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REPORT TO THE CONGRESS

Pacific Northwest Hydro-Thermal Power Program—A Regional Approach To Meeting Electric Power Requirements

B-114858

Department of the Interior
Department of the Army

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

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JUNE 5, 1972

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

B-114358

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on the Pacific Northwest Hydro-Thermal Power Program--a regional approach to meeting electric power requirements.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretaries of the Interior and the Army.

Acting Comptroller General
of the United States

Contents

ABBREVIATIONS

BPA Bonneville Power Administration

GAO General Accounting Office

WPPSS Washington Public Power Supply System

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

PACIFIC NORTHWEST HYDRO-THERMAL POWER PROGRAM--A REGIONAL APPROACH TO MEETING ELECTRIC POWER REQUIREMENTS

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D I G E S T

WHY THE REVIEW WAS MADE

A Joint Power Planning Council--comprising 104 publicly owned utilities, 4 privately owned utilities, and the Bonneville Power Administration (BPA)-- developed the Hydro-Thermal Power Program in 1969 to meet growing electrical energy needs of the Pacific Northwest through the integration of regional power resources.

GAO made this review to

--assess the progress that has been made under the program and

--identify problems which must be resolved to enable the prompt development of planned electrical energy.

FINDINGS AND CONCLUSIONS

The Pacific Northwest has historically met 93 percent of its electricity needs through hydroelectric projects. Because most of the desirable hydroelectric sites in the region have been developed, the program aims to satisfy future power needs, in large part, through energy developed from thermal plants--coal burning or nuclear power.

The program is divided into two phases. Phase I covers estimated annual increases in demand for energy through 1981. Phase II covers the region's energy needs after 1981. (For a list of the hydroelectric and thermal projects in the Council's January 1969 plan, see app. I.)

Under the program plan, the Corps of Engineers and the Bureau of Reclamation--Departments of the Army and the Interior, respectively--are to construct and operate hydroelectric generating facilities at present and proposed Federal projects.

BPA is to construct and operate most of the regional transmission facilities (to move electrical energy in bulk).

Private and public utilities are to construct and operate generating facilities, primarily thermal projects, and distribution facilities, which serve consumers.

Each of the participants is to construct facilities in time to meet increases in power requirements estimated to occur through 1990.

The cost of the January 1969 plan was estimated at about $17.9 billion through July 1990. Of this amount, $6.1 billion would be provided by the Federal Government and about $11.8 billion by the 108 non-Federal utilities.

The Public Works Appropriation Act of

1971 authorized BPA to enter into a net billing arrangement to acquire part or all of the generating capacity of seven non-federally financed thermal plants to be constructed under phase I. (See p. 3.)

Under net billing, BPA acquires its preference customers' share of the electric power generated by the new nonfederally financed thermal plants. The 104 publicly owned utilities are preference customers of BPA.

This thermal power is integrated into BPA's hydroelectric system and sold to BPA's customers at BPA's rates.

In return for the power acquired, BPA assumes the preference customers' share of the construction, operation, and maintenance costs of these plants and pays for these costs by offsetting them against the amounts due BPA for the sale and/or transmission of power to the preference customers.

BPA's authority to acquire thermal power under net billing is limited by the amounts preference customers owe BPA for their power purchases. (See p. 16.)

Power shortages resulting from program delays

Through cooperation between Federal, public, and private utilities, the program has been successful in providing additional generating capacity.

As of September 30, 1973, about 4,200 megawatts of additional generating capacity had been provided under phase I; however, 1,590 megawatts of additional generating capacity, scheduled to be available by September 30, had not been provided.

An additional 8,670 megawatts scheduled to become available between October 1, 1973, and December 31, 1981, were behind schedule by an average 4-1/2 years.

As a result of the delays, power shortages in increasing amounts have occurred and are expected to continue to occur. (See p. 6.)

Delays in providing generating capacity under phase I resulted from problems in

--obtaining funds for constructing the Federal hydroelectric projects to be provided under the program plan (see p. 8),

--planning, designing, and constructing both Federal and non-Federal facilities (see pp. 9 and 11),

--obtaining public acceptance of a Federal hydroelectric project (see p. 10), and

--meeting State air pollution control requirements for a thermal plant (see p. 13).

Actions taken to reduce impact of program delays

Actions being taken will reduce the impact of program delays, but BPA is predicting regional power shortages during the next 4 years. (See p. 15.)

To reduce the impact of those delays, the Federal Government has

--requested that the public voluntarily curtail use of electricity and suggested that utilities do the same;

--extended an agreement for the sale

of steam produced from an Atomic Energy Commission reactor for utilities to use in operating an 840-megawatt thermal electrical generating plant from July 1, 1975, to October 31, 1977; and

--accelerated its plans for providing about 1,800 megawatts of hydroelectric power at the Bonneville Second Powerhouse in Oregon and Washington and at the Lower Granite and Little Goose projects in Washington and increased the generating capability of three units at Grand Coulee, in Washington, by 100 megawatts each.

The utilities have

--encouraged customers to reduce their use of electricity and told them how to use electricity more wisely,

--started planning and constructing combustion turbine generating facilities to provide 1,150 megawatts of additional generating capacity not scheduled under the program, and

--begun planning and constructing a thermal coal generating project providing 1,400 megawatts of capacity not scheduled under the program.

Additional funding requirements for phase I

BPA's current capability to net bill its preference customers is not sufficient, under existing rates, to meet all of its contracted commitments for the program. According to BPA this situation is due to escalation in thermal plant construction, operation, and maintenance costs.

BPA estimates that rate increases of between 40 and 75 percent will be needed by 1980 to meet its contractual obligations to construct, operate, and maintain thermal plants included in phase I. (See p. 16.)

Additional appropriated Federal funds totaling about $2 billion will be required for other hydroelectric projects and transmission facilities in order to complete phase I of the program, according to BPA.

Plans for implementing phase II of the program

Pacific Northwest utilities and BPA have agreed upon a plan for implementing the program through 1986.

Under this plan:

--Federal hydroelectric projects will be completed under Federal budget and appropriation processes in accordance with Corps and Bureau construction schedules.

--Net billing will be discontinued and there will be no Federal participation in the cost of constructing, operating, and maintaining the non-Federal thermal projects.

--The Federal Government will construct, operate, and maintain the main transmission system needed for the additional hydroelectric and thermal projects. (See p. 19.)

Proposed changes in funding BPA transmission program

According to BPA, prompt access to funds is necessary to continually supply Federal power to its customers and to construct and operate economic facilities added to the

Federal transmission system. BPA estimated that the cost of these additions and related expenses will average $177 million annually over the next decade.

BPA has concluded that continued reliance on Federal appropriations will not insure the availability of funds to coordinate the completion of transmission and powerplant facilities. (See p. 21.)

BPA has developed a legislative proposal authorizing it to finance operation and maintenance expenses and additions to its transmission system by using its revenues and by selling revenue bonds to the Secretary of the Treasury. The proposal has been incorporated in H.R. 14168 and S.3362, introduced on April 10 and April 22, 1974. (See p. 21.)

The purpose of these bills is to shift the financing of the Interior's electric power transmission program in the Pacific Northwest from the present arrangement of funding through Federal appropriations to a self-financing basis and thereby enable BPA to more effectively coordinate transmission completion with powerplant completion.

BPA activities would be subject to the budget and audit provisions of the Government Corporation Control Act.

The BPA budget would be submitted annually to the Congress and be subject to limitations or directives contained in appropriations acts.

The foregoing arrangements would give the Congress a satisfactory measure of control over BPA activities covered by the proposed legislation. (See p. 22.)

RECOMMENDATIONS OR SUGGESTIONS

This report contains no recommendations or suggestions.

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Departments of the Interior and the Army in general agreed with this report. The Interior provided a detailed description of the agreement between BPA and the utilities to implement phase II of the program. (See p. 22.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

The report should help the Congress in considering the method and level of funding and priorities for planned Federal hydroelectric projects and related facilities in the Pacific Northwest region.

CHAPTER 1

INTRODUCTION

In October 1966 the Joint Power Planning Council in the Pacific Northwest region,[1] comprising representatives of 104 publicly owned utilities; 4 privately owned utilities; and the Bonneville Power Administration (BPA), Department of the Interior, was formed to develop a plan to meet the anticipated power supply needs of the region. In 1969 the Council established the Hydro-Thermal Power Program to accomplish this purpose.

Program objectives are to (1) supply adequate power for the Pacific Northwest, (2) provide efficiencies in plant size, operations, and electrical distribution systems which serve consumers, and (3) minimize environmental impact. The program is designed to meet the growing electrical energy needs of the Pacific Northwest region through the integration of regional power resources--Federal and non-Federal, public and private, existing and planned. In 1969 BPA estimated that the electrical energy needed in the Pacific Northwest region was expected to triple between 1970 and 1990.

In 1969 hydroelectric projects were providing about 93 percent of the electrical energy in the Pacific Northwest; of this amount, about 50 percent was being supplied by BPA from Federal hydroelectric projects. Because most of the desirable hydroelectric sites in the Pacific Northwest had been developed, it was recognized that the region's future power needs would have to be met, in large part, through energy developed from thermal plants.[2]

The Joint Power Planning Council decided that the most efficient way to provide for future power needs would be through joint efforts of Federal agencies and utility companies. By constructing thermal plants jointly, larger, more economical plants can be built to achieve lower power production costs. Also, the construction of larger, but

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[1]Oregon, Washington, and Idaho and parts of Montana, Utah, California, Nevada, and Wyoming.

[2]"Thermal plants," as used in this report, means coal-burning or nuclear powerplants.

fewer, plants reduces the number of transmission facilities[1] needed and thereby reduces the environmental impact.

The program entails the merging of hydroelectric power with thermal power. The plan for implementing the program was prepared in January 1969 by the Joint Power Planning Council and provides for developing about 21,700 megawatts of hydroelectric generating capacity and about 21,400 megawatts of thermal electrical generating capacity to meet the estimated annual increases in demand for energy through 1990.

The program is divided into two phases. Phase I covers the estimated annual increases in demand for energy through 1981, and phase II covers the region's energy needs after 1981. The plan originally provided for 20,100 megawatts of generating capacity to be provided under phase I and 23,000 megawatts under phase II. (See app. I for a list of the projects--hydroelectric and thermal--in the January 1969 plan.)

Under the program plan the Corps of Engineers, Department of the Army, and the Bureau of Reclamation, Department of the Interior, are to construct and operate hydroelectric generating facilities at existing and proposed Federal projects. BPA is to construct and operate most of the regional transmission system. The non-Federal private and public utilities are to construct and operate generating facilities, primarily thermal, and distribution facilities which serve consumers.

The Administrator, BPA, is authorized to dispose of electrical energy generated at Federal projects constructed by the Corps and the Bureau in the Columbia River Drainage Basin, comprising a system known as the Federal Columbia River Power System. The Administrator markets power at rates approved by the Federal Power Commission. The power rates are required to be set at levels to provide sufficient revenues to repay the Treasury for funds made available to construct and operate the system.

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[1]Facilities used to move electrical energy in bulk.

The 108 non-Federal utilities which have teamed together with BPA under the program are customers already purchasing power from BPA. Of these, 104 are public utilities defined as "preference customers" under the Bonneville Project Act (16 U.S.C. 832c) and are entitled to preference and priority with respect to the delivery of electricity from the Federal system. The remaining four participants are private utilities which are not entitled to preference in the purchase of power from BPA but which are paying for about 60 percent of the program's non-Federal costs.

Program participants are to construct facilities in time to meet the annual increases in power requirements that are estimated to occur through 1990.

The cost of the January 1969 plan was estimated at about $17.9 billion through July 1990; the Federal Government was to provide about $6.1 billion of this amount to construct Bureau and Corps hydroelectric generating facilities and BPA transmission facilities. The 108 non-Federal utilities were to provide about $11.8 billion under this plan to construct thermal and hydroelectric generation facilities and transmission facilities.

In November 1973, BPA estimated that an additional $2 billion in Federal appropriated funds would be needed to complete phase I. It also estimated that the costs of phase II--Federal and non-Federal--would be $23.4 billion.

In December 1973, in reassessing the electrical energy needs of the Pacific Northwest region, BPA estimated that even more generating capacity would have to be provided than originally planned under the program.

CONGRESSIONAL AUTHORIZATION OF THE HYDRO-THERMAL POWER PROGRAM

In October 1969, the Secretary of the Interior announced that the President had approved the program. The Congress approved its implementation in the Public Works Appropriation Act for 1970 (Public Law 91-144, Dec. 11, 1969), by appropriating funds for preliminary engineering required by BPA to acquire generating capability from thermal generating plants under an arrangement called net billing.

Public Law 91-439 (Oct. 7, 1970), appropriated additional money for preliminary engineering and referred to the House Committee on Appropriations report (House report 91-1219, June 18, 1970), in describing the way the program was to be implemented. The Committee's report states that:

> "The program includes the construction of seven thermal generating plants between 1971 and 1981. None will be federally constructed, financed or owned. The committee approves implementation of the remainder of the program by the use of net billing as the means of affecting payment by the Bonneville Power Administration for part or all of the generating capacity of nonfederally financed thermal plants, under suitable agreements between Bonneville Power Administration and preference customers to accomplish this purpose. Such agreements would provide that the Bonneville Power Administration will acquire from a date certain, on a cost basis, the preference customers' rights to the generating capability of nonfederally financed plants whether or not they are operable. Any costs or losses to the Bonneville Power Administration under these agreements will be borne by Bonneville Power Administration rate payers through rate adjustments if necessary."

Under net billing, BPA acquires its preference customers' share of the electric power generated by the new nonfederally financed thermal plants. This thermal power is integrated into BPA's hydroelectric system and sold to BPA's customers at BPA's rates. In return for the power acquired, BPA assumes the preference customers' share of the construction, operation, and maintenance costs of these plants. BPA pays for these costs by offsetting them against the amounts due BPA for the sale and/or transmission of power to the preference customers.

Assume that one of BPA's preference customers has a 5-percent interest in a thermal plant. The customer pays its 5-percent share of the total plant costs, including construction, operation, and maintenance costs--$400,000 per period--in return for the rights to 5 percent of the thermal plant output. The customer assigns its 5-percent

share of plant output to BPA. BPA sells the customer power from various sources, including the thermal plant, and may provide other services, such as transmission over BPA's system, amounting to $500,000 per period. BPA offsets the $400,000 costs against the $500,000 charge. Thus, BPA net bills the customer $100,000 per period.

The result of net billing is that BPA integrates the preference customer's share of the more costly thermal power with the less costly hydroelectric power. BPA averages the cost of the combined thermal and hydroelectric energy in its overall charge to its power customers, preference and nonpreference.

SCOPE OF THE REVIEW

We examined the pertinent documents, records, reports, and files relating to BPA, Corps, and Bureau participation in the Hydro-Thermal Power Program covering fiscal years 1970-73. We did our work at BPA in Portland, Oregon; the Bureau's regional office in Boise, Idaho; the Corps' division office in Portland, Oregon; and in the Washinton, D.C., offices of these agencies. We discussed the program with officials of these Federal agencies and representatives of industrial power customers, utilities participating in the program, and utility and industrial customer committees working on various aspects of the program.

CHAPTER 2

PROGRESS AND PROBLEMS IN IMPLEMENTING PHASE I OF THE PROGRAM

As of September 30, 1973, about 4,200 megawatts of additional generating capacity had been provided in the Pacific Northwest under phase I of the program. Even with this increase, however, the program was behind schedule because of problems encountered by Federal agencies and participating utilities. As a result of the delays that have affected the program, power shortages in increasing amounts have occurred and are expected to continue.

STATUS OF PROGRAM

The following table shows the number of megawatts of generating capacity scheduled to be provided under the program by September 30, 1973, compared to the number actually provided.

Type of project	Number of megawatts		Percent behind schedule
	Scheduled	Provided	
Federal hydroelectric	3,862	2,272	41
Non-Federal hydroelectric	500	500	-
Non-Federal thermal	1,400	1,400	-
Total	5,762	4,172	28

The extent of the delays in the Federal hydroelectric projects that were behind schedule is shown in the following table.

Project	Unit number	Number of megawatts	Estimated completion date as of January 1969	Estimated completion date as of September 1973	Months of delay
The Dalles	21	86	Nov. 1972	Oct. 1973	11
(Wash. and Oreg.)	22	86	Feb. 1973	Nov. 1973	9
Grand Coulee	7	48.5	Mar. 1973	Dec. 1973	9
(Wash.)	8	48.5	June 1973	Dec. 1973	6
	19	600	Sept. 1973	Aug. 1975	23
Dworshak	1,2	180	June 1972	May 1974	23
(Idaho)	3	220	June 1972	May 1974	23
Libby	1	105	July 1973	July 1975	24
(Mont.)	2	105	July 1973	Oct. 1975	27
Ice Harbor	4	111	July 1973	Feb. 1975	19
(Wash.)					
Total		1,590			

About 14,330 megawatts of Federal and non-Federal electrical generating capacity were scheduled to become available under phase I between October 1, 1973, and December 31, 1981.[1] Of the 14,330 megawatts, about 8,670, or 60 percent, were behind schedule by an average 4-1/2 years as of September 1973. Also, eight projects originally scheduled to provide about 2,460 megawatts have been deferred.

Some of the power shortages occurring in the Pacific Northwest in December 1971 and 1972 and again in 1973 could have been lessened if the additional generating capacity had been available as scheduled. In December 1971, average deliveries of 373 megawatts an hour to industrial customers were interrupted for 6 hours during 1 day, and in December 1972, average deliveries of 473 megawatts an hour to industrial customers were interrupted for 71 hours over a 10-day period.

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[1]One thermal plant was planned to become available by January 1982 but was included under phase I by BPA.

We were informed by 12 of BPA's industrial customers that the December 1972 power interruptions cost them production losses valued at about $2.6 million.

In 1973 power shortages occurred earlier than in the previous years because of an unusually dry winter and low streamflows in the spring. On April 11, 1973, power deliveries to industrial customers were reduced by 520 megawatts through July 20, 1973, when power deliveries were further reduced by an additional 260 megawatts. BPA advised us that, as a result of the power reductions, industrial customers were employing 1,070 fewer workers as of November 1973. BPA advised us further that the monthly payroll for these employees was about $1 million and that the losses in production were valued at about $15 million.

All the reductions in power deliveries were to those industrial customers with contracts providing for interruptible power.[1]

PROBLEMS CONTRIBUTING TO PROGRAM DELAYS

The delays in providing the scheduled generating capacity resulted generally from problems in (1) obtaining funds for constructing the Federal hydroelectric projects to be provided under the program plan, (2) planning, designing, and constructing both Federal and non-Federal facilities, (3) obtaining public acceptance of a Federal hydroelectric project, and (4) meeting State air pollution control requirements for a thermal plant.

Federal projects

1. Funding problems--To develop the Nation's water resources, the Corps and the Bureau construct projects for such purposes as recreation, flood control, and irrigation, as well as for hydroelectric power. In considering projects for construction, the Corps takes into account the needs of each region of the country for such projects. The Bureau's project development work is confined to 17 western

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[1]Power made available under agreements which permit curtailment or cessation of delivery by the supplier.

States. The Federal hydroelectric projects included in the Hydro-Thermal Power Program are included in the overall Corps and Bureau programs for the development of water resources.

Executive branch budget limitations were placed on the construction of water resource projects during each of the fiscal years included in our review--1970-73. During this period, the construction of 10 hydroelectric projects (including those projects listed in the table on p. 7) scheduled to provide about 6,000 megawatts of electrical generating capacity under the program was delayed because of the budget limitations.

For example, construction work at the Chief Joseph Dam on the Columbia River involves the installation of an additional 11 hydroelectric generators with a total generating capacity of 1,045 megawatts. The January 1969 program plan scheduled the first generator to be available by November 1974 and the last one by November 1976. Although the Corps requested funds in fiscal year 1970, the project was not approved for funding by the Office of Management and Budget.

The Corps repeated its request for funds to start construction at the Chief Joseph Dam, as well as at other projects, in fiscal years 1971-73. The Chief Joseph project was not included in the President's annual budget until fiscal year 1973. Funds to start construction at the Chief Joseph project in fiscal year 1973 were appropriated by the Congress in the act of August 25, 1972 (86 Stat. 621). However, the Executive Office did not make the funds available for the Corps until April 1973 and, as a result, construction of the additional power-generating facilities at the project has been delayed 28 months.

2. Design and construction--Design and construction problems occurred after the January 1969 plan was developed. This delayed construction of the Corps' Bonneville Dam Second Powerhouse and the Bureau's Teton Basin project and therefore delayed the provision of 346 megawatts of additional generating capacity by about 2 years.

In January 1969, the Corps said preconstruction planning for the Bonneville Dam Second Powerhouse could be completed in fiscal year 1970 and that construction could begin in fiscal year 1971. The Corps, however, had problems in selecting a site that would be compatible with another project

for improving the navigation facilities at Bonneville Dam. As a result, the Corps made more studies to investigate alternative sites. This caused about a 3-year delay in completing preconstruction planning and therefore delayed provision of the 324 megawatts of generating capacity.[1]

In January 1969, the Bureau's construction plans for the Teton Basin project showed that 22 megawatts of generating capacity would be provided by April 1974. However, more detailed construction plans prepared in October 1970 showed that this capacity could not be provided until May 1976--a delay of about 2 years.

According to Bureau officials, collection of more detailed design data and preparation of construction specifications showed that (1) the original time estimate was overly optimistic, (2) there was more construction work than originally planned, and (3) the original plan did not adequately consider the effect of winter weather conditions on the time required for construction.

The Bureau estimates that construction delays at the Columbia Basin Project Third Powerplant (Grand Coulee) will delay 1,800 megawatts of generating capacity by about 15 months and another 1,800 megawatts by about 10 months. The major construction work on this project is behind the Bureau's original construction schedule. The Bureau has allowed the contractor some construction delays due to (1) adverse weather conditions, (2) labor strikes, and (3) additional construction work not originally planned.

In February 1974, the Bureau advised us that the first three units at Grand Coulee which were behind schedule about 15 months had been delayed an additional 8 months. The Bureau advised us also that it did not anticipate a delay for the second units which were behind 10 months.

3. Problems in obtaining public acceptance of project construction--Public resistance has delayed the construction of one Corps program project--Asotin Dam--to be located on the Middle Snake River between Washington and Idaho.

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[1]In addition, the project was delayed about 3 years due to budget limitations.

Several bills have been introduced in the Congress to preserve this area of the Snake River. For example, Senate bill 717, 92d Congress, 1st session, provides that this segment of the river be designated as the Hells Canyon-Snake National River and precludes the construction of any additional dams or other water impoundments in this area. As of a result of the controversies over plans for ultimate development of the area, the Corps has indefinitely delayed providing 270 megawatts of electrical generating capacity originally scheduled to be available by June 1977.

Non-Federal projects

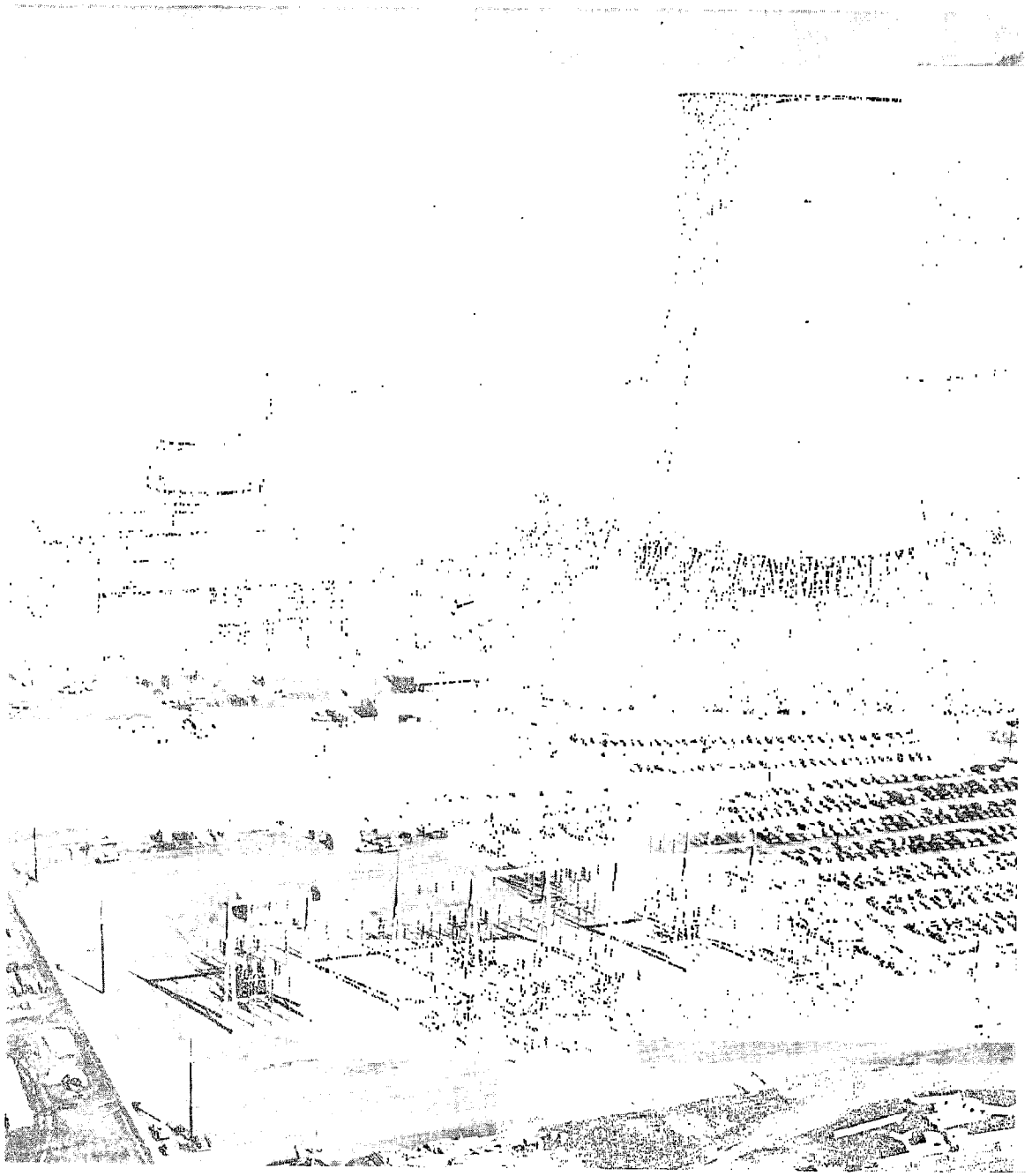
Thermal projects to be provided by the private and public utilities have also been delayed because of problems in meeting construction schedules and in meeting State air pollution control requirements.

1. Problems in meeting construction schedules--The Trojan thermal plant in Prescott, Oregon (see picture below), when completed, will be the first nuclear project under the program. The Portland General Electric Company--a private utility--will construct and operate the Trojan plant and will finance about two-thirds of the costs. The remaining costs will be borne by 15 other utilities in varying proportions. Under the January 1969 program plan, the project was expected to provide 1,000 megawatts of generating capacity by February 1975.

The revised date for completing the Trojan plant is now July 1975, and the plant is expected to provide 1,130 megawatts. Utility officials advised us that the original project construction schedule did not allow enough time for contingencies. They stated, for example, that the original construction schedule did not provide enough time to obtain the construction permit from the Atomic Energy Commission or allow for adverse weather conditions.

The Atomic Energy Commission issued a construction permit and the Oregon Department of Environmental Quality a certificate of compliance, both in February 1971. Construction of the plant is well underway.

Three other nuclear projects included in the January 1969 program plan have also been delayed, as follows.



THE TROJAN THERMAL NUCLEAR PROJECT IS UNDER CONSTRUCTION ON THE COLUMBIA RIVER AT PRESCOTT (AS OF APRIL 1973). THE LARGE TOWER ON THE RIGHT IS THE COOLING TOWER, AND THE BUILDING ON THE LEFT WILL HOUSE THE REACTOR.

Source: BPA

Project	January 1969 program plan: Megawatts	January 1969 program plan: Estimated installation date	Estimated installation date as of September 1973
Thermal plant 3 (WPPSS 2) (note a)	1,000	Apr. 1977	Sept. 1978
Thermal plant 4 (Boardman, Oreg.)	1,000	Oct. 1978	Sept. 1980
Thermal plant 5 (WPPSS 1)	1,000	Apr. 1980	Sept. 1981

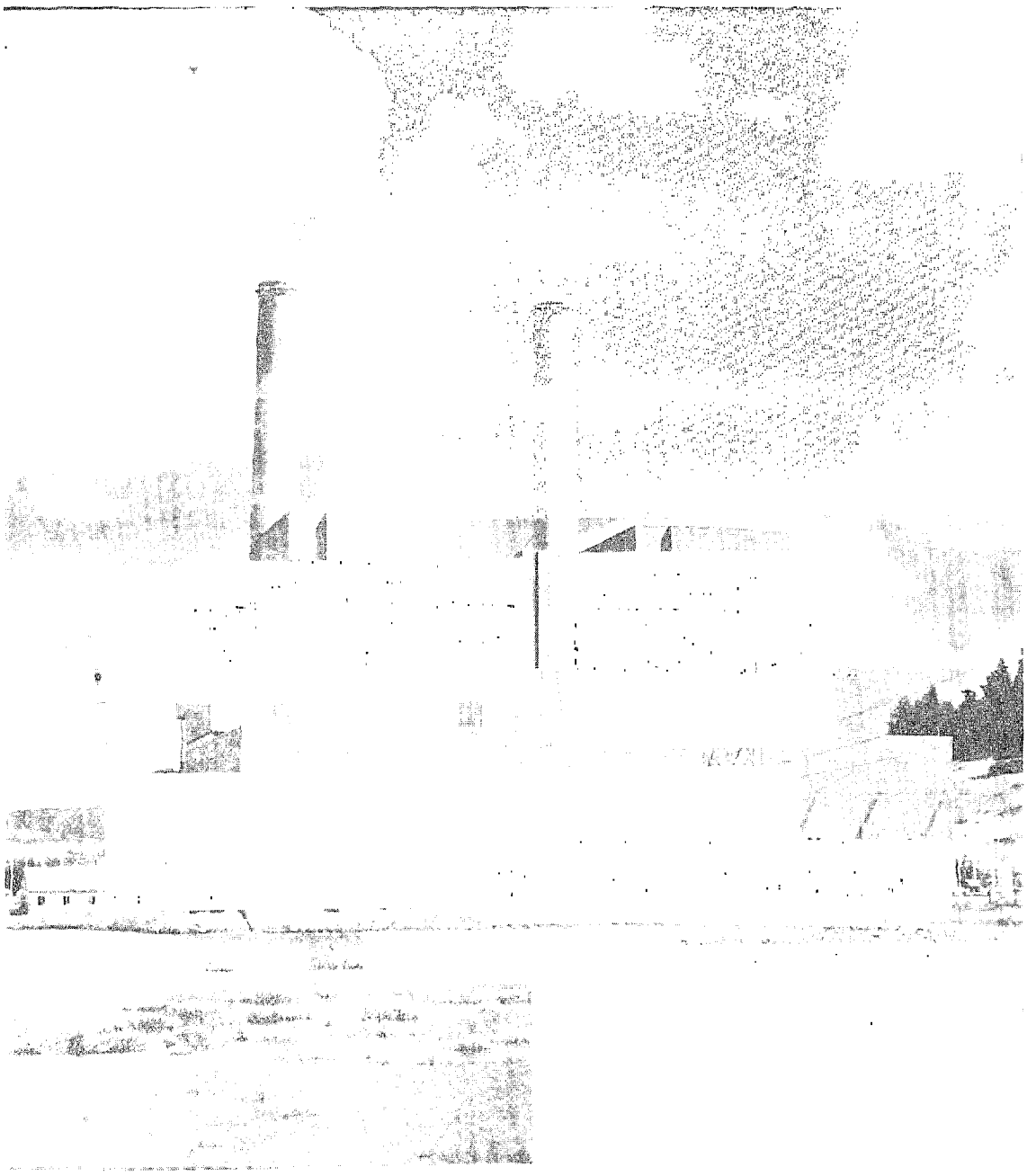
[a]Washington Public Power Supply System.

The dates have been moved backward for WPPSS projects numbers 1 and 2 in anticipation of (1) delays in licensing by the Atomic Energy Commission, (2) the unavailability of certain craftsmen and skilled laborers when they are needed, and (3) suppliers' inability to meet delivery dates for project equipment.

The estimated installation date for the Boardman plant was delayed because of a site problem. The Oregon State Nuclear and Thermal Energy Council rejected the plant site because of the hazards posed by low-flying aircraft at a nearby U.S. Navy practice range where nonexploding bombs are dropped. Efforts are being made to get the Navy to relocate the bombing range.

2. Problems in meeting State air pollution control requirements--The Centralia plant near Centralia, Washington (see picture below), was the first thermal coal plant to be constructed under the program. It was constructed and is operated by the Pacific Power and Light Company--a privately owned utility--which is financing about half the costs. Seven other utilities are paying the remaining costs in varying proportions. The project has two power-generating units, each of which is designed to provide 700 megawatts of electrical generating capacity. These are the largest generating units in the area.

The Centralia plant's first unit began to produce power in August 1971 and the second unit in August 1972. However, the units have been permitted to operate at only about 50 to 70 percent of capacity because, when operated at full



THE CENTRALIA PLANT LOCATED NEAR CENTRALIA IS THE FIRST THERMAL PLANT COMPLETED UNDER THE PROGRAM.

Source: BPA

capacity, the units cannot meet the State of Washington's air pollution standards.

During fiscal year 1974, hydroelectric power shortages occurred because of unusually low water conditions in the Pacific Northwest. To help alleviate the power shortage, the Governor of Washington authorized the utilities to operate the project up to an average output of 1,200 megawatts during the period November 9, 1973, to May 1, 1974.

However, the problem of meeting State air pollution control requirements remains when the Governor's authorization expires. Utility officials told us that the air pollution problems occurred because the plant's air pollution control equipment had not performed in accordance with specifications and that they plan to install additional air pollution control equipment to correct the problems by September 1, 1974.

ACTIONS TAKEN TO MEET POWER NEEDS

Program participants have taken action to reduce the impact of program delays. The Federal Government has

- --requested that the public voluntarily curtail use of electricity and suggested that the utilities promote such energy conservation to their customers;

- --acquired 400 megawatts of power from the Southern California Consolidated Edison Company for the winter of 1973-74;

- --extended an agreement for the sale of steam produced from an Atomic Energy Commission reactor for utilities to use in operating an 840-megawatt thermal electrical generating plant from July 1, 1975, to October 31, 1977;

- --authorized BPA to purchase additional power from utilities outside the region; and

- --accelerated its plans for providing about 1,800 megawatts of hydroelectric power at the Bonneville Second Powerhouse, Lower Granite, and Little Goose projects and increased the generating capability of three units at Grand Coulee by 100 megawatts each.

The utilities have

--encouraged customers to reduce their use of electricity and told customers how to use electricity more wisely;

--begun planning and constructing combustion turbine generating facilities to provide 1,150 megawatts of additional electrical generating capacity not scheduled under the program;

--begun planning and constructing a thermal coal generating project providing 1,400 megawatts of capacity not scheduled under the program;

--accelerated the construction schedules for providing 700 megawatts of additional hydroelectric power generation at three projects in Washington--Rock Island Additions and Mossyrock Additions (included in the program) and High Ross (not included in the program); and

--planned to purchase power from California utilities during 1973-74 and 1974-75.

It is apparent that, due to the leadtime required for implementation, some of the actions being taken by program participants will not have an immediate impact in meeting the Pacific Northwest's power needs. As of January 1974, BPA was still predicting regional power shortages for the next 4 years, as follows.

	1974-75	1975-76	1976-77	1977-78
Estimated power shortages (megawatts)	2,381	957	1,467	1,062

RATE INCREASE REQUIRED TO MEET CONTRACTUAL COMMITMENTS

BPA's authority to acquire thermal power under net billing is limited by the amounts preference customers owe BPA for their power purchases. The preference customers have no right to payment in cash from BPA for thermal power delivered to BPA. BPA's current capability to net bill with its preference customers is not sufficient, under existing power rates, to meet all of its contractual commitments for

the program. According to BPA, this situation has occurred because of the escalation in thermal plant construction, operation, and maintenance costs.

BPA expects to raise its rates for power, which would increase its revenues from preference customers and enable BPA to meet its contractual obligations for the construction, operation, and maintenance costs of thermal plants included in the program. BPA estimates that rate increases between 40 and 75 percent will be needed by 1980.

CONCLUSIONS

Through cooperation between the Federal Government and public and private utilities, the Hydro-Thermal Power Program has been successful in adding generating capacity in the Pacific Northwest. There have been significant delays, however, in both the Federal and utility segments of the program.

Many of the delays have been caused by site, licensing, design, and construction problems similar to those encountered throughout the electric power industry in recent years. Some of the delays in Federal projects, however, have been directly related to funding problems inherent in the Federal budgetary process.

According to BPA, additional appropriated Federal funds totaling about $2 billion will be required for other projects and transmission facilities in order to complete phase I of the program. In view of the constantly changing priorities that must be considered in developing the Federal budget, it is apparent that there can be no assurance that these funds will be available when needed. Thus, the utilities in the Pacific Northwest will have to consider these uncertainties in planning how to meet increasing power requirements through 1981--the scheduled completion date of phase I.

CHAPTER 3

PLANS FOR IMPLEMENTING PHASE II OF THE HYDRO-THERMAL POWER PROGRAM

The January 1969 program plan provided that 23,000[1] megawatts of capacity--15,200 from non-Federal hydroelectric and thermal facilities and 7,800 from Federal hydroelectric facilities--would be made available from 1982 through 1990. In November 1973 BPA estimated program costs from 1982 through 1990 at $3.2 billion for the Federal Government and $20.2 billion for the public and private utilities.

As we said in the preceding chapter, the constantly changing priorities that must be considered in developing the Federal budget cause uncertainties in planning the extent of Federal participation in the construction of Federal hydroelectric projects and transmission facilities. Also, even with future rate increases, BPA does not expect to have sufficient revenues to enable it to participate--under net billing--in assuming the preference customers' share of the output from additional non-Federal thermal plants after the completion of phase I of the program.

Recognizing the problems concerning the extent of continued Federal participation in the program, the Secretary of the Interior, on March 12, 1973, instructed the Administrator, BPA, to begin planning for phase II by

- --informally notifying all BPA customers that notices of power insufficiency, effective 1982, would be issued within 1 year unless the utilities and BPA developed a plan for carrying forward the program or some alternative procedure which would assure the region of a future power supply and minimize financial demands on the Federal Treasury;

- --advising the utilities and other interested regional parties that, as long as affirmative progress was being made on such a plan, the Interior Department

[1] One thermal plant was planned to become available by January 1982 but was included under phase I by BPA.

would make every effort to support timely completion of Federal hydroelectric generating facilities under construction; and

--proceeding as rapidly as possible in developing the plan and reporting to the Secretary of the Interior.

The Administrator, BPA, advised us that a policy committee composed of representatives of the utilities and industrial power consumers in the region was asked to prepare the plan.

PROPOSED COOPERATIVE ROLE UNDER PHASE II

On December 14, 1973, the Pacific Northwest utilities and BPA agreed upon a plan for implementing the program through 1986. Under this plan:

--The Federal hydroelectric projects will be completed under Federal budget and appropriation processes in accordance with Corps and Bureau construction schedules.

--Net billing will be discontinued and there will be no Federal participation in the cost of constructing, operating, and maintaining the non-Federal thermal projects.

--The Federal Government will construct, operate, and maintain the main transmission system needed for the additional hydroelectric and thermal projects.

In addition to the agreement on phase II, BPA and the utilities agreed that--instead of obtaining annual appropriations--it would be advisable for BPA to seek legislative authority to use its revenues to pay operation and maintenance expenses and to finance additions to its transmission system by selling bonds which would be guaranteed only to the extent of revenues earned by BPA.

Under phase II the utilities and BPA agreed to move forward in a cooperative effort to implement the financing, construction, and operation of hydroelectric and thermal generation facilities. BPA and the utilities identified the

thermal generation to be developed and revised the schedule of hydroelectric generation to be supplied from 1973 through 1990.[1]

Under the revised schedule, the 7,800 megawatts of Federal hydroelectric generation, originally planned to be supplied under the January 1969 program plan, were reduced by about 5,700 megawatts. About 1,410 megawatts of this reduction was due to rescheduling the projects from phase II to phase I. A BPA official advised us that about 4,560 megawatts to be provided by Federal hydroelectric project construction were dropped from the program because of project uncertainties, such as those associated with the Asotin project on the Middle Snake River. (See p. 10.) One project for providing about 270 megawatts (Bonneville Second Powerhouse) was added which was not in the January 1969 program plan.

The 2,100 megawatts of Federal hydroelectric generation now scheduled under phase II are estimated to cost about $345 million. As of December 1973, the facilities to produce about 1,860 megawatts of this power were not yet under construction.

BPA suggested that other possible hydroelectric projects, estimated to provide 3,700 megawatts, be investigated by the utilities, the Corps, and the Bureau to minimize power deficits beginning in the 1983-84 period.

BPA and the utilities have also determined the specific thermal projects to be provided by the utilities for the period July 1, 1978, to July 1, 1985. The thermal plants are scheduled to provide 7,560 megawatts, of which 840 megawatts will be provided if the agreement for operating an Atomic Energy Commission reactor is extended beyond October 1977. (See p. 15.) BPA has advised us that, without the hydroelectric facilities (3,700 megawatts), the following power deficiencies are projected.

	1983-84	1984-85	1985-86
Estimated power shortages (megawatts)	650	1,634	3,006

[1] The schedule includes five units providing 275 megawatts which are to be operational by 1993.

Under the recently announced phase II plan, utilities will provide the additional thermal generation without using net billing. BPA's preference customers may directly purchase all or part of the thermal generation or they may request BPA to act as an agent to purchase power for them. Under the agent approach, BPA will obtain the lowest cost power available, deliver the power to the preference customer requesting it, and charge the customer for the cost of the power and the expenses incurred in delivering it.

Nearly all the power becoming available under the program is to be transmitted on BPA's transmission system to participating utilities and BPA customers in the Pacific Northwest. To implement the plan, BPA will have to construct new transmission facilities to transmit the increased power generated. BPA provides about 80 percent of the transmission system in the region.

PROPOSED CHANGES IN FUNDING BPA ELECTRIC POWER TRANSMISSION PROGRAM

According to BPA, prompt access to funds is necessary to continually supply Federal power to its customers and to construct and operate economic facilities added to the Federal transmission system. BPA estimated that the cost of these added facilities and related expenses would average about $177 million annually over the next decade.

BPA has concluded that it cannot satisfactorily meet the objectives of an optimal transmission system if it continues to rely on Federal appropriations. According to BPA, because of other Federal budget priority items, there is little assurance that required facilities will be funded as promptly as necessary to coordinate transmission completion with powerplant completion. BPA stated that the utilities could, individually or collectively, finance and construct more transmission facilities but that such an arrangement would place additional financial responsibility on utilities which already have the rapidly increasing financial burdens associated with the construction of major new thermal plants.

Therefore, BPA has developed a legislative proposal which would authorize it to finance operation and maintenance expenses and additions to its transmission system by using its revenues and by selling revenue bonds to the Secretary of the Treasury. The proposal was incorporated in

H.R. 14168, introduced in the House of Representatives on April 10, 1974, and in S. 3362, introduced in the Senate on April 22, 1974.

The purpose of these bills is to shift the financing of the Interior's electric power transmission program in the Pacific Northwest from the present arrangement of funding through Federal appropriations to a self-financing basis and thereby enable BPA to more effectively coordinate transmission completion with powerplant completion.

Under these legislative proposals BPA activities would be subject to the budget and audit provisions of the Government Corporation Control Act. The BPA budget would be submitted annually to the Congress for review by the appropriations committees and be subject to limitations or directives contained in appropriations acts.

We believe the foregoing arrangements would give the Congress a satisfactory measure of control over BPA activities covered by the proposed legislation.

AGENCY COMMENTS

The Interior informed us by letter dated February 27, 1974 (see app. II), that our report presented an excellent description with supporting data regarding the impact of generator installation delays on the availability of electric power in the Pacific Northwest. The Interior also gave us a detailed description of the agreement between BPA and the utilities to implement phase II of the program. The substance of these comments has been discussed previously in this chapter.

The Army commented on our report by letter dated February 25, 1974. (See app. III.) The Army stated that resolving the energy crisis in the Pacific Northwest would depend on continued cooperative efforts and on both Federal and non-Federal additions to regional power capabilities. Federal facilities could be added through the Corps' program by the timely completion or acceleration of authorized power projects currently underway, initiation of those not yet underway, or the authorization and construction of economically justified power installations having a high potential for early completion.

PLANNED AND ACTUAL INSTALLATION DATES

FOR PROJECTS IN THE JANUARY 1969 PLAN

FOR THE HYDRO-THERMAL POWER PROGRAM

Project	Unit number	Number of megawatts per unit	Total number of megawatts Phase I	Total number of megawatts Phase II	Planned installation date (note a)	Actual installation date as of September 1973
HYDROELECTRIC:						
Lower Monumental (Wash.)	1	135	135	-	Jan. 1969	May 1969
	2	135	135	-	Jan. 1969	Sept. 1969
	3	135	135	-	Jan. 1969	Jan. 1970
	4,5	135	270	-	Dec. 1978	
	6	135	135	-	Jan. 1979	
John Day (Wash. and Oreg.)	10	135	135	-	Nov. 1969	Aug. 1969
	11	135	135	-	Dec. 1969	Feb. 1970
	12	135	135	-	Feb. 1970	May 1970
	13	135	135	-	Apr. 1970	Nov. 1970
	14	135	135	-	June 1970	Feb. 1971
	15	135	135	-	Nov. 1971	Oct. 1971
	16	135	135	-	Nov. 1971	Nov. 1971
	17,18	135	-	270	Oct. 1983	
	19,20	135	-	270	Jan. 1984	
Little Goose (Wash.)	1	135	135	-	June 1970	May 1970
	2	135	135	-	June 1970	Oct. 1970
	3	135	135	-	June 1970	Dec. 1970
	4,5,6	135	-	405	Dec. 1986	
The Dalles (Wash. and Oreg.)	15,16	86	172	-	Aug. 1971	Jan. 1973
	17	86	86	-	Nov. 1971	Feb. 1973
	18	86	86	-	Feb. 1972	Mar. 1973
	19	86	86	-	May 1972	Apr. 1973
	20	86	86	-	Aug. 1972	May 1973
	21	86	86	-	Nov. 1972	
	22	86	86	-	Feb. 1973	
Rocky Reach Additions (Wash.) (note b)	8	125.4	125.4	-	Dec. 1971	Oct. 1971
	9	125.4	125.4	-	Dec. 1971	Nov. 1971
	10	125.4	125.4	-	Dec. 1971	Nov. 1971
	11	125.4	125.4	-	Dec. 1971	Dec. 1971
Grand Coulee (Wash.)	7	48.5	48.5	-	Mar. 1973	
	8	48.5	48.5	-	June 1973	
	9,10,11,12	48.5	-	194	Jan. 1989	
	19	600	600	-	Sept. 1973	
	20	600	600	-	Mar. 1974	
	21	600	600	-	Sept. 1974	
	22	600	600	-	Dec. 1977	
	23	600	600	-	Dec. 1981	
	24	600	-	600	Jan. 1983	
	25	600	-	600	Jan. 1990	
Dworshak (Idaho)	1,2	90	180	-	June 1972	
	3	220	220	-	June 1972	
	4,5,6	220	-	660	Jan. 1987	
Libby (Mont.)	1,2	105	210	-	July 1973	
	3	105	105	-	Oct. 1973	
	4	105	105	-	Jan. 1974	
	5,6,7,8	105	-	420	Jan. 1988	
Ice Harbor (Wash.)	4	111	111	-	July 1973	
	5	111	111	-	Oct. 1973	
	6	111	111	-	Jan. 1974	
Teton (Idaho)	1,2	11	22	-	Apr. 1974	

APPENDIX I

Project	Unit number	Number of megawatts per unit	Total number of megawatts Phase I	Total number of megawatts Phase II	Planned installation date (note a)	Actual installation date as of September 1973
HYDROELECTRIC (continued):						
Lost Creek (Oreg.)	1	24.5	24.5	-	Apr. 1974	
	2	24.5	24.5	-	June 1974	
Lower Granite (Wash.)	1,2,3	135	405	-	June 1974	
	4,5,6	135	-	405	Dec. 1985	
Chief Joseph (Wash.)	17	95	95	-	Nov. 1974	
	18	95	95	-	Feb. 1975	
	19	95	95	-	May 1975	
	20	95	95	-	Aug. 1975	
	21	95	95	-	Nov. 1975	
	22	95	95	-	Jan. 1976	
	23	95	95	-	Mar. 1976	
	24	95	95	-	May 1976	
	25	95	95	-	July 1976	
	26	95	95	-	Sept. 1976	
	27	95	95	-	Nov. 1976	
	28,29	116.5	-	233	Oct. 1986	
	30,31,32	116.5	-	349.5	Dec. 1987	
	33,34	116.5	-	233	Dec. 1988	
	35,36,37	116.5	-	349.5	Dec. 1989	
Bonneville Second Powerhouse (Wash. and Oreg.)	1	54	54	-	Mar. 1975	
	2	54	54	-	May 1975	
	3	54	54	-	July 1975	
	4	54	54	-	Sept. 1975	
	5	54	54	-	Nov. 1975	
	6	54	54	-	Jan. 1976	
Asotin (Wash. and Idaho)	1,2	135	270	-	June 1977	
	3,4	135	-	270	Dec. 1985	
Muddy-Meadows (Wash.) (note b)		135	135	-	July 1977	
Mt. Sheep, Low (Idaho and Oreg.) (note c)	1,2	100	200	-	Mar. 1979	
	3,4	100	200	-	July 1979	
Lower Scriver (Idaho)	1,2	30	60	-	May 1979	
	3,4	30	60	-	July 1979	
Appaloosa (Idaho and Oreg.) (note c)	1,2,3	350	1,050	-	July 1979	
	4,5,6	350	-	1,050	Jan. 1989	
Klamath River Additions (Oreg. and Calif.) (note b)		118	118	-	July 1979	
		164	-	164	July 1982	
Upper Scriver (Idaho)	1	37.5	37.5	-	July 1979	
Ben Franklin (Wash.)	1,2,3	34.4	103.2	-	Mar. 1980	
	4,5,6	34.4	103.2	-	May 1980	
	7,8	34.4	68.8	-	July 1980	
	9,10	34.4	68.8	-	July 1981	
Guffey (Idaho)	1,2	21.25	42.5	-	May 1980	
	3,4	21.25	42.5	-	July 1980	
Lynn Crandall (Idaho)	1,2	60	120	-	May 1980	
	3,4	60	120	-	July 1980	

Project	Unit number	Number of megawatts per unit	Total number of megawatts Phase I	Total number of megawatts Phase II	Planned installation date (note a)	Actual installation date as of September 1973
HYDROELECTRIC (continued):						
North Fork Snoqualmie (Wash.)	1,2	20	40	-	June 1980	
	3	20	20	-	July 1980	
Lucky Peak (Idaho)	1,2	17.5	35	-	July 1980	
Kootenai Falls (Mont.)	1,2,3	60	180	-	Mar. 1981	
	4,5,6	60	180	-	July 1981	
Lower Flathead (Mont.)	1,2	56.7	-	113.4	Mar. 1983	
	3,4	56.7	-	113.4	May 1983	
	5,6	56.7	-	113.4	July 1983	
Lenore (Idaho)	1,2	50	-	100	Mar. 1984	
	3,4	50	-	100	June 1984	
Quartz Creek (Mont.)	1,2	26	-	52	Apr. 1984	
	3,4	26	-	52	July 1984	
Garden Valley (Idaho)	1,2	43.75	-	87.5	Apr. 1984	
	3,4	43.75	-	87.5	June 1984	
Garden Valley Reregulating (Idaho)	1,2	9	-	18	May 1984	
	3,4	9	-	18	July 1984	
Twin Springs (Idaho)	1,2	34.5	-	69	June 1984	
Sullivan Creek (Wash.) (note b)	1,2	6.8	-	13.6	July 1984	
Spruce Park (Mont.)	1,2	60	-	120	July 1984	
Smoky Range (Mont.)	1,2	95	-	190	July 1984	
Strube (Oreg.)	1	4.5	-	4.5	July 1984	
Rock Island Additions (Wash.) (note b)	1,2,3,4,5,6,7	33	-	231	July 1984	
Libby Reregulating (Mont.)	1,2	30.5	-	61	Sept. 1984	
Wenatchee River (Wash.) (note b)			-	150	July 1985	
			-	150	Dec. 1989	
American Falls Enlargement (Idaho)			-	60	July 1985	
Ninemile Prairie (mont.)	1,2,3	40	-	120	July 1986	
Cougar Addition (Oreg.)	3	35	-	35	Oct. 1987	
Boundary Addition (Wash.) (note b)	5,6	137.8	-	275.6	Dec. 1989	
Mossyrock Addition (Wash.) (note b)	3	150	-	150	Dec. 1989	
Mayfield Addition (Wash.) (note b)	4	40.5	-	40.5	Dec. 1989	
Total megawatts (21,697.5)			12,699.1	8,998.4		

APPENDIX I

Project	Unit number	Number of megawatts per unit	Total number of megawatts Phase I	Total number of megawatts Phase II	Planned installation date (note a)	Actual installation date as of September 1973
THERMAL:						
Centralia (Wash.) (note b)	1	700	700		Sept. 1971	Aug. 1971
	2	700	700		Sept. 1972	Aug. 1972
Thermal plant 1 (Prescott, Oreg.) (note b)	-	1,000	1,000	-	Feb. 1975	
Thermal plant 2 (Jim Bridger, Wyo.) (note b)	-	1,000	1,000	-	May 1976	
Thermal plant 3 (WPPSS 2, Wash.) (note b)	-	1,000	1,000	-	Apr. 1977	
Thermal plant 4 (Boardman, Oreg.) (note b)	-	1,000	1,000	-	Oct. 1978	
Thermal plant 5 (WPPSS 1, Wash.) (note b)	-	1,000	1,000	-	Apr. 1980	
Thermal plant 6 (WPPSS 3, Wash.) (note b)	-	1,000	1,000	-	Jan. 1982	
Themal plant 7 (note b)	-	1,000	-	1,000	Mar. 1982	
Thermal plant 8 (note b)	-	1,000	-	1,000	Oct. 1983	
Thermal plant 9 (note b)	-	1,000	-	1,000	Feb. 1984	
Thermal plant 10 (note b)	-	1,000	-	1,000	Apr. 1985	
Thermal plant 11 (note b)	-	1,000	-	1,000	Jan. 1986	
Thermal plant 12 (note b)	-	1,000	-	1,000	Mar. 1986	
Thermal plant 13 (note b)	-	1,000	-	1,000	Jan. 1987	
Thermal plant 14 (note b)	-	1,000	-	1,000	Apr. 1987	
Thermal plant 15 (note b)	-	1,000	-	1,000	Jan. 1988	
Thermal plant 16 (note b)	-	1,000	-	1,000	May 1988	
Thermal plant 17 (note b)	-	1,000	-	1,000	Jan. 1989	
Thermal plant 18 (note b)	-	1,000	-	1,000	Mar. 1989	
Thermal plant 19 (note b)	-	1,000	-	1,000	Nov. 1989	
Thermal plant 20 (note b)	-	1,000	-	1,000	Feb. 1990	
Total megawatts of thermal generating capacity (21,400)			7,400	14,000		
Total megawatts (43,097.5)			20,099.1	22,998.4		

[a]Planned installation date, as used here, refers to the anticipated date when a project can be relied upon to generate electric energy on a firm basis.

[b]Non-Federal project.

[c]Project unauthorized by the Congress.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

FEB 27 1974

Mr. Philip Charam
Deputy Director
Resources and Economic
Development Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Charam:

Your draft report to the Congress on "Pacific Northwest Hydro-Thermal Power Program -- Problems in Meeting Regional Power Requirements" has been reviewed. That review encompassed both the original draft and subsequent revisions received February 8, 1974.

[See GAO note, p. 29.]

The draft report presents an excellent description with supporting data regarding the impact of generator installation delays on the availability of electric power in the Pacific Northwest. The impact of these delays as presented in the report has not changed significantly. However, agreement among Pacific Northwest utilities and BPA concerning Hydro-Thermal Program Phase 2 was reached on December 14, 1973. Attachment 1 is a description of the Phase 2 program. Implementation of this program is being initiated, a fact which affects certain aspects of your report

[See GAO note, p. 29.]

[See GAO note, p. 29.]

As to the attached description of the Phase 2 Program, the last paragraph, "Implementation," indicates that no legislation is required. This has been confirmed with the Solicitor's office. This paragraph also notes that Bonneville and the utilities are developing a legislative proposal for BPA to use its revenues to pay operation and maintenance expenses and to finance additions to the transmission system. The legislative authority for this "self-financing" is not directly related to implementation of the Phase 2 Program. However, BPA and the Pacific Northwest utility representatives did reach concurrent understandings regarding the advisability of self-financing and the content of the Phase 2 Program.

[See GAO note, p. 29.]

[See GAO note.]

We appreciate your providing us an opportunity to review your proposed report in draft form, and particularly the cooperation of your staff on report changes.

Sincerely yours,

Allan L. Reynolds
Director of Audit and
Investigation

Attachments

GAO note: The deleted comments relate to matters which were discussed in the draft report but omitted from this final report.

HYDRO-THERMAL PROGRAM PHASE 2

On December 14, 1973, representatives of the Pacific Northwest's publicly and cooperatively owned systems, investor-owned utilities, direct-service industrial customers of BPA, and the Bonneville Power Administration, joined to pursue a plan to continue to meet the region's requirements on a cooperative basis.

Summary

The utilities, industries, and the Bonneville Power Administration agreed to move forward in a cooperative effort to implement the financing, construction, and operation of approximately 1.8 million KW of coal-fired generation, about 5.8 million KW of nuclear generation (including continuation of the New Production Reactor (NPR) at Hanford), and 3.7 million KW of peaking capacity to be added to the generation included in the already approved Phase 1 of the Hydro-Thermal Program. In view of the national energy policy, dependence upon oil or gas is avoided. Due to loads now estimated to grow faster than previously forecasted and delays in already approved projects, there is now a projected deficiency beginning in the 1970's. The resource schedule is designed to meet the regional power requirements in the late 1970's and through 1986. It is expected that additional resources to provide the power requirements beyond 1986 will also be identified soon.

Power Situation

Power shortages have been forecasted for the 1970's and 1980's. Delays in scheduled generating units, recognition of the need to provide reserves for possible delays and loads forecasted above previous estimates, account for this deficiency. For example, current load forecasts for the region in 1979-80 are 688 MW higher on peak and 377 average MW larger on energy than the forecasts appearing in last year's study.

With the general shortage of all forms of energy, there is a possibility of electrical loads growing even faster than now projected. If the loads do not materialize, generation can be delayed or, in the present energy shortage, power temporarily surplus to the region's needs probably can be sold outside the region. However, if too little is planned, the area will suffer shortages.

Proposed Generation

Subject to the results of further investigation and such substitutes as such investigation indicate desirable, the additional resources proposed to meet the deficits in the late 1970's include extension of the operation

of the NPR at Hanford (840 MW) and addition of four coal-fired generating units (1,800 MW). Discussions are now underway with the Atomic Energy Commission (AEC) and Washington Public Power Supply System (WPPSS) to extend the NPR operations past October 1977. Extension of the operation of NPR past 1977 will require moving the site of WPPSS #1 to another location on the Hanford reservation and probably delay commercial operation from 1981 to 1982.

One additional coal-fired unit is suggested at Jim Bridger and another at Centralia. Two coal-fired units are suggested for the Boardman or another appropriate site. Coal-fired electric generating units can probably be completed by July 1, 1978, unless delayed by shortages of material or other considerations.

At Jim Bridger, coal can be secured from nearby fields.

At Centralia, where local economic coal deposits may be sufficient only for the existing two units, coal might be imported from other areas.

Preliminary economic studies indicate that Centralia No. 3 be investigated as a peaking and standby plant. Under critical water conditions, it would need to operate to meet energy needs through 1981-82. Beginning in 1982-83 in our analysis, the plant factor is taken at 20 percent instead of the 75 percent used in prior years. Boardman would also be fueled by coal imported from other regions and may be in the same category. However, in this analysis, a 75 percent plant factor was used throughout.

The four nuclear units amounting to about 5,000 MW are in accordance with present investigations of Puget Sound Power & Light Company, Pacific Power & Light Company, Portland General Electric Company, and Washington Public Power Supply System. A generation schedule is shown in Exhibit A. Further studies might indicate the desirability of changing the schedule, for example, to put two units at Sedro Woolley back-to-back, or two at Hanford, or an additional unit at the Satsop site (WPPSS #3). Such a procedure would result in a substantial saving in capital investment. Exhibit B shows the area shortage and the effect of adding the thermal units. The amount of shortage is taken from the "Work Coordination Group Load-Resource Task Force" report of December 7, 1973. Peaking will be provided to go with the baseload thermal plants under the plan. About 3700 MW of peaking capability in addition to existing authorized units, exclusive of Asotin Dam, is needed to meet the 1985-86 loads. Several additional hydroelectric units, including some pumped storage projects, are under active investigation, and it is suggested that other possibilities be investigated immediately.

Allocation of Additional Power

Exhibit C shows a possible allocation among public systems, investor-owned

utilities, direct-service industrial customers, and BPA of the energy from the proposed new units. The load-resource report indicates BPA, under Phase 1 of the Hydro-Thermal Program, will meet preference and existing industrial loads through 1982-83. It is anticipated that BPA will allocate to each preference customer a share of the resources available under Phase 1 of the Hydro-Thermal Program and will make available an appropriate portion of such resources to carry out the new industrial contracts noted below. The allocation to preference customers could be increased if additional resources became available to BPA.

It is assumed in Exhibit C that the increased energy requirements of public systems would be met by their participation in new generation. Bonneville's existing commitment of 25 average MW to each preference customer is included in BPA's distribution in the exhibit and is not shown separately since it adds only a small additional amount to BPA's overall commitments.

Arrangements for Acquiring Additional Power

(1) Investor-owned utilities will own plants or part of plants or purchase power from other non-Federal utilities to meet their energy requirements. This does not represent any change from Phase 1 of the Hydro-Thermal Program.

(2) Publicly owned and cooperatively owned systems will have several ways to participate in the new generation required to meet their loads.

As individual utilities, they might own all or a portion of a thermal generating unit. An alternative would be direct participation in units owned by a joint operating agency such as WPPSS, or indirect participation with BPA acting as an agent for them. Or a utility system might utilize a combination of these methods. A small system with average energy requirements of 25 MW or less could continue to purchase all of its power from BPA until its purchases reach that level. Such a system might, if it desires, meet part of its requirements from any of the methods available to other publicly owned or cooperatively owned systems.

The agency approach is similar to "net-billing" except the ownership of acquired power is never in BPA and the actual costs flow through to the participating systems. Bonneville will act as an agent for any preference customer in acquring specific amounts of power for that system.

BPA will contract for the lowest cost power available. Full cost of such power will flow through to the electric systems in the agency arrangement. In addition, BPA will charge for its services such as overhead for handling these transactions, load shaping, wheeling, and reserves. Each electric system will estimate its own load requirements and request BPA to obtain that quantity of power for it. If any system underestimated its requirements,

it is anticipated that BPA would have power available from its load growth reserves to make up the resulting deficiency; and such power would be sold at the Reserve Power Rate discussed below. If a system overestimates its requirements, it will be required to accept its requested thermal power at cost. It is anticipated that shortages or surpluses of contracted thermal power may be reassigned among systems to minimize costs, but to the extent adequate reassignment of surpluses is not arranged, the system may sell such surplus or temporarily reduce its purchases from BPA.

(3) Direct-service industrial customers will purchase up to 1,000 MW to provide extra reserves for the area for the purposes described below or to firm up their interruptible power in case this power is not needed for such reserves.

Industries also would probably have BPA act as an agent. Alternatively, they might purchase directly from a generating plant. The reserve feature will be implemented by contracts that will provide that in case of delay in any scheduled generation, or if projected output of any units is less than the planning plant factor, any utility or BPA dependent upon such delayed or inadequate generation to meet firm loads may withdraw all or part of the reserve power contracted for by the industries. The withdrawal would have to be made on at least 30 days notice prior to July 1 of any year and effective for that year beginning July 1.

The industries will secure new 20-year contracts with BPA. These contracts will be in accordance with BPA's industrial sales policy adopted on January 22, 1971. The industries will also secure additional power for existing plants if needed because of technological changes, including improved pollution control devices.

(4) Bonneville will acquire energy for load growth reserves, to meet the requirements of preference customers up to 25 average MW, and to serve existing commitments. BPA will acquire such additional electric energy by exchanges of peaking or services for energy and by appropriations. Exchange of services from BPA for energy will provide that BPA make available one or more of the following services: transmission, load shaping, peaking capacity, or forced-outage reserves. In turn the utility will provide energy to BPA. If the energy secured by exchanges is inadequate to meet these needs, Bonneville could acquire energy through the appropriation process.

Rates

BPA will establish a Reserve Power Rate to apply to the sale of load growth reserves. The Reserve Power Rate will be set to cover anticipated cost of generation, load shaping, transmission, reserves, possible unsaleable surpluses and a fair share of BPA overheads. The Reserve Power Rate will be

higher than estimated costs of new generation as a result of including in the rate the costs attributable to unsaleable surpluses.

Rates to industry under the new 20-year contracts will gradually increase so that at 100 percent availability the BPA industrial rate will increase at a rate commensurate with the increased cost of power for preference customers.

Dry Hole

In case of a "dry hole" or costs relating to extensive plant delays or plant abandonment, the whole region or interested utilities might share in the additional costs. Further analysis should be made as to what type "dry holes" should be covered and to what extent.

NPR and WPPSS No. 1

Since arrangements were previously worked out for operation of NPR through October 1977 and for WPPSS No. 1, these arrangements should be continued. A new extension agreement would need to be worked out for operation of NPR after October 1977. It is expected that those purchasing energy from the extended operation of NPR would pay the charges to AEC, additional costs of WPPSS, and transmission charges of BPA. The amount of energy delivered would be reduced by losses.

Implementation

No legislation is required to implement the above. Bonneville and the utilities are proceeding upon legislative authority for BPA to use its revenues to pay operation and maintenance expenses and to finance additions to the transmission system. The Pacific Northwest Utility Conference Committee is organizing task forces to work immediately on the analyses and contracts necessary to implement the plan. Sponsoring utilities are proceeding with studies of the proposed new generation.

3 Enclosures [See GAO note.]

GAO note: The enclosures are not included here but were considered in this report.

December 19, 1973

DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 20310
FEB 25 1974

Mr. Harold Pichney
Assistant Director
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Pichney:

This letter is in response to your request to the Secretary of Defense for comments on a draft report entitled, "Pacific Northwest Hydro-Thermal Power Program - Problems in Meeting Regional Power Requirements," (OSD Case #3760).

The report reviews and discusses the capabilities of the regional Hydro-Thermal Power Program (Program) in meeting the objectives of providing for the area's power requirements. The Program was developed by a Joint Power Planning Council comprised of Federal and non-Federal interests and involves primarily the responsibilities of the Department of the Interior. Corps involvement results only from inclusion of the power capabilities of its projects in the Program potentials. Although no specific recommendations are made regarding Corps or other Federal participation in this Program, the report does note that its success in meeting the stated objectives may be jeopardized due to continuing uncertainties in making timely Federal power additions stemming from changing priorities in the Federal budget.

[See GAO note.]

I believe, however, that resolution of the energy crisis in the area is dependent on continued cooperative efforts and both Federal and non-Federal additions to regional power capabilities. Federal additions could be effected through the program of the Corps of Engineers by the timely completion or acceleration of authorized power projects currently underway, initiation of those not yet underway, or the authorization

GAO note: The deleted comments relate to matters which were discussed in the draft report but omitted from this final report.

and construction of economically justified power installations having a high potential for early accomplishment.

The opportunity to review the draft report is appreciated.

Sincerely,

Charles R. Ford
Chief
Office of Civil Functions

PRINCIPAL OFFICIALS OF THE DEPARTMENT OF THE INTERIOR AND THE DEPARTMENT OF THE ARMY RESPONSIBLE FOR THE ADMINISTRATION OF ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
DEPARTMENT OF THE INTERIOR		
SECRETARY OF THE INTERIOR:		
Stewart L. Udall	Jan. 1961	Jan. 1969
Walter J. Hickel	Jan. 1969	Nov. 1970
Fred J. Russell (acting)	Nov. 1970	Dec. 1970
Rogers C. B. Morton	Jan. 1971	Present
ASSISTANT SECRETARY--LAND AND WATER RESOURCES (note a):		
Kenneth Holum	Jan. 1961	Mar. 1969
James R. Smith	Mar. 1969	Feb. 1973
Jack O. Horton	Mar. 1973	Present
COMMISSIONER OF RECLAMATION:		
Floyd E. Dominy	May 1959	Oct. 1969
Ellis L. Armstrong	Nov. 1969	Apr. 1973
Gilbert G. Stamm (acting)	Apr. 1973	May 1973
Gilbert G. Stamm	May 1973	Present
ASSISTANT SECRETARY--ENERGY AND MINERALS (note a):		
Stephen A. Wakefield	Mar. 1973	Present
ADMINISTRATOR, BONNEVILLE POWER ADMINISTRATION:		
Henry R. Richmond	Sept. 1967	Dec. 1972
Donald P. Hodel	Dec. 1972	Present

	Tenure of office	
	From	To
DEPARTMENT OF THE ARMY		
SECRETARY OF THE ARMY:		
Stanley R. Resor	July 1965	June 1971
Robert F. Froehlke	July 1971	Present
CHIEF OF ENGINEERS, CORPS OF ENGINEERS:		
Lt. Gen. William F. Cassidy	July 1965	Aug. 1969
Lt. Gen. Frederick J. Clarke	Aug. 1969	Aug. 1973
Lt. Gen. William C. Gribble, Jr.	Aug. 1973	Present

[a]Secretary of the Interior Order No. 2951, dated February 6, 1973, established the Office of Assistant Secretary--Land and Water Resources, formerly the Office of Water and Power Resources, and the Office of Assistant Secretary--Energy and Minerals.

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