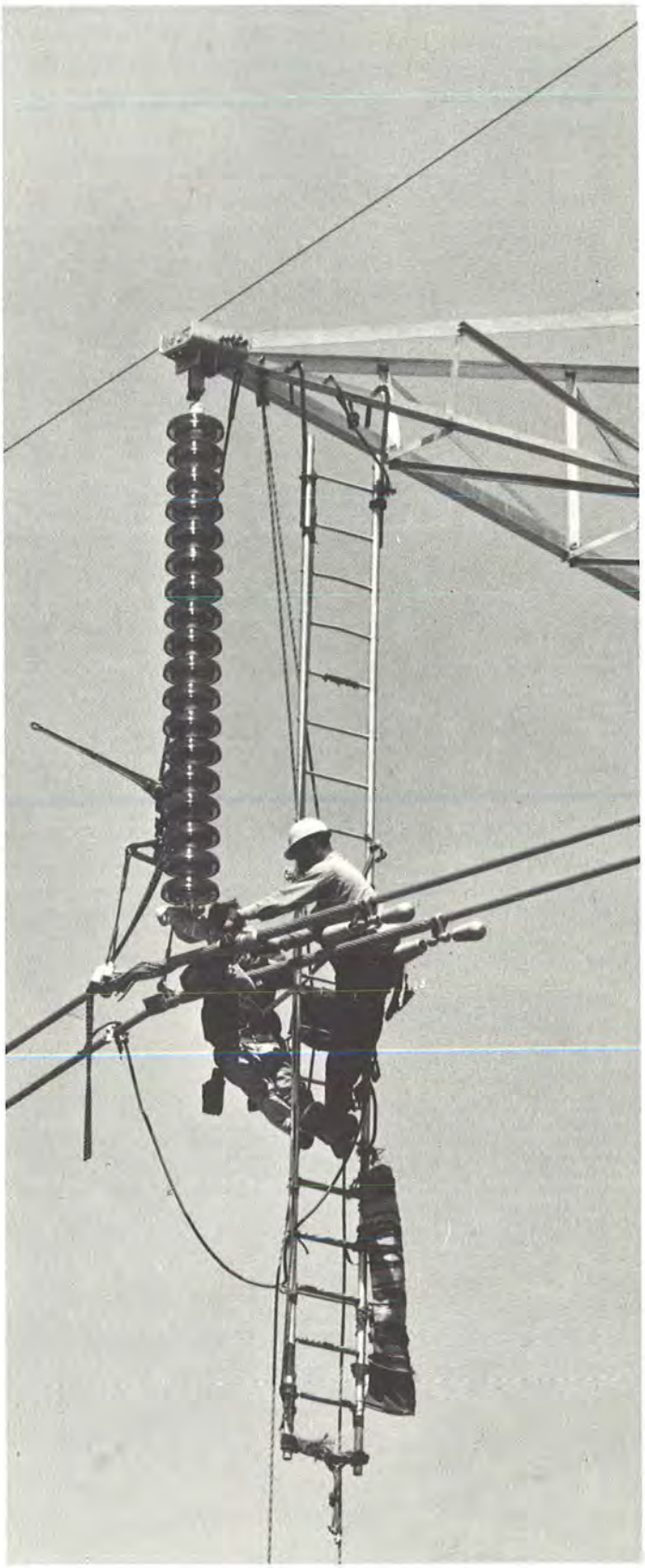
GENERATION BY THE PRINCIPAL ELECTRIC UTILITY SYSTEMS OF THE PACIFIC NORTHWEST FISCAL YEAR – 1974[1]

Table 4

Utility	Kilowatt-Hours (Billions)	Of Total Generation (Percent)
Publicly Owned:		
Federal Columbia River Power System[2]	74.0	54.9
Grant County PUD	10.5	7.8
Chelan County PUD	7.9	5.9
Seattle City Light	6.0	4.4
Douglas County PUD	4.1	3.0
Tacoma City Light	3.1	2.3
Eugene Water & Electric Board	0.5	0.4
Pend Oreille County PUD	0.3	0.2
Total Publicly Owned	106.4	78.9
Privately Owned:		
Idaho Power Company	8.4	6.2
Pacific Power & Light Co.	6.9	5.1
Montana Power Company	4.9	3.6
Washington Water Power Co.	3.5	2.6
Portland General Electric Co.	3.0	2.2
Puget Sound Power & Light Co.	1.8	1.4
Total Privately Owned	28.5	21.1
Total Generation	134.9	100.0

[1] Generation shown is for members of the Northwest Power Pool plus Pend Oreille County PUD and Washington Public Power Supply System. Utah Power & Light Co., British Columbia Hydro and Power Authority and West Kootenay Power and Light, who are members of the Power Pool, are not included because their service area lies outside the Pacific Northwest.

[2] Includes generation from the Washington Public Power Supply System's Hanford steamplant (NPR) and the Centralia Steamplant.



Federal Columbia River Power System

Table 5

INSTALLATION SCHEDULE FOR THERMAL POWER PROJECTS
WEST GROUP AREA
1975-76 THROUGH 1985-86

Project	Status[1]	Type of Fuel	Nameplate Rating Megawatts	Scheduled Commercial Operation Date		Principal Sponsor[2]
Colstrip #1	UC	Coal	165[3]	Sep.	1975	PSPL
Trojan	UC	Nuclear	1130	Nov.	1975	PGE
Jim Bridger #2	UC	Coal	500	June	1976	PPL
Colstrip #2	UC	Coal	165[3]	Jul.	1976	PSPL
Jim Bridger #3	UC	Coal	500	Mar.	1977	PPL
Combustion Turbine Beaver Combined Cycle (Addition)	UC	Oil/Gas	150	Nov.	1977	PGE
Colstrip #3	T	Coal	490[3]	Jul.	1978	PSPL
WNP #2 – Hanford	UC	Nuclear	1100	Sep.	1978	WPPSS
Jim Bridger #4[4]	T	Coal	333	Sep.	1979	PPL
Colstrip #4	T	Coal	490[3]	Jul.	1979	PSPL
Carty Coal (Boardman)	T	Coal	500	July	1980	PGE
WNP #1 – Hanford	C	Nuclear	1250	Sep.	1980	WPPSS
Skagit #1	C	Nuclear	1288	Jul.	1982	PSPL
WNP #3 – Satsop	C	Nuclear	1240	Sep.	1981	WPPSS
WNP #4 – Hanford	C	Nuclear	1250	Mar.	1982	WPPSS
Pebble Springs #1	C	Nuclear	1260	July	1982	PGE
WNP #5 – Satsop	C	Nuclear	1240	Mar.	1983	WPPSS
Skagit #2	T	Nuclear	1288	Jul.	1984	PSPL
Pebble Springs #2	T	Nuclear	1260	July	1985	PGE

[1] UC–Under Construction; C–Committed; T–Tentatively Scheduled.

[2] Abbreviations are: PPL–Pacific Power & Light Co.; PGE–Portland General Electric Co.; PSPL–Puget Sound Power & Light Co.; WPPSS–Washington Public Power Supply System.

[3] Colstrip Units #1 and #2 are rated 330 MW each; one-half of each unit will be used by West Group Area. Colstrip Units #3 and #4 are rated 700 MW each; 70% will be used by West Group Area.

[4] Jim Bridger Unit #1 is scheduled outside the hydro-thermal program. Jim Bridger Unit #4 is rated 500 MW; two-thirds of the unit will be used by West Group Area.

Federal Columbia River Power System

REPAYMENT STUDY FOR F.Y. 1974

AUTHORIZED PROJECTS –
(All Amounts in $1,000)

Table 6

[1] *The cost estimates used in this study are the same as those used in the repayment study submitted to the FPC on August 9, 1974, in support of the 27 percent rate increase. These estimates were developed as follows: Hydro generation and transmission construction costs were estimated using July 1, 1973, price levels but including a contingency allowance; O&M costs were estimated to include escalation through fiscal year 1976; purchase and exchange power costs were based on early 1974 estimates of the cost to complete the thermal plants from which BPA has contracted to purchase output. The only difference in this study and the one submitted to the FPC is that the FPC study included fiscal year 1974 costs and revenues on an estimated basis whereas this study includes the actual fiscal year 1974 revenues and costs. This accounts for a slight difference in the total revenues and expenses over the entire repayment period.*

1	2	3	4	5	6	7	8	9	10	11
					Investment Placed in Service			Plant Allocated to Commercial Power: Cumulative Investment Placed in Service		
Fiscal Year Ending June 30	Revenues	Operation and Maintenance Expense	Purchase and Exchange Power	Interest Expense	Initial Project	Replacements	Total	Initial Project	Replacements	Total
Cumulative to 6-30-74	2,465,706	695,438	199,208	879,283	3,680,337		3,680,337	3,680,337		3,680,337
1975	228,600	64,539	26,700	87,316	418,343	17,206	435,549	4,098,680	17,206	4,115,886
1976	299,000	70,154	29,900	102,209	686,031	7,516	693,547	4,784,711	24,722	4,809,433
1977	315,500	74,031	51,200	116,886	341,647	19,160	360,807	5,126,358	43,882	5,170,240
1978	333,400	75,152	88,100	129,105	390,587	8,554	399,141	5,516,945	52,436	5,569,381
1979	367,600	76,928	86,900	140,267	247,090	10,089	257,179	5,764,035	62,525	5,826,560
1980	375,500	79,538	84,600	147,763	144,000	24,403	168,403	5,908,035	86,928	5,994,963
1981	379,200	81,078	62,400	149,579	49,082	12,268	61,350	5,957,117	99,196	6,056,313
1982	385,800	82,113	62,600	151,296	281,488	22,520	304,008	6,238,605	121,716	6,360,321
1983	407,200	83,714	59,900	155,772	162,530	13,484	176,014	6,401,135	135,200	6,536,335
1984	409,000	84,244	62,000	155,754	38,816	18,176	56,992	6,439,951	153,376	6,593,327
1985	407,900	84,384	62,200	151,759	2,000	23,165	25,165	6,441,951	176,541	6,618,492
1986	408,600	84,424	61,400	146,386	2,000	17,886	19,886	6,443,951	194,427	6,638,378
1987	408,000	84,936	67,100	142,812	51,900	24,314	76,214	6,495,851	218,741	6,714,592
1988	415,200	85,628	76,300	140,454	43,965	20,599	64,564	6,539,816	239,340	6,779,156
1989	414,200	85,848	77,600	137,043	2,000	35,607	37,607	6,541,816	274,947	6,816,763
1990	413,100	86,828	76,100	139,497	206,762	35,370	242,132	6,748,578	310,317	7,058,895
1991	418,700	87,268	72,800	140,312	1,000	29,140	30,140	6,749,578	339,457	7,089,035
1992	418,200	87,461	72,200	137,047	41,046	58,421	99,467	6,790,624	397,878	7,188,502
1993	416,700	87,521	72,200	133,762	1,000	28,489	29,489	6,791,624	426,367	7,217,991
1994	425,200	87,621	72,200	129,738	9,861	47,658	57,519	6,801,485	474,025	7,275,510
1995	426,400	87,621	72,200	126,481		35,757	35,757	6,801,485	509,782	7,311,267
1996	427,600	87,621	72,200	122,279		53,375	53,375	6,801,485	563,157	7,364,642
1997	429,000	87,621	72,200	118,778		51,515	51,515	6,801,485	614,672	7,416,157
1998	429,200	87,621	72,200	115,650		37,564	37,564	6,801,485	652,236	7,453,721
1999	430,500	87,621	72,200	112,360		47,460	47,460	6,801,485	699,696	7,501,181
2000	434,200	87,621	72,200	108,860		49,145	49,145	6,801,485	748,841	7,550,326
2001	434,300	87,621	72,200	105,299		54,032	54,032	6,801,485	802,873	7,604,358
2002	434,400	87,621	72,200	102,226		57,532	57,532	6,801,485	860,405	7,661,890
2003	434,800	87,621	72,200	98,382		43,984	43,984	6,801,485	904,389	7,705,874
2004	437,800	87,621	72,200	94,740		58,663	58,663	6,801,485	963,052	7,764,537
2005	437,800	87,621	72,200	91,316		50,824	50,824	6,801,485	1,013,876	7,815,361
2006	437,800	87,621	72,200	88,445		67,912	67,912	6,801,485	1,081,788	7,883,273
2007	437,800	87,621	72,200	85,402		70,526	70,526	6,801,485	1,152,314	7,953,799
2008	436,100	87,621	72,200	81,712		52,381	52,381	6,801,485	1,204,695	8,006,180
2009	436,100	87,621	72,200	78,125		62,812	62,812	6,801,485	1,267,507	8,068,992
2010	436,100	87,621	72,200	74,853		75,430	75,430	6,801,485	1,342,937	8,144,422
2011	428,900	87,621	59,000	71,338		85,420	85,420	6,801,485	1,428,357	8,229,842
2012	428,900	87,621	59,000	67,286		80,133	80,133	6,801,485	1,508,490	8,309,975
2013	428,900	87,621	59,000	63,139		61,413	61,413	6,801,485	1,569,903	8,371,388
2014	405,500	87,621	2,500	58,729		79,605	79,605	6,801,485	1,649,508	8,450,993
2015	405,500	87,621	2,500	53,801		62,456	62,456	6,801,485	1,711,964	8,513,449
2016	405,500	87,621	2,500	49,612		91,878	91,878	6,801,485	1,803,842	8,605,327
2017	405,500	87,621	2,500	44,964		70,054	70,054	6,801,485	1,873,896	8,675,381
2018	405,500	87,621	2,500	39,844		60,861	60,861	6,801,485	1,934,757	8,736,242
2019	405,500	87,621	2,500	35,122		79,017	79,017	6,801,485	2,013,774	8,815,259
2020	405,500	87,621	2,500	31,207		73,401	73,401	6,801,485	2,087,175	8,888,660
2021	405,500	87,621	2,500	26,253		66,226	66,226	6,801,485	2,153,401	8,954,886
2022	405,500	87,621	2,500	20,824		79,692	79,692	6,801,485	2,233,093	9,034,578
2023	405,500	87,621	2,500	14,914		61,946	61,946	6,801,485	2,295,039	9,096,524
2024	405,500	87,621	2,500	9,189		64,711	64,711	6,801,485	2,359,750	9,161,235
2025	405,500	87,621	2,500	2,256		63,512	63,512	6,801,485	2,423,262	9,224,747
2026	405,500	87,621	2,500	(2,966)		90,188	90,188	6,801,485	2,513,450	9,314,935
2027	405,500	87,621	2,500	(7,342)		75,657	75,657	6,801,485	2,589,107	9,390,592
2028	405,500	87,621	2,500	(7,935)		56,268	56,268	6,801,485	2,645,375	9,446,860
2029	405,500	87,621	2,500	(7,468)		71,539	71,539	6,801,485	2,716,914	9,518,399
2030	405,500	87,621	2,500	(7,332)		59,664	59,664	6,801,485	2,776,578	9,578,063
2031	405,500	87,621	2,500	(7,489)		70,870	70,870	6,801,485	2,847,448	9,648,933
2032	405,500	87,621	2,500	(7,298)		76,978	76,978	6,801,485	2,924,426	9,725,911
2033	405,500	87,621	2,500	(8,082)		51,481	51,481	6,801,485	2,975,907	9,777,392
2034	405,500	87,621	2,500	(7,744)		62,586	62,586	6,801,485	3,038,493	9,839,978
2035	405,500	87,621	2,500	(8,063)		52,195	52,195	6,801,485	3,090,688	9,892,173
2036	405,500	87,621	2,500	(7,601)		67,220	67,220	6,801,485	3,157,908	9,959,393
2037	405,500	87,621	2,500	(7,876)		58,229	58,229	6,801,485	3,216,137	10,017,622
2038	405,500	87,621	2,500	(8,195)		47,874	47,874	6,801,485	3,264,011	10,065,496
2039	405,500	87,621	2,500	(7,954)		55,751	55,751	6,801,485	3,319,762	10,121,247
2040	405,500	87,621	2,500	(7,802)		60,591	60,591	6,801,485	3,380,353	10,181,838
2041	405,500	87,621	2,500	(7,759)		62,059	62,059	6,801,485	3,442,412	10,243,897
2042	405,500	87,621	2,500	(7,094)		83,748	83,748	6,801,485	3,526,160	10,327,645
2043	405,500	87,621	2,500	(8,146)		49,379	49,379	6,801,485	3,575,539	10,377,024
2044	405,500	87,621	2,500	(7,976)		54,891	54,891	6,801,485	3,630,430	10,431,915
2045	405,500	87,621	2,500	(7,675)		64,842	64,842	6,801,485	3,695,272	10,496,757
2046	405,500	87,621	2,500	(7,457)		71,936	71,936	6,801,485	3,767,208	10,568,693
2047	405,500	87,621	2,500	(7,827)		59,836	59,836	6,801,485	3,827,044	10,628,529
2048	405,500	87,621	2,500	(7,983)		54,760	54,760	6,801,485	3,881,804	10,683,289
2049	405,500	87,621	2,500	(7,366)		74,820	74,820	6,801,485	3,956,624	10,758,109
2050	405,500	87,621	2,500	(7,846)		59,237	59,237	6,801,485	4,015,861	10,817,346
TOTALS	33,342,406	7,235,624	2,948,308	5,618,650	6,801,485	4,015,861	10,817,346			

12	13	14	15	16	17	18	19	20	21	22
		Allowable Unamortized Investment			Irrigation Assistance					
Amortization	Unamortized Investment	Initial Project	Replacements	Total	Cumulative Amount in Service	Amortization	Unamortized Amount	Allowable Unamortized Amount	Cumulative Surplus Revenues	Fiscal Year Ending June 30
691,777	2,988,560	3,679,376		3,679,376	474,487		474,487	474,487		
50,045	3,374,064	4,091,918	17,206	4,109,124	474,487		474,487	474,487		1975
96,737	3,970,874	4,777,949	24,722	4,802,671	474,487		474,487	474,487		1976
73,383	4,258,298	5,119,322	43,882	5,163,204	474,487		474,487	474,487		1977
41,043	4,616,396	5,509,909	52,436	5,562,345	494,886		494,886	494,886		1978
63,505	4,810,070	5,756,441	62,525	5,818,966	512,766		512,766	512,766		1979
63,599	4,914,874	5,895,833	86,918	5,982,751	539,450		539,450	539,450		1980
86,143	4,890,081	5,926,500	99,179	6,025,679	573,369		573,369	573,369		1981
89,791	5,104,298	6,201,345	121,691	6,323,036	600,516		600,516	600,516		1982
107,814	5,172,498	6,348,208	135,157	6,483,365	611,617		611,617	611,617		1983
107,002	5,122,488	6,386,394	153,327	6,539,721	611,617		611,617	611,617		1984
109,557	5,038,096	6,383,092	176,424	6,559,516	611,617		611,617	611,617		1985
116,390	4,941,592	6,382,857	194,283	6,577,140	611,617		611,617	611,617		1986
113,152	4,904,654	6,432,089	218,535	6,650,624	611,617		611,617	611,617		1987
112,818	4,856,400	6,461,176	239,094	6,700,270	630,062		630,062	630,062		1988
113,709	4,780,298	6,447,427	274,652	6,722,079	654,062		654,062	654,062		1989
110,675	4,911,755	6,627,947	309,975	6,937,922	668,997		668,997	668,997		1990
118,320	4,823,575	6,600,015	338,792	6,938,807	684,998		684,998	684,998		1991
121,492	4,801,550	6,502,713	396,414	6,899,127	715,490		715,490	715,490		1992
123,217	4,707,822	6,442,983	424,806	6,867,789	735,991		735,991	735,991		1993
135,641	4,629,700	6,360,637	472,319	6,832,956	770,115		770,115	770,115		1994
140,098	4,525,359	6,339,262	507,404	6,846,666	798,450		798,450	798,450		1995
145,500	4,433,234	6,293,396	560,493	6,853,889	806,540		806,540	806,540		1996
139,729	4,345,020	6,267,605	611,202	6,878,807	828,374	10,672	817,702	817,702		1997
153,729	4,228,855	6,203,476	648,761	6,852,237	851,208		840,536	840,536		1998
158,319	4,117,996	6,169,849	695,359	6,865,208	878,542		867,870	867,870		1999
165,519	4,001,622	6,125,186	743,054	6,868,240	905,543		894,871	894,871		2000
159,143	3,896,511	6,054,380	796,300	6,850,680	923,975	10,037	903,266	903,266		2001
172,353	3,781,690	6,008,541	851,422	6,859,963	940,642		919,933	919,933		2002
176,597	3,649,077	5,953,280	894,565	6,847,845	962,308		941,599	941,599		2003
182,458	3,525,282	5,784,184	945,513	6,729,697	980,143	781	958,653	958,653		2004
186,663	3,389,443	5,606,653	995,437	6,602,090	998,144		976,654	976,654		2005
189,534	3,267,821	5,447,073	1,059,900	6,506,973	1,007,145		985,655	985,655		2006
192,577	3,145,770	5,293,109	1,129,707	6,422,816	1,034,479		1,012,989	1,012,989		2007
191,615	3,006,536	5,063,254	1,181,895	6,245,149	1,053,812	2,952	1,029,370	1,029,370		2008
191,878	2,877,470	4,891,729	1,243,336	6,135,065	1,085,979	6,276	1,055,261	1,055,261		2009
201,426	2,751,474	4,679,492	1,302,918	5,982,410	1,110,646		1,079,928	1,079,928		2010
210,941	2,625,953	4,579,410	1,387,824	5,967,234	1,129,979		1,099,261	1,099,261		2011
214,447	2,491,639	4,385,338	1,452,357	5,837,695	1,146,646	546	1,115,382	1,115,382		2012
183,124	2,369,928	4,280,826	1,512,781	5,793,607	1,164,981	36,016	1,097,701	1,097,701		2013
218,788	2,230,745	4,184,006	1,589,642	5,773,648	1,181,648	37,862	1,076,506	1,076,506		2014
225,240	2,067,961	4,089,006	1,643,737	5,732,743	1,205,150	36,338	1,063,670	1,063,670		2015
219,166	1,940,673	3,989,006	1,727,380	5,716,386	1,228,151	46,601	1,040,070	1,040,070		2016
232,653	1,778,074	3,809,372	1,787,673	5,597,045	1,259,818	37,762	1,033,975	1,033,975		2017
256,188	1,582,747	3,753,372	1,838,981	5,592,353	1,282,151	19,347	1,036,961	1,036,961		2018
228,699	1,433,065	3,401,424	1,899,268	5,300,692	1,302,819	51,558	1,006,071	1,006,071		2019
262,773	1,243,693	3,025,491	1,946,365	4,971,856	1,322,819	21,399	1,004,672	1,004,672		2020
278,215	1,031,704	2,891,292	1,997,795	4,889,087	1,341,320	10,911	1,012,262	1,012,262		2021
283,503	827,893	2,803,716	2,053,081	4,856,797	1,360,154	11,052	1,020,044	1,020,044		2022
294,319	595,520	2,413,016	2,099,448	4,512,464	1,374,513	6,146	1,028,257	1,028,257		2023
292,891	367,340	2,376,148	2,143,582	4,519,730	1,385,370	13,299	1,025,815	1,025,815		2024
304,964	125,888	2,050,805	2,186,784	4,237,589	1,396,227	8,159	1,028,513	1,028,513		2025
216,076		1,462,774	2,257,107	3,719,881	1,407,084	18,499	1,020,871	1,020,871	83,770	2026
75,657		1,235,127	2,294,751	3,529,878	1,417,941	17,728	1,014,000	1,014,000	313,106	2027
56,268		880,540	2,331,061	3,211,601	1,428,053	17,052	1,007,060	1,007,060	563,100	2028
71,539		737,450	2,365,461	3,102,911	1,428,053	13,869	993,191	993,191	800,539	2029
59,664		693,450	2,395,893	3,089,343	1,428,053		993,191	993,191	1,064,086	2030
70,870		652,368	2,422,702	3,075,070	1,428,053	8,532	984,659	984,659	1,307,552	2031
76,978		406,880	2,454,144	2,861,024	1,428,053	1,353	983,306	983,306	1,551,898	2032
51,481		285,350	2,476,481	2,761,831	1,428,053		983,306	983,306	1,823,878	2033
62,586		250,534	2,497,161	2,747,695	1,428,053		983,306	983,306	2,084,415	2034
52,195		250,534	2,515,027	2,765,561	1,428,053	8,998	974,308	974,308	2,346,664	2035
67,220		250,534	2,530,605	2,781,139	1,428,053	32,357	941,951	941,951	2,570,067	2036
58,229		224,634	2,544,059	2,768,693	1,428,053	23,433	918,518	918,518	2,811,660	2037
47,874		200,669	2,556,118	2,756,787	1,428,053	26,340	892,178	892,178	3,061,020	2038
55,751		200,669	2,565,631	2,766,300	1,428,053	15,545	876,633	876,633	3,313,057	2039
60,591		37,907	2,574,100	2,612,007	1,428,053	6,131	870,502	870,502	3,569,516	2040
62,059		37,907	2,580,169	2,618,076	1,428,053	27,802	842,700	842,700	3,802,793	2041
83,748		1,861	2,585,003	2,586,864	1,428,053	9,717	832,983	832,983	4,031,801	2042
49,379		1,861	2,588,139	2,590,000	1,428,053	5,446	827,537	827,537	4,300,501	2043
54,891			2,589,961	2,589,961	1,428,053	11,101	816,436	816,436	4,557,864	2044
64,842			2,590,579	2,590,579	1,428,053		816,436	816,436	4,816,076	2045
71,936			2,590,121	2,590,121	1,428,053		816,436	816,436	5,066,976	2046
59,836			2,588,693	2,588,693	1,428,053		816,436	816,436	5,330,346	2047
54,760			2,586,499	2,586,499	1,428,053	18,445	797,991	797,991	5,580,503	2048
74,820			2,583,407	2,583,407	1,428,053	24,000	773,991	773,991	5,804,428	2049
59,237			2,579,615	2,579,615	1,428,053	14,935	759,056	759,056	6,053,481	2050
10,817,346						668,997				

Construction of the transmission system starts . . .

BPA Structure and Administration

. . . with decisions made in the conference room.

BPA Organization Chart

MANAGEMENT ANALYSIS OFFICE
December 1, 1974

ADMINISTRATOR (A)
Donald Paul Hodel

DEPUTY ADMINISTRATOR
Carl R. Foleen

WASHINGTON D.C. OFFICE (AC)
Assistant Administrator (Mgr., Wash.D.C.Ofc.)
William S. Clagett, IV

Assistant Manager - George W. Toman

ASSISTANTS TO THE ADMINISTRATOR
Executive (AD) - Harold Kropitzer
Policy (AE) - Dan W. Schausten
Interagency Relations (AJ) - Emmet E. Willard
Energy Conservation (AL) - William A. Galbraith

REGIONAL SOLICITOR
Robert E. Ratcliffe

BONNEVILLE REGIONAL ADVISORY COUNCIL

EQUAL OPPORTUNITY OFFICER (AH) - Reginald M. Kaiser
PUBLIC INFORMATION OFFICER (AI) - John R. Ulrich

DIVISION OF ENGINEERING AND CONSTRUCTION (E)

Assistant Administrator for Engineering and Construction (Chief Engineer) - George S. Bingham
Chief of Program Control (EB) - John L. Bloodworth
E&C Environmental Coordinator (EE) - John O. Hooson
Construction Program Coor. (EA) -
Asst. to Chief Engineer, Computer Applications Staff (EC) - R. Scott McDuffie
Quality Conformance Coordinator - William H. Clagett, III
Administrative Officer (ED) - William H. Hagestedt, Jr.

Engineering Manager (EH) - Harry D. Hurless

Manager of Planning, Research & Development (EI) - Ralph S. Gens
BPA Project Manager - Phillip C. Otness
Thermal-Nuclear Analysis Staff (EIC) - Eugene C. Starr

Construction & Services Manager (EG) - Stanley E. Efferding, Jr.
Asst. to Construction & Services Mgr. - Lawrence D. Morderosian

BRANCH OF CONTROL ENGINEERING (EP)
Chief - Donald E. Johannson
Assistant Chief - James L. Jones
- Control Systems Software Section (EPF) Milton J. Brown
- Control & Protection Section (EPG) Richard E. Dietrich
- Data Systems Section (EPH) Wallace E. Helm
- Communications Section (EPI) Donald J. Marihart

BRANCH OF SUBSTATION DESIGN (ES)
Chief - C. Edwin Bragunier
- Station Projects Section (ESH)
- Architectural, Civil & Mech. Section (ESI) Norman R. Drulard
- Design Services Section (ESJ) Delmar C. Johnson

BRANCH OF TRANSMISSION DESIGN (ET)
Chief - Edward H. Gehrig
Assistant Chief - Charles F. Clark
- Specifications Section (ETF) Rodney V. Moorman
- Electrical Design Section (ETG) James J. Ray
- Line Design Section (ETH) H. Gordon Jensen
- Location & Mapping Section (ETI) Kirk E. Williams

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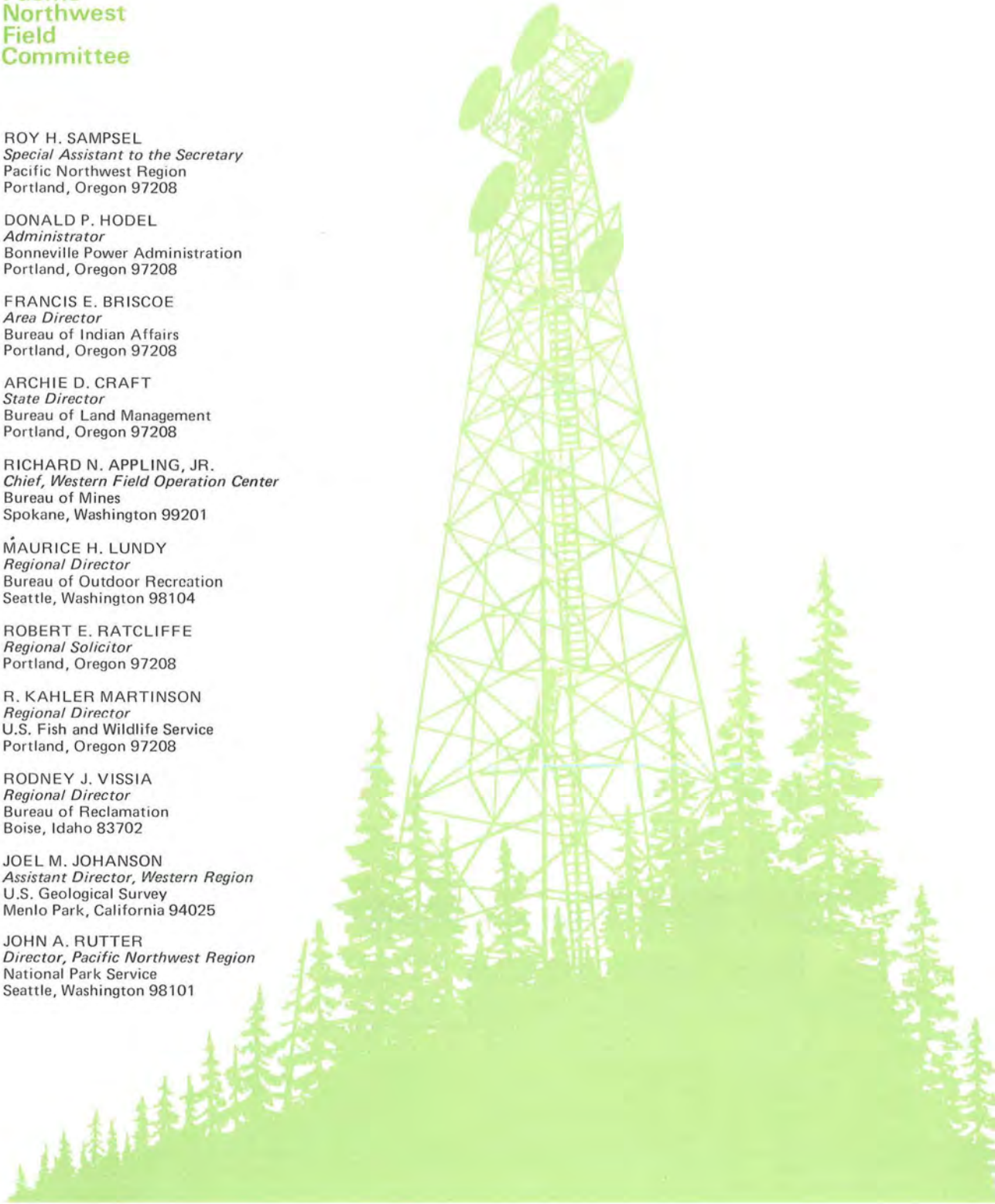

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