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ADDRESS BY DR. WILLIAM A. PEARL, ADMINISTRATOR, BONNEVILLE POWER ADMINISTRATION, U. S. DEPARTMENT OF THE INTERIOR, BEFORE TWENTY-FIFTH ANNUAL CONVENTION, INLAND EMPIRE WATERWAYS ASSOCIATION, EMPIRE ROOM, MULTNOMAH HOTEL, PORTLAND, OREGON, 10:00 A.M., DECEMBER 12, 1958

POWER OUTLOOK FOR PACIFIC NORTHWEST

Mr. Crookham, Members, Guests:

The twenty-fifth annual convention or silver anniversary of the Inland Empire Waterways Association marks an important milestone in the unified efforts of the people of the Northwest to bring about a comprehensive development of our water resources. During this period, your organization has made an outstanding contribution not only to development of navigation on the Columbia river and its tributaries, but to power, flood control, irrigation and the other key resource uses.

The concept of comprehensive river development has made tremendous strides in the last quarter of a century. We see new evidence almost every day of the growing cooperation of federal, state and local agencies and resource organizations in bringing about the fullest utilization of our water, land and other resources. There is also a better realization of the close relationships that must be maintained between the agencies concerned with multi-purpose river development if full utilization of all resources is to be achieved.

The same spirit of cooperation is evident among the utilities and agencies concerned with the hydroelectric power resources of the Pacific Northwest. Today we have municipalities, PUDs, cooperatives, private utilities, and federal and local agencies getting together, and working together, to

develop new generation as well as to coordinate their transmission systems for the fullest utilization of our power resources.

An example of this new era of cooperation in the power field is the Puget Sound Utilities Council operations. A recent public opinion survey on power in the Puget Sound-Cascade region bears out the importance of cooperation among utilities of a region. The survey points out that among the major elements contributing to overwhelming endorsement by the public of the Puget Sound Utilities Council operations, the following reasons were given:

1. That the consuming public is the loser in a period of conflict, and benefits from cooperation among utilities.

2. That such united effort can bring an ample supply of power at the lowest possible cost.

3. That pooling arrangements effect maximum utilization of water at substantial savings.

One of the fruits of this cooperation and coordination between our Pacific Northwest utilities is the marked improvement in our power outlook for the next 10-year period. Today, for the first time since World War II, the Pacific Northwest has in sight sufficient generation to meet all of the region's power requirements for a 10-year span under median or average water conditions. Even under critical water conditions all firm loads in the west group area can be met for the next four years from our hydroelectric resources except for moderate amounts of steam or imports during fiscal year 1960-61.

All federal installations currently under construction in the Columbia river system including John Day will be in service by 1968 giving a total

installed capacity of 7,818,650 kilowatts compared to 5,334,000 existing as of June 30, 1958.

However, an even greater factor in the marked im rovement shown in our current power outlook is the 16 nonfederal projects scheduled for construction, under construction or licensed for construction in the BPA marketing area. These have been made possible primarily through the cooperation of all the major nonfederal utilities in the west group area and will add a nameplate rating of 3,400,250 kilowatts during the next decade, making a total installed capacity of 6,135,300 kilowatts of nonfederal generation, including 446,000 kilowatts of existing steam generation capacity. Another 41 new nonfederal projects are under active consideration and could ultimately provide an additional 5,201,000 kilowatts.

Load estimates indicate our domestic and commercial energy requirements will double in the next 10 years. Residential and farm loads are expected to increase from 11 billion kilowatt-hours in 1957 to 23 billion kilowatt hours in 1968, while commercial loads are expected to grow from 4 billion kilowatt hours to 9 billion kilowatt hours. During the same period industrial requirements are expected to increase about five percent annually, or from 21 billion kilowatt hours in 1957 to about 36 billion kilowatt hours in 1968.

Potential expansion of heavy power using industries in the electrometallurgical and chemical field could add as much as 9 billion kilowatt hours to this load forecast during the next decade. However, most of the future industrial growth is expected to be oriented directly to regional and western markets and to local resources such as pulp, paper and local minerals.

Another field where utility cooperation is making an outstanding contribution to maximum utilization of our power resources in the Pacific

Northwest is the pooling and coordinated operation of our generating plants and transmission systems. The Northwest Power Pool continues to grow in strength and prestige. New facilities both federal and nonfederal are being continually added to this pooled effort and new benefits are being derived from closer coordination between the east and west groups of the pool. I am sure that today Northwest pool operations add well over a million kilowatts to the firm capacity of our region through hydraulic and electrical integration.

BPA's wheeling program, initially conceived about four years ago, is today playing an important part in coordinating all the major new nonfederal projects with these pooled operations. The BPA wheeling program is a contractual commitment to transmit nonfederal power over BPA's 7,500 mile high voltage transmission grid from the generating plants to the load centers. In some cases the process is reversed in that federal power will be wheeled over the transmission lines of nonfederal utilities. Wheeling is based on the principal of providing the most economical transmission of power on a reimbursable basis and avoiding costly duplication of transmission facilities.

A number of large as well as small projects are being made feasible through the wheeling program, particularly those where the generation is located long distances from the ultimate load centers.

BPA to date has completed long term contracts up to 50 years for wheeling more than 1,250,000 kilowatts of peaking capacity from Priest Rapids, Rocky Reach, Pelton, and the Box Canyon projects to some 12 municipalities, PUDs, cooperatives, private utilities and industries. An additional 475,000 kilowatts are accounted for by wheeling commitments on an excess capacity

basis that is subject to withdrawal if the transmission capacity is required by BPA.

Coordination and the use of the wheeling principle apply not only to the larger hydroelectric projects, but are proving of equal interest to utilities proposing smaller hydro projects such as the Bald Mountain project on the Illinois river, the Priest Lake project, and others. Some of the smaller projects are not feasible unless they can be coordinated through wheeling or power exchange with projects having some water storage. BPA has entered preliminary negotiations on several of these projects and is presently trying to formulate a program that will assure equitable distribution of the increased benefits to be derived from coordination. We hope to have the basic principles for such a program established early next year.

New concepts, I am sure, are also in the making in the fuller utilization of our secondary and dump power. As you know, the region will have a surplus of low availability secondary power during the high water months for some years ahead. BPA is already disposing of secondary energy by sale or exchange of power with Montana, Idaho and British Columbia. It is also possible that California may be able to use advantageously some of our dump power.

Coordination of this type is of course, mutually beneficial to both parties involved by taking advantage of diversity in loads and stream flows and through steam displacement. The time is also not too distant when thermally generated electric power will carry the base loads in many areas. Here again the feasibility of steam plants such as the proposed plant at CleElum can be definitely enhanced by use of low cost dump or secondary power for displacement and coordination purposes.

Bonneville's policy is not to sell any firm power outside of BPA's marketing area. However, we will sell dump or secondary power otherwise not salable in the marketing area to utilities outside of the marketing area. Wherever utilities outside of our marketing area desire to purchase dump or secondary power, they must bear the cost of constructing or providing transmission facilities to our nearest existing transmission centers for transmitting such power. In other words, we will sell dump or interruptible outside of the region on a "come and get it" basis.

There are many bright spots in the Pacific Northwest power picture. There are also less favorable trends that concern all utilities of the region.

It appears inevitable that during the next 10-year period, the cost of power both at the wholesale and retail level will increase. This will be primarily a reflection of the higher costs of generating projects now under construction or being planned, both federal and nonfederal. It has been both normal and logical that the most feasible and economical hydroelectric projects have been developed first. It is also an inescapable fact that projects now under construction or being planned will be more costly not only in terms of labor and material but because the most economical sites have already been developed.

Transmission line and substation construction is also reflecting the rising costs of labor and materials. In the case of BPA the cost of transmitting power per kilowatt hour delivered has risen very little since beginning of operations largely because we have gone to higher voltages and multiple circuit lines permitting us to deliver two to three times as much power over the original arterial right of ways. In addition, development of more economical light

steel towers, circuit breakers and other heavy equipment together with operating economies from automatic relaying and supervisory controls, have substantially reduced costs.

Bonneville power administration during the fiscal year ending June 1958 reached the point where our revenues would not meet our expenses on the basis of the $17.50 per kilowatt year rate. This rate has been in effect since beginning of operations or nearly 20 years. Our operating deficit for fiscal year 1958 was $2,950,000. Even as far back as the early 1950s the possibility of an increase in BPA's basic rate was considered in the light of the rising cost per kilowatt of federal generation.

We have been able to maintain the original basic rate during this period due largely to unusually favorable water conditions, and to the sale of an appreciable amount of our secondary power which in recent years accounted for as much as 20 percent of our revenues.

Earlier estimates, based on the trend of the increased cost of new generation and other costs per kilowatt hour sold, indicated our power costs would equal our revenue either in 1959, the end of our current rate period, or by 1960. However, the point was reached a year earlier than we had estimated due to a combination of unanticipated mild weather conditions and economic factors. As a result our revenues for fiscal year 1958 were $5,200,000 below our estimate.

You will be interested in an analysis of this decrease in terms of our earlier 1958 estimates.

Drop in estimated public and private utility loads due to the business recession	$2,000,000
Drop in estimated public and private utility distributor loads due to abnormally mild winter	1,200,000
Drop in estimated industrial interruptible loads due to depressed markets and business conditions	2,050,000
Drop in estimated firm power industrial loads due to depressed business conditions	550,000
Total	$5,800,000
Less miscellaneous revenues above estimates	600,000
Net total decrease	$5,200,000

We are currently making a study and analysis of our projected revenues and payout requirements for the next six years including the new five-year rate period which begins December 1959. Preliminary estimates indicate we can expect a deficit of $7,257,000 and $6,052,000, respectively, for fiscal year 1959 and fiscal year 1960 on the basis of our present rates. The rate cannot be changed prior to December 1959. We hope to complete this study within the next four to six months and at that time determine whether it will be necessary to recommend an increase in our present rates.

Many things must be considered in a rate study and analysis of this kind. For example, what would be the effect of distributing the payments we have made in excess of requirements, over the balance of the payout or amortization period? I would like to point out here that while we had an operating deficit for fiscal year 1958 and anticipate deficits in 1959 and 1960, we have accumulated net revenues since beginning of operations totaling over $76,000,000 on a payout basis, or $101,000,000 on a cost accounting basis.

There are several other aspects of the revenue situation that may be of interest to you.

We believe that our revenues can be increased by finding new markets for a larger part of our secondary power. Except for fiscal year 1958 when conditions were not normal, we have contracted all of our available firm power.

We have also sold a substantial amount of our high availability interruptible power. During the last four years we have been able to supply interruptible power sufficient to meet the requirements of our industrial customers approximately 90 percent of the time. Sales of low availability interruptible power, that is, power available during May, June and July, have been limited. If we can find a market for more of this low quality or dump power for steam displacement or use in cooperation with hydroelectric plants, our revenues would benefit accordingly.

Estimated revenues based on the wheeling contracts signed to date show that starting with $1,537,000 in fiscal year 1959, this new source of revenue will pass $4,000,000 by 1963.

Another factor and one of the harder ones to analyze is that of electrical load growth in the area. The picture could be colored by the lack of growth in power requirements during fiscal year 1958. There are indications of an up trend in business and industry and in making our estimates we are dealing with the economic conditions of 1958 as temporary. Needless to say, this factor directly affects our estimated revenues for the next 10 years.

Several marketing problems are inherent in an area such as the Pacific Northwest served almost entirely by hydroelectric energy. First, streamflows

are 10 to 20 times hi her during the late spring and early summer months than during the fall and winter months. Second, the loads are heaviest during the winter when streamflows are the lowest.

As a result of the streamflow and load characteristics, BPA can market only a substantial part of the potential hydroelectric generation due to the fact that all firm power contracts must be based on critical flows. In other words, the power we guarantee to deliver 12 months of the year is limited by the critical year power flows of record, even though median or average water flows may prevail in seven out of ten years. Under these conditions the Administration finds itself with large blocks of secondary power during the months of high stream flow. We have been fortunate in being able to market a good percentage of the higher grade interruptible power that can be made available for most of the year under favorable water conditions.

There is no doubt that during the next 25 years thermal and nuclear energy plants will assume a substantial part of the base power loads in the Pacific Northwest. This development in combination with such storage projects as may be constructed would give us a new basis for contracting firm power and eliminate the old critical year yardstick. Sufficient storage projects in the headwaters of the Columbia would not only bring up the low winter flows and lower the spring flood crests, but secondary or dump power could be firmed up with available stream or nuclear generation.

Bonneville Power Administration has the responsibility of providing those transmission facilities that will be required to carry new federal generation and nonfederal generation for which we have firm wheeling contracts to load centers.

Long range and short range transmission studies are being carried out with members of the Northwest Power Pool. The short range studies give us an indication of our budget requirements for construction of facilities for the next few years. The long range studies are concerned with the transmission facilities, both federal and nonfederal, that will be required for a contemplated system of 17,500,000 kilowatts by 1970. These studies will result in a coordinated system of federal and nonfederal transmission facilities that will best meet the requirements of the area.

Our construction program will require twenty to twenty-five million dollars in each of the next five years. This figure is based on the addition of about 1,113,000 kilowatts of new peaking to the federal system during this period and contracts for transmitting about 1,217,000 kilowatts of nonfederal power over the federal system.

Ultimate costs of the 17 federal multipurpose projects existing or under construction, for which BPA is the marketing agency, are estimated at $3,228,900,000, including the related BPA transmission system. Power revenues are expected to repay $2,747,300,000 of the total cost, plus power interest and all cost of power operation and maintenance. This includes $1,620,900,000 in dam costs allocated to power, $666,400,000 for the BPA transmission facilities and $460,000,000 allocated to irrigation.

I would like to say by way of summary that the Pacific Northwest today faces a power future that is much brighter than it was even two years ago.

1. Construction of the John Day dam and unprecedented activity on the part of local utilities in building and scheduling new generation, assures

sufficient energy to meet all firm and interruptible requirements of the west group pool area for the next decade under median water conditions. Even under critical water conditions, with addition of available steam and imports, all firm and interruptible loads of the area can be served through the next four years. There are indications that enough new nonfederal projects may be definitely scheduled in the next few years to carry us through the entire period under minimum water conditions.

2. We have made almost phenomenal strides in the last few years in assuring the continued hydraulic and electric integration of the power resources of the region. This is being made possible through the Northwest Power Pool program for coordinating our generating resources, BPA's wheeling program, and the growing spirit of cooperation among all utilities of the region.

3. An increase in the cost of power in the Pacific Northwest is inevitable. Our Annual Reports have revealed an increase in the cost per kilowatt hour of power sold each year for the last decade. Our study of estimated loads and resources for the next six years should provide a valuable criteria on which to determine when a rate increase will be necessary and how much. It is our plan to complete this study in the next four to six months.

4. It will be only a matter of years until we solve the present marketing problem of the large blocks of secondary power resulting from the streamflow and load characteristics of the Columbia river basin. Within the next 25 years or less there is every indication that a combination of new large upstream storage projects and new steam and nuclear generating plants will solve the problem of the high load and low streamflow winter draw-down period.

In the meantime, new markets for secondary power and coordination with steam and smaller projects can reduce our energy losses in this category.

I want to express, in closing, my appreciation for having a part in observing the Silver Anniversary of the Inland Empire Waterways Association. I also want to assure you that Bonneville Power Administration will continue to work closely with you and every group, regional or local, that has as its goal the comprehensive development of all of the great water, land and other resources of the Columbia River Basin.

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