CORRIDORS OF POWER

THE BONNEVILLE POWER ADMINISTRATION TRANSMISSION NETWORK

HISTORIC CONTEXT STATEMENT

BPA Transmission Lines
Near Bakeoven Converter Station, Wasco County, OR, June 2009

for the Bonneville Power Administration
Portland, Oregon
under Master Agreement #38010

Prepared by George Kramer, M.S., HP
Kramer & Company, Ashland, OR

April 2010

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FINAL VERSION

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BPA Master Agreement #38010

APRIL 2010

EXECUTIVE SUMMARY

CORRIDORS OF POWER
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PURPOSE:

The following historic context statement documents the history and significance of the Bonneville Power Administration [BPA] Transmission Network in Oregon, Washington, Idaho and portions of Montana, Wyoming, Utah and California. This document was commissioned by BPA as the first phase of a planned analysis of its built resources intended to help streamline BPA's review process under Section 106 of the National Historic Preservation Act (36 CFR 800 et. Seq.).

At present some portion of the BPA system related to the "Master Grid," documented by Holstine and Lenz (1987), is considered eligible for listing in the National Register of Historic Places. That document, temporally limited to resources built prior to 1945, creates considerable management burden for both BPA and the State Historic Preservation Offices [SHPOs] by failing to address the vast majority of the Administration's extensive transmission network, all of which is, by law, subject to the Section 106 process. *Corridors of Power* is the first phase of a planned multi-phase project that intends to establish a more comprehensive review of the BPA network and culminate in a Programmatic Agreement that will considerably reduce review time and costs at both the Administration and the multiple jurisdictions in which it operates. Ultimately BPA's goal, in cooperation with the various SHPOs, is to develop a comprehensive strategy for the management of historically significant resources within the BPA system and thereby avoid the present costly and time-consuming case-by-case evaluation of effect for any project modification. This document is subject to review and approval by the various State Historic Preservation offices, who will additionally participate in all subsequent management and review documents to assure acceptable standards of compliance.

CONTEXT:

BPA was created in 1937, during the Great Depression as part of President Franklin Roosevelt's "New Deal." The Administration was originally intended as a temporary entity that would market the huge electric output of the Bonneville and Grand Coulee dams on the Columbia River, pending the expected creation of a Columbia Valley Authority, comparable to the New Deal program in the Tennessee Valley. BPA, and the Columbia River dams, owned and operated by the US Army Corp of Engineers and the Bureau of Reclamation, were all developed in response to an extended political debate sometimes called the "Power War." During the early 20th century, who would control America's power network, whether public power providers or for-profit, investor-owned utilities, was an issue of considerable national interest, resulting in contentious legislative battles, advertising campaigns and, in the Northwest, successful efforts to form public utility districts and press for massive Federal investment on the Columbia River.

During its initial development, under its first Administrator, J.D. Ross, and then after Ross's sudden death, under Paul Raver, BPA played a significant role in the promotion of public power in the Pacific Northwest, leading to the formation of public utility districts and, in conjunction with the Rural Electrification Administration, many rural electric cooperatives. These public providers, assured of a stable, low-cost power at BPA's "postage stamp" rate expanded electric service statewide and helped temper costs for other residents though competition. To deliver power from the federal dams on the Columbia, Chief Engineer Charles Carey devised a complex transmission system known as the "Master Grid" to efficiently transmit power throughout the region. During World War II, BPA's power grid allowed the development of significant wartime industry, including major shipyards, airplane plants and most importantly the development of the aluminum industry that would continue as an important sector of the regional economy for years. In part the availability of BPA power led to the development of the Hanford Nuclear Works, in southeastern Washington, a facility that helped develop and build the world's first atomic bomb.

In the decade following WWII the Bonneville Power Administration continued to expand its transmission network but was increasingly constrained by limited power supplies. New programs over the next decade, including the approval of wheeling, the development of the Northwest Power Pool, construction of additional dams on the Columbia and Snake, and extension into Idaho, , culminated with the ratification of the Columbia River Treaty, an international agreement with Canada that significantly increased BPA's available firm power. Technological advancements soon led to the construction of the High Voltage Direct Current intertie between the Pacific Northwest and the Pacific Southwest, along with construction of the fully computerized Dittmer Control Center in 1974, that allowed centralized management and operation of the entire BPA/Federal Columbia River Power System. Today, BPA operates more that 15,000 circuit miles of transmission line extending into seven states and provides over fifty percent of the electrical energy consumed within its service region. The original BPA concept of a publicly-owned transmission network working in partnership with other public and investor-owned utilities has been replicated for other Federal transmission systems throughout the nation, transcending its "temporary" creation to become the defacto model for long-distance energy transmission in the United States.

FINDINGS:

As documented in the following narrative, the Bonneville Power Administration Transmission Network is associated with significant themes in American history relating the rise of public power and the development of PUDs and rural electric cooperatives, the industrial development of the Pacific Northwest in response to World War II and, after the war the continued expansion and development of a model transmission network that included technological development of international import. In accordance with the findings and recommendations of this statement, the Bonneville Power Administration Transmission Network should be considered ***eligible for the National Register under Criterion "A" and "C"*** and should be treated and managed accordingly, under the requirements of 36 CFR 61 et seq.

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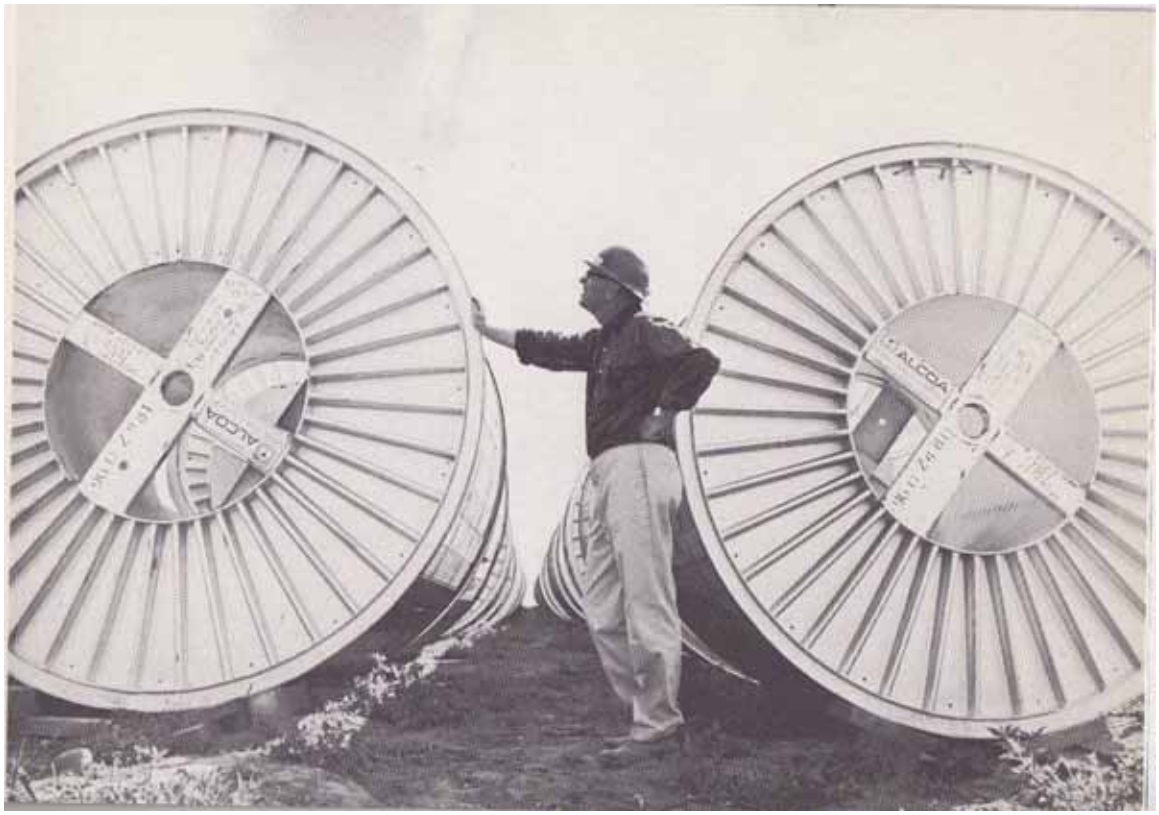

Figure 1.1 Intertie Cable Reels, 1965
Source, BPA Image

What cotton is to the South, what wheat is to the Great Plains, what automobiles are to Detroit, what steel is to Pennsylvania, power is to the Columbia River basin.

Richard Neuberger (1938:88)

The Bonneville Power Administration — BPA— was created in 1937, during Franklin Roosevelt's "New Deal," to transmit and market Columbia River hydropower from the Bonneville and Grand Coulee dams. Since then BPA has grown into a multi-state 15,000 circuit mile long network of transmission lines that provides electric power to industry, Public Utility Districts and municipally-owned power providers, as well as investor-owned utilities, throughout much of the western United States. It's not too much of an overstatement to claim, as historian Richard White has done, that the Pacific Northwest as a region was not clearly identified until the reach of the transmission lines of Bonneville Power Administration defined its boundaries.

The BPA is not, and never has been, a typical utility. The Administration does not own or operate any dams or generation facilities. It produces, on its own, exactly *zero* watts of electricity. In fact it's specifically prohibited by law from doing so. Yet everyday scores of cities and millions of people throughout the Pacific Northwest depend on "BPA Power." As a part of the Federal Columbia River Power System, in cooperation with the Bureau of Reclamation and the U. S. Army Corps of Engineers, who operate thirty-one federally-owned multipurpose dams on the Columbia River and its tributaries, BPA is responsible for the distribution of more than 20,000 megawatts of energy.[1] That amount represents about half of the total generation capacity in Oregon, Washington, Idaho and western Montana. As a major element in the Northwest Power Pool, in partnership with other public and investor-owned utilities, BPA's transmission grid is interconnected with virtually every power provider in the region, extending south into California and crossing the international boundary into British Columbia, Canada. As documented in detail later in this statement, the Administration was set up with specific limitations, as well as specific responsibilities, that put it at the very center of the development of the Columbia River Basin. BPA has played a pivotal, if often ignored or misunderstood, role in the economy and development of the Pacific Northwest to a degree near unequaled by any other Federal or state entity.

Established at the peak of the "power wars," when New Deal-inspired advocates who envisioned a national system of utilities entirely owned by the government were countered by well-funded and long-established private utility holding companies and

[1] A megawatt is one million watts (mW), or one thousand *kilo*watts (kW), which is a thousand watts (W), the power equal to one joule of energy per second, a standard unit of power. The 21 Army Corps dams and 10 Bureau of Reclamation dams in the FCRPS produce 20,430 mW (BPA Facts, 2008).

Wall Street investment banks, BPA's legacy in the Northwest includes the still strong cadre of public power providers that the Administration's very creation made possible. Since BPA supplies a major percentage of the total electrical generation in the region, the energy that makes the Northwest "go," the Administration has helped support the growth and ultimate success of the public power movement in Washington, a state where the entire population, whether they receive public power or not, still benefits from some of the lowest power costs in the nation. In Oregon and Idaho, while not as prevalent as in Washington, dozens of Public Utility Districts and municipally-owned utilities rely on BPA's preference clause to assure themselves a stable power supply. This "Power at Cost" legacy is among BPA's most enduring effects and represents the continuation of the populist dream that led to the initial development of the Columbia River Federal Power System.

During WWII, BPA power supplied the Northwest's surprisingly massive defense industry, providing aluminum in unheard of quantities for bomber and fighter planes and power for the electric arc welders that built thousands of ocean-going vessels in Portland and Vancouver. A BPA transmission line in southeastern Washington mysteriously supplied huge amounts of power during the war, power that ultimately was revealed as serving the needs of the Hanford Research Facility, responsible for the development of the atomic bombs that fell on both Hiroshima and Nagasaki. After the war, as the defense industry waned, BPA power supported the development of the Northwest's timber industry, delivered increased power for population growth, new irrigation and a booming agriculture economy, along with every other major industry or technology of the last half of the 20th century, from microchips to tennis shoes.

As the Federal system of generation and water storage on the Columbia River grew during the 1950s and 1960s, BPA's reach and impact expanded as well. With the ratification of the Columbia River Treaty with Canada, finalized in 1966 and governing water storage on the upper Columbia, and the related development of the Pacific Northwest-Pacific Southwest Intertie, the Administration developed the capability to market excess Northwest power to southern California. In that project, and many others, BPA engineers and scientists developed milestone technologies that help improve electrical transmission system design throughout the United States and beyond. Even the model of Bonneville Power Administration as a collaborative partnership among multiple federal agencies has been successfully replicated to create other regional power management and distribution entities that collectively serve the entire nation. So, while nominally tucked into the northwest corner of the continent, and clearly of most effect in the western United States, BPA's impact over the past seven decades touches places throughout North America and its technological breakthroughs have had an impact around the world.

This historic context statement for the Bonneville Power Administration was prepared in response to a lack of cultural resource documentation related to BPA's built resources. Earlier works, principally a multiple property document prepared by Craig Holstine and Gloria Lenz, documented portions of BPA's "Master Grid," the ring of transmission lines

and the associated substations that connected Bonneville, Grand Coulee, Portland, Seattle and Spokane by 1945 and formed the original 'backbone' of the BPA system. Though never formally entered into the National Register of Historic Places, the Bonneville Power Administration Master Grid Discontiguous Historic District was Determined Eligible by the National Park Service in 1986 and established the basis for all subsequent Section 106 compliance review at BPA. More than two decades old and temporally limited to 1945, the need to review and possibly update or expand the Holstine-Lenz study has become increasingly apparent in recent years, as more and more of the BPA system approaches the standard 50-year evaluation threshold established by the National Historic Preservation Act of 1966. Interest in updating, and hopefully streamlining, BPA's compliance process served as the primary motivation for this document. The development of this statement began, therefore, with the obvious research question: *What did BPA do after 1945; are any of those activities significant under National Register evaluation criteria and, if so, why?*

The following historic context statement endeavors to answer that question, starting with a discussion of the Pacific Northwest prior to the Administration's creation and the development of the first Federal dams on the Columbia. In the process it updates, and considerably expands, and re-evaluates, the history of the 1937-1945 period covered by Holstine-Lenz and then continues forward, into the post-WWII era to document what exactly BPA did in fact "do" after 1945. It should come as little surprise to the reader that the Administration's activities over the past six decades are, in fact, significant.

Answering "why" BPA's activities are considered significant relied upon dozens of primary and secondary sources, from BPA's own extensive library, the holdings and manuscripts at the University of Oregon Special Collections and the Oregon Historical Society's research library. Previously published histories on the Northwest, on Grand Coulee and Bonneville, on the public power and public utility movement, rural electrification and various investor-owned utilities in the Northwest all provided focused documentation of the threads that the BPA story touches. BPA's own histories, principally the work of Vera Springer, Gus Norwood and Gene Tollefson all established the essential framework for this project. Those in-house BPA authors, often writing of events that they themselves participated in, provided a solid basis that substantially informed this context statement.

Early on in this project, as I was just starting to get my brain around the concept of the Bonneville Power Administration and beginning to appreciate the impact of its far-flung network of transmission facilities, I started to think of it as single connected system, rather than a collection of disparate parts flung around the Northwest. Separate parts, discrete elements, is how BPA's built resources have been generally documented, as individual substations, or transmission lines, some of which were considered significant and others not, despite their internal connectivity and shared operation. Somewhat anthropomorphically it struck me that BPA was sort of the "blood supply" of the Northwest, taking the power, the "blood," of the region's federal dams and delivering it throughout "the body" as needed.

First impressions being what they are, it came as no great surprise, as BPA's story become clearer, that the blood supply analogy proved far too simplistic. Instead I've come to think of the Administration's 15,000 miles of transmission line, it's *Corridors of Power*, as more akin to the central nervous system. BPA provides not just raw materials, as power, to where it is needed, but it has enabled the region to react, to respond to a changing world, a changing economy and a changing population with an eloquent efficiency. Wikipedia, the widely utilized encyclopedia on the Internet defines the nervous system as "…a highly specialized network whose principal components are….interconnected to each other in complex arrangements..."[2] a definition that provides an equally accurate description of the Bonneville Power Administration's transmission network. BPA connects the West, provides much of its electrical energy, and ties together a system of investor and publicly-owned generation facilities that supply residential, governmental, and corporate uses for some fifty million Americans. BPA's reach is so broad, its actions so intrinsic to the history of the western United States that it should be clearly, and unequivocally, stated that the answer to the question of the significance of its activities after 1945, just as the answer was prior to 1945, is most certainly "yes."

[2] http://en.wikipedia.org/wiki/Nervous_system (Vested 28-July-2008).

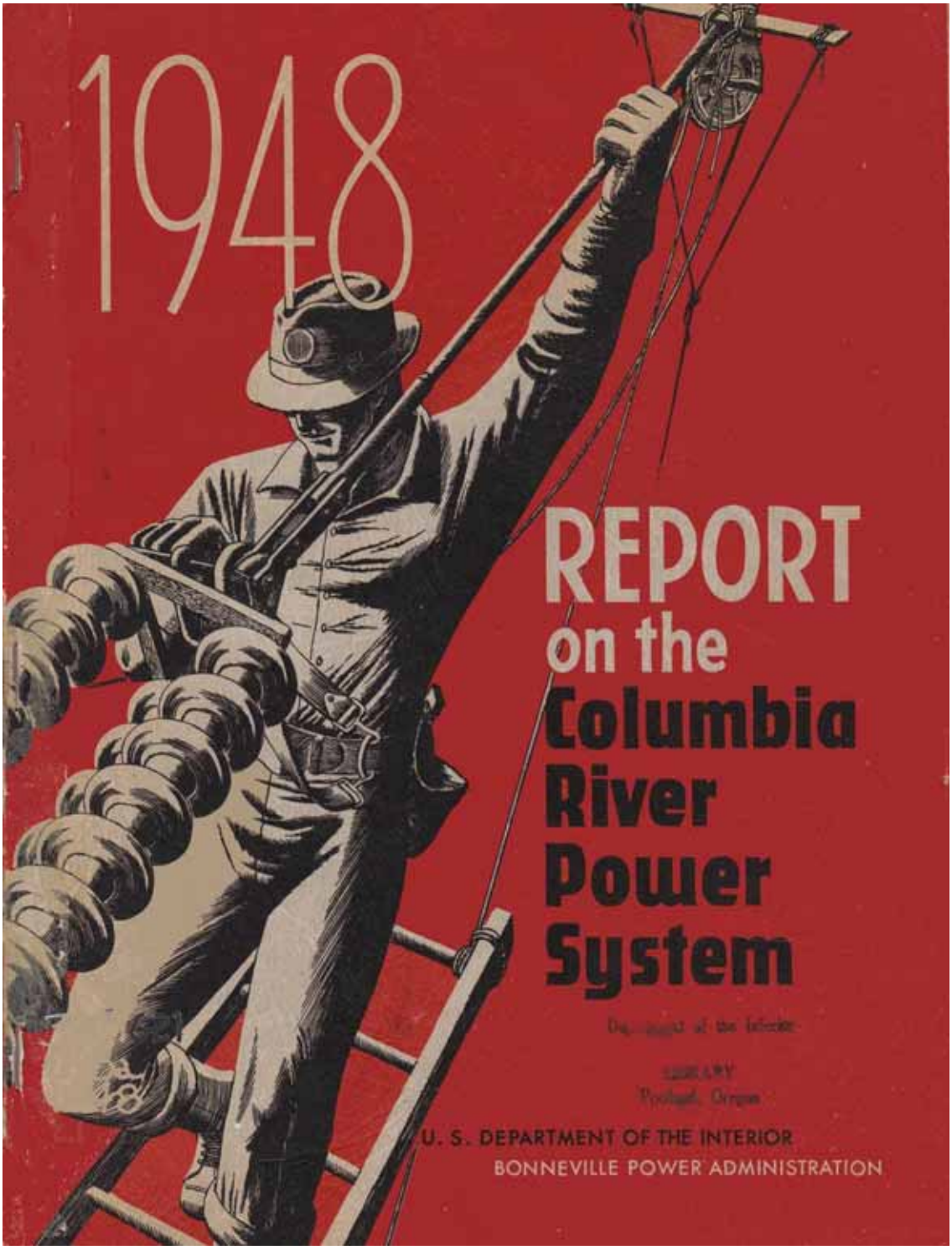

Figure 1.2: BPA Annual Report, 1948
Source- BPA Library Collection

2.0 GEOGRAPHIC SCOPE:

The Bonneville Power Administration's transmission system extends in a linear network throughout the states of Oregon, Washington and Idaho, and into western Montana and extreme northern California and Nevada as well as western Wyoming and portions of Utah. Through interconnections with investor-owned utilities, BPA power continues into southern California, portions of Utah and Wyoming and Nevada. In total the BPA transmission system includes 15,238 circuit miles of line and 259 substations (as of 2008) and serves an area of some 300,000 square miles, an area roughly the size of France and the United Kingdom combined.[3]

Although the main concentration of the BPA system is internally connected, the system also includes discrete sections such as that portion beginning at the Bureau of Reclamation's Minidoka Dam in southern Idaho, or the extensive network that extends from the Bureau's Palisades Reservoir in southeastern Montana. The BPA system utilizes water storage located in Canada, impounded by several dams with hydroelectric facilities operated by BC Hydro. While the development of those facilities is covered as a significant element in BPA's 1960s expansion, those resources and the transmission lines that connect them to the BPA system, outside the boundaries of the United States of America, are accordingly beyond the scope of this review

Although this context examines the significance and impact of the Bonneville Power Administration since 1937 and so concentrates on that BPA core service area, it must be acknowledged that the impact of BPA activities through the distribution of power extends beyond the reach of its own transmission system through Intertie and interconnection to virtually every other electrical distribution system in the region.

Intended primarily to guide the future evaluation and management of BPA's built resources, the geographic scope of this context is by design limited to the *BPA-owned and operated elements of the Columbia River Federal Power System.* As such, the extensive network of Federal dams and reservoirs operated by the Bureau of Reclamation and the U.S. Army Corps of Engineers that generate the electricity BPA distributes are, by definition, excluded from this context despite their obvious importance within it. That division, however artificial, dates from Bonneville's creation and is as much a part of the Administration's story as are its built resources.

[3] France's area is 211,207 square miles and the size of the United Kingdom is 93,026 for a combined area of 304,233. For comparison the population of those two nations is approximately 1.2 billion persons, or about ten times the population of the BPA service area (see http://www.wisegeek.com/how-big-are-the-states-in-america.htm (visited 16-July-2008). See also BPA Facts 2008.

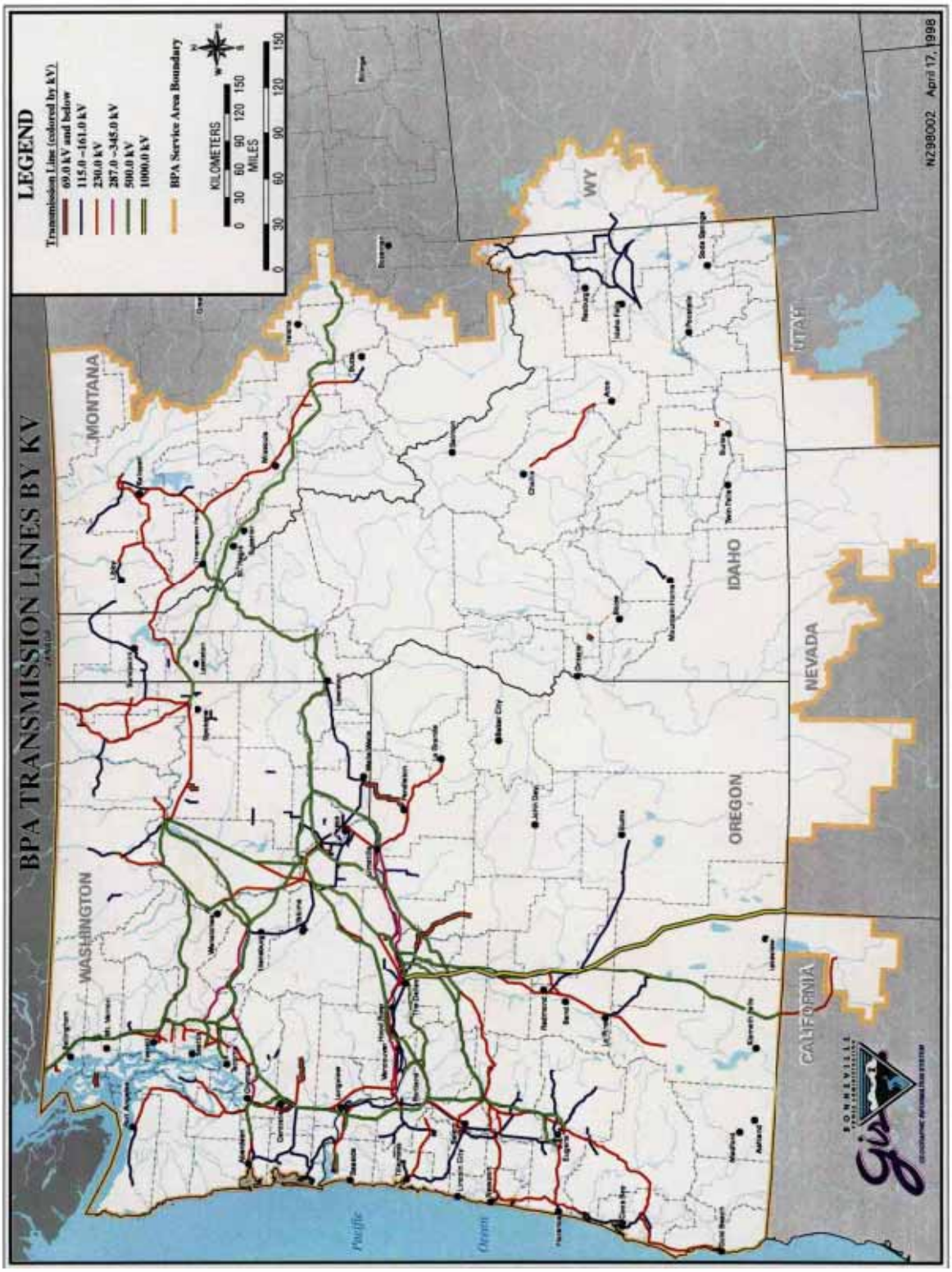

Figure 2.1: BPA Transmission Network, April 1998
Source- BPA Website

3.0 HISTORIC OVERVIEW

The formal history of the Bonneville Power Administration begins in August 1937 with passage of the Bonneville Project Act and the creation of what was initially known as the Bonneville Power Project, a "temporary" federal agency charged with the marketing and distribution of power from the soon-to-be operational generation facilities at Bonneville dam. Of course, the Bonneville Project Act did not spring whole from the mind of Oregon's U.S. Senator Charles L. McNary, its chief sponsor, but was instead the culmination of decades of politics, promotion, planning and engineering dedicated to developing a method to tap into the mammoth power of the Columbia River.

3.1 Early Development of the Columbia River Basin

Beginning at its headwaters in British Columbia, the Columbia River winds through Washington and Oregon over a distance of 1200 miles on its way to the Pacific Ocean. Though not the longest or the widest of North American rivers, the Columbia is notable for the huge volume of water that it carries. The Columbia is "…the largest river emptying into the Pacific Ocean from the American continent, and second only to the Mississippi in length or volume." (Harpers, 1882:3).

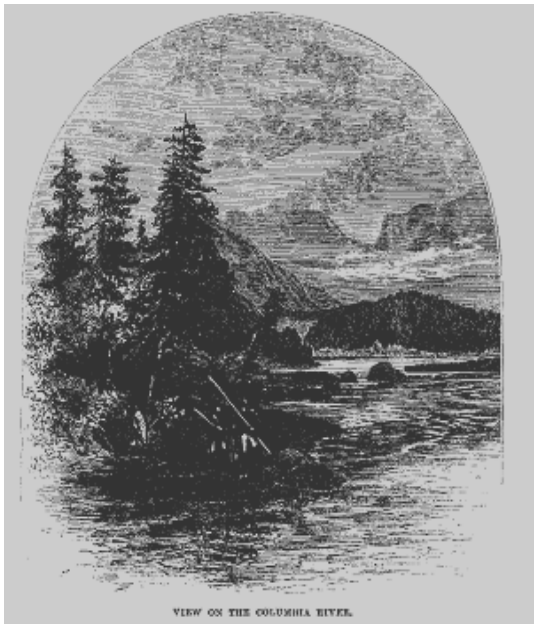

Figure 3.1 View of the Columbia River Source, *Harpers Magazine* (Rockwell, 1882)

Along its course to the ocean, other significant rivers flow into the Columbia, adding to its volume. The Columbia has ten major tributaries, the Koontenay, Okanagan, Wenatchee, Spokane, Yakima, Snake, Deschutes, Willamette, Cowlitz and Lewis rivers.[4] Dozens of other streams, including the Walla Walla, John Day, Deschutes, Hood, Sandy, also empty directly into the Columbia. Many more streams feed into the Columbia's many tributaries and thus add to the Columbia as well. Among these, for example, are the Salmon, Grande Ronde and Palouse, all rivers of some size, that join the 1100 mile long Snake River and so ultimately add their water to the Columbia River All told the Columbia River, with combined flow of its entire drainage, discharges an average of 265,000 cubic feet of water per second at its mouth near Astoria, Oregon.

[4] Lang, Bill. "Columbia River," at Center for Columbia River History. http://www.ccrh.org/river/history.htm (visited 28-July-2008).

As late as 1882, when *Harper's New Monthly Magazine* wrote of the Columbia's potential, the river's value was largely seen as a corridor for transportation, a route for water-borne barges leaden with agricultural goods grown in the interior, that could be shipped to the bustling cities then developing in the Pacific Northwest and then, via the Pacific Ocean, to the entire western United States. The falls along the river's route, and the dangerous passage through its mouth at Astoria were reported as the Columbia's "Achilles Heel," a lamentable feature that in *Harper's* view might well keep the river from successfully transforming the Northwest in the future and encouraging settlement. But while water-borne transportation would always remain an important element of the Columbia's regional value, it wasn't too long before another attribute of the Columbia, its potential for hydroelectric development, would become the major focus for its future.

Figure 3.2 The Cascade Locks, on the Columbia River, c1900
Source, G. Kramer Collection

At Oregon City, Oregon the falls of the Willamette River, a major tributary to the Columbia, had been providing water power to mills and factories since the 1840s. That waterpower enabled the city at the "end of the Oregon Trail" to develop into an early industrial center, inspiring dreams of development in the local business community akin to that of Lowell, Massachusetts.[5] By the last quarter of the 19th century, however, the era of waterpower was reaching its end. In 1883 a group of Oregon City investors formed the Willamette Falls Electric Company, a forerunner of today's Portland General

[5] Lowell, on the Merrimack River north of Boston, is generally regarded as the "birthplace" of the Industrial Revolution in the United States. Much of the towns industrial character, along the millrace that powered the early textile mills, was included in the Lowell National Historical Park in 1978.

Electric, and built a small hydroelectric powerhouse at the Falls, the first in the Northwest. From those modest beginnings, the waterways of Oregon and Washington soon sprouted a wide array of dams and powerhouses built at the end of the 19th and throughout the first quarter of the 20th century. Nationwide, electricity became an increasingly important element in modern life during this same period.

The difficulty and expense inherent in building a dam across the main channel of the mighty Columbia River, coupled with the limited need in the Northwest for the huge potential power such a structure could generate, shunted early dam construction onto other smaller tributary rivers with more manageable water flows. Local and privately-funded dams were built on the Willamette, the Clackamas, the Skagit and the Skokomish, among many others as small regional utilities rushed to provide the region's water and power needs. The hydroelectric potential of the Columbia remained obvious, if somewhat intimidating, and there was little serious effort to develop it. It was, instead, the Columbia's potential for irrigation that first attracted active support.

Figure 3.3 Prospective View, Columbia Basin Project, circa 1935
Source, G. Kramer Collection, Ellis Image #1942

Farmers and business leaders in eastern Washington began to seriously explore options for irrigation from the Columbia River in the late 19th century and by 1892 were proposing to impound waters behind a large dam at Grand Coulee, a broad canyon lining the river northwest of Spokane. Their efforts received a huge boost when the US Congress passed the Newlands Act of 1902, a bill that created the Reclamation Service, later to be renamed the Bureau of Reclamation (Pitzer, 1994:10-11). The Newlands Act stated that all monies received from the sale and disposal of public lands in sixteen

western states, would be allocated "…to the construction of irrigation works for the reclamation of arid lands." It further authorized the Secretary of the Interior to make "…examinations and surveys for, and to locate and construct, as herein provided, irrigation works for the storage, diversion, and development of waters.." (Newlands Act of 1902, 57th Congress, Sess. I., CH. 1093, 1902).

Nationally, Newlands Act irrigation projects proceeded with mixed results. Construction and operational costs were high, paybacks based on farmer payments for water use took longer than expected, and while the Bureau was supported in the west, eastern opposition to federal involvement remained a contentious issue in Congress, complicating project funding.

Prior to WWI, business leaders from Spokane and eastern Washington continued to agitate for a Grand Coulee dam project to promote agriculture in the region under the Newlands Act. They made considerable noise but not much real progress against entrenched opposition. Perhaps most importantly in the long term as concerns the Bonneville Power Administration irrigation, and the desire for a Federally-constructed dam at Grand Coulee to enable it, became a heated issue throughout Washington and eastern Oregon. This led to the election of a group of pro-irrigation, pro-dam, individuals to represent the region in the US Congress.

Slowing the likelihood of success was the fact that even within the region's pro-irrigation forces, there were two factions; the "pumping" and "gravity" proponents. Pumping advocates wanted to see the development of an irrigation system that relied on water from wells and multiple small, low-head dams and reservoirs. Gravity proponents supported the construction of a large, higher, dam, that would create a huge upstream reservoir among several other benefits including recreation and even power generation. This option required far more land, and far more money, and also required the inundation of a huge area under water. The two groups continued to battle fiercely for federally-financed construction of their version of a Grand Coulee project throughout most of the 1920s, dividing the regional effort and essentially resulting in something of a stalemate on any progress. A major milestone in the process was achieved when, as a part of the River and Harbor Act of 1925, the Secretary of War was authorized to investigate navigable rivers for potential hydropower sites and to direct the U.S. Army Corps of Engineers to undertake such a study. A subsequent bill, passed in January 1927, specifically added the study of the Columbia River to the scope of the project approved in 1925 (Pitzer, 1994:43). Arguably this put an impartial Federal agency in the position of assessing the options for the Columbia River and, in the end, making a recommendation between the pump and gravity options.

The Army Corps report, published in 1932, would become famous as "the 308 Report" after its House Document number.[6] The 308 Report, initially focused upon the Columbia and the Snake, was the first complete analysis of the basin as an integrated system that might be developed as a series of multi-purpose dams that could significantly benefit the entire Columbia River Basin. Essentially, the 308 Report laid out the plan for the Columbia that would govern its development over the following five decades, including water supply, hydropower, navigation, and irrigation uses. The 308 Report was major element in the creation of the modern Pacific Northwest after the mid-20th century.

> The engineers found that the Columbia River and its tributaries, through integrated development, could provide flood control, irrigation for potentially valuable land, a major waterway from the sea to the interior, and [that the river] could be developed into the greatest system of low-cost hydro-electric power in the United States (Johansen and Gates, 1967:516).

The 308 Report for the Columbia River called for a system of ten multi-purpose dams on the Columbia River between the Canadian border and the Pacific, beginning at Grand Coulee and ending at what would become Bonneville Dam, east of Portland. Its release effectively settled the long-running pumper and gravity feud in eastern Washington. The gravity proponents, with the heft of the US Army Corps of Engineers and the federal government behind them, had clearly triumphed.

The long-anticipated 1932 release of the 308 Report on the Columbia River made its recommendations a regional issue in that year's campaign for United States President. President Hoover, the Republican candidate for re-election, was an engineer with extensive background in reclamation but he was not generally in favor of Federal investment to develop systems such as those the report proposed. His opponent, Democratic candidate Franklin Delano Roosevelt, not only supported the concept of public investment and development of multi-purpose dams in general but in the depths of the Great Depression saw such public works projects as a vehicle to help put the nation back to work. Whatever FDR may have thought about the long-term wisdom of developing a massive system of navigation, irrigation, and hydroelectric dams on the Columbia River, he would balance the need and desirability of such a project against the thousands of jobs that building such a project might provide to the region. In 1932, with millions out of work, for most Northwestern voters, creating jobs was more of a priority than any academic argument regarding the long-term benefits of building a dam or not. On September 21, 1932, candidate Roosevelt appeared in Portland, Oregon and delivered a well-received address on power issues and the Columbia River. Positioning himself as

[6] The River and Harbor Act of 1925 directed the Army to study rivers throughout the nation, resulting in twenty-four separate 308 Reports, while a 1927 amendment to that bill specifically directed the Army Corps to study the Columbia River, ultimately leading to the famed "308 Report" on the Columbia River's hydroelectric potential. "The 308 document set the stage for multipurpose dams by its focus on river basins with a combined use for navigation and power" (Billington, Jackson & Melosi, 2005:121).

a staunch proponent of public power, Roosevelt told the cheering crowd that were he to be elected, the Federal government's next great hydroelectric project would be on the Columbia River (Tollefson, 1987:110).

> I have strengthened the belief that I have had for a long time and that I have constantly set forth in my speeches…that the question of power, of electrical development and distribution, is primarily a national problem (*Oregonian*, 22-Sept-1932, 6:1-8).

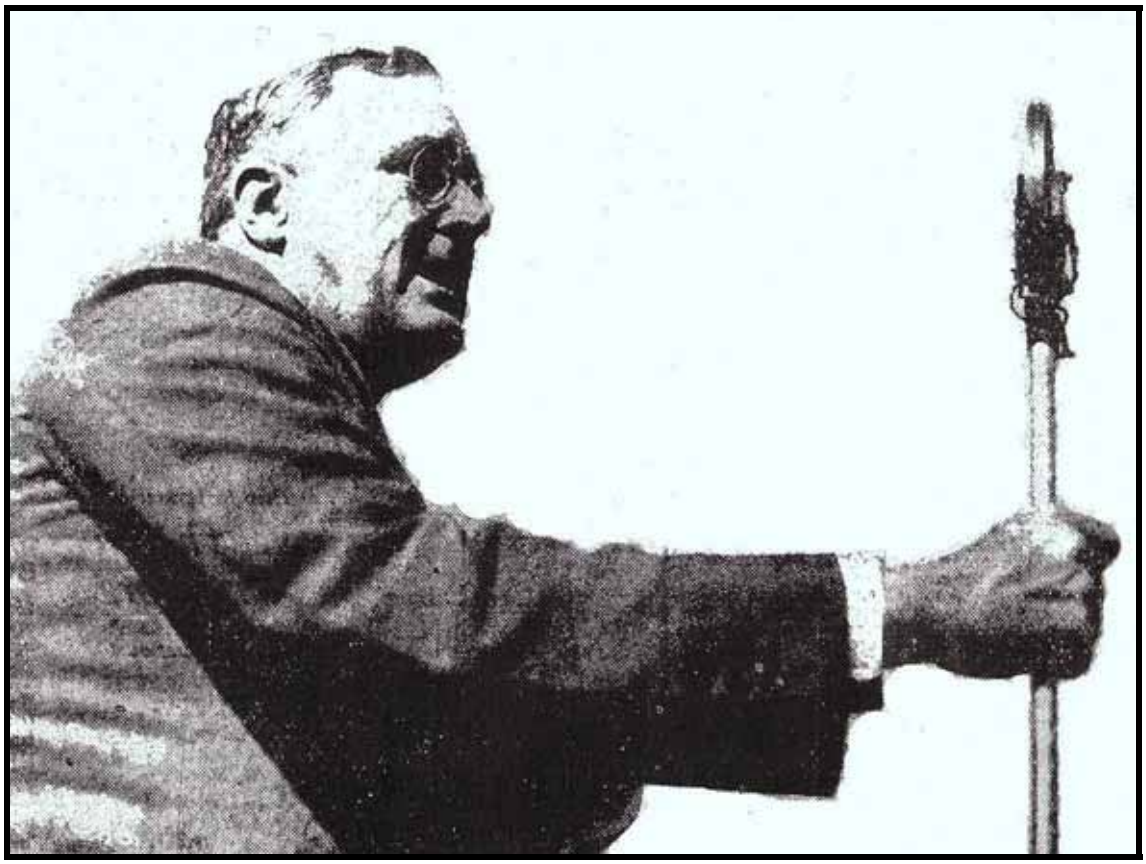

Figure 3.4 FDR at Portland, Oregon, September 1932
Source, *Oregonian*, 22-September-1932)

The election of Franklin Delano Roosevelt, who brought to the White House an interest in public investment in new infrastructure that has rarely been matched, gave Northwestern legislators that had been lobbying unsuccessfully for Columbia River development for nearly three decades a strong partner. While it would take time for FDR and the Congress to develop a workable plan for the first elements of the Columbia River project, his election in November 1932 largely transformed the question from *if* the dam at Grand Coulee would be built to *how* the dam at Grand Coulee would be paid for and operated.

3.2 Farms without Power: Rural Electrification

It is not generally remembered that prior to World War II, particularly in the Pacific Northwest, electricity was largely limited to cities and towns, leaving farms and rural areas without many of the benefits of the modern era. Private power providers were not willing to invest thousands of dollars to develop distribution systems over wide regions that served only a few scattered users, and few farmers could afford to pay the steep costs of building a line on their own. As a result, farm life, rural living in general, remained nearly unchanged by most of the improvements in communication and labor-saving devices that other Americans took for granted. As urban Northwesterners looked at the possible development of hydroelectric dams on the Columbia as a huge boon to economic development and new factories, the typical farmer had different goals in mind.

> From the farmers point of view, the Portland stress on Bonneville for industry was a luxury which only the urban dweller could afford because he had sufficient electric power. [In the 1930s] *seventy percent* of Oregon's farmers and about half of Washington's were without electricity (Dick, 1973:187, emphasis added).

Figure 3.5 Pumping Water, c1930s
Source, BPA Image No. H176-2

Even with those numbers, Washington and Oregon were doing better than most of the nation. In the 1930s only one farmer in ten, 10% of the total, benefitted from centralized electric service (Beall, 1940:790). Prior to the 1920s some smaller towns and rural areas overcame the reluctance of investor-owned utilities to serve themselves by creating electric cooperatives. These member-owned utilities would solicit funds from the scattered farms or smaller communities in an area and then erect their own distribution system to supply power.[7]

[7] Co-ops are private, not-for-profit, associations that are not a part of local government. Co-ops were almost always financially challenged when it came to developing systems, since they served sparsely-populated, widely spaced, users. Unlike municipally owned systems, such as Seattle's City Light or the Eugene Water and Electric Board in

Many rural cooperative utilities, "co-ops," purchased wholesale power from a nearby private utility but others, particularly in the Northwest where streams and flowing water are a plentiful and ready-source of power, built small hydroelectric generation facilities to supply their own needs. And sometimes, as in southern Idaho, power was supplied through a federal hydroelectric project that was developed in conjunction with a dam primarily designed for irrigation or flood control (Jones, 1977:11). The best example of federal supply, the Minidoka Project in southern Idaho, was completed by the Reclamation Service in 1909 and included five 1.4 megawatt units to provide power for irrigation pumps, a major boon to regional farmers.[8] Extra power was made available to the farmers to heat their homes and to provide other modern conveniences.

> The quality of life for Minidoka settlers was the pride of the Reclamation Service…Rupert's 1914 three story brick high school building was the first in the United States to be heated with electricity and received national publicity. Cheap electricity heated and lit the 1,100 settler houses… (Stacy, 1991:57).

Farm groups without access to a federal power project, or without the available capital to develop their own power source and distribution network, took notice of the improvements to farm life that were possible with electricity, hoping to one day achieve the same benefits.

> Because there was no electricity, a farmer could not use an electric pump. He was forced not only to milk, but to water his cows by hand, a chore that in dry weather meant hauling up endless buckets from a deep well. Because he could not use an electric auger, he had to feed his livestock by hand, pitch-forking heavy loads of hay up into the loft of his barn, then stomping on it to soften it enough so the cows could eat it…Because there was never enough daylight for all the jobs that had to be done, the farmer usually finished after sunset, ending the day as he had begun it, stumbling around the barn milking cows in the dark, as farmers had done centuries before (Pence, 1984:15).

The complaints of the farmers over their inability to obtain electric power grew increasingly vocal and, ultimately, political, as rural suspicion of "big power" was fed by national events related to the so-called "Power Trust" and its role in the 1929 collapse of the stock market. Adding to the growing unrest, many power companies turned a deaf ear to rural residents, even those living near their primary service areas. As late as 1935 many investor-owned utilities remained convinced that farmers themselves didn't really need or want electricity and that all the "clamor" for rural electrification was entirely the work of outside agitators (Jones, 1977:11).

Oregon, Co-ops did not benefit from government's ability to pass bonds, levy taxes, condemn competitive systems or enjoy the concentration of users that helped amortize the upfront costs of electrical distribution.

[8] See http://www.usbr.gov/pn/about/minidoka.html (Visited 30-July-2008).

By the early 1930s, in Washington state and elsewhere, the Grange, a respected organization that touched virtually every farming community in the region, began to seek legislative solutions that would allow the creation of public power options for communities private power would not serve due to economics.[9] In Washington in particular interest in public or not-for-profit rural power systems ran high if only due to the example set by municipally owned utilities in Seattle and Tacoma. Each of these cities benefited from large and successful public electric systems, established decades earlier, that had proven a reliable and low-cost source of electricity for urban consumers.[10] "By the 1920s, these two city light systems were seen nationally as prime examples of how public power could provide better service and lower rates" (Billington, 1988:8).

With support from a newly elected member of the Washington legislature, Homer T. Bone of Pierce County, Washington considered passage of several bills in its 1923 session that would allow municipal power companies to also provide power to surrounding rural areas. This was essentially intended to allow a successful utility such as Seattle City Light to extend its services beyond the incorporated limits of the city and so provide the benefits of lower cost public power to more Washingtonians.[11] Companies like Seattle City Light, with excess generation capacity and a near religious zeal toward the benefit of public power, had a long-term goal of extending its publicly-owned system into ever-more rural areas. As might be expected, investor-owned power interests fought this idea with vigor and ultimately the so-called "Bone Bill" failed. The debate however did result in a series of legislative efforts on the issue of public power over the next few elections and brought the Washington State Grange firmly into the discussion on the side of rural electrification options. Private power was successful, through political pressure and other methods, of delaying a sweeping statewide public power law for several legislative sessions in Washington. Ultimately the issue, identified as Initiative 1, was put on the ballot, to be decided by the voters in the November 1930 general election (Billington, 1988:11).

The Grange push for a rural electrification program in Washington State coincided with increased pressure in eastern Washington for what would become the Grand Coulee Dam

[9] The National Grange, also called the "Patrons of Husbandry" was founded in 1867 by Oliver Hudson Kelley, a US Department of Agriculture employee. It spread quickly during the Panic of 1873 as a unifying force among farmers concerned about fairness for rural issues. The Grange was politically active in the late 19th century, generally supporting "populist" causes and the presidential candidacies of William Jennings Bryan, the "Boy Orator of the Platte." It remains a strong unifying force in rural America today.

[10] Tacoma's municipal utility was founded in 1893, when voters agreed to take over the Tacoma Light and Water Company. Seattle City Light was started in 1902 to provide increased street lighting and expanded to serve residential customers three years later.

[11] Washington law limited a municipally owned system's service area to the municipality it served. Such companies could not provide power or other services outside the boundaries of the city that owned them, functionally minimizing competition.

and these two populist-inspired threads, both of which could be addressed by construction of a high dam on the Columbia River, naturally came together and together they carried the day. Initiative 1 passed with a statewide majority of 54 percent, carrying 28 of Washington's 39 counties. It created a local option for Public Utility Districts, or PUDs, that could serve an area as large as a county and could include towns and cities as municipal corporations. "Once a district was formed, the people could use the right of eminent domain (condemnation) to take over the properties of the private power company serving the district if the company refused to sell its property to the people at a fair negotiated price" (Billington, 1988:13).

Washington's action, largely the result of the Grange and rural interest in low-cost power, was mimicked by the passage of a similar bill in Oregon, also in November 1930. Oregon's bill created what were called People's Utility Districts, and required two elections rather than one as in Washington. Rural Oregonians needed to initially vote to create a district and then, having done so, vote in a second election to approve a bond to pay for acquisition of an existing private system or the construction of a new one.

> In Oregon the public power movement has been somewhat retarded by the conservatism of the state. When legislation was passed permitting the formation of People's Utility Districts, a provision was included in the law requiring that voters decide in each instance on major acquisitions of the property of private power companies on bond issues. Sponsored by the private utilities, this provision crippled the PUDs in Oregon (Childs, 1952:206).

In practice the Oregon requirement for a second election clearly worked against the expansion of the public power movement in that state. Whereas Washington is still among the nation's leaders in public and low cost power, Oregon's public utility development, while better than many other areas, is not nearly as robust as its neighbor.[12]

> Washington's voters at the county level created 29 PUDs, of which 22 now provide electric service mainly in central and western Washington. Oregon voters created fewer PUDs, and due to the more restrictive Oregon PUD law, only four became active (Norwood, 1981:96).

The Depression-era development of the Columbia River would play a huge role in supporting Public Utility Districts, co-ops, and public power in the Northwest, all of which benefited significantly from the availability of abundant, low-cost Federal power generation. In addition to building dams, and the passage of the Washington and Oregon public utility legislation, farmers and rural citizens also benefitted from another New Deal program, the Rural Electrification Administration, or REA.

[12] Public utility development in Idaho was even slower, except for those few rural areas adjacent to Bureau of Reclamation facilities. Idaho never passed PUD legislation similar to that of Oregon and Washington.

In 1930 Morris Cooke, an engineer who had been studying methods for rural electrification since the mid-1920s, "…proposed a rural electrification program to Hoover but received a brush-off from a White House secretary" (Schlesigner, 2003:381). Two years later, with the backing of Harold Ickes (FDR's Secretary of the Interior), Cooke was given an opportunity to lay out his government program for self-financing of rural electric systems to President Roosevelt. "The real difficulty was not the farmer's ability to pay… found but the indifference of operating companies to the farm market" (Childs, 1952:55). On May 11, 1935, FDR signed an executive order creating the Rural Electrification Administration under the Emergency Relief Act, a tentative status that made the agency's job more challenging. This was especially so given the opposition to the entire concept from the investor-owned utilities, who opposed REA as little more than a socialist effort to undermine their private investment.

Figure 3.6 REA Electrified Farm, Rosedale, Washington, 1936
Source, National Archives Image 221-G-377

In blunt answer to the opposition from private utilities, Congress passed the Norris-Rayburn Act in 1936, known as the Rural Electrification Act, and gave REA full statutory authority as an independent agency, extended its life for an additional ten years, and granted the administration substantial new powers.[13] Key among those new powers,

[13] Senator George W. Norris, of Nebraska, was a leading proponent of both rural electrification and public power development, having played a major role in the creation of the Tennessee Valley Authority (which includes the Norris Dam, named in his honor). Rep. Sam Rayburn, of Texas, was then just an up and coming power in the House of

the REA Administrator was authorized to make loans "…for the purpose of financing the construction and operation of generating plants, transmission lines, and distribution lines for the furnishing of electric energy to persons in rural areas *who are not receiving central station service*" (Slattery, 1940:33, emphasis as in the original). REA loans could cover the full cost of construction for power lines, even for the generation facilities, required to serve an entire rural area provided that once built the system would be self-supporting. "The test was not whether an individual line or section was self-supporting, but whether the entire system was feasible" (Rixse, 1960:69). Even the threshold for this standard was devised to generously support rural development. Systems were considered "self-supporting" when the REA Administrator calculated that they could realistically pay back their initial REA loan in twenty-five years.

Figure 3.7 Rural Electrification, c1935
Source, BPA Image No. H178-2

Private utilities, who had for decades ignored rural Americans and refused to provide them with service by claiming it wasn't economical to do so, now responded aggressively to REA's efforts to electrify these areas. "[T]he utilities tried to forestall REA by moving into the profitable rural areas themselves…[or] by building lines that would attract just enough potential REA customers to make it impossible to organize an REA co-operative" (Schlessinger, 2003:383). As REA got underway and new rural cooperatives were formed, private utilities engaged in even more aggressive tactics as a way of nipping the young movement in the bud. Paul Bull, a lineman for the Idaho Power Company,

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Representatives but would ultimately rise to serve as a legendary Speaker of the House. Both Norris and Rayburn, along with influential Congressman John E. Rankin, of Tennessee, were allied with the so-called "Public Power Block" that supported federal development of power nationwide during 1930s.

recalled how he and other private power employees reacted to the introduction of REA to southeastern Oregon.

> When REA came in around 1939 at Vale, we fought it. We used to set poles in the ground one side of the road, the REA crew on one side and us on the other. We wouldn't even tamp them in. It was a race to get to the farm house. There would be two lines, two transformers, and two meters at each house. The homeowner had a choice of who to buy service from….It was bitter, very bitter (Stacy, 1991:105).

Such lines were called "spite" lines, driven carefully through the center of an REA district. Another tactic was the installation of "snake lines," which went out in all directions from a central source to quickly cover a wide territory. Both were part of the private utility's efforts to starve out REA-funded co-ops before they started, a policy that was known by an appropriate farm-inspired metaphor; cream-skimming (Schlesinger, 2003:383).

Of course the REA-funded co-operatives did succeed in providing rural electrification to areas of the nation that had long sought such service. In the Northwest, where REA's preference for non-profit organizations such as cooperatives, PUDs, and other public power providers, was joined to BPA's public power preference clause. The two New Deal agencies worked in tandem to help electrify huge rural areas of the region with great success. One shining example among the many REA-BPA assisted efforts that occurred after the mid-1930s is Inland Power and Light, a sprawling cooperative in Washington that can trace its beginnings to the passage of the REA Act. Inland Power is today among the most successful of the 1,000 rural electric co-ops in the United States. "With power lines not only criss-crossing throughout Eastern Washington, but running into Idaho and near the Oregon and Canadian borders…it serves a geographic area of roughly 10,000 square miles, larger than the states of Connecticut, Rhode Island and Delaware combined" (Jones, 1977:2-3).

3.3 Investor Owned Utilities and "Giant Power"

As the story of rural electrification demonstrates, public opinion of private power providers, or as they preferred "investor-owned" utilities, was almost certainly at an all-time low during the 1930s. Indeed several writers have characterized the period of the 1920s through 1940s as the years of the "power wars." Public, and ultimately governmental, antipathy toward "the power trust" would play an important role in the development of the Columbia River and, ultimately, in the form and the mission of the Bonneville Power Administration.

Electrical generation and distribution systems in the United States began to develop in the 1880s, typically starting near hydropower sources or in connection with steam-fired boilers associated with large industrial uses. In the latter situation, electricity produced on-site primarily for the plant's own consumption would be made available for residential or other commercial sale only after normal business hours. Among the first

major uses of electricity was municipal street lighting, followed later by electric-trolleys. In fact many early utility companies actually started out as transportation providers.[14]

As electric service became more prevalent throughout cities, particularly after the development of an AC motor for industrial uses and increased residential lighting and other conveniences, private power utilities grew significantly. As systems and demand grew, small local competitors merged into regional entities or were purchased by larger utilities. This trend soon expanded beyond individual cities or service areas as the amount of capital required to underwrite new generation facilities and ever-larger distribution networks grew to the point where local investors needed to attract massive amounts of capital. By the 1920s, even many of the regional utilities were in deep financial distress, having borrowed heavily to construct their systems or to purchase their competition. These companies, struggling against debt while trying to build their sales in what amounted to legally protected monopolies within their service regions, were ripe for the picking. Wall Street, in the form of what became known as holding companies, took notice and influential eastern and Midwestern financiers stepped in. Large scale investors purchased controlling interest in many of these once-independent and locally- or regionally-owned utilities.

Before WWI, engineer-financiers such as Samuel Insull and H. M. Byllsby, Stone and Webster, and Sidney Z. Mitchell, among others, had begun to assemble holding companies by purchasing the assets of dozens, if not hundreds, of once-independent and locally-owned power providers, consolidating them into massive, connected, networks. In this way, given the nature of the power industry, they could avoid competition within their primary service areas and, with their skilled engineers design efficient systems that benefitted from shared distribution lines. Such companies were able to work in a coordinated fashion, shunting excess power from one portion of their network to another, leveling supply and demand.

The heads of these massive enterprises, at least at first, were utility men. They were engineers, not bankers, attracted to the economies of scale and the efficiencies inherent in the operation of larger utility networks. H. M. Byllsby, for example, began his power career as an electrical engineer, working first for Edison, but soon branching out to form a national consulting practice that helped design many of the regional power systems he would eventually purchase. Samuel Insull, though not an engineer, also begun his career working for Edison, as the inventor's personal secretary, and so was also something of an electrical pioneer. When Edison sold his interests to what became General Electric,[15] Insull left and became a leader in Chicago-area utilities. Standard Gas & Electric, a

[14] In the Pacific Northwest the classic example of this trend is Portland General Electric, who among its many predecessors counts the Willamette Falls Locks and Navigation Company, builders of the locks at Oregon City, and which by 1906 was a part of a virtual monopoly on power generation and transportation in the Portland area called the Portland Railway Light and Power Company, a name which in accurate order reflected the company's concerns.

[15] Edison's original company also gave life to what became EBASCO, as discussed on the following page.

partnership between Insull and Byllsby founded in 1910, grew into a nationally significant utility holding company with systems in twenty states, serving over 1600 communities (Tollefson, 1987:67).

The Northwest, with its generally smaller cities and towns, was ripe for combination by the well-funded utility holding companies.[16] As a result, by 1930, the vast majority of the Pacific Northwest was served by a group of providers that were in turn actually owned and controlled by a very limited number of national concerns. Largest among these was EBASCO, the Electric Bond and Share Company, under the direction of Sydney Z. Mitchell. EBASCO, with connections to both Edison's General Electric and J. P. Morgan, controlled the geographic majority of Pacific Northwest through its ownership of Pacific Power and Light, Idaho Power, Washington Water Power, Northwestern Electric, Utah Power and several other smaller regional utilities. Samuel Insull, through Standard Gas and Electric was primarily focused on southern Oregon through his control of the Mountain States Power Company and the California-Oregon Power Company, both of which also had connections to H.M. Byllsby. Finally Stone and Webster controlled Puget Sound Power and Light, serving most of western Washington outside the public power strongholds of Seattle and Tacoma. Other Northwest utilities during the 1930s era, most notably Portland General Electric, were also owned by eastern financiers. PGE was controlled by E.W. Clark, an investment banking concern headquartered in Philadelphia. Henry L. Doherty controlled Cities Service a huge company nationally, but one that had only a minor presence in the Northwest, on the southern Washington Coast. W. B. Foshay, through People's Light and Power and West Coast Power owned utilities in southeastern Oregon and parts of Idaho. To varying degrees each of these Northwest utilities, though actually owned by eastern or Midwestern investors, functioned as independent local concerns, with headquarters located within their service areas. Within the norms of the day, they were responsible corporate citizens of their regions, providing reasonable service given their monopolistic franchises. And, largely as the result of its available hydropower, utility rates in the Northwest, even in the 1920s, when compared to other regions of the nation, were among the lowest in the nation.

Those low rates, however, didn't do much to ease the friction between the region's citizenry and the "power trust." People in the Pacific Northwest, led by Farmers and public power advocates, continued to push for more local, and more government, control of the power generation and distribution.

> Electric service was becoming a commonplace necessity for city dwellers, and even a limited number of farmers were beginning to realize the potential for advantages of applying electricity to their daily chores.

[16] This was especially true given that Seattle, one of the region's largest urban areas, had early on established a municipally owned utility, pulling that market, and its strong customer base, out of any larger regional mix.

> During this period the question of public or private ownership gradually moved to the forefront…(Williams, 1975:10).

In Washington State, in particular, the municipally-owned Seattle City Light and Tacoma Power and Light demonstrated that public utilities could provide reliable and high quality service at significantly reduced costs over investor-owned utilities. That fact, and the high regard for J.D. Ross, the longtime head of City Light, provided a constant irritant to the regional investor-owned utilities. City Light in particular served to seriously undercut private utilities' claims of their superior service and, for public power proponents, served as a powerful beacon of an alternative, better future.

Even during the economic prosperity of the "Roaring 1920s," populist opposition to the influence of the private, investor-owned, utilities grew. Advocates of public power ownership believed that private companies not only limited access to electricity in rural areas but that, as monopolies, they routinely over-charged urban customers, limiting the benefits of electricity for a large segment of the population. Such ideas coalesced around the theory of "Giant Power." Giant power was based upon the idea that Federal investment could and should harness the power of the nation's publicly-owned rivers and streams for the benefit of its citizenry, rather than allowing the power of those same streams to be developed by private firms for their own profit. The term "Giant Power" was coined by none other than Morris Cooke, the engineer who would later advocate for the creation of a Federal agency to assist farmers and who ultimately served as the first Administrator of the REA.[17]

> Giant Power [is] large scale economic development tapping the cheapest sources of power and practicing every economy…with mass transmission at high voltages if need be to great distances, to the areas of distribution and use, the whole integrated for operation in a single system (Cooke, 1925).

Giant Power proponents envisioned a nationwide grid of transmission lines running from a system of publicly owned dams and generation facilities that could supply the entire nation with inexpensive, plentiful, electrical energy. While Cooke initially did not distinguish between private and public ownership of the grid and generation facilities, it didn't take too long before others seized upon the concept as a mechanism for unifying the nation's power generation system under public control.[18]

Today, it's rather difficult to appreciate the fervor with which the public power/private power issue was debated in the United States eighty years ago. Public power advocates believed electricity was a "natural monopoly," and that the distribution of power for the

[17] Cooke originally developed the "Giant Power" concept as an element of an early rural electrification program in Pennsylvania, under the direction of Governor Gifford Pinchot.

[18] Giant Power, as envisioned by Cooke, would include stringent public regulation and rate control, though he was not entirely opposed to private ownership of some facilities.

benefit of the public constituted what amounted to an inherent 'right' of humanity. The right to inexpensive electric power was seen as equivalent to the public interest in clean water and fresh air.[19] Advocates considered it nearly immoral that profit should be an element in the distribution of such an essential "force." This was particularly true for electricity from hydropower, derived as it was directly from nature, and often reliant upon a publicly owned and controlled waterway.

Of course, despite the dominance of the "Power Trust" and the holding companies, there had always been some public power during this period, much of it a holdover from the industry's early development. In addition to the successful systems in Seattle and Tacoma, both established during the late 19th centuries, the Eugene Water & Electric Board [EWEB] system in Eugene, Oregon, established in 1905, and Bureau of Reclamation generation project in southern Idaho discussed above, were providing public power in the Northwest before World War II. Smaller communities, such as Ashland, Oregon, voted early in the century to purchase their existing private power provider and take over the system as municipal franchise (Atwood, 1999:52).

Nationally there was an example of a large-scale Federal project as well, that served as model of sorts for the possibilities of the "Giant Power" concept. During World War I, the Federal government developed large power generation facilities at Muscle Shoals, Alabama, to provide power for a munitions factory. While the war ended before the dam could serve its intended purpose, a controversy about what to do with the mammoth facility became something a flashpoint for the public power debate.[20] Private utilities fought to keep any generation at the Wilson Dam under their control, while public power advocates saw an opportunity to develop a huge source of low-cost power in the region. Ultimately, the government turned down an offer to sell the dam to Henry Ford for $5 million (Wilson Dam had *cost* the government $46 million). Several proposals for public power generation at the dam were vetoed by presidents Coolidge and Hoover. "During the next eleven years, Muscle Shoals was the focal point for the water power fight" (Norwood, 1981:25). Finally, in 1933, through the leadership of Senator George Norris, Wilson Dam became a cornerstone in the initial development of the Tennessee Valley Authority. Today it still remains one of TVA's single largest hydropower generation facilities.[21]

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[19] A similar approach in the late-19th century saw the transformation from investor-owned water companies to a system almost entirely superseded by municipal and government sources of drinking water. Giant Power proponents saw electricity in the same way.

[20] Upon its completion in 1924, Wilson Dam could generated over 675,000 kilowatts of electricity.

[21] http://www.cityofmuscleshoals.com/Default.asp?ID=11&pg=History (Visited 4-August-2008).

Figure 3.8 The Wilson Powerhouse at Muscle Shoals, c1930
Source, G. Kramer Collection

Several other events created increased support and interest in public power nationally, and in the Northwest in particular, during the 1930s. The first was the perceived role of utility holding companies in creating the Great Depression. This was largely due the sudden financial collapse of Samuel Insull, a founder of Standard Gas and Electric Company. Insull was seen, perhaps not entirely accurately, as the primary culprit in one of the more spectacular economic failures in American business history.

Insull, as already noted, was an early leader in the private power movement and, individually, was largely responsible for the development of the concept of using holding companies to consolidate smaller utilities into the sprawling, multi-state, corporations that dominated the industry by the late 1920s. It was Insull who had fostered the concept of municipal franchises and convinced the other utilities that submitting to regulation in exchange for exclusive franchises and limited, but guaranteed, returns on their capital investments was in their best interests. Beginning from his ownership position in the Chicago transit system, by 1929 Insull's two major investment vehicles, Insull Utility Investments Inc. and Corporation Securities Company of Chicago had holdings though two major divisions; Middle West Utilities and, in the Northwest, Standard Gas and Electric. Middle West and Standard Gas operated in thirty states and produced eight percent of the nation's total power generation. Insull's concerns were the second largest utility holding company then in operation, after EBASCO.[22]

[22] EBASCO was estimated to control approximately 13 percent of the entire electric generation in the nation. Collectively, by 1930, utility holding companies controlled some 78 percent of the nation's power generation (Hughes, 1983:391-92).

Insull's holding companies had a total stock market value estimated as high as $2.5 *billion*.[23] Sadly, and typical of the utility holding companies, Insull's book value was highly leveraged, with assets estimated at just $27 *million*. These so-called "pyramid" companies, where dozens of smaller corporations were given higher values than their assets supported, created exponentially inflated values at the top, holding company, level. This meant that virtually all the utility holding companies, companies like Insull's, were grossly under-capitalized when compared to their stock values.

Because of the disparity between their actual, and their stock, values, when the market collapsed in October 1929, nearly all the shareholder value in utility holding companies quickly evaporated. With no collateral assets to support their inflated worth, several holding companies declared bankruptcy, an act that in Insull's case left more than 600,000 shareholders in financial ruin. The plummeting values of the holding companies, even those that survived the crash, wiped out millions of investors' savings while enriching the men responsible for the schemes to begin with, including Insull. [24] Aside from the financial impacts, in the view of public power advocates the pyramided holding company schemes also imperiled the delivery of the essential service of electricity to consumers nationwide, adding significant fuel to the pro-public power movement.

Ernest Gruening, a noted journalist who ultimately became a New Deal administrator and in later life was Territorial Governor of Alaska and that state's first US Senator, was an early advocate of public power. In 1931 he wrote *The Public Pays-A Study of Power Propaganda* that documented the coordinated approach of the "power trust" to maintain high rates, mislead the public about issues surrounding public power, and generally maintain its economic position through what Gruening considered devious, if not outright illegal, methods. Gruening's book, in part, led to a three-year study of the holding companies practices by the Federal Trade Commission that was completed in 1934, after Insull's collapse. That report concluded, in part;

> That the utilities' aggressive country-wide propaganda campaign… measured by quantity, extent, and cost…was probably the greatest peace-time propaganda campaign every conducted by private interests in this country… repeated attacks were made on every outstanding public project, whether in existence or contemplated… (as quoted in Gruening, 1964: xii-xiii).

[23] For comparison, in today's values, Insull's holdings would be worth approximately $30.7 billion dollars.

[24] After the stock collapse and the company's failure in 1932, Insull fled to Greece but was ultimately extradited and tried for mail fraud in 1933. Though acquitted of all charges, he remained a dejected figure until his death in 1938. See Wasik, The Merchant of Power: Sam Insull, Thomas Edison and the Creation of the Modern Metropolis for a generally even-handed assessment of this leading individual in the development of the modern electric utility in the United States.

As a result of the FTC hearings on utility company abuses, Congress passed the Public Utility Holding Company Act of 1935, putting such holding corporations under Federal regulatory control for the first time. The PUHCA mandated that all related utility companies needed to be integrated into a single firm with the sole purpose of efficient operation of a utility system. The Securities and Exchange Commission was charged with oversight of all holding company structure and operations, assuring that stock value to capitalization was maintained within specified limits so as to protect investors from the sort of abuses that characterized the 1920s.[25]

The second, and far more significant, event effecting the development of public power in the Pacific Northwest during the 1930s was the election of Franklin Delano Roosevelt as president. FDR not only supported public power, but he saw the larger implications of its development to support the Pacific Northwest's economic growth while creating thousands of construction jobs in the process. The Oregon and Washington senators and congress members who had labored in vain over the Grand Coulee project for nearly two decades suddenly had a new, and hugely attentive, audience. Even as FDR was beginning his campaign, prior to the election, he was learning of the huge potential of the Columbia River to transform this region of the nation.

[25] Among the new SEC Commissioners that were appointed by the President to implement the new requirements of the Public Utility Holding Company Act was the head of Seattle City Light, J. D. Ross.

Figure 3.9 President Roosevelt, at Grand Coulee, 1940
Source, BPA Image H-147-3

3.4 FDR, Bonneville, and Grand Coulee

In January 1931, before Franklin Roosevelt, the second term governor of New York was publicly considering a run for President of the United States, Washington's US Senator C. C. Dill visited with him at the Executive Mansion in Albany. Sen. Dill knew that any New York Governor, particularly one who had already been a candidate for Vice President, was a potential presidential nominee. While in New York on other business Dill made a point to go to Albany and introduce himself. Being Clarence C. Dill, a long-time champion of the development of the Columbia River and advocate for federal funding of a dam at Grand Coulee, he naturally used the opportunity to educate Roosevelt about the project and what its construction could mean for the Northwest. As Dill would later recount, Roosevelt asked numerous questions about the project, its scope and benefits, recognizing what increased irrigation and low-cost public power could do for the Pacific Northwest region. Roosevelt, according to Dill, concluded by stating;

> I don't suppose I'll ever be president, but if I am, I'll build that dam… If I were president, I'd start it and Congress would have to [find the money to] finish it (Dill, 1970:150).

By 1932, after Roosevelt had begun to campaign for the Democratic nomination, he and Dill, along with other Northwest leaders, remained in contact, with Dill became one of FDR's main supporters in the Senate. After securing the nomination, FDR campaigned in the northwest and in September 1932 gave speeches to huge crowds in the region. In Portland, to a packed audience, Roosevelt left no doubt about his support for public power development.

> State owned or federal-owned power sites can and should properly be developed by the government itself…We have, as all you in this section of the country know, the vast possibilities of power development on the Columbia rivers. The next great hydroelectric development to be undertaken by the Federal government must be that of the Columbia River (*Oregonian*, 22-Sept-1932, 6:1-8).

Roosevelt advanced the concept that water power belonged to the people and he advocated public power as a "yardstick" against which consumers could measure the high cost of private power (Pitzer, 1994:66). When it came time to cast their ballots, Northwesterners were enthusiastic in their support of Roosevelt, at least in part because of his promise of Federal investment on the Columbia River. He carried Oregon, Washington and Idaho by comfortable margins over President Hoover, garnering about 58% of the vote, despite Hoover's own connection to the region.[26]

[26] Although born in Iowa, Hoover grew up in Newberg, Oregon, at the home of his uncle, John Minthorne, attending what is now George Fox University before enrolling in Stanford. Oregon considered Hoover something of an

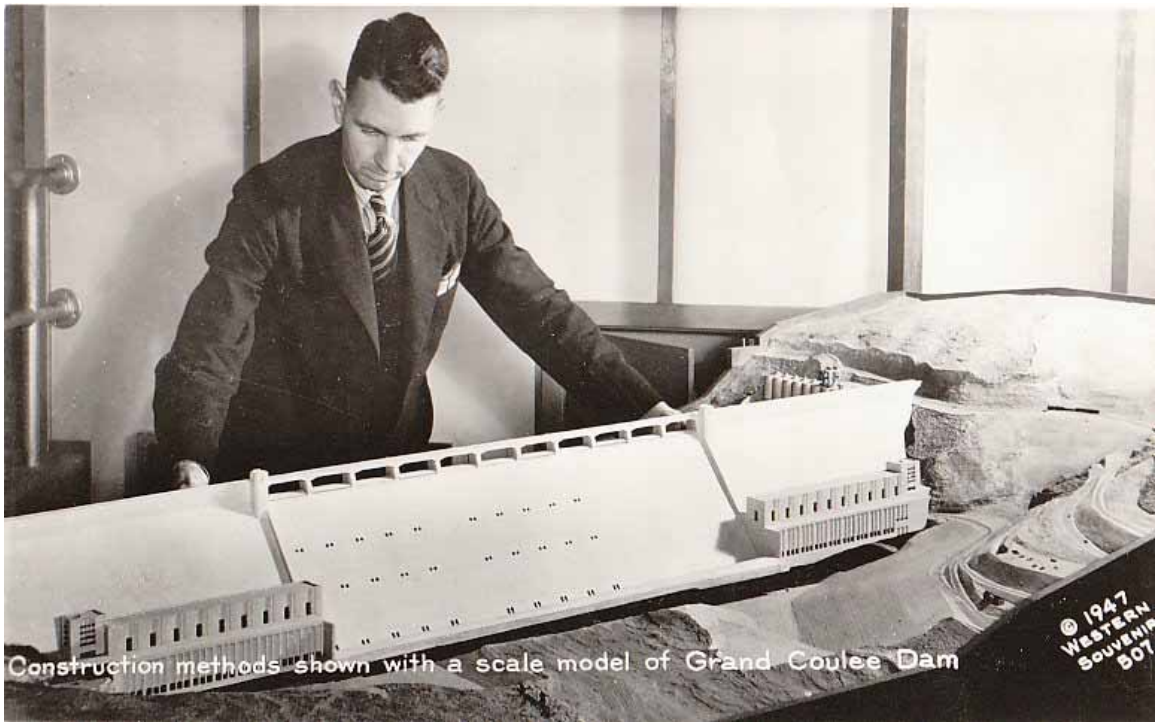

Figure 3.10 Grand Coulee Dam Model
Source, G. Kramer Collection

After his inauguration, FDR's support of public power was made definite with the creation of the Tennessee Valley Authority, incorporating the Wilson Dam at Muscle Shoals, and extending the concept of public power and federal investment to a huge portion of southeastern United States. According to Sen. Dill, he waited "…more than a month after the inauguration…" before reminding FDR of his promise for the Columbia River (Dill, 1970:167). While it took longer than Dill and the Northwest may have hoped, in mid-1933 FDR ultimately made good on his word, including the $60 million that it was expected the Grand Coulee would cost in a Public Works Administration bill.[27]

As Dill and the Washington state contingent were pushing forward on Grand Coulee, another powerful U.S. Senator from the Northwest, Charles McNary, of Oregon, was also pushing for development of the Columbia River, preferably something a bit closer to Portland than the Grand Coulee. McNary and his fellow Oregonian, Sen. Frederick Steiwar introduced legislation to fund the construction of a second Columbia dam from among those recommended by the Army Corps 308 Report, the one planned for

adopted "Native Son," and he remains the only US President to have any strong family connection to Pacific Northwest.

[27] The Public Works Administration was an element in the National Industry Recovery Act, signed into law on June 13, 1933.

Warrendale, the nearest to Portland. That bill stalled, but McNary and others convinced FDR that if improving navigation on the Columbia was a key element in the project, as the 308 Report had stated, it only made sense to start with the Warrendale project, at the downstream end of the river.[28] Always the politician, FDR recognized that he had a brewing issue in the Northwest that he needed to address.

> …Roosevelt knew his campaign promise had been interpreted in Washington to mean construction of Grand Coulee and in Oregon construction of the dam at Warrendale (Norwood, 1981:36).

Accommodating Oregon was likely not that difficult a decision for FDR to make. A supporter of public power and in agreement with Dill and his interest in implementing the entire multi-dam vision of the Corps 308 Report, FDR also believed in public power and the ability of public works to put Americans back to work. If Congress was willing to fund a second dam on the Columbia River before the first was even underway, FDR was not going to stand in the way. McNary was a powerful force in the Senate, a Republican, and he would bring not only substantial political clout but bi-partisanship to the project.[29] As far as FDR was concerned, if McNary could make it happen, Oregon could have its dam too.

McNary did what was necessary and in August 1933 Congress allocated $31 million to construct an Oregon dam on the Columbia, relocated slightly from Warrendale to Bonneville. Oregonians, naturally, were thrilled to have attracted a major project but the entire Northwest, with Bonneville and Grand Coulee soon to be fully underway, was nearly overwhelmed. After nearly 40 years of trying to attract Federal interest, they had now done so with spectacular success.

> For these many years, the people of the Columbia river valley have envisioned the time when their great river would be made practicable for traffic and the vast force of its waters would furnish the power for new industry…Now that dream appears at the point of being realized…this is only the beginning (*Oregonian*, 14-July-1933, 8:1).

In early August 1934, the President and Interior Secretary Harold I. Ickes came to Bonneville to mark the formal beginning of construction of the Columbia River Project. To the massive crowd assembled for the historic event, Roosevelt said;

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[28] As several critics of the Columbia project would point out, McNary's argument conveniently ignored the existing navigation canal at Celilo Falls, built by the Army Corps in 1915, a feature that had entirely failed to live up to its expectations in terms of increasing river transport. "The Dalles-Celilo Canal has often been referred to as the skeleton in the closet of the Portland District. For many years after its completion it was virtually unused" (Willingham, 1983:73).

[29] McNary was appointed to the Senate in 1917, after Sen. Harry Lane died in office. Replaced by Frederick Mulkey in a special election, he was again appointed following Mulkey's death in 1918. McNary was re-elected in his own right in 1924 and then again every six years until his death in February 1944. McNary served as the Chairman of the Committee on Irrigation and Reclamation of Arid Lands, a powerful position in the Columbia River issue, as Senate Minority Leader and was a candidate for Vice-President in 1940, running on the ticket headed by Wendell Willkie.

> I don't believe you can have enough power for a long time to come, and the power we are developing here is going to be power which for all time is going to be controlled by the government (*Oregonian*, 4-August-1934, 6:6-7).

Figure 3.11 FDR and Entourage Review Bonneville Construction, 1934
Source, BPA Image No. H146-3

Excavation at Bonneville began in February 1934 and work on the locks, the powerhouse and the massive dam itself continued nearly around the clock. The first of its generation units went into service a little more than four years later, in June 1938. Construction at Bonneville, the first project on the Columbia to get underway, and the first project to be completed, was something of a test for FDR's policy of public power.

> Bonneville Dam is the keystone of the New Deal's power arch. It is the most important, as well as the most expensive, Federal construction project to be started and completed during the Roosevelt Administration. Will it be a paying proposition or a losing venture?...Should Bonneville fail, all the New Deal power plans would totter perilously close to collapse (Neuberger, 1938:94).

Construction at Grand Coulee lagged behind that at Bonneville. Coulee was both a larger project and was beset by political and legal infighting over its authorization that slowed

its progress.[30] Still, with the impetus and demand from both projects, workers flocked to the Pacific Northwest, in search of steady work during the depths of the Depression. At each of the dam sites, thousands found it.

Figure 3.12 Grand Coulee Dam, Under Construction, c1938
Source, G. Kramer Collection

3.5 Dam of Doubt

While the reaction to the beginning of the Grand Coulee and Bonneville dams in the Northwest was nearly unanimous excitement, the sheer scale of the projects on the Columbia raised questions in other parts of the nation that they would not directly benefit. Critics of Roosevelt and the New Deal, many of them also opposed to exactly the sort of public power development that the dams would create, loudly and frequently questioned the financial soundness of the Columbia projects. The legislative intent behind the financing of both Grand Coulee and Bonneville was that they would repay their construction costs through the sale of the hydroelectricity they would generate.[31] Given the vast sums that the dams would cost, and the comparatively low population and

[30] Work at Grand Coulee, at the behest of FDR and Dill, had actually been started by the State of Washington, intended as a prod to goad the Congress into funding. There were legal challenges concerning the relationship between a state and federal undertaking that complicated Coulee's construction.

[31] The sale of hydropower was also expected to offset much of the cost of the project operations associated with navigation, irrigation and reclamation.

demand for electricity in the Pacific Northwest, critics decried the Administration's estimated power sales and payback schedule as simply unsupportable and unrealistic.

> …Can power rates in the Northwest be reduced sufficiently for 3 per cent of the people to consume nearly 50 per cent of the country's power supply? The answer is clearly in the negative. (Neuberger, 1938:90).

In a highly critical article published in *Collier's Magazine* titled "Dam of Doubt," author Jim Marshall essentially lambasted FDR and the entire concept of developing the Columbia River as patently foolish or worse. While Marshall correctly pointed out the admittedly questionable accuracy of characterizing Grand Coulee as primarily an irrigation project, and Bonneville as a navigation feature, he took serious issue with the ability of the power generation component of the projects to ever recoup the federal investment in them. There quite simply, according to Marshall, weren't enough people or enough industry in the Northwest to absorb that massive amount of power, no matter how cheaply it was sold.

> The catch in the government's cheap power promise is that the consumer pays the delivery charges, which are six or seven times the cost of the power itself…If some power plants gave away power at the plants and charged only for the distribution costs, the monthly bills wouldn't effect enough savings to buy a package of cigarettes (Marshall, 1937:95).

For the Columbia River project dams not to become huge "white elephants," unable to reimburse the millions of dollars the US Treasury was going to invest in their construction, a system to distribute the power they generated, and a market to sell that power to, both had to be developed. In that, the history and the organization of the Columbia River project, not to mention the sheer magnitude of the task, made the solution complex.

Implicit, and often blatantly obvious, in the criticisms and opposition to the Columbia projects was the same private vs. public power debate that had been swirling around electric supply for decades. Private power providers in the Northwest were more than willing to distribute cheap electricity from Bonneville and Grand Coulee to their customers but they were adamantly opposed to any direct competition from a massive, taxpayer-financed, public power operation, particularly one with so much power at its disposal. The argument, and the approach, was not substantially different from the positions of the earlier "Bone Bill," in Washington State, where private power has successfully contained the scourge of Seattle City Light to just that city, maintaining all the surrounding rural areas for itself.

Unlike the Bone Bill arguments, however and countering the might of the private power interests, the populist-fueled PUD's and cooperative movement, along with the budding Rural Electrification Administration, saw Columbia River power as a way to completely eliminate private power from the region. "The proportions of this struggle threaten to make the warfare that for three years has been fought between the Tennessee Valley Authority and its power company rivals seem like some toy-soldier skirmish before the

real battle" (Neuberger, 1938). Like so much about the Columbia River project's earliest development, power policy and the battle between public and private interests, greatly complicated and delayed the discussion about who would actually operate the gigantic Columbia River dams once they were completed and, perhaps more importantly, who would set the ratepayer costs and market the power that they produced.

Largely in response to politics and funding, among other issues, Grand Coulee and Bonneville, as Marshall had pointed out, were conceived as *multi-purpose dams*, providing irrigation, navigation, and power generation. This stems from the original River and Harbor Act language, as well as the Army Corps 308 reports, that had proposed the multiple dam development on the river. It also helped justify the expense of the dams and deflect criticism that they were simply a public power grab in competition with private utilities.

The multi-purpose dam approach also proved a middle-ground through entrenched Federal agency interest. Under the multi-purpose approach, the Bureau of Reclamation, the Federal government's primary agency for irrigation development, was the lead entity at Grand Coulee. At Bonneville, the US Army Corps of Engineers was designated as the lead, to construct and operate the project and its associated navigation locks. While the Bureau had experience in distributing electricity, as in the Minidoka Dam project in southern Idaho, the Army Corps did not and inter-agency politics between the two made it highly unlikely that either would welcome the other stepping into a lead role on the Columbia River.

Initially, of course, the public and governmental expectation was that the Columbia River projects would follow a similar trajectory as that at Muscle Shoals and the other dams in the southeastern United States. There a comprehensive managing entity, the Tennessee Valley Authority, was given near total control over a broad range of issues centered around the development of the waterway. In the Northwest, many assumed that a similar entity, a Columbia Valley Authority or CVA, would play that same role once the two dams were completed.

> The issue of marketing the power from Bonneville and Grand Coulee dams first came before Congress in 1935. U.S. Senator James P. Pope of Idaho, a Democrat long identified with public power in the Northwest, introduced legislation creating a Columbia Valley Authority (Tollefson, 1987:127).

Both the Bureau of Reclamation and the Army Corps, in addition to the investor-owned utilities, strongly objected to Pope's legislation (S. 869). Even in the Depression, the TVA model served as a near lightning rod for regional concerns about Federal domination of local government and private business, an issue which opponents, sparing no hyperbole, lost little time in exploiting as the onset of creeping "socialism" that would threaten the very bedrock of American life. In such an climate, it was no surprise that Sen. Pope's proposal for a Columbia Valley Authority stalled. Without a CVA, and without any likelihood of the Corps and the Bureau of Reclamation coming to an

understanding, the key question of the Columbia project was who would control the transmission system and actually sell the power the dams were to generate (Rudolph & Ridely, 1986:72-73).

One solution to marketing Columbia River power was offered by Oregon senators McNary and Steiwer, both Republicans, who proposed a bill (S. 3330) that would have seen all Federal power from Bonneville marketed by the Army Corps of Engineers and sold directly to industrial users located in close proximity to the dam sites. This would have eliminated the need for an extensive transmission system while concurrently, and somewhat conveniently minimizing any impact from the public power on the existing private power systems in the Northwest.[32] Under this system, the Federal Power Commission would establish the rates for power sales. "The geographical area proposed to be traversed by Bonneville transmission lines would be restricted to the territory of the lower Columbia River constituting the immediate hinterland of metropolitan Portland" (McKinley, 1952:157-8). Power at Grand Coulee would be marketed by the Bureau of Reclamation and the two gigantic dams would remain entirely separate in terms of operation and power generation.[33] Not surprisingly, the Army Corps and the Bureau of Reclamation were very pleased with the McNary-Steiwer plan, as were the region's private utilities and most of the Portland establishment.[34] Also not surprisingly, Washington's senators Homer T. Bone and Lewis Schwellenbach, both Democrats and huge public power supporters[35], were not pleased if for no other reason than the McNary-Steiwer plan would virtually destroy their state's growing Public Utility District movement. Bone and Schwellenbach employed Senate rules to delay any action on the McNary-Steiwer plan and then, in March 1936, introduced their own competing legislation, S. 4178, further complicating any resolution of the issue.

President Roosevelt, who was in support of a coordinated and comprehensive Columbia River approach, allowed this squabble to proceed without comment, although he personally is believed to have favored connecting Grand Coulee and Bonneville and creating a management vehicle similar to TVA that could accommodate the other proposed dams on the river as they were completed. The Corps and the Bureau, focused respectively on Bonneville and Grand Coulee and their own futures, had little interest in unifying the system and connecting its generation for either distribution or marketing.

To overcome the stalemate created by the competing Oregon and Washington bills in Congress, FDR charged his Natural Resources Committee, "a recently created central

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[32] Congressman Martin Smith, a Democrat of Washington, introduced the companion bill in the House.

[33] Reclamation envisioned transmission lines into Spokane and, eventually, the Puget Sound area while the Corps would serve the Portland-area markets. Each would be responsible for its marketing and distribution systems, primarily focused upon large industrial users.

[34] A later version of the McNary bill shifted all power marketing to the Army Corps.

[35] Clarence Dill had chosen not to run for reelection to the US Senate and was replaced in that chamber by Schwellenbach in January 1935. Rep. Walter Pierce, of Oregon introduced a companion bill to S 4178 in the House.

planning agency for the executive branch of government" to study the future development of the entire Columbia River basin and offer a solution. One of the key personalities in creating that report, a consultant to the Pacific Northwest Regional Planning Commission, was Charles McKinley, a professor at Portland's Reed College. The Commission, freed of much of the inter-agency politics, took a broader view of the development of the Columbia River and how it might benefit the region in the future.

> It recommended policies to govern the transmission and marketing of hydroelectric energy from the Grand Coulee and Bonneville dams together with a plan for administrative organization for those functions. Its recommendations took a longer range view of developments in the Columbia River Valley than had theretofore been expressed (McKinley, 1952:159).

While recommending a unified Grand Coulee-Bonneville entity, the Pacific Northwest Regional Planning Commission advised against a TVA-type authority for the Northwest. It suggested the construction of a "master grid" that would provide uniform-rate low cost power throughout the region, with preference to public and municipal utilities, all to be distributed via a Federal transmission system, and governed by a three-member Administrative board (Norwood, 1981:73, Tollefson, 1987:127,). Faced with two competing concepts in Congress, and a third from his own Administration, FDR proposed a "temporary" solution, an agency largely patterned along the lines of the Pacific Northwest Regional Planning Commission Report recommendations.[36] This new entity would be empowered to establish rates, develop the grid, and market the power generated at Bonneville, since that project was further along and would soon have capacity to sell.

As would happen frequently in the history of the Columbia River projects, politics intervened and Congress demurred on any action. Little would happen to resolve the issue of who would market the electricity from the Bonneville and Grand Coulee dams until after the November 1936 election. Roosevelt, re-elected by a huge majority of the nation, beat Republican Alf Landon of Kansas by 60.8% to 36.5% nationwide, carrying all but two states in a landslide election that is still the most lopsided in US history.[37] Clearly, the nation believed in what Roosevelt wanted to do and his administration in its second term placed new emphasis on solving the Columbia river issues. FDR asked Secretary of the Interior, Harold Ickes, to convene a "Committee on National Power Policy" to settle the matter. Ickes and the committee, along with the four senators from Oregon and Washington, met in late January 1937 to iron out the issue. It was largely

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[36] This cursory history of several of the major issues surrounding the issue of who would market the power of the Columbia glosses over the near byzantine complexity of the period. See Norwood, 1981:56-62 for one of the most concise, year-by-year analysis of the period between 1935 and 1937. "In view of this and other circumstances, BPA's birth had some miraculous aspects" (Norwood, 1981:56).

[37] FDR did even better in the Northwest, garnering an average of 65% of the vote in Oregon, Washington and Idaho. Landon won only the states of Maine and Vermont, collecting just 8 electoral votes to FDR's 523.

resolved once Oregon's Charles McNary retracted his requirement that the Army Corps be in charge of power marketing (Norwood, 1981:61).

There followed a host of various bills from Northwest legislators, each with subtle variations but all generally in keeping with the basic provisions of the Pacific Northwest Regional Planning Commission's recommendations for the creation of an entirely new federal entity to market the power of the Columbia River dams. Despite additional proposals and modifications, H.R. 7642, based on S. 2092, was finally passed and the Senate and House measures were reconciled. The Bonneville Project Act, creating what would become the Bonneville Power Administration, was signed into law by President Roosevelt on August 20, 1937.

> With this victory, the Administration set a pattern designed to make sure that the national investment in public power would result in lower rates for the consumers, rather than in higher profits for the private utilities (Schlessinger, 2003:378).

3.6 The Bonneville Project Act

Born of compromise, the Bonneville Project Act created a new Federal entity to direct the marketing of electricity from the Bonneville Dam and to construct the transmission system for its delivery throughout the region. Roosevelt's model, accepted by Congress, was largely based on the recommendation of the Northwest Regional Planning Commission and created what was seen as an interim solution until a Columbia Valley Authority could be established. "The form of administration herein established for the Bonneville Project is intended to be provisional pending the establishment of a permanent administration for Bonneville and other projects in the Columbia River Basin" (Bonneville Project Act, 50 Stat. 731, Section 2(a)).

Counter to the three person recommendation, however, the operation of the new agency was vested in an Administrator, a single director to be appointed by the Secretary of Interior, in marked contrast to TVA's three-person board. The single administrator was to be almost entirely responsible for the implementation of the organization's duties, as laid out in the Act. The Administrator was charged to "…make all arrangements for the sale and disposition of electric energy generated at [the] Bonneville project…" except the power necessary for the operation of the powerhouse and the locks (Bonneville Act 50 Stat. 731, Section 2(a)). To assure "…the widest possible use of all electric energy…" and to prevent monopolization of the facilities by any group, the Administrator was additionally directed to "…provide, construct, operate maintain and improve such electric transmission lines and substations, and facilities or structures appurtenant thereto as he finds necessary, desirable or appropriate," and further as may be required to "…interconnect the Bonneville project with other Federal projects and publicly owned power systems now or hereafter constructed" (Bonneville Act 50 Stat. 731, Section 2(b)).

Two concepts within the Bonneville Project were both hard won and of huge impact on all subsequent Federal power activities, both in the Northwest and beyond. The first, found in Section 4, was a statement that has come to known as "the preference clause."

> In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the Administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and cooperatives (Bonneville Act 50 Stat. 731, Section 4(a)).

The Act further stated that an application for power from a public body "…shall not be denied" on the grounds that funding for a cooperative or new public district has not yet been authorized, leaving to the discretion of the Administrator to determine a "reasonable time" has been afforded. This was a huge element of support to Northwesterners in the midst of politically-charged Public Utility District formation, in that it essentially required BPA to assure any such district a stable source of power were it to be formed, a provision that undercut a key claim of the investor-owned utilities efforts to stop PUD formation.

The second key element of the Bonneville Project Act had to do with the rate schedules that the BPA Administrator was authorized to develop, subject to approval by the Federal Power Commission. Section 6 of the Act states "The said rate schedules may provide for uniform rates or rates uniform throughout prescribed transmission areas in order to extend the benefits of an integrated transmission system and encourage equitable distribution of the electric energy developed at the Bonneville project" (Bonneville Act 50 Stat. 731, Section 6). This seemingly simple sentence encompassed one of the most significant aspects of the Columbia River Project, guiding the adoption of the so-called "postage stamp" rate that would eventually become a key component of the entire federal power system.

A postage stamp rate, like its namesake, is the same no matter where you are located. Just as it costs as much to send a letter to your neighbor via the US Postal Service as it does to send a letter across the state or even the nation, a postage stamp electric rate was a fixed charge per kilowatt hour, no matter how many hundreds, or even thousands, of miles the energy had to be transmitted from the source.[38] Postage stamp rates assured that the entire Pacific Northwest, at minimum, would benefit from the huge power generation on the Columbia, not just those communities that were physically located near the Bonneville and Grand Coulee powerhouses themselves. BPA distribution was only a matter of building a transmission network to get the power to where it was needed.

[38] The opposite of the postage stamp rate, and the sort of rate schedule the private utilities of the Northwest were advocating for, was termed a "Bus Bar" rate, where there was a cost at the source of generation, the bus bar, that increased the further distance the power traveled, to account for the costs of transmission. The postage stamp rate simply amalgamated transmission costs all over the region and spread them equally. Bus bar rates penalized areas further from the source of generation, generally meaning those areas already served by existing, investor-owned, power systems. Without any profit, the Federal rate was still significantly lower than that of the private utilities.

The eminent historian Arthur M. Schlessinger Jr. states that with the passage of the Bonneville Project Act in August 1937, Roosevelt's New Deal policy on the contentious issue of public power began to firmly take shape. The Tennessee Valley Authority model, passed earlier, resulted in the creation of a massive government enterprise that would remain controversial, at least in part because of the personalities associated with its implementation, but also simply because of its sheer scale and absorption of what some saw as private and local government interests. Eventually that model waned, to be replaced by a multi-faceted approach that utilized existing Federal systems and agencies, while creating a new marketing/transmission entity that would connect them; the BPA model. Whereas the TVA approach inspired strong opposition (and it should be noted that BPA would garner its share of opponents as well), the Bonneville Project Act model, even though it was intended as temporary, would prove highly durable. No other power producing and marketing entity on the scale of the Tennessee Valley Authority has ever been created in the United States. Instead the Bonneville Project Act serves as the model for what is now a nation-wide system of power transmission and marketing entities.[39]

> The essential purpose, which underlay New Deal programs in both public and private areas, was to stimulate the use of electricity by lowering the price, to tap markets which the power companies, bound to a narrow faith in quick and certain profits, had thus far been unwilling or unable to open up (Schlessinger, 2003:379).

By mid-1937 construction of the Bonneville Dam was steadily moving forward and the day it would start generating electricity was less than a year away. Further up the Columbia, the Grand Coulee was not as close to completion as Bonneville but construction there was also moving ahead and its massive turbines would soon have "power to burn" as well. Now, with the resolution of the political issues between Oregon and Washington, between the US Army and the US Bureau of Reclamation, and between the proponents of public and private power temporarily solved by the passage of the Bonneville Project Act, the basic character of the government's massive new public power system in the Northwest was clear. Bonneville's new Administrator would have significant discretion and would play a huge role in working out the implementation of the region's decades long dream to utilize the Columbia River. The question on everyone's mind was to whom the Secretary of the Interior would entrust that momentous task.

[39] See WAPA, Serving the West: Western Area Power Administration's First 25 Years as a Power Marketing Agency. (Denver, CO: Western Area Power Administration), October 2002.

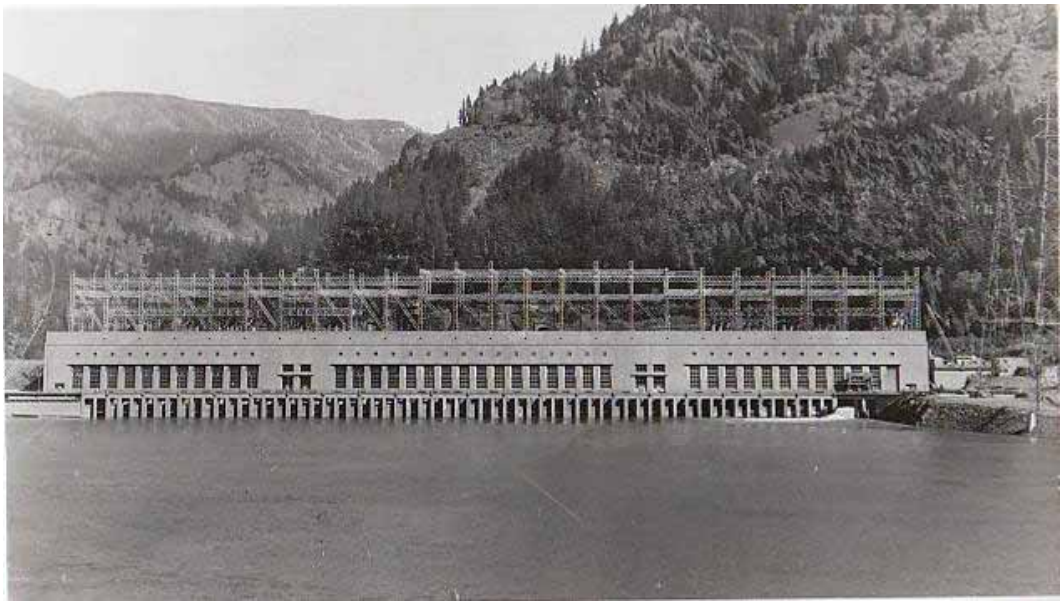

Figure 3.13 Bonneville Dam Powerhouse, c1940
Source, G. Kramer Collection

3.7 John Delmage Ross

Figure 3.14 J.D. Ross
Source, BPA Archive

Few men in the Pacific Northwest were as knowledgeable about the operation of a public power system as John Delmage Ross, best known as J.D. Born in Canada in 1872, in 1902 J. D. Ross, entirely self-trained as an electrical engineer, was hired by Seattle City Light to design a new power plant. Ross quickly rose through the ranks to lead the operation and then built City Light into one of the largest, and most successful, municipal utilities in the nation. Ross stood firm against utility holding company challenges in the Seattle area, ultimately negotiating successfully to purchase competing private utilities in the company's service area. Under Ross' direction, City Light succeeded in grand fashion, lowering costs to consumers, creating new sources of public power to meet increased demand, and expanding City Light's influence.

By the mid-1930s Ross, an articulate, passionate and effective supporter of the public power movement, had become a nationally recognized spokesman for professionally-managed, publicly-owned, low-cost electric power. His reputation brought him to the attention of the similarly minded White House, which tapped Ross' expertise for its own public power planning. "During 1934 and 1935 Ross was dividing his time between Seattle and Washington, D.C., as a consultant on the Federal Power Commission's national power survey and the power division of PWA [Public Works Administration]" (Dreher, 1940:55). In 1935, through PWA (which would also be the funding source for Grand Coulee), Ross played a significant role in redesigning the electrical distribution

system in the state of Nebraska. The State of Nebraska was, and today still remains, the only state in the nation that is entirely served by publicly-owned utilities, enjoying some of the lowest power rates as a result.

Nebraska's blanket public ownership was Ross' ultimate vision for the future, not only for the Northwest, but for the United States. In 1932, convinced the power holding companies were largely responsible for the financial collapse of the economy, Ross wrote that the holding companies were "…inefficient monopolists attempting to get by propaganda and falsehood and politics what they cannot get by engineering and merit" (Dick, 1979:299). Knowledgeable about the utility business with three decades experience, well-connected to the White House, physically imposing, even-tempered, likeable, and doggedly persistent, Ross was, when it came to the BPA Administrator position, without too much overstatement, the investor-owned utilities worst nightmare.[40]

As the planning for Bonneville and Grand Coulee was underway, prior to the passage of the Bonneville Project Act, Ross had been a visible and enthusiastic supporter of using the vast hydroelectric potential of the river for the public's benefit. From his position at Seattle City Light, and then at the Federal Power Commission and PWA, Ross was able to gain considerable visibility for his opinions on how the Columbia should be developed and what that development might mean for his Pacific Northwest region. In 1935 Ross gave a much-cited speech in which he compared the cost of electricity to a yardstick, a term that FDR would later, and more famously, appropriate. *Producing* power, said Ross, was only a small portion of the cost yardstick, amounting to just four or five inches. *Distributing* the power to where it was needed was the other 31 inches and that, he said "…could be cut to 10-12 inches by efficient operation and public ownership" (Dreher, 1940:56). Reducing the cost of power, while expanding the amount of it that was available for use, was the key goal of any public power system, according to Ross. He had no particular issue with investor-owned utilities. He just believed that their for-profit model increased the cost of electricity and made less of it available to the people than public power did.

> The handwriting on the wall tells us that public power is coming. Public power is for service; private power is for profit (Ross, 1935:25).

Ross had other ideas too, about how the Columbia River might best benefit the entire United States. He saw Grand Coulee and Bonneville, along with Seattle City Light's own Skagit project, as the first three mammoth facilities of what would eventually become an entire string of powerhouses that would be connected with other public generation facilities to create a massive interconnected system producing huge amounts of publicly-owned, low-cost, electricity.

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[40] In 1935 FDR appointed Ross to the Securities and Exchange Commission, where he was to oversee the implementation of the Public Utility Holding Company Act of 1935, passed in response to the Insull collapse and other holding company issues. For investor-owned utilities, Ross's appointment to the SEC must have struck them much as if FDR had asked the wolf to guard the henhouse.

> The great government plants should be inter-tied, and the Columbia system should be inter-tied with the municipal systems west of the Cascades. The people are forming their power districts and, all together, we should now go forward to make the Northwest the power center of the world (Ross, c1936).

And just as Ross envisioned that Grand Coulee and Bonneville would be interconnected with the other power plants of the Northwest into a large system, so too did he see the advantage of power lines that would eventually connect the Northwest with the Southwest, the Midwest and even the Eastern seaboard of the United States, brushing aside the technological obstacles to long-distance transmission of power by relying upon direct current, rather than the-then standard alternating current. "Longer transmission lines of the order of a thousand miles will circle the nation and … huge power plants of high efficiency and low cost per unit…" will create a unified, nationwide, public power system" (Ross, 1938).[41] Ross was a public power visionary, as he told journalist Richard Neuberger in 1937;

> You must remember that the electrical age is still in its infancy…New uses are being found for power each year. All the energy in the Columbia River Basin may not be needed right now, but the time is going to come when the country will use it, every single kilowatt… and we will see the day when the territory between the Rockies and the Pacific Ocean will be the power house for a large part of the United States (Neuberger, 1937b).

Ross knew FDR, and as a Roosevelt appointee to the Securities and Exchange Commission had already shown he had the President's confidence. Given his history and position in both the Northwest and public power, he was logically on many lists as an obvious choice as the first Administrator of BPA. Equally obviously, Ross , a formidable force for public power, was just about the last choice for the BPA job in the opinion of the investor-owned utilities. They found a willing partner in Charles H. Martin, the Governor of Oregon, a staunch opponent of the New Deal's labor policies and generally a reliable friend of the private utilities. Martin worked to undermine Ross' appointment, Martin on the spurious grounds that Ross, a Washingtonian, would unfairly skew the project's benefits toward that state and to the detriment of Oregon. Martin attempted to push another candidate on Secretary Ickes, Thomas Delzell, of Medford. Delzell, an executive in the California Oregon Power Company, an investor-owned utility, was backed by the Portland Chamber of Commerce and other groups that had largely opposed the Bonneville Project Act concept in favor a singular interest in providing cheap power to large industrial users.[42]

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[41] See Section 3.13 for more on Ross' direct current vision for transmitting electricity from the Northwest over long distances.

[42] The California-Oregon Power Company, COPCO, was an element of the Byllsby-Insull controlled Standard Gas and Electric system serving southwestern Oregon.

Public power proponents, including the Grange and most of the incipient PUDs in Washington state, enthusiastically supported Ross for the BPA Administrator position. Steve Kahn, a lawyer who had helped lobby for passage of the Bonneville Project Act, had returned to Oregon and helped set up the People's Power League of Oregon, a group that was formed largely to assure that the first BPA Administrator wasn't from the investor-owned utilities. Kahn would later recall that "We were backing J. D. Ross" (Tollefson, 1989:131) It appears that Delzell was never really given any serious consideration by Ickes or the President, who likely recognized that Ross was the near ideal candidate for the Administrator job. Neither FDR or Ickes were likely to have selected a private-utility figure after all their effort to keep Columbia Power in public control.[43]

In October 1937 Secretary Harold Ickes appointed Ross to the BPA Administrator position. Ross immediately resigned from both the Securities and Exchange Commission and stepped down from Seattle City Light to assume the BPA position.

> Whatever one may think of the relative merits of public versus private operation of the electrical power utilities, all who are informed must know that Mr. Ross is a competent power administrator… It is no valid objection to say that his experience has been in operation under public ownership, for Bonneville is a public ownership project. The national administration does not want Bonneville operated as a [private] utility is operated…Mr. Ross' views are in harmony with that policy..(*Oregonian*, 12-October-1937, 8:1).[44]

3.8 Bonneville Power Administration, The First Year

Ross, along with a talented group of associates and engineers, began the process of setting up the new agency immediately. Beyond the primary goals of building a transmission system and developing markets for the huge amount of Federal power that would soon be BPA's responsibility, Ross and crew also needed establish a rate structure. The transmission system had to be designed, rights-of-way secured, and construction crews trained and set to the task. Developing markets would require identifying or recruiting new industrial users to take advantage of low rate electricity, creating both demand and new regional jobs. Developing the growing Public Utility District movement in both Oregon and Washington, philosophically close to Ross' heart, was also a vehicle to build demand, as was expanding electrical service to rural areas through partnership with REA-inspired electric cooperatives. Working with these groups

[43] There is at least some implication that part of the reason the Bonneville Administration was set up to have a single administrator rather than the three-person board that headed TVA was a response to either Ross's input on the job, or his insistence upon that format as a condition of acceptance (See Dick, 1973:184-187).

[44] The *Oregonian* here contrasted Bonneville to a *community* utility, a common period euphemism that was almost certainly intended to blur the distinction between investor-owned utilities with publicly owned ones.

scattered throughout the entire Northwest, providing BPA's expertise along with future assurance of a power supply, would be an important task during Ross's tenure.

The day after Ross' appointment was announced, the *Oregonian* ran a six-column statement by the new Administrator, "as told to Richard L. Neuberger," on its front page. Underneath a large headline proclaiming "Low Bonneville Rates Ross' Aim," Ross laid out his approach to establishing rates and providing electrical service to the region.

> The goal sought by the President and Secretary Ickes at Bonneville is the greatest good to the greatest number. This in turn means the widest use of electricity for everybody. Surely no right-minded man can object to that program… in fact, there is no reason that every class of business should not be treated alike and get everything they want at equitable rates (*Oregonian*, 11-October-1937, 1:2-6).

Ross clearly expected his new agency to be an interim step, marketing the power from the Bonneville Dam until the Grand Coulee was completed, and then to be replaced by more comprehensive TVA-style entity that would have oversight for the entire basin. "The Bonneville act is intended to get the work started. It will be superseded and abolished when…a Columbia basin authority of some kind is expected" (*Oregonian*, 11-October-1937, 4:5).

Congress allocated the Administrator $100,000 to establish an office and hire a staff "…as he may find necessary for the proper administration of this Act" (Bonneville Act 50 Stat. 731, Section 9(b)). Ross hired a skilled group of individuals, many of whom he knew from either Seattle City Light or his time with PWA. He brought on Steve Kahn, lately of the Public Power League, to direct the agency's public relations issues. Ulric J. Gendron was named the Executive Assistant and even Richard L. Neuberger, the prolific journalist and future U.S. Senator (who had also been Kahn's college roommate) served as a temporary assistant at BPA (Norwood, 1981,106). Key among Ross's initial hires was Charles Carey, an engineer formerly associated with the Northwest Regional Planning Council, who was set to the task of designing the transmission grid. While Carey and others worked out the design and logistical details of what would become the BPA "Master Grid," Ross spent his efforts securing additional Congressional funding to actually build the transmission system and, in the Northwest, laying the groundwork to develop markets for the vast amount of power soon to be available.

For almost all of Ross's tenure as Administrator, BPA had no power to sell and so most of the agency's effort went toward planning and promotion. One important task was to tour the region, determine needs, and ultimately establish the cost of BPA power. This was a critical element in the marketing of power, for if the rate were too high, it would not create demand at a level anywhere near consistent with the amount of new power that would be generated by Bonneville and Grand Coulee. Conversely, were the rate set too low, BPA would not be able to make its required payments from sales and cover its debt payment to the US Treasury as was required by law.

Setting the rate for power, the single most fearsome issue to the private utilities, was almost certainly the single most important decision Ross and BPA made in 1938. The Portland business community, in particular, hoped for a *bus bar* rate, meaning power was cheapest at the powerhouse and rose proportionally as the distance away from the powerhouse increased. Portland's Chamber of Commerce envisioned electro-chemical and paper mills near Bonneville, dependent upon Portland for services, as the primary user of the public power. The fact that distant public utility districts would pay more, limiting their attractiveness, may have played a role into the bus bar support as well. Under a bus bar rate, the power that was not consumed by these large wholesale users would be sold to existing private power providers and distributed over their already existing transmission systems, thereby saving the taxpayers the cost of constructing a new BPA transmission network, or at least so went the argument. After all the effort to secure a federal role in the development of the Columbia River, much of it coming from Washington state, not everyone was enamored with the Portland proposal or the bus bar concept in general. "People in the remainder of the region, particularly throughout Oregon and Washington, disagreed with Portland's proposal" (Norwood, 1981:79). Ross traveled throughout the region talking about power rates, hearing from people interested in PUD formation, searching for lower rates than were then paying, or in the case of rural areas, simply getting the convenience of power in the home or farm.

The rate schedule that Ross ultimately recommended, a postage stamp rate that provided for uniform costs throughout the region, was accepted by the Federal Power Commission on Jun 8, 1938. Ross established a wholesale rate of $17.50 per kilowatt year, about one-fifth of one cent per kilowatt hour. Power within 15 miles of the dam would be sold at $14.50 per kilowatt year. This was an incredibly low rate, "at cost," and while it did not mandate any particular retail rate, since fully half the available power was obligated to public bodies, BPA's rate for electricity the Northwest would clearly be among the lowest in the United States.

> Under the slogan "Electricity for Everyone," Mr. Ross points out that the Pacific Northwest is the greatest power watershed in the world, and that the potential energy must be distributed for the benefit of all classes of consumers. He called Bonneville Dam and the Columbia River "a coal mine that will never be dug out, an oil well that will never run dry" (BPA Bulletin No. 1, 1937).

3.8.1 SUPPORTING THE PUD MOVEMENT

The passage of the Bonneville Project Act and the inclusion of the preference clause to support public and cooperative utilities led to resurgent interest in the establishment of Public Utility Districts. Ross and the BPA staff provided significant assistance to a wide variety of local groups seeking to form new public power systems, including the assessment of feasibility and even preliminary assessment of the costs involved to acquire the investor owned lines within the proposed district boundary. The Bonneville Act has reserved fully 50% of the power from Bonneville and Grand Coulee for sale to public utility districts and other non-profit consumers and so BPA had a clear interest in assuring there was adequate public power demand to utilize that supply.

At BPA's formation, there were twenty public power districts or rural cooperatives in Washington while, according to Ross, Oregon and Idaho had "practically none" (Billington, 1988:16, *Oregonian*, 11-October-1937, 1:2-6). Washington, already the home of the large municipal utilities in Seattle and Tacoma, had passed Initiative 1 in 1930, to allow the creation of countywide public utility districts, resulting in the first wave of such public power providers around the state. The elections of 1938 and 1940, both after the creation of BPA and its assurance of a power supply, saw the formation of another eleven county-wide utility districts, bringing the pre-WWII total in that state to thirty-one (Billington, 1988:16).

> Ross chose to announce BPA's "objective rates" about ten days before the 1938 elections. He emphasized that lower-end user rates could be offered by public bodies getting power from Bonneville Dam…The private power companies were dismayed. (Tollefson, 1989:134).

The public power movement in Oregon was not nearly as successful as that in its neighbor on the opposite bank of the Columbia River. As noted earlier, district formation in Oregon required two elections, one to form the district and a second to authorize it to purchase an existing system or to create funding so that it could build its own lines. The difficulty of dual elections, coupled with Oregon's generally conservative attitudes and strong business community, made the public utility elections highly contentious affairs. They met with only limited success, especially within the Portland metropolitan area, where Portland General Electric, though owned by east coast interests, enjoyed a long local history of service. One strategy utilities employed was an effort to turn union labor against the formation of public districts, claiming it challenge existing union jobs, implying the new public entities wouldn't rely on union labor.

In Spring 1938 residents of seven Oregon counties embarked on what remains one of the most ambitious public power plans Oregon had ever, and likely ever will, see. Oregon's law, despite its double-vote requirements, allowed districts to both span multiple counties and include non-contiguous areas. In a Special Election held in April 1938 that opportunity was put to the test, amid of flurry of pro and con advertising that typified the public power debate during this period.

Counties involved are Clackamas, Clastop, Columbia, Lincoln, Polk, Washington and Yamhill. The election, geographically speaking, will be one of the strangest ever held in Oregon. In the first place, only portions of each of the seven counties will vote — only the most populous areas — are included in the district (*Oregonian*, 7-April-1933, 6:1-3).

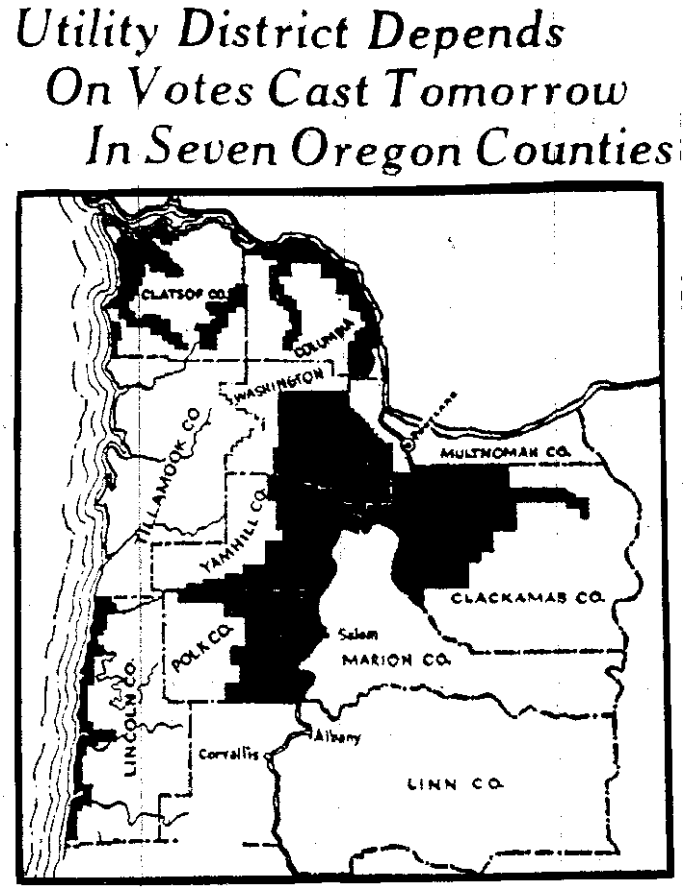

Figure 3.15 Utility District Depends on Votes, 1938
Source, *Oregonian* April 4, 1938

Ross, though largely remaining in the background, certainly saw this vote as something of a referendum on the future of the public power movement in Oregon and used his position to provide assistance and information to the district's supporters. He was almost certainly disappointed by the results. Under a headline stating "7 Counties Crush Power Proposal" the *Oregonian* reported the nearly 2-to-1 defeat of the measure in virtually all of the 53 jurisdictions that were involved. Given that BPA was to sell 50% of its power to public entities, BPA's detractors now had reasonable expectations that the Administration would fail to meet that goal.

> There are several power districts in Oregon already created but inactive. J.D. Ross now has only the inoperative districts (here) and 18 in

> Washington in which to sell this reserved power…Franklin T. Griffith, president of the Portland General Electric company said that the election indicated the voters preferred private operation under state regulation [over public power] (*Oregonian*, 9-April-1938, 1:5-6).[45]

Most of the 1938 public power elections in Oregon went down to defeat. However Tillamook County, a coastal county with a strong agricultural/dairy industry, formed the first People's Utility District in Oregon and was among BPA's earliest customers once the transmission system was in place (BPA Annual Report 1940:3).

In Idaho, public power advocates had even less success during the first years of the Bonneville Power Administration than they had in Oregon. Efforts to pass PUD legislation bogged down in the Idaho state legislature and no meaningful legislation was ever adopted.

> Idaho Power Company had survived the [public power] siege. Editorial opinion had favored it, Republican sentiment had favored and championed it, and a lot of Democratic sentiment had favored it when it came right down to a vote…There would be no public utility districts in Idaho (Stacy, 1991:109).

Despite a governor who had been elected largely on a public power platform, Idaho private utilities, particularly the state's largest provider, Idaho Power, were almost entirely successful in limiting the development of public power in their state outside the few Bureau of Reclamation properties at Minidoka that had been established in the first two decades of the 20th century.[46]

[45] In addition to the Tillamook PUD, the other Oregon public utilities prior to April 1938 were the City of Monmouth's municipal system and the MacKenzie River People's Utility District, in Lane County. (USDI/ The Bonneville Project, Bulletin No. 28, November 29, 1938).

[46] The rural cooperative movement in Idaho did have some success, with eight such entities organized during the "Power War" period of 1935-1942. These were Clearwater Power Company (1938), Fall River Rural Electric (1940), Idaho County Light and Power Cooperative Association (1939), Kootenai Electrical Cooperative Association (1938), Lost River Electric Cooperative (1941), Northern Lights Inc., (1936), Prairie Power Cooperative (1942) and Raft River Rural Electric Cooperative, organized in 1940 (Stacy, 1991:109).

3.8.2 INDUSTRIAL USERS

The other essential element BPA was charged with, in addition to the construction of the transmission lines, was marketing the power output from the dams. While the PUD movement would grow slowly outside of Washington State, BPA also focused on large industrial users who could contract for huge blocks of the Columbia River's power. This aspect of BPA, tied to the development and growth of the regional economy, was key to fulfilling Roosevelt's and Ross's views of power as the way to bring new jobs, new opportunities, and a better life to the Northwest. It was also, at least to a degree, self-preservation for if BPA could not attract new industry to use significant amounts of Bonneville and Grand Coulee output there was little hope the entire Columbia River Basin project would be able to repay the taxpayer investment in its construction. At least initially, until the regional population and residential consumption of power grew, significant industrial development was the best opportunity to disprove the "Dam of Doubt" naysayers that had fought the development of the Columbia River from the start.

Ross hired Ivan Bloch and placed him in charge of developing major industries that could relocate to the Northwest and take advantage of low-cost BPA power. Bloch, assisted by Stanford-trained economist Samuel Moment and a small team of others, identified electro-metallurgy, primarily aluminum production which required huge amounts of power, as a strong possibility for the area. In the late 1930s aluminum production in the United States was almost entirely monopolized by two companies; ALCOA and Reynolds. Buoyed by the availability of plentiful, low-cost, power, BPA's industrial marketing program was almost immediately successful.

> In December 1939, Alcoa announced that its new aluminum reduction plant would be built west of Vancouver, on the Columbia River, at a cost of more than $4 million…BPA eventually signed three 20-year contracts with Alcoa, totaling some 97,500 kilowatts (Tollefson, 1989:161).

Soon, Reynolds Aluminum announced plans to build its own aluminum plant in the Northwest, this one at Longview. Other aluminum plants would follow and at least in 1940 put BPA in the position of having been so successful at pursuing new industrial development in region that they had outstripped the power supply available from Bonneville Dam during low-water periods. Aluminum was clearly a successful industrial enterprise and BPA encouraged new plants, both to use their power and, in best New Deal fashion, to challenge the near monopoly that then existed in the aluminum industry. "The first two aluminum plants had been privately owned. The next four were built by the Federal Government's Defense Plant Corporation" (Tollefson, 1989:168). All these plants were developed in the Northwest specifically due to the availability of low-cost electricity. Each would consume huge blocks of BPA power. They were proof positive of Ross's insistence that industry would follow the construction of Bonneville and Grand Coulee and would provide much needed economic stimulation to the region.

Bloch's efforts at attracting additional industrial investment, beyond the aluminum reduction plants, were not as immediately successful. While BPA gathered huge amounts of data on the natural resources, particularly the mineral resources, of the region

with an eye toward increasing industrial investment, it does not appear that these plans bore much fruit prior to 1940. Then, international events began moving forward at rapid pace in Europe and Asia, putting the entire United States on what amounted to war-footing despite its actual neutrality in the conflict between Britain and Germany. By the middle of 1941, with both Bonneville and Grand Coulee producing power, the Northwest, and the Bonneville Power Administration, would begin to play an ever more important role in Roosevelt's dream of transforming America into an "Arsenal of Democracy.

3.8.3 THE MAIN GRID:

While Ross and others were working to establish low-cost power rates, attract new industry and build the public utility district movement in the Northwest, Charles Carey was working on designing the transmission grid that would send Bonneville power to where it was needed. Like Charles McKinley, Carey had first become involved with what would lead to the creation of the Bonneville Power Administration through the Northwest Regional Planning Commission process. While there Carey had participated in the Commission's recommendation for a "Master Grid" plan that would tie the massive generation capacity of Bonneville and Grand Coulee into what amounted to a loop, connecting Seattle, Portland and Spokane, the three major urban areas of the Northwest.

Whether BPA should build its own transmission grid or simply rely on existing private utilities systems was briefly a point of contention, as the private power companies and their allies pushed for shared solution. Ross, of course, was committed to a public transmission system and, as Administrator, it was almost entirely his decision to decide what was in the public's best interest. He announced a 230,000 volt master grid along the lines of that proposed by Charles Carey and the Pacific Northwest Regional Planning Commission and then gained the funding from Roosevelt and the Congress to see that it was built. "In July 1938… the Public Works Administration allocated $10,750,000 to the BPA for construction of power transmission lines and substations in Washington and Oregon" (Tollefson, 1989:136).

> Several thousand Works Progress Administration laborers cleared the rights-of-way of all the earliest BPA lines and worked on many of the substation sites as well. Without the considerable contribution of the WPA, the Master Grid would not have taken shape as early as it did (Holstine & Lenz, 1987).

Construction of the entire plan for the Master Grid, 2,736.8 circuit miles of lines and 55 substations, would be delayed by World War II, however construction on key elements began immediately after the funding was secured (Holstine & Lenz, 1987). The first line to be built was a small 13.8 kV line built from Bonneville Dam to the city of Cascade Locks. Secretary Ickes flipped a switch to energize that line on July 9, 1938, and BPA sold its first power, appropriately, to a public power customer.

A major element of the initial construction of the Master Grid was the completion of the Bonneville-Vancouver line, a 230,000 volt line between the dam and the BPA substation in Vancouver, Washington that served as the "backbone" of the system. Six other major transmission lines were a part of the original plan; the Bonneville-Coulee 230-kV line, that connected Bonneville and Grand Coulee so that BPA could jointly market their power; the Vancouver-Eugene 115-kV line, connecting the Vancouver substation to Lane County, Oregon; the Vancouver-Kelso and Kelso-Chehalis 230-kV lines, heading north toward Puget Sound; the Chehalis-Raymond 115-kV line to southwestern Washington; and the Bonneville-The Dalles 115-kV line. The 230-kV high voltage backbone lines, with the 115-kV lines leading to load centers would establish a model for the BPA grid system for years to come. The entire concept for the Master Grid, "an advanced synchronized-at-the-load master system" was state-of-the-art for its time and while built with amazing speed by the BPA crews, was something of a technological achievement in the power industry that reflects highly on Ross, Carey and the entire BPA approach.

> A skeletal network of 230,000 volt transmission lines linked the major population centers and generation plants in what was referred to as the "loop." Radiating outward from the 230-kV loop would be transmission lines of lesser voltages serving individual customers, such as cities and small towns, industrial plants, and utility districts. The system would be kept in "synchronism," that is stabilized, by state of the art electrical equipment installed at substations scattered at vital located throughout the network. Most importantly, the system was designed to allow expansion (rapid if necessary) without demolition or duplication of previous efforts (Holstine & Lenz, 1987).

Even today, expanded to cover portions of five states and interconnected with even higher voltage systems, the essential Master Grid of the BPA transmission system remains the 'backbone' of the BPA system in the Pacific Northwest, continuing to function much as envisioned by McKinley, Carey and J.D. Ross in the mid-1930s.

J. D. Ross, described as the "Paul Bunyan" of public power in the Pacific Northwest and the first Administrator of the Bonneville Power Administration was not present when BPA's first line was energized between the Bonneville Dam and Cascade Locks. While he knew that the dream of power "at cost" for the Northwest was well on its way to reality, he did not live to see that dream fulfilled. On March 13, 1939 a group of BPA officials, led by engineer Charles Carey, were present for a formal ground-breaking for the Cascade Locks line that would supply BPA's first customer. On that March day, Ross was at the Mayo Clinic for what has generally been described as minor surgery to remove an intestinal obstruction. He died unexpectedly during recuperation, when he had

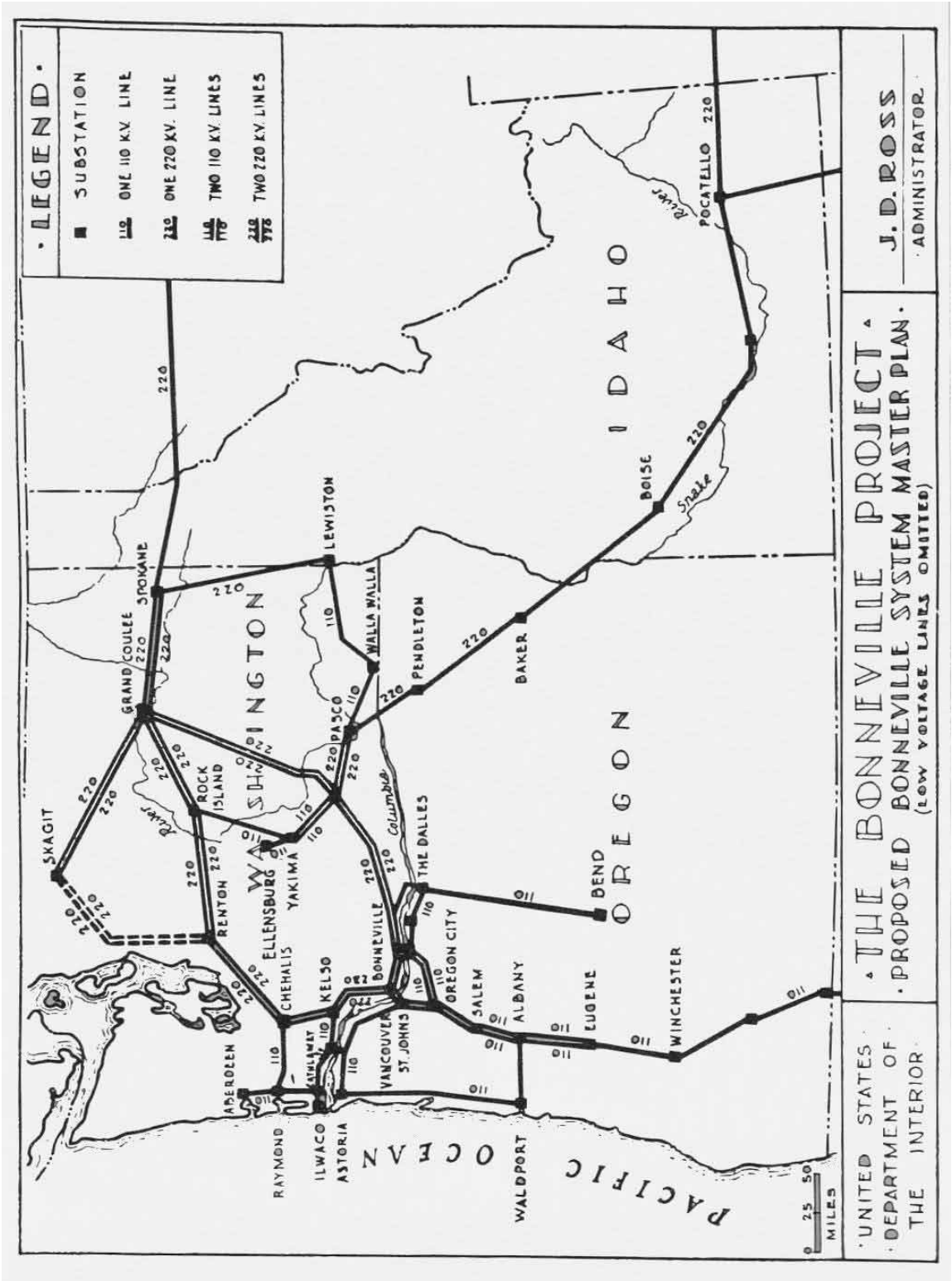

Figure 3.16 The Bonneville Project-Proposed Transmission System Map, 1938 [NOT AS BUILT]
Source, Bonneville Power Administration

a coronary thrombosis, a heart attack. He was sixty-seven. As one historian put it, "Like a light switch being shut off, he died instantly."[47]

Ross's sudden death was a blow to the public power movement in the Northwest and the United States. There is no way of knowing what the nation's electrical system might have become had he lived to see the Bonneville Power Administration, Bonneville and Grand Coulee dams fully operational. Perhaps, with the force of his personality, BPA might have been transformed into a Columbia Valley Authority with himself at its head.

Despite his short tenure as Administrator, there is no doubt that much of what BPA became was because of J. D. Ross. His personal character, his political clout, and his steadfast support of public power at cost for Americans everywhere shaped not only the Administration itself, but the future of federal power as a concept. Nearly forty years after Ross's death Ulric J. Gendron, Ross's second in command at BPA, wrote:

> I cannot over emphasize that history was made that first year. Were it not for the personal support of the President and J.D.'s background as a public power advocate, Bonneville would have never gone off the ground. [The] result would have been two giant dams with power and no place to go…It can only be said that the Northwest is richer today because of the actions of President Roosevelt in the early '30s and that he personally selected J. D. Ross, a man with a national reputation who knew the Northwest and admired its people. I know of no one who could have met those qualifications better than J. D. Ross. He lived long enough to set a foundation solid as rock and which no one could destroy. (Gendron, 1976).

[47] http://www.historylink.org/essays/output.cfm?file_id=2557 (Visited 19-August-2008).

3.9 BPA, WORLD WAR II AND DEFENSE INDUSTRIES

After the sudden death of J. D. Ross, Charles Carey become the Acting Administrator of BPA. Carey was only an interim choice for the job and soon returned to his more accustomed role as BPA's Chief Engineer. Frank Banks, who had been in charge of the construction of the Grand Coulee Dam next served as Acting Administrator however "[H]is lack of sympathy for such public power objectives as the formation of new PUD's and preference in sale of Federal power to public agencies led to a short tenure" (Tollefson, 1989:139). Combined, Carey and Banks would head the agency for less than six months. BPA's second permanent administrator, Dr. Paul J. Raver, was appointed in September 1939. Raver would oversee the agency for the next fourteen years.

Figure 3.17
Paul Raver
Source, BPA Image H163-6

If J. D. Ross was a Roosevelt man, Raver was more strongly linked to FDR's powerful and somewhat acerbic Secretary of the Interior, Harold Ickes. Ickes had found Ross' close ties to the President something of a slight to his own authority over BPA. The Secretary found Raver in Illinois, where he was serving as Chair of the Illinois Commerce Commission, having previously taught at Northwestern University. As an academic, Raver had written frequently in support of public power expansion and was clearly a "pro-public power" advocate. Ickes, frustrated with Frank Banks' backing away from Ross' strong support of the PUD movement, turned to Raver based largely on the strength of his commitment to the public power movement. "Ickes interpretation of the preference clause…was to the effect that Bonneville actively seek to set up preference customers instead of just sitting passively and waiting for a preference customer to be formed and acquire properties and then serving them" (Luce, 1984).

Raver's commitment to public power was unwavering. As a Chicagoan, and Chair of the Illinois Commerce Commission, Raver had a front row seat for Samuel Insull and the failure of the utility holding companies in the early 1930s. He was generally of the opinion that power should be entirely public-owned, and believed, like many New Dealers, that the era of private utilities was ending. Whereas Ross, an engineer and power manager for decades, had been willing to accept private power in partnership as long as it provided low-cost electricity to customers, Raver was far more strident in his tone.

> Naturally private utility management with lucrative jobs at stake have wanted to remain in the business and so have attempted to obstruct, delay, and discourage the establishment and acquisition of publicly owned systems, even after an electorate has voted for publicly owned operations (Raver, 1940).

Replacing a Northwest legend like J. D. Ross was a challenge for the more bookish Raver, who had never set foot in the region until arriving to assume his duties. "He was

greeted in his new post as an outsider and a carpetbagger. He found BPA in what Ickes described as a 'mess," largely due to the limited staff budget that Ross had labored under and at least partially due to Ickes own conflicts about Ross' independence (Norwood, 1981:121-23). Raver faced no small task. In addition to bringing in additional staff, re-energizing the organization devastated by Ross' sudden death, continuing the construction of the transmission network, marketing industrial power, and renewing support for the public utility district movement, Dr. Raver also faced an ever-increasing likelihood of war.

On September 1, 1939, just two weeks before Raver arrived in Portland, Germany invaded Poland. Within a few days the United Kingdom, France, Canada, and several other countries declared war on the Nazi regime, marking the beginning of what would become World War II. The United States, though technically neutral, would swiftly move to support its natural allies, particularly the British, by supplying munitions and war materials. Within a year the Northwest, largely as the result of BPA and its electrical capacity, became a major center for defense-related manufacture.

Even as the nation's commitment to defense grew, Raver picked up the public power program of J. D. Ross with renewed vigor and in the process became a near lightning rod for the investor-owned private utilities and their supporters. This was not unjustified, as Raver was entirely in favor of the total public control of electric power and made clear his intent to "…put every kilowatt in the Northwest under public ownership (Current Biography, 1941). Both Raver and Secretary Ickes chafed at the political impediments to Public Utility Districts in Oregon and Washington, believing that local and state politics, subject to the influence and outright manipulation of the private utilities, was unnecessarily slowing the growth of public power that would benefit citizens through low-cost Bonneville power.[48] In 1941 Ickes sought to gain new authority that would allow BPA itself to condemn or negotiate the purchase of private power companies directly, amalgamating their distribution and generation capacity into the BPA system, and building the public power network within its service area. Essentially this move would have allowed BPA to compete directly for residential and commercial customers, rather than limiting itself to wholesale customers only.

Raver's first target for a private-utility buy-out was Puget Sound Power and Light, managed by the "thin-nosed Donald C. Barnes, president of Engineers Public Service, that owned Puget Sound Power. Barnes was an old hand in the power wars, having staved off its direct competitor Seattle City Light for 35 years" (*Time*, 31-March-1941). Raver's efforts to buy Puget Sound Power and Light, as well as his and Secretary Ickes effort to expand the Bonneville Project Act, failed, almost entirely due to private utility

[48] It should be noted that Raver and Ickes were also likely nervous at the reduced market for the Administration's growing power output if they could not develop public power users. Part of the private utility approach was to limit the purchase of BPA power to assure the project's failure while at the same time increasing the likelihood that BPA would be forced to sell excess power to the private utilities for re-sale at a profit.

opposition amid cries of creeping "socialism" and worse. Raver was undaunted and would continue to advocate for public power, both during World War II and, most especially afterwards, throughout his entire tenure at BPA. "[H]e is an indominately (sic) patient man who knows his business and has the backing of the White House and the resources of the United States Treasury behind him" (Current Biography, 1941).

Although Raver focused on increasing public power in the region, the failure of public utility district elections in Oregon in 1938 and the looming war effort worked against his success. Even though the number of PUDs grew between the 1938 and 1940 elections, they didn't use much of BPA's electricity. "While 1940 marked the highwater of the public ownership movement, it also marked the ebbing of the tide" (Tollefson, 1989:185). As a result, to the glee of its detractors, BPA faced an increasing problem of where to sell the abundant power that was coming from the generators at Bonneville and, after March 1941, Grand Coulee.[49]

> Last week the biggest thing mankind has ever made began to spurt power. As Grand Coulee's first bolt of electricity sped to Bonneville's Government-owned transmission lines…Fifteen months after Bonneville's generators started purring, the project's first report ruefully admitted that it had only one short-term customer… Anti-Federal (power) newspapers headlined 'Bonneville Dam Has Everything But Customers' (*Time*, 31-March-1941).

The development of new public utility districts and rural electrification in the Northwest slowed after 1938 and then stopped almost entirely during the war. "The onset of war brought an uneasy truce in the battle between public and private power. No new PUDs were launched until after the end of the war" (Tollefson, 1989:238). Those projects that were approved by voters often had to wait to build lines as critical materials were all devoted to the war effort.[50] As late as 1940, BPA reported that "Five public utility districts, in Skamania, Pacific Wahkiakum and Klickitat counties of Washington, and in Tillamook County, Oregon, had contracted for a purchase of a total of 5,600 kilowatts of prime power by June 30, 1940" (BPA Annual 1940:3). This was at a time when Bonneville's first two units Nos. 1 and 2, were already producing 43,200 kW *each* and units 3 through 6, that would add substantially more power capacity, were already under construction (Willingham, 1997). The implication, at least in the short term, was that BPA was going to generate far more power than it could expect to market to public power providers.

Seeking other uses for the power from Bonneville and the soon to be operational Grand Coulee, Raver and the BPA turned their focus toward developing new industrial users in

[49] Executive Order 8526, in 1940, authorized BPA to market power from Grand Coulee in addition to its authority to market Bonneville power as established by the Bonneville Project Act (Norwood, 1981:124).

[50] Some cooperatives and rural electric associations were considered critical to the war effort by providing foodstuffs or other materials and so could receive the priority clearance to secure the metals required for distribution lines.

the Northwest. This resulted in BPA functioning as something very much like a highly-skilled, multi-state, regional, chamber of commerce or economic development department. BPA economists surveyed natural resources in the region, identified development sites, and formulated business opportunities and then negotiated with established national firms and others to take advantage. Due to the area's vast mineral potential and the availability of virtually unheard of amounts of low-cost electricity, not to mention a variety of other Federal-inspired industrial programs that created incentives for heavy industrial development, the Administration was far more successful than anyone could have predicted just a short time earlier.

During 1940 and early 1941, as the war raged in Europe, American industrial might was increasingly retooled to provide munitions to the British and other nations that were fighting the Axis, all in fulfillment of FDR's vision that the United States should become an "Arsenal of Democracy." The United States' transformation to a defense-based economy only increased after the surprise attack on Pearl Harbor and the nation's entry into the war.

> When war was declared on December 8, 1941, overnight the Northwest became an armed camp with Army and Navy bases and war industries located in practically every sector of Oregon and Washington…transition to a war economy put new responsibilities on all the utilities and BPA (Springer, 1976,45).

As a result of the war, BPA was forced to grow at an accelerated rate. "The impact of the war on the Bonneville Power Administration has one preponderant result. It has telescoped more than 10 years of normal growth into a brief five years" (Norwood, 1981:123). Even as BPA rushed its own transmission construction plans to meet new demand, in 1942 it also played a key role in the formation of the Northwest Power Pool, an association where the transmission lines of the largest utilities in the region were interconnected through the BPA grid to allow increased cooperation and transfer of generation capacity as needed. "It is clear that an effective regional pool would have been impossible without the federal transmission lines built and operated by BPA…There were no private transmission lines in the region that could carry these essential voltages" (McKinley, 1952:179). By pooling their generation capacity and sharing transmission lines during the war, the utilities of the Northwest were able to utilize an additional 100,000 kilowatts of power through increased efficiency, all without building a single plant. "This was a super power pool" (Kramer, 1986:87).

Aluminum production, identified early on as a prime industrial opportunity for the Northwest region, developed spectacularly as the result of low-cost BPA power. Prior to 1939 there was no aluminum production in the Northwest at all. Indeed, nationally the industry was just in its infancy and capable of only limited production of what during a

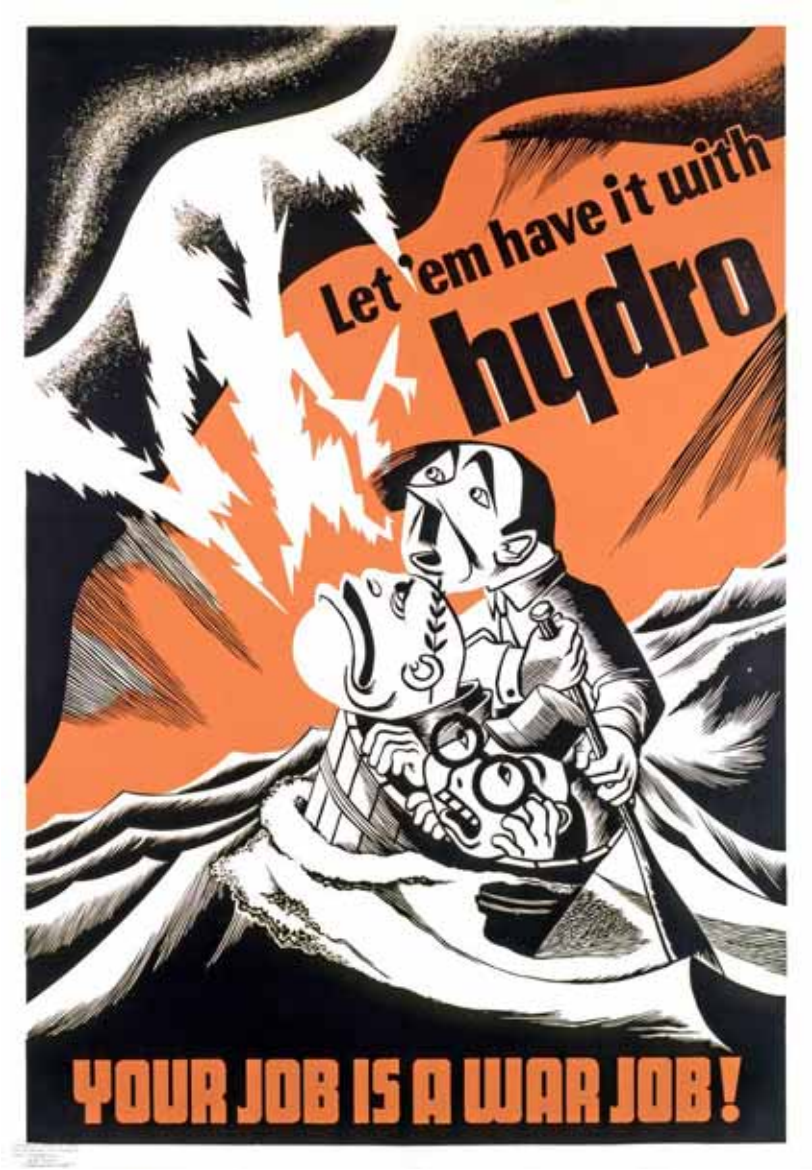

Figure 3.18 Let 'em Have it with Hydro, WWII Poster, c1942
Source, BPA Image HT-62

time of war would become an ever-more important material. "Of all the major wartime industrial expansions in the region, aluminum was one of the most important, both as a power consumer and as a potential peacetime industry" (Springer, 1976:47). BPA under Raver solidified and expanded its contracted power sales to the growing aluminum reduction plants in the region and by war's end the Pacific Northwest would become a major producer of aluminum nationally. In 1940 Congress passed the Defense Appropriation Act to increase national preparedness, with a goal of building 50,000 new aircraft per year. That required steep increases in aluminum production, the vast majority much of would come from the Pacific Northwest. The first aluminum plant in the Northwest, built by Alcoa at Vancouver, Washington, had a capacity of 164,000 tons. To put that amount into perspective, the Vancouver plant, just the first of the several to be

built in the Northwest, *by itself* produced as much aluminum as the rest of the nation combined prior to its construction. (DOI/BPA, 1953:12). By war's end, Northwest-based aluminum plants were responsible for more than half of the aluminum output of the United States.

Boeing, the airplane manufacturer located outside Seattle, would depend upon the supply of aluminum from Northwest plants to build airplanes for the US military. Thousands of new workers came to Puget Sound for defense-related jobs, boosting the use of electricity for heat and domestic use as well.

> There is no longer any doubt in most peoples' minds the Columbia River development is paying huge dividends in ships, airplanes, armor plate, chemicals and a dozen other war industrial uses….A single aluminum plant in the state of Washington takes as much power from the Bonneville system as all the power plants in the entire state of Montana can generate (Raver, 1943).

Other industries related to the war effort were also drawn to the Northwest, partially to supply Boeing and other major defense contractors, again largely due to the abundant and inexpensive power available thru BPA. These included, for example, the Electro Metallurgical Company, a division of Union Carbide, which purchased a 100 acre tract of land in Portland to produce calcium carbide and Ferro-silica using, as the name of the company implies, an electric-powered process (*Oregonian*, 20-March-1941, 1:2). Nor was this new concern the only such venture in the region "Portland has two carbide plants,…two soap plants, a sodium chlorate plant, a Ferro-alloy plant, a half-dozen oxygen and acetylene plants, and several other specialty chemical plants" (Portland Chamber of Commerce, 1945:35).

In addition to the aluminum plants, the development of Portland and Vancouver into major shipbuilding centers was likely among the most significant new use of power in the Northwest. During 1939 and early 1940 the U. S. Maritime Commission was undertaking an effort to revitalize the nation's commercial shipbuilding capacity in anticipation of the coming war in Europe. The Commission identified locations nationwide that could successfully accommodate the construction of major shipyards and Portland-Vancouver, with strong local support, was high on their list. Using ship designs originally created by the British, the Maritime Commission was attempting to transform the process of fabricating ocean-going vessels to reduce the time between laying the keel and launching. The goal was to take the year that was typically required for a vessel of any size and reduce that construction time to four months or less. One of the major methods of doing this was to standardize the designs and, more importantly, to weld the hull plates together rather than secure them with rivets. Arc welding uses high-voltage electricity and thanks to Bonneville and Grand Coulee, the Portland-Vancouver area had lots of that at low-cost. The simple, 450-foot long ocean-going vessels built in this fashion from modified British plans would soon become famous as "Liberty Ships."

Figure 3.19 Boeing Plant, Airplane Fuselages
Source, BPA Image H304-1

Henry Kaiser, a nationally-regarded industrialist and builder, had been partially responsible for the construction of both Bonneville and Grand Coulee dams, the latter of which was winding down just as the Maritime Commission was looking for partners for its shipbuilding plans. Kaiser, a friend of FDR's whom *Fortune Magazine* referred to as a "Titan of Industry" during this period, was considered something of the 'go-to' guy for projects deemed impossible by others. FDR and the Maritime Commission convinced Kaiser to enter the shipbuilding field, an area with which he had no experience whatsoever.[51]

Kaiser ultimately built three massive shipyards in the Northwest, two in Portland and one in Vancouver, that for the most part built Liberty Ships, Victory Ships, and what were called Kaiser-Class aircraft carriers, essentially Liberty Ships with a flat deck. Kaiser,

[51] Kaiser's phenomenal success at building ships faster than ever believed possible was in no small way inspired by FDR's statement that "…we must built ships faster than they can sink them," a reference to the Germans effort to create a blockade around the British Isles.

always the innovator, established standards for construction that will likely never be equaled, launching as many as 24 Liberty ships from a single yard in the month of September 1943. In one amazing display, Kaiser's Oregon Shipbuilding Corporation, in Portland, completed the 441-foot long Liberty Ship *Joseph N. Teal*, from laying the keel to launch, in just 4 days (Kramer, 2007:23).

Kaiser's three yards alone employed over 100,000 workers and were only the largest of the half dozen or so major shipbuilding facilities that operated in Portland during World War Two, building sub-chasers, tankers, landing craft and an entire range of ocean-going vessels for both U.S. and British Royal navies. Ancillary industries to the shipyards, building engines, anchors, deck ladders and all sorts of other fittings related to the shipbuilding operations also opened in the region, employing tens of thousands of new workers, all creating new demand for electricity. Almost entirely due to the booming defense industry, between 1940 and 1945 the population of Portland grew significantly, growing by more than one-third, fueled by the influx of workers from all over the nation. Housing, transportation and nearly every other aspect of service were strained to near-breaking point. The Housing Authority of Portland, which built 18,500 entirely new dwelling units between 1942 and 1943, and the Vancouver Housing Authority, with 12,000 new units, represented two of the three largest defense worker housing programs in the nation. HAP, the Housing Authority of Portland and the Vancouver Housing Authority combined accounted for more than half of all the Federal defense workers housing units built nationwide (Kramer, 2003:13).

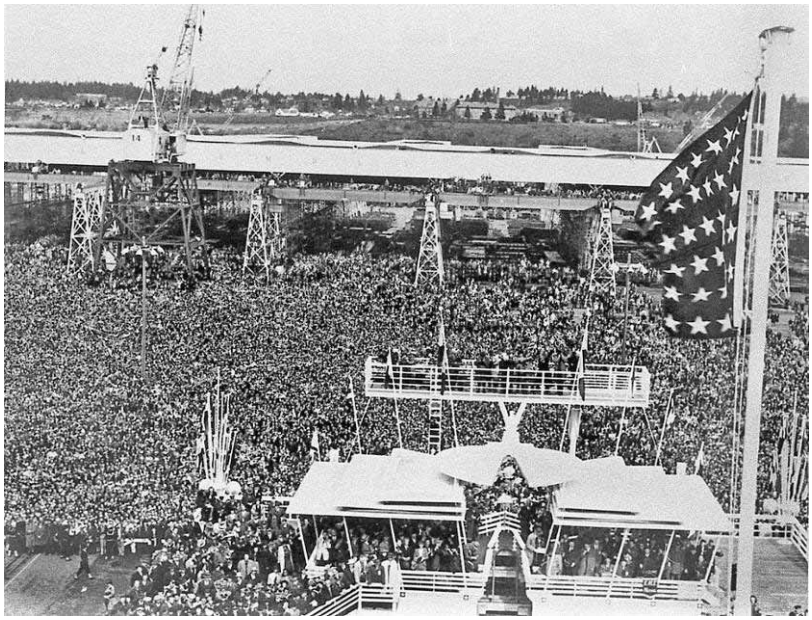

Figure 3.20 Kaiser Shipyard, Launching Ceremony, c1942
Source, BPA Image H293-2

One user of significant amounts of BPA power during the war was shrouded in secrecy. "In March 1943, the War Production Board directed Bonneville Power Administration to make available though its substation at Midway, Washington a "mystery load" estimated

at 75,000 to 150,000 kilowatts" (Springer, 1976:47). This load, serving Hanford, in southeastern Washington, was later revealed as the Hanford Nuclear Works, a major facility within the super-secret Manhattan Project, and the location that was responsible for refining the fissionable materials that were used in "Little Boy" and "Fat Man," the atomic bombs the United States dropped on Hiroshima and Nagasaki, Japan in August 1945. The project's requirements—an isolated location with vast quantities of electricity and adequate water for cooling—made the Hanford site nearly perfect.[52]

Figure 3.21 Hanford "Atomic Bomb Plant" c1946
Source, G. Kramer Collection

Collectively, the availability of the massive power of the Columbia River from Grand Coulee and Bonneville, castigated as a "Dam of Doubt" and FDR's white elephants while they were being planned and constructed, proved a critically important source of electricity for a wide variety of wartime industries between 1940 and 1945. BPA, along with the Army Corps and Bureau of Reclamation, had swiftly added huge generation capacity to both dams and coupled with the design and construction of BPA's high-voltage master grid network and the coordination of the Northwest Power Pool, the Columbia River project provided critical energy needs for high-demand war industries to both support the national war effort and enable a massive industrial and population expansion throughout Oregon, Idaho and Washington.

> By the end of World War II Bonneville and Grand Coulee dams had an installed capacity of 1.3 million kilowatts. Their output was nearly equal to all of the more than 150 hydroelectric and steam plants built by the

[52] The "B Reactor" at Hanford was declared a National Historic Landmark in August 2008.

region's 15 major public and private utilities over the previous 50 years (McKinley, 1952:131).

With the end of the war, obviously, the need for thousands of warplanes and hundreds of ocean-going freighters and aircraft carriers diminished swiftly, with the resultant cutback or entire elimination of many of the shipyards and other defense industries. Still the operations at the various aluminum plants, at Hanford and, of course, at Boeing would remain. So too would the increased residential usage, as the population of the Pacific Northwest would never again drop to pre-War levels. Populations in Oregon, Washington, Idaho and western Montana, which had ballooned during the war would, while slowing, continue to grow during the postwar period at levels that nearly double the rest of the nation.

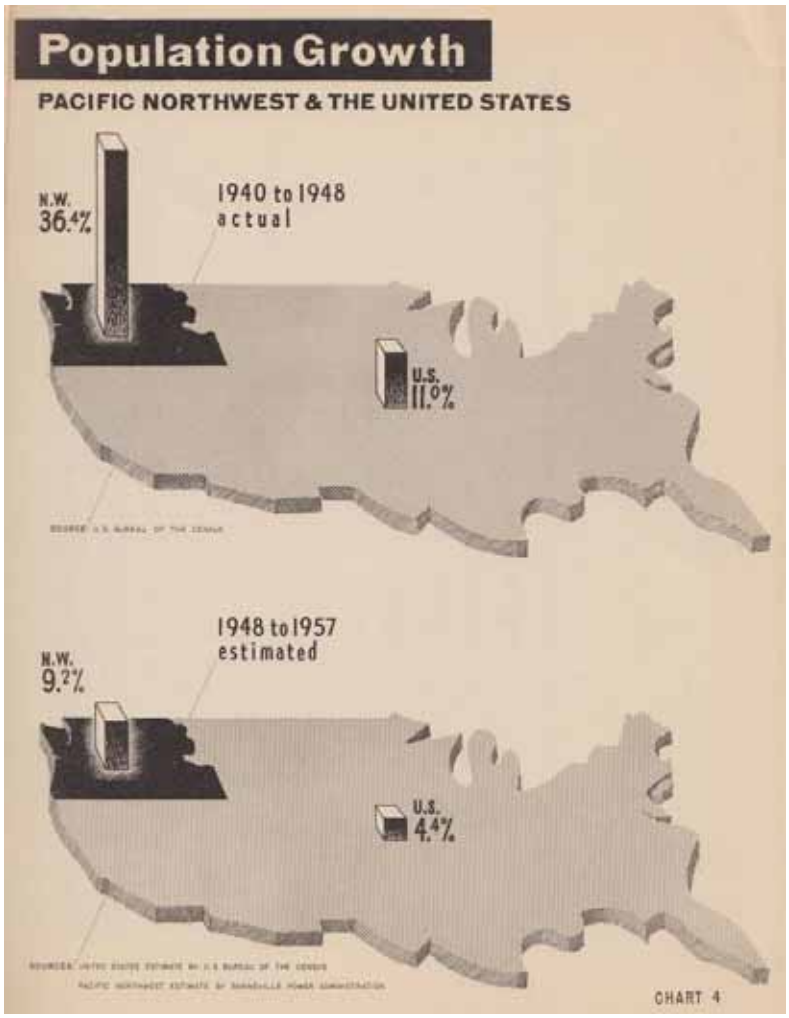

Figure 3.22 Real and Projected Growth in the BPA Service Area, 1940-1957
Source, BPA Annual Report, 1949

3.10 POST WWII- CHANGES AND CHALLENGES

As WWII ended and the massive defense industry in the Northwest was being dismantled, BPA returned to many of its pre-war concerns, including efforts to bolster public power development and rural electrification in the Pacific Northwest. Although the Administration worked to retain the large-scale industrial users that it could, particularly the aluminum plants, most of the shipyards were closed as their output was no longer needed. Even where a plant survived, such as at Boeing, production dropped significantly from wartime levels. To maintain employment, and to provide as much public benefit from low-cost power as it was able, BPA again ramped up its power marketing efforts to identify and attract new industries to the region.

The return to supporting local PUD elections and the formation of rural cooperatives, not to mention efforts to secure contracts with large industrial users, naturally put the Administration back into direct conflict with the private utilities in the Northwest, effectively terminating the temporary truce that had characterized that relationship since Pearl Harbor. Even more controversial, the end of the war also led to renewed efforts to form a Columbia Valley Authority. Congressional bills to create such an agency were introduced near the war's end, in 1944, and then again in 1949, the latter time by a new Washington Representative, Henry Jackson, who would remain a stalwart supporter of public power and BPA during a long and influential legislative career.[53] Both attempts to pass CVA legislation had the support of President Harry Truman and both attempts failed, almost entirely due the strong opposition of the private utilities and their growing lobbying efforts. BPA's work to support public power development, and particularly the renewed effort to form a Columbia Valley Authority, led to the renewed charges of "socialism" and creeping communism, charges that carried ever more weight as the national political scene moved into what would become McCarthyism, the "Red Scare," and the Cold War by the mid-1950s.

At the eye of the CVA storm, Paul Raver, the BPA Administrator, again found himself vilified by private power advocates as a socialist and worse, facing claims that he and BPA were out to undermine the American way of life by providing low-cost public power to the citizens of Oregon, Washington, and Idaho. One particularly vitriolic statement, written by Leslie A. Miller, a former member of the anti-public power Hoover Administration and former Democratic governor of Wyoming, was published in *Reader's Digest*. Entitled "What Does CVA Mean to You?," Miller's piece described the latest efforts at forming a Columbia Valley Authority in the Northwest as a "prime example of creeping socialism."

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[53] Henry M. "Scoop" Jackson (1912-1983), a Democrat, was elected to the Senate in 1952, having served in the House since 1941. For much of his long tenure, which included Chairmanships of both the Senate Interior and Senate Energy and Natural Resources Committee, he was joined by Warren G. Magnuson (1905-1989), also a Democrat, who was elected to Senate in 1944 to replace Homer T. Bone. Together "Maggie" and "Scoop" gave Washington, and BPA, a formidable 1-2 punch at the US Congress that would serve the region well through the 1950s. Magnuson was defeated, by Slade Gorton, in 1980. Jackson served in the Senate until his death.

> The CVA means plenty to you. It is just one more step in an ambitious plan to socialize the electric power industry and a big stride toward socialism" (Miller, August 1950).

Raver was personally attacked, identified as a prominent socialist, and castigated in the national media as a socialist tool. Much of this effort stemmed from supporters of private power that were frustrated by BPA's refusal to sign long-term contracts to sell power to private utilities and Raver's continuing efforts to assist PUD's attempting to raise funding to acquire private utility distribution systems via either condemnation or negotiated purchase through bond sales. Iowa Representative Ben F. Jenson, in a speech on the floor of Congress, railed about the "motley forces of Marxism" and the "socialistic policies of the Bonneville Power Administration."

> It will soon become apparent that a gang of Wall Street promoters has joined hands with forces of American socialism to socialize the electro-power industry of the great Pacific Northwest country, for the money benefit of the first group and the political benefit of the latter (*Congressional Record*, 29-March-1949).

Raver's hesitancy in signing long-term power contracts with Portland General Electric, Pacific Power and Light and others stemmed in large part from BPA's analysis of what the Administration saw as a looming power shortage in the Pacific Northwest. This predication, given the huge power supply of Bonneville and Grand Coulee, was greeted with skepticism if not outright derision by most of the same forces that had dismissed the entire concept of Columbia River development as the "dam of doubt" a decade earlier. How could the Northwest, of all places, run out of power?

In the common view the end of the war and the closure of most of the wartime industrial plants, seemed to indicate that the Northwest was again poised for a return to a huge BPA surplus beyond any regional opportunity for power sales. In an article entitled "Power to Burn" *Fortune Magazine* ruminated upon the vast inequities of the massive power available in the Pacific Northwest, given its sparse population, and the massive populations in the Pacific Southwest, which in 1945 was considered to be quickly running out of sufficient power sources. "This imbalance is an accident of war. Since plentiful, cheap, power existed in the Northwest, the light-metals and chemical industries were placed there, and the power capacity was expanded to serve them" (*Fortune*, 1945:141).

> Currently 70 percent of BPA's power goes into production of war materials. When cutbacks are complete there will be a marketable surplus of nearly 600,000 kilowatts in the region. To this BPA…hopes to add 1,600,000 kilowatts of new power immediately after the war by completing Grand Coulee's powerhouse and constructing six dams on the Columbia and its tributaries (*Fortune*, February 1945:141-2).

BPA's predictions for a coming power crunch, supported by the Truman Administration's advocacy for additional dam construction, represented the potential for even further solidification of the Federal system on the Columbia. Not surprisingly,

private interests fought the construction of additional Federal dams. The Administration and BPA were also in favor of a Columbia Valley Authority to consolidate the operation of the Columbia River system and obtain significantly broader powers to continue the development of a dominant public power system. This was opposed even more forcibly by the private utilities, who rightly saw the concept as a threat to their continued operation.

That the private utilities likely knew Raver's prediction of a coming power shortage was real, less than a decade after they had argued that BPA's power was entirely unnecessary to the region's future needs, only exacerbated their frustration. Like BPA, the private utilities also needed new power sources to meet demand. They wanted to purchase BPA's excess power and Raver, constrained by the preference clause in the Bonneville Project Act that gave priority to public entities, refused to the long term contracts they sought. In doing so Raver was protecting BPA's public consumers, but he was leaving the private utilities to fend for themselves to face growing shortages that would lead to customer demand they could not meet.[54]

In its 1947 Annual Report, celebrating the tenth anniversary of the Bonneville Project Act, Raver wrote "This year's operations were accompanied by a growing concern over the power supply situation in the region" (BPA Annual Report, 1947:3). BPA began to press Congress for additional funding to begin construction of new generation facilities on the Columbia, in the hopes of implementing a second phase of the multi-dam basin project that was originally envisioned in the Army Corps "308 Report" in 1932. Although BPA, which was obligated to reimburse the US Treasury for the construction expenses associated with both Grand Coulee and Bonneville, as well as its own costs, was far ahead of its repayment schedule at this period, Congress balked at any additional Federal investment in the region. This was almost certainly the result of a change in the leadership after the Congressional elections in November 1946, which ended more than two-decades of Democratic, largely pro-public power, leadership in favor of a new Republican majority with a vastly different view of Federal power projects. Still, in 1948, as BPA's employment reached the lowest levels since 1939 and its revenues reached a new all-time high, the probability of a power shortage grew ever more likely. Dr. Raver, advocating strongly for the Administration, made the issue forcefully in the 1948 report.

[54] One of the private utilities' primary arguments against expanding public power was that they, the private utilities, were more experienced, more competent, and entirely capable of providing quality, reliable, service. During the war, of course, few if any new generation facilities outside of the Federal program had been added to the Northwest system and now, immediately postwar, it was unlikely that private power could develop sufficient new supply on its own quickly enough to accommodate the rapidly rising demand for power. Private utilities were going to run out of power, diminishing their argument of sufficiency. BPA, which had helped supply their needs through the Northwest Power Pool during the war now, essentially, was telling private power that it had other priorities that came first, being public power. PGE, Pacific Power, Puget Sound Power and Light and others rightly feared brownouts or worse would undercut their ability to survive any buy-out challenges through the PUD process and harbored plausible suspicions that Raver and BPA had engineered the entire coming shortage to support just such an outcome.

> It must be clearly stated, however, that a number of disquieting factors have been developing for some time…During 1948 the cumulative effect of these factors reached a degree of severity which seriously threatened the objectives of the Bonneville Act and the economic health of the region… Briefly the situation is, on the one hand, a continued heavy growth in the region's population and business needs and, on the other hand, [a] failure to invest federal capital in the Columbia River power enterprise at a rate and volume commensurate with this regional growth….(BPA Annual Report, 1948:1).

As noted earlier, in reference to Raver's quest to expand public power in the region prior to the war, he was "…an indominately patient man." Writing again, in the 1949 BPA Annual Report, Raver bluntly reported to the Congress and the Secretary of the Interior on the Northwest power situation.

> As has been pointed out in each annual report and Advance Program of the Bonneville Power Administration for the past several years, no new major federal power projects were begun on the Columbia River system between the years 1933 and 1947. The effects of this failure to make adequate investment in multi-purpose facilities on the Columba River, commensurate with the region's population growth and industrial needs, caught up with the region in fiscal year 1949 (BPA Annual Report, 1949:3).

What "caught up" with the region, as Raver put it, was not brownouts or blackouts caused by power shortages, but rather an even more dramatic example of the need for *multi-purpose* dams on the Columbia River. On May 30, 1948, following a very wet winter and unusually heavy Spring run-off, a 200-foot section of a dike adjacent to Vanport, a WWII-era defense workers housing project constructed by the Housing Authority of Portland to serve workers at Kaiser's Portland and Vancouver shipyards, collapsed under the surging force of the river. Fifteen people were killed and the city that once housed more than 40,000 was virtually destroyed. The Vanport Flood, one of the most serious natural disasters in the history of the Northwest put renewed interest on the Columbia and led to new calls for flood control.[55]

[55] Built in 1942-43, Vanport (named after a contraction of "Vancouver" and "Portland," the community was dubbed "KaiserVille" during construction) was upon its completion the second largest city in Oregon. By 1948, after the closure of Kaiser's shipyards, Vanport was mostly occupied by Veterans and the bulk of Portland's African-American community (See Maben, 1987).

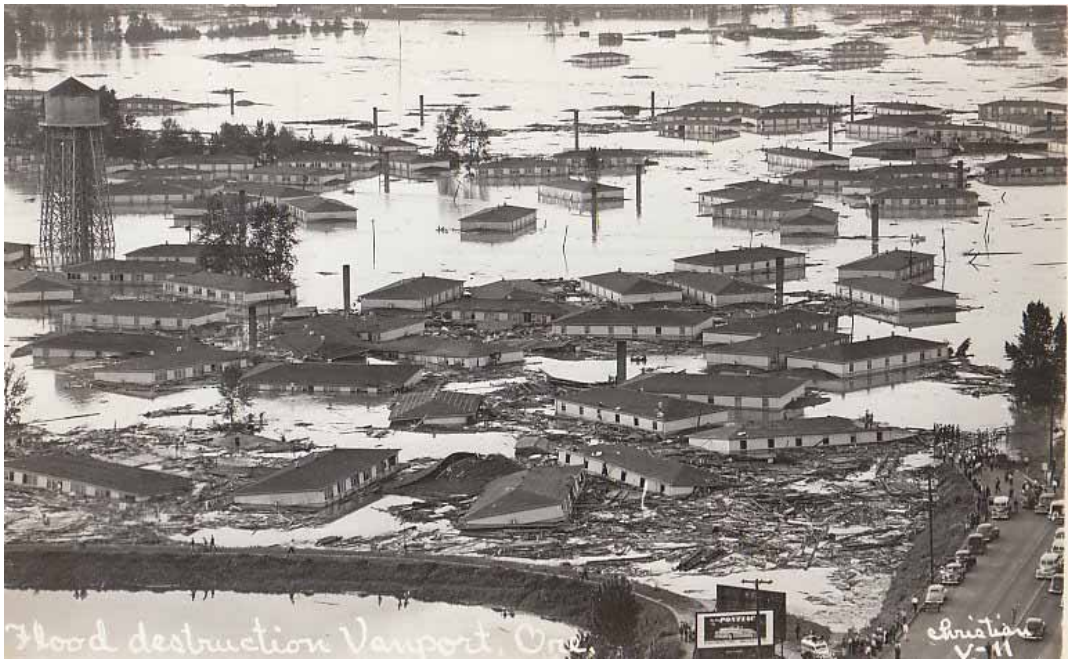

Figure 3.23 Flood Destruction, Vanport, Ore., 1948
Source, G. Kramer Collection

McNary Dam, located east of Umatilla, Oregon, was originally authorized in 1945 but construction didn't start until 1947[56]. Despite the drama of the destruction of Vanport, and the worsening power situation in the Northwest (McNary Dam would not begin to generate power until 1954), Congress still did not appropriate additional monies for new hydropower construction. In 1951 a dry winter led to reduced stream flows by late Fall those low flows impacted generation capacity, forcing BPA to reduce energy sales to some industrial customers so as to protect other users during the winter. "Although only minor curtailment of hydroelectric power deliveries to aluminum reduction plants operating on interruptible contracts became necessary for a brief period, the situation gave dramatic emphasis to the need for proceeding with all haste to increase total generating capacity of the region…" (BPA Annual Report, 1951:II).

That the Bonneville Power Administration, the agency supplied with what had been seen as the near inexhaustible power capacity of the mighty Grand Coulee and Bonneville dams actually had to ration power, a brownout, during the Winter of 1950-1951, once again provided proof that Paul Raver's predictions of power shortages were not mere speculation.

> If there is anything that makes the rest of us more furious than a man who says he knows where he is going it is watching him prove it. That's why

[56] McNary was originally to be called "Umatilla Dam" but was renamed by Congress in honor of longtime Oregon Senator, Charles McNary, who had died in 1944. McNary was one of the original sponsors of the Columbia Basin Project and the Bonneville Project Act.

> Paul Raver annoys some people so much. He keeps making predictions and they keep coming true. For years now Dr. Raver has been predicting there would be serious power shortages in the Pacific Northwest unless the government built enough dams and transmission lines in time to meet future demands [and] for years now, some people have been disagreeing with him…and the power shortages developed right on schedule as the 'planners' had predicted (Johnston, 1951).

Although McNary Dam was finally under construction by 1952 and offered the promise of additional Federal generation capacity for the first time in many years, Raver's report in that year showed some strain in his famed patience. Congress had additionally authorized the Hungry Horse Dam, on the South Fork of the Flathead River in Montana, which began to generate power in October 1952[57] but clearly these two projects were not, in Raver's opinion, sufficient to the problem at hand. In BPA's report on 1952, Raver's last, his exasperation with the on-going lack of Federal investment comes through loud and clear.

> It is my duty to report again, as I have during each of the past four years, that unless a realistic level of capital investment in multi-purpose projects is achieved on the Columbia river the vital stimulus to private industrial enterprise which this program has provided in the past, will disappear. The loss of this stimulus will stultify economic growth for decades to come and will constitute a factor adverse not only to the national defense program but to the longer range economic progress of the nation (BPA Annual Report, 1953:III).

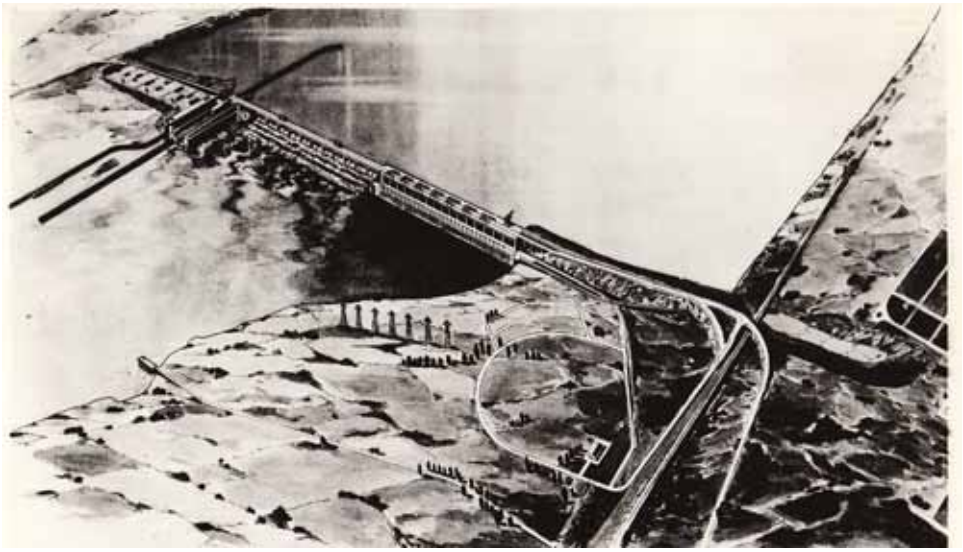

Figure 3.24 McNary Dam Rendering, c1953
Source, G. Kramer Collection

[57] See BPA, Multi-Purpose Dams of the Pacific Northwest, (Portland, OR: BPA), 1976.

From its creation during the heady New Deal public power era of the Roosevelt Administration in 1937, the Bonneville Power Administration had long basked in the general support of Congress under President Franklin Roosevelt and then his successor Harry Truman. Throughout that period, Democratic administrations, paired with Democratic congresses, had seen the development of public power and the Federal investment in dams and transmission lines as a positive social goal. After the war, however, BPA faced new challenges to its mission that began with the 1946 election of the 80th Congress. This body, the first in BPA's history to be controlled by the Republican Party, was considerably less supportive than earlier Congresses with regard to public power and the Federal government's involvement in it.

With the presidential election of 1952, when the Eisenhower Administration came to power as the first Republican administration in two decades, BPA entered an entirely new relationship with Washington, D.C. Eisenhower, and his Interior Department did not necessarily share BPA's goals for the Northwest, or at least didn't agree with BPA's traditional approach as to how they might best be achieved.[58] During the 1952 campaign Eisenhower made clear that he considered the public power policies of the New Deal, including both TVA and BPA, to be "creeping socialism."

> Eisenhower's first four years brought a dramatic shock to the public power systems….six months into the Eisenhower presidency Senator Warren Magnuson [of Washington] told delegates attending the annual convention of the American Public Power Association, 'You are in a fight for your very existence' (Rudolph & Ridley, 1986:103).

Public power and Federal involvement in natural resources was of sufficient merit to Eisenhower that he used his first State of the Union speech to announce the changed direction, the so-called "partnership policy," that his administration would pursue.

> The best natural resources program for America will not result from the exclusive dependence on Federal bureaucracy. It will involve a partnership of the State and local communities, private citizens and the Federal government all working together.[59]

Raver, who's fourteen year tenure still ranks as BPA's longest, remained in charge throughout 1953, serving under Eisenhower's new Secretary of Interior, former Oregon Governor Douglas McKay, a longtime supporter of private hydropower investment. Raver "…put a positive face on the new partnership policy" that saw BPA contract more

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[58] The 80th Congress had a Republican senate majority, the first in BPA's history. The 81st Congress saw a resurgent Democratic senate while the 82nd Congress was evenly split, 48-48 with Truman's Vice-President, Alben Barkley in a key decided role. The 83rd Congress, elected in the November 1952 Eisenhower election had 48 Republicans, 47 Democrats and one independent, Oregon's Wayne Morse. More importantly, perhaps, was that for the first time since 1931 and the beginning of the New Deal, the Republican's controlled the House of Representatives too, creating a unified Congress and White House with a different perception of how public and private power interests should function.

[59] See http://www.infoplease.com/t/hist/state-of-the-union/165.html (visited 28-August-2008).

and more Federal power to private utilities, including "…20-year firm power contracts with investor owned utilities under terms that had previously been unacceptable to him" (Tollefson, 1989:290-91). His patience obviously at an end, Paul J. Raver resigned as Administrator and left BPA at the end of 1953. In a satisfying bit of symmetry that bookends BPA's initial decade and a half of existence, Raver took over the position of Superintendent of Seattle City Light, the position that J. D. Ross had left to start the Administration in 1937.[60]

3.11 THE 1950S: PUBLIC POWER UNDER EISENHOWER

3.11.1 PARTNERSHIP POLICY

Eisenhower and Interior Secretary McKay turned to Dr. William Pearl, of Washington State College, to replace Raver as BPA's next administrator. Pearl's tenure began on January 15, 1954. With McKay's backing the new partnership policy between BPA and the regional investor-owned utilities developed as a primary method of selling the long-anticipated added generation from the Columbia. "In simple English, this policy was to reduce federal participation in power development and, since the federal power involvement in the Pacific Northwest was large, the policy did not bode well for public power people" (Billington, 1988:73). Pearl's first Annual Report, at the end of 1954, reflected the new Administration's shift in direction.

> The power partnership policy of President Dwight D. Eisenhower under the guidance of the Department of Interior has aroused great activity and interest in the Pacific Northwest. Bonneville Power Administration is offering full cooperation to all utilities in the region, both publicly and privately owned, in planning for integration of proposed non-Federal projects within the Federal power system (BPA Annual Report, 1954:3).

Supporting the partnership program, new incentives were created at the national level that encouraged private, investor-owned, utilities to build generation projects of their own. This was accomplished through the creation of huge tax advantages through a declaration of national defense concerns tied to the conflict in Korea. Since maintaining adequate electric generation capacity was now seen as critical to national security, boosting output was required. This, of course, was in stark contrast to the reluctance to boost generation as requested by Dr. Raver since the end of World War II.

Under an Eisenhower-era program called the Defense Electric Power Administration, sixty-five percent of the construction costs of new generation facilities could be written off on a fast-track timeline of just five years, creating a huge financial incentive for investor-owned utilities to start new projects throughout the Pacific Northwest (Norwood, 1981:192). And start them the private utilities did, adding almost 250,000

[60] See http://washingtonlink.org/essays/output.cfm?file_id=3619 (visited 27-August-2008). Paul Raver served with distinction at City Light until his death on April 6, 1963.

kW of non-federal generation to the Northwest in 1954, including Pacific Power's Yale Project, PGE's upgrades to its pre-existing Sullivan and Faraday projects, PGE's North Fork and Pelton-Round Butte projects, and Washington Water and Power Company's Cabinet Gorge project, among many others.

One of the major examples of the Partnership policy was the development of Hells Canyon, on the Snake River. This project was first envisioned by investor-owned Idaho Power, who had plans to build five small "run of the river" dams. The Department of Interior, under President Truman, had challenged that plan, as it would affect their own proposal for a much larger, high dam on the Snake, envisioned as a multiple-use project that would be Federally owned and provide for reclamation and flood control in addition to hydropower. Idaho Power responded to the government's opposition with a modified proposal for three low dams that would provide, some, if not as much, flood control, reclamation and other benefits. The Snake River project amounted to a stalemate until the change in White House in 1952.

The Eisenhower Administration retracted the Federal government's opposition to the Idaho Power plan, largely through the efforts of Undersecretary of the Interior Ralph A. Tudor. Soon BPA, under Dr. Pearl, announced that the partnership policy would also extend to certain multi-purpose dams, exactly the sort of project that Idaho Power was proposing for the Snake River.. Under this policy, "the Federal Government would finance the non-power features and encourage non-Federal financing of powerhouse construction" (Norwood, 1981:195). As proposed, the partnership policy would now allow Idaho to build the generation elements of the Snake River dams that it was interested in while the taxpayers would pay for the irrigation and flood control aspects of the multi-purpose projects, eliminating the possibility for the high dam that had been under consideration.

> There could be no technical compromise between the government and the power company proposals. The 'high' dam would be over 600 feet high, generate over 800,000 kilowatts of hydroelectric power, provide flood control in its 93 mile pool, and other benefits. The sites for Idaho Power's 'low' dams were all upstream from the government's site and would all be flooded out by the pool of the high dam (Stacy,1991:144).

The development of Hells Canyon became a major national issue, pitting not only private and public power interests against each other, but raising environmental concerns about the Hells Canyon site. Ultimately, the 83rd Congress refused to pass any of the funding bills for construction of the public "high dam" concept and the Eisenhower Administration's members on the Federal Power Commission ultimately approved Idaho Power's three-dam concept in 1955. While later efforts in Congress were made to

condemn the company's project in favor of public development they failed. Idaho Power's three Hells Canyon dams, were placed into service between 1958 and 1967.[61]

Figure 3.25 Hells Canyon Dam, Idaho
Source, BPA Image 141840

The limits of the "Partnership" approach to power development on the Columbia River reached its zenith during the planning for John Day Dam, approved as a Federal project in the late 1940s.[62] Congressional bills were introduced that would have transformed the John Day Dam entirely into a joint venture between public and private interests similar to that on the Snake, with the public paying for the largely non-revenue producing features related to navigation, flood control and fish passage while private interests would pay for and operate the power generation capacity. All such legislation was defeated.[63] Similar efforts to privatize generation at several of the US Army Corps dams within the Willamette Basin Project, Cougar and Green Peter dams, never saw the light of day.[64]

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[61] While Idaho Power and the Eisenhower Administration saw the development of Hells Canyon as a success of the Partnership Policy, others decried the permanent loss of benefits that would have resulted from the Federally-planned high dam. In one report the Administration's decision was called a "…wasteful underdevelopment" while another called the process "private exploitation at private cost, for private profit" (Neuberger, 1957:43).

[62] The John Day Dam, near Rufus, Oregon, was authorized during the Truman Administration but controversy and funding issues delayed its construction until 1958. The huge dam, third in generation capacity in the United States at the time, was not completed until 1971. It is now the four largest hydro facility in the US Dam, after Grand Coulee, an enlarged Chief Joseph Dam and Niagara Falls.

[63] Because of its scale and potential output, the John Day Dam served as a major rallying cry for the public v. private development of the main channel of the Columbia River.

[64] The Willamette Basin Project, an element of the Flood Control Act of 1936, authorized the construction of a coordinated series of multi-purpose dams throughout the Willamette Valley of Oregon. Largely devised to reduce the rivers regular and devastating flooding, many of the projects included hydroelectric generation operated by the US Army Corps of Engineers and incorporated into the BPA system for sales and marketing purposes under the

"When Congress rejected those proposals, the Administration reacted angrily by refusing to request appropriations for federal dams. Critics began calling it the 'no new starts' policy" (Tollefson, 1989:294). "No new starts" would remain in effect, or at least no new Federal dams would be authorized, until Douglas McKay resigned as Secretary of the Interior in 1956 to challenge Wayne Morse for one of Oregon's U.S. Senate seats.[65] McKay was replaced by Fred Seaton, of Nebraska, who took a more favorable view toward public power than did McKay and urged a relaxation of the policy. With McKay's departure, the Partnership Policy waned in impact during the second Eisenhower Administration.

3.11.2 WHEELING

While the partnership policy garnered most of the attention during the mid-1950s, another modification in the way BPA functioned during that period would have more lasting impact on the Administration. "Wheeling is the use of the transmission facilities of one system to transmit power for another system" (Tollefson, 1989:314). During World War II, the BPA grid, particularly the 230kV Main Grid, served as the backbone for transmission of public power and, through contracts for power sales, served private utilities as well. The Northwest Power Pool, created during WWII, saw BPA and private power pooled to balance generation and demand through the region, relying heavily on the BPA transmission system. "[U]nder the power pool, electric power is shifted back and forth across a vast network of power lines in such a way as to take full advantage of this great diversity in water resources" (Kramer, 1986:88).

During the 1950s, as private power built new generation facilities of its own, there was the potential that they would also begin to construct a separate, investor-owned, network of high-voltage lines in the Northwest. In order to avoid the potential for duplicate transmission lines, Roger Conkling, a Raver-era holdover at BPA under Dr. Pearl, proposed "Wheeling" non-federal power on BPA's system, essentially allowing the private utilities to rent time on the BPA network, and in so doing avoid the costs of building their own individual transmission systems. BPA would charge utilities for the use of the lines but since the wheeling rates were significantly less expensive than the costs of building an entirely new system, ratepayers would ultimately save money.[66] Additionally, Wheeling would provide an additional income stream to BPA, allowing it to continue to meet its payments to the US Treasury as required by law. Wheeling allowed the near unification of the private-public partnership within the Northwest Power Pool system and probably did more to establish the continuing cooperative tone between

Bonneville Project Act. The Willamette Basin Project was Determined Eligible for Listing on the National Register of Historic Places in 2005.

[65] Morse, who had re-registered as an independent, was generally supportive of public power and conservation whereas McKay made one of his main campaign planks the private development of Hell's Canyon. Morse won re-election by one of the largest pluralities in Oregon's history.

[66] Beyond the actual construction and maintenance costs associated with the construction of a transmission line, wheeling allowed private utilities to avoid the costs and political opposition that was associated with right-of-way acquisition across lengthy corridors of public and private lands.

BPA and the regional utilities than any other effort of the Eisenhower program. Wheeling was actively pursued by BPA and the concept was well-received by the region's investor-owned utilities.

> Plans to make the Federal grid available for wheeling non-Federal generation to load centers, wherever most economical and feasible to do so, are progressing rapidly. Joint studies are underway to explore 'wheeling possibilities' with the City of Tacoma Cowlitz projects, Grant County PUD Priest Rapids project, Portland General Electric Company Pelton project and Pacific Northwest Power Company Mountain Sheep and Pleasant Valley dams. (BPA Annual Report, 1955:III)[67]

President Eisenhower signed the legislation that allowed BPA to wheel power on the Federal transmission grid in August 1957 (Public Law 85-167). The Administration thereby gained authority to construct new transmission lines from the Priest Rapids Dam, built and owned by the Grant County PUD in Washington, and Rocky Reach Dam, built and owned by the Chelan County PUD, adding collectively almost 2,000,000 kW of power to the Columbia Basin system.

> The authority to wheel power virtually eliminated proposals to build non-Federal transmission lines which would duplicate Federal lines. It also established the precedent of an authority to build Federal transmission in part or wholly for wheeling non-Federal power….(Springer, 1976:61).

3.11.3 CANADIAN TREATY

As new public and private generation plants were authorized and moving to construction and operation during the 1950s, available hydropower sites in the Columbia River basin were largely taken or soon to be so. Even in the early years of the decade, BPA planners, looking for new sources of power for the future, turned their eyes northward, to the portion of the Columbia River that was above the 49th parallel, in the Canadian province of British Columbia.

The Columbia River, which begins at Columbia Lake in British Columbia, runs northward for 200 miles (320 kilometers) to the northern end of the Selkirk Mountains before hooking sharply and heading south, toward the United States-Canadian border and ultimately to the Pacific Ocean. In total, some 468 miles, more than one-third of the river's 1200-plus total miles, are located within Canada.

As early as 1947 the BPA transmission system had been inter-connected with Canadian utilities, to allow the balancing of power generation and demand across the international border. Although initiated during the war, to supply the Canadian defense industry, the

[67] In 1953, with the change in Administrator, the former BPA Annual Report was re-titled the "Columbia River Power System Report." For ease of citation these documents remain cited as BPA Annual Report, by date.

line was only completed after the war's end but allowed BPA a market for its surplus power and provided Canadians with a low-cost power source.

> On August 1, the Administration and the British Columbia Electric Company completed construction of a 230,000-volt line linking the two power systems at Blaine, Washington. Originally undertaken as a war time project to assist Canadian production, the line is now utilized under a joint agreement permitting the flow of excess power, when available, to and from Canada (BPA Annual Report, 1947:4).

As electrical demand on both sides of the border continued to grow, the question of water storage on the upper Columbia River in Canada became a major issue for both nations. British Columbia was considering whether to develop its portion of the river for needed power, flood control and irrigation while in the US the impact of Canada's decisions caused great concern. Simply put, if Canada interests impounded significant amounts of upstream water, something that they were legally entitled to do under the Boundary Waters Treaty signed by the two nations in 1909, the ramifications on the Federal and private generation sites already built or under construction on the American section of the Columbia would be significant. Reduced flows from upstream storage at Grand Coulee alone were predicted to create a possible reduction of over 1,000,000 kW of annual power generation. Without Canadian water, all of the complex system of dams that supplied BPA and the Northwest couldn't generate as much firm power to serve the existing regional need, reducing the amounts of water for available for irrigation needs as well.

Given the potential impacts from this issue for both nations, there was considerable interest in reaching some long-term solution to the future development of the Columbia River. But negotiating an arrangement over Canadian use of Columbia River water presented the Eisenhower Administration with a major dilemma during its first term. On the one hand, successfully negotiating a treaty to maintain adequate water flow in the lower Columbia channel would maximize the existing investment in Federal dams and allow BPA to pay off its debt that much faster through the generation and sale of additional capacity, supporting the concept of public power in the Columbia Basin. On the other hand, supporting public power on the Columbia was something that the Eisenhower Administration did not favor and expanding it was certainly not their intent. Independent of the fact that a reduction in river flow as the result of Canadian development did little to benefit the United States at all, whether for public and private power interests, the Eisenhower Administration did not approach the Canadian Treaty issue with much eagerness.

Consistent with its ambivalent interest, in 1954 the President appointed Lee Jordan, the former Governor of Idaho, to represent America on the Canadian-American International Joint Commission that was to determine the future of the Columbia River. Gov. Jordan, who had played an important role the Hells Canyon issues in Idaho, was no friend of the public power development he was nominally negotiating to protect.

> While he was responsible for the dealings with Canada….Mr. Jordon traveled through the land making speeches which denounced as a scandalous federal monopoly the very agency he was presumably representing…a typical such address prophesied that government dams could soon lead to 'federally-owned sawmills, federally-owned mines, federally-owned fish canneries and federally-owned farms and livestock ranches.. (Neuberger, 1957:43).

As the negotiations predictably stalled, in 1955 the Canadian Parliament authorized a $250,000 study to consider the possibility of drilling a tunnel through the Monashee Mountains for twelve to fifteen miles to divert a major portion of the Columbia River into Shuswap Lake, in the Fraser River drainage. There, with the added flow of the Columbia waters, Canada could build its own hydroelectric project and while not exactly dewatering the lower Columbia, in the United States, the project could not help but severely limit the water flowing through the many dams that had already been built within the Columbia Basin. The 1909 Boundary Waters Treaty gave each of the two nations the right to use, without reserve, the "exclusive jurisdiction and control over the use and diversion over all waters" originating on its side of the international boundary and if the Canadians were concerned about fairness, it was not evident in the mid-1950s. As one member of the Canadian Parliament stated, "Really, you Americans ought be bending over backward to work out an arrangement with us…Sometimes we don't understand your intransigence. After all, we hold most of the trump cards…because the river originates in our country" (Hon. Howard C. Green, as quoted in Neuberger, 1957:44-5). In blunt terms, the Canadians had the full authority and legal status to take ALL the water on their side of the boundary and do with it as they pleased, independent of the impact on any downstream users. This could have potentially disastrous effect in the US, both to the various PUDs with dams on the Columbia River as well as the Federal dams operated by the Army Corps and Bureau of Reclamation. The Canadians didn't really have to negotiate at all and Eisenhower's envoy, Gov. Jordan, was not working particularly hard to secure the benefit of the American interests.

From the American standpoint, a driving aspect of the Canadian Treaty was the plan to build Libby Dam, in northern Montana, a project that would create an impoundment that backed up over the international border and extended some 45 miles into Canada. On another, related, front, American industrialist Henry Kaiser was independently negotiating directly with Canadian interests over a plan for Kaiser to pay for the construction of a dam at Arrow Lakes, impounding water that could be used to support additional generation downstream. Kaiser proposed that half the additional power generated would go to BPA, the other half to his own aluminum operations and that he would directly reimburse the government of British Columbia for the use of its portion of the Columbia River water. Yet another complication was the British Columbia plan to build a mammoth hydroelectric facility at Peace River, largely meeting their own electric needs for the future and making the Columbia River water less critical to the Canadian power demand.

The Peace River project, coupled with environmental concerns about the impact of a series of dams on the Fraser River, one of the great salmon producing streams in Canada, pretty much extinguished the Canadian Parliament's interest in diverting the Columbia River. This change opened the door for a more balanced compromise for long-term development of the entire basin to the benefit of both nations.

Ultimately a more collaborative approach on both sides of the border prevailed. In 1958 President Eisenhower and Canadian Prime Minister John Diefenbaker met in Ottawa and directed the International Joint Commission, the body that had been established by the 1909 Boundary Treaty, to develop a plan for cooperative use of the Columbia River and determine how to pay for development and apportion any benefits. Formal treaty negotiations based on the IJC recommendations began in early 1960, near the end of Eisenhower's second term.

> The United States derives two major benefits from the Treaty. One is flood control, ending the danger of serious flooding on both the Columbia and the Kootenay (spelled Kootenai in the United States)… The other is power storage, the Treaty dams hold spring run-off and release them gradually to sustain levels of power generation downstream when stream flows would ordinarily be low (Springer, 1976:67).

President Eisenhower and the Prime Minister signed what was called the Columbia River Treaty on January 17, 1961. Three days later John F. Kennedy, a Democrat and a strong supporter of public power, was sworn in as the 35th President of the United States of America.

3.12 THE 1960S: NEW DIRECTIONS AND CONNECTIONS

Figure 3.26 Charles F. Luce
Source, BPA Image

The beginning of the Kennedy Administration brought major changes and opportunities to the Bonneville Power Administration, most significantly the fruition of the far-reaching, long-term, planning efforts that the agency had struggled to achieve since the end of the World War II.[68] With the approval of the wheeling program and the progress toward ratification of the Canadian Treaty, two of BPA's goals were well underway.

Following the 1960 Presidential election and the change in administrations, BPA gained new leadership during a time that would be a critical period in its development. Dr. William Pearl, who had been the BPA Administrator since

[68] Another key element in BPA's 1950s-1960s long range planning, a shift to a growing reliance on new thermal (i.e. nuclear) generation capacity was an important aspect of the Administration's planning efforts during this period.

1953, retired in early 1961. President Kennedy's Secretary of the Interior, Stewart Udall, selected Charles F. Luce as BPA's next Administrator. Luce, an attorney from Walla Walla, Washington, had worked briefly as a staff attorney for BPA under Paul Raver in the mid-1940s, when he had been involved with the legal aspects of PUD formation. Unlike BPA's previous administrators, Luce was not an engineer or strongly associated with public or private power issues, but he was a Northwesterner and he was familiar with BPA's role in the development of the region. He was also well connected with the regional congressional delegation through a long-time association with Sen. Henry M. "Scoop" Jackson of Washington.

Among Luce's first tasks was to finalize the details of the international agreement with Canada. While President Eisenhower and Prime Minister Diefenbaker had signed the Columbia River Treaty in January 1961, key issues remained before each nation's legislature would ratify the document and formalize its authority. The United States moved quickly to ratify the pact, no doubt anxious to begin construction of Libby Dam and the other projects. In Canada, however, differences between the national government and the province of British Columbia about how to divide the rewards from their share of the project, known as the "Canadian Entitlement," slowed the process down. British Columbia didn't need any power from the Columbia River, since it was developing its own huge public power project on the Peace River, and it didn't have the capital to construct the Treaty dams for water storage.[69] To raise money, British Columbia wanted to sell the entitlement, its share of the additional power generation enabled by the upstream water storage. In order to raise its construction costs, the Canadians insisted on sale to a single entity in one lump sum, so that it could leverage the proceeds for other purposes. The Province and the Canadian national government took some time to negotiate how to divide this income between them. Meanwhile American interests looked to "purchase" the Canadian entitlement in a single lump sum, without much success. Congress, in a tight budget period, denied BPA, the logical purchaser, the funds required to undertake that investment. Instead a group of private utilities formed a cooperative, the Columbia Storage Power Exchange, or CSPE, and issued tax-exempt bonds to pay $314 million for the first thirty years of entitlement power (Norwood, 1981:235). CSPE then contracted with BPA to transmit power in direct proportion to the percentage of investment by each of the CSPE members. With funding in place, the Canadian interests were satisfied and the treaty was ratified by Canada.

Essentially, the Canadian Treaty allowed the construction of Libby Dam and the reservoir behind the dam that backed water up some forty miles over the international boundary into Canada, along with three new water storage dams inside Canada itself, the Mica, Keenlyside and Duncan.

[69] The W. A. C. Bennett Dam on the Peace River, completed by the British Columbia Electric Company (now BC Hydro) in 1968, has a generating capacity of 2730 mW.

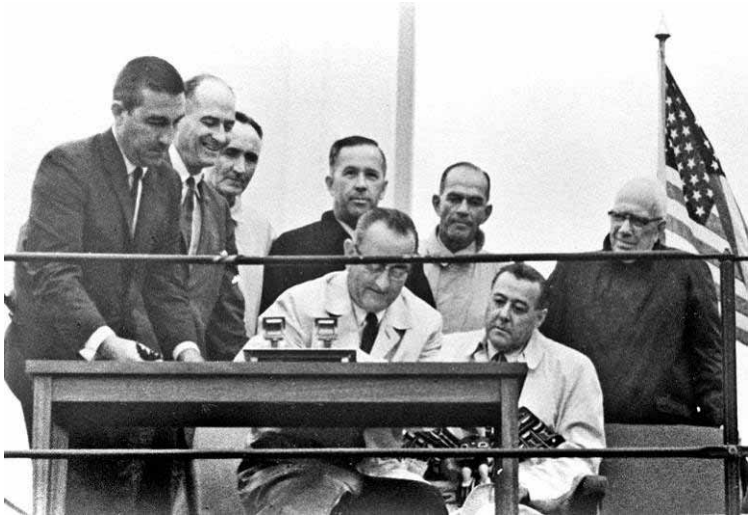

Figure 3.27 President Lyndon Johnson signing the Canadian Treaty, Sept 1964
Source, BPA Image H444-3

> The Treaty dams provide 15.5 million acre-feet of storage for the production of power downstream in the United States and Libby Dam provides 5 million acre-feet of usable storage as well as power generation. Together these dams more than double the amount of previously available storage in the Columbia River System (Springer, 1976:68).

With the details of payments for the Canadian Entitlement finally worked out, President Lyndon Johnson and Canadian Prime Minister Lester Pearson signed the Columbia Treaty Protocols on September 16, 1964, formally acknowledging the near decade long process of joint development and cooperation between the two nations in the Columbia River Basin. Construction of the Libby Dam and the three Canadian storage dams began soon thereafter with all thee "Treaty Dams" completed and operational by April 1973.

Figure 3.28 Keenlyside Dam, Canada
Source, BPA Image 141121

3.12.1 The Pacific Northwest-Pacific Southwest Intertie

An important factor in the management of the BPA system, entirely based as it was upon hydroelectric generation, was the natural cycle related to the volume of water flowing within the Columbia and its tributary streams. The seasonal nature of water flow creates firm power. This is the amount of power generation that can be reasonably guaranteed on a year-round basis, given the anticipated minimum amounts of water flowing through the generation units in a typical yearly cycle. Power producers strive to build enough "firm" power to provide the critical load needed to serve a region's basic needs. Waterpower, of course, unlike some other forms of generation, is uniquely prone to huge variations based on the amount of water in cubic feet per second (cfs) passing through the point of generation at any given time.[70] Since river flows are part of a natural seasonal cycle, water volume can spike considerably over the "firm" power levels at various times of a year, or even on a given day, as the river volume rises or falls.

Unlike oil, or coal, natural gas or other sources of energy, electricity, no matter from what source it comes, cannot be stored against increased demand. Whereas oil itself can be held in the Strategic Defense Reserve or coal can be piled awaiting need, once oil, coal, natural gas or, in the case of hydropower, running water, are converted into electrical energy, that energy must be used immediately or it is lost.[71] With hydropower, therefore, when there is more water flowing past the turbines than is normal, as typically occurs in Spring and Summer in the northwest when snowpack is melting, there is an opportunity to generate considerably more electricity than exists at other times of the year. That extra power, *secondary power*, can be sold and utilized if demand warrants and if the systems are in place to distribute it. But if there is no demand, or no way to distribute it to where demand exists, that 'secondary' power is lost. You can't store electricity, as you can oil or coal, until you need it.

The huge amounts of secondary power generated from the Columbia River system meant that BPA was losing literally millions of dollars in potential income for lack of distribution methods. Those dollars would help offset the Administration's payments to the Treasury and, through that increased income, help keep the costs of firm power in the BPA region at low cost. During the 1950s, as the Administration worked to increase its

[70] Coal, gas, or even nuclear-fired thermal plants, because their energy source is more predictable than flowing water, generally produce nothing but "firm" power. When the plant is operating, it produces power as long as you continue to create enough heat to turn water into the steam that makes the turbine spin.

[71] It is worth noting, as many forget, that to a degree all electricity with the exception of photo-voltaic and windpower, is essentially hydroelectricity in that it requires water (or steam) to move a generator's windings at a controlled rate (typically 60 cycles per second) and so by forming and breaking contact, generating a usable electric current. Coal, natural gas, wood, even nuclear facilities (all generally lumped together as "thermal generation") simply use those fuel sources to heat water, transform it to steam, and use that steam to revolve a turbine. Normal hydroelectric power uses the flow of the water (either naturally in a run-of-the-river plant or artificial "head" created by a controlled drop in elevation) to do the same thing. In all these situations it is water (or water vapor) that moves the turbine blades that spins the windings, that generates the power.

firm power capacity, it was additionally developing ever more potential for secondary power.

BPA's "preference clause" coupled with a customer base that included co-ops and PUDs plus direct sale high-voltage commercial users began to stress the Administration's available firm power at certain times of the year. This was particularly the case in the winter months when shorter days required longer periods of residential and street lighting and colder temperatures required more energy for residential heating.[72]

At the same time BPA which had previously been making advance payments, in addition to its regular debt service to the US Treasury as required by the Bonneville Project Act, was seeing reduced sales and increasing costs that impacted its ability to continue to make those advance payments. The Administration had abundant secondary power that could be sold at advantageous rates to industry if the demand warranted, but the Pacific Northwest's primary period of electrical demand coincided with reduced winter river flows due to the natural cycles of the region. After the end of WWII, aluminum users, while still a major electrical consumer in the region, were in decline from their WWII consumption.[73] By the early 1960s, BPA estimated that the lost value of its potential secondary power from the Columbia River system was worth as much as $32 million in lost sales each year (Luce, 1962).

In direct contrast to the seasonal cycles of demand in the Pacific Northwest, in California, a thousand miles to the south, the nearly opposite situation was true. In that area peak demand for power typically occurred during the summer, as residential and commercial air conditioning plus increased irrigation, consumed huge amounts of power in an effort to make the arid climate more tolerable for an ever-growing population and the state's expanding agricultural industry. In the winters, when the Northwest power consumption rose to serve increased lighting and heating needs, the temperate climate of Southern California meant the region saw a consumption drop from its summer peak. And while hydropower was an important element in the Pacific Southwest generation matrix, the region relied extensively on its large thermal capacity for peak power needs during the Summer. Southern California's thermal generation was reliable and effective, but it was also considerably more costly than hydropower, especially BPA's low-cost hydropower.[74]

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[72] The growing pressures on "firm" power supplies drove much of the push for additional generation plants in the late 1940s and early 1950s under Dr. Raver, as described in Section 3.10.

[73] Documenting the scope of this trend, in 1945, at the end of WWII, the aluminum industry alone was responsible for 51.49% percent of BPA total revenue. By 1950 that amount had dropped to 38.89%. and by 1959 had declined even further, to 24.38%. (See BPA Annual reports, by year cited).

[74] The latitude of much of southern California also typically yields increased stream flows in winter and fall, the reverse of streams in the Pacific Northwest, where precipitation during the colder months is stored as snowpack.

The offsetting seasonal demands between these two regions created a huge opportunity for each. If it could secure access to power from the Columbia River, Southern California utilities could meet their peak summer demand while reducing reliance on more expensive thermal generation plants and thereby saving money. BPA, on the other hand, could utilize its massive secondary power supply during the summer, increasing sales to raise additional revenue, pay down its obligation to the US Treasury and in so doing help keep its famed postage stamp rates among the lowest in the nation.

In 1961, the anticipated ratification of the Columbia River Treaty and the increased water storage and generation that would result in additional firm power from Libby Dam and the three Canadian dams (by allowing additional control for water flows year round), created additional pressure to identify new markets for BPA's secondary power. Since Canada, through its own public utility BC Hydro, didn't want or need that additional power, and since CSPE was depending upon BPA to find potential users that did, BPA sought to identify new demand. Southern California, the Pacific Southwest, was the logical choice. The problem was how to transmit the power from where it was generated, on the Columbia River, to where it could be sold.

The answer was an "Intertie," a long distance transmission line that would connect the massive generation capacity of the Columbia River Basin in the Pacific Northwest with the teeming Pacific Southwest summer demand. In the summer low cost hydropower from the Columbia could offset expensive thermal power for southern California municipal utilities such as the Los Angeles Department of Water and Power as well as supplying power to California's investor-owned utilities such as Pacific Gas & Electric. In the winter, the thermal capacity of the southwest could be sent northward as needed, to offset that region's winter heating and lighting loads when river run-off was lower.

The idea of long-distance transmission of Columbia River power was not new, having been first raised as a logical method of fully utilizing the incredible hydroelectric potential of the basin before the passage of the Bonneville Project Act and the formation of the Bonneville Power Administration. J.D. Ross, as early as the 1920s, was promoting an ambitious (some claimed fanciful) plan to transmit electricity from the Pacific Northwest as far east as Chicago and New York.[75] Ross envisioned an entire system of transmission lines, a massive grid, that would connect public power generation facilities all across the North American continent into a grid of interties, balancing out supply and demand regionally and seasonally. This was an outgrowth of an even earlier Ross concept, formulated when he was still at Seattle City Light, that proposed to unify the entire west coast into a multi-national system.

> For many years the writer has urged that the people of the Pacific Coast keep in mind the ultimate building of a super-power transmission line

[75] Springer reports that the earliest proposal for a long-distance transmission line on the west coast of the United States was in 1919, by Professor C. Edward Magnusson, of the University of Washington (Springer, 1976:75).

> from Canada to Mexico, west of the Cascade Mountains. This idea is outlined in the annual report of 1928 of the Seattle municipal system (Ross, 1936).

By 1935 Ross had expanded this west coast vision into a more elaborate concept he called the "Industrial Backbone of the Pacific Coast," linking the large Federal dams at Grand Coulee and Bonneville with the output of his own Seattle City Light and the municipal system in Tacoma, Washington into a huge "Super Power Transmission" system. A key element of Ross' vision of an intertied transmission grid was that it would rely upon Direct Current (DC) to permit easier and more efficient transmission of power over long distances. "The whole nation can have Columbia Power in its factories and homes. This statement is past prophecy. It is fact. This can be accomplished by the use of direct current transmission" (Ross, 1939:15).[76]

Direct Current, the original form of many utility transmission and distribution systems, had fallen out of favor in the late 19th century during the fabled "War of the Currents" between electrical pioneers Thomas Edison and Nikola Tesla. Edison was associated with the system that would become General Electric while Tesla was the primary engineer for George Westinghouse at the corporation that bore its founder's name.[77] Essentially Edison's original design for electrical transmission relied upon DC, requiring multiple generation locations in close proximity to the point of use. Tesla, on the other hand, developed a system of Alternating Current (AC) that could be transmitted longer distances without loss of power and so enabled the creation of significantly larger, centralized, generation facilities that served a widespread area. After a pitched public relations "battle" that included Edison's claims of the dangers of AC current versus the relative safety of DC, the Tesla/Westinghouse system won out, and DC systems gradually fell out favor.[78]

While AC generation and distribution systems were the norm by the mid-1930s, some still believed that there were advantages to using DC for long-distance transmission of the sort that J. D. Ross envisioned between the Columbia River and distant metropolitan areas. Upon his appointment as BPA's first Administrator, Ross was interested in the

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[76] Actually, at the time, Ross' statement wasn't fact. It was an expectation but in typical visionary fashion he knew an answer to permit long-distance DC transmission was possible. Unfortunately he would not live to see it become reality.

[77] Much has been written about the "War" or "Battle" of the currents, pitting as it did two of the most flamboyant inventors America has ever produced against each other. Awareness of the period was made even more accessible in the Public Broadcasting System's documentary *Tesla-Master of Lightning*, produced by New Voyage Communications and first aired in 2000. (See http://www.pbs.org/tesla/index.html),

[78] Always the showman, Edison demonstrated the "dangers" of AC current by, among other stunts, electrocuting an elephant and filming the event for public viewing. He also took to referring to death by electrocution as being "Westinghoused." Independent of the merits of AC versus DC transmission, at least one motivator for the Westinghouse system, as far as Westinghouse and the larger utilities were concerned, was that the extensive capital required to develop the larger plants would limit competition, a feature of AC distribution that logically resulted in the system of the larger regional monopolies and holding companies the characterized the entire utility industry for the first three decades of the 20th century.

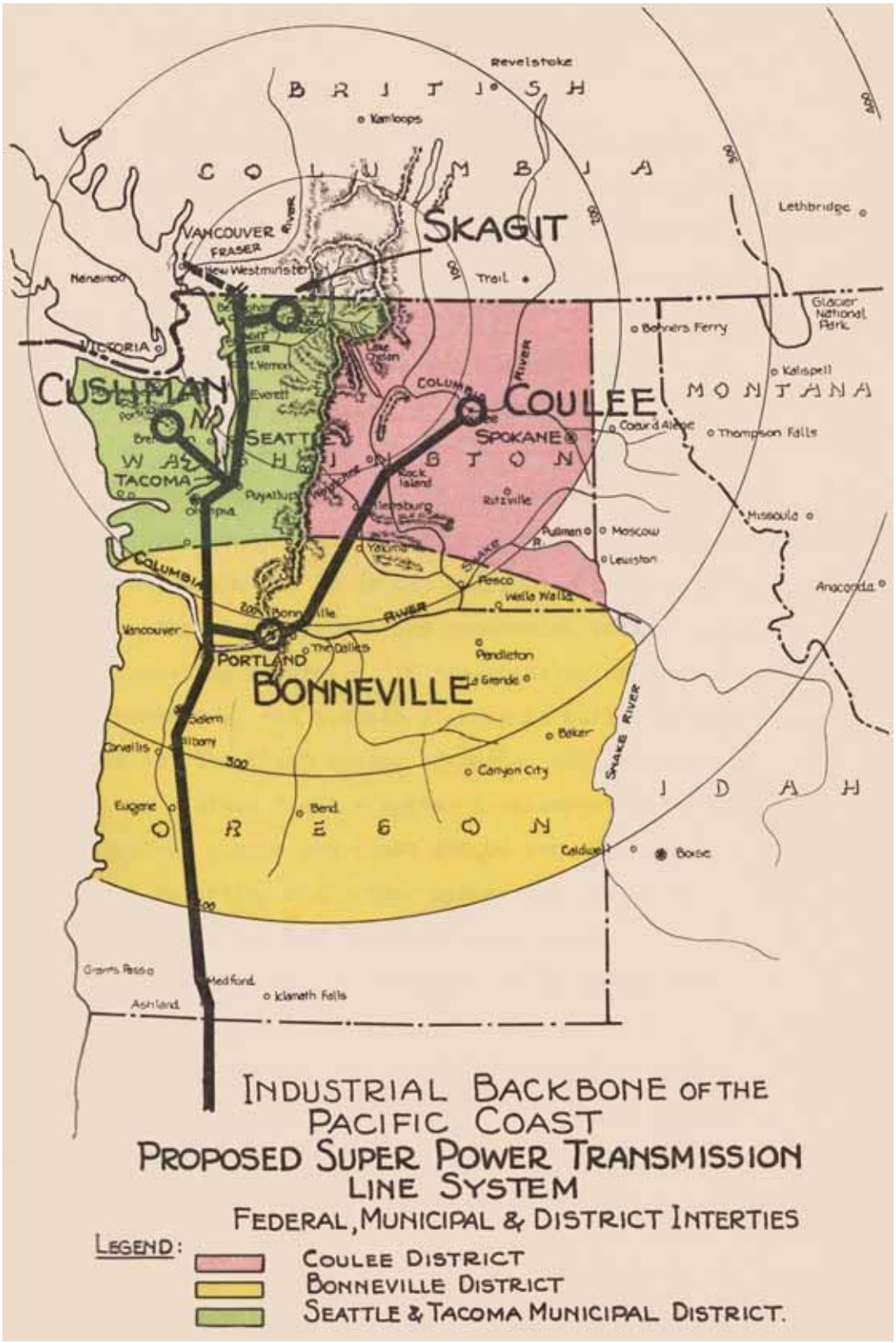

Figure 3.29 Proposed Super Power Transmission Line System, Feb 1935
Source, BPA Library

possibility of developing a long-distance DC transmission system and directed Charles Carey, BPA's chief engineer, to explore the technological challenges to such a concept. Carey in turn, asked Dr. Gene Starr, a professor of electrical engineering at Oregon State University, to research the issue. So great was Ross's excitement for long-distance DC transmission that he actually persuaded the US Congress to appropriate $600,000 in 1939 to pay for the project, although those funds were never expended.

In 1939 when Ross had boasted that DC transmission was not prophecy, but "fact" he had allowed his confidence to get ahead of him. After Ross's death, Dr. Starr reported that that long distance DC transmission was, in fact, not feasible from a technological standpoint, at least yet. Rushing to meet wartime demand, Carey designed BPA's master grid to deliver alternating current.

> Dr. Starr's study was completed in 1942 and made public in 1945. It found the DC project to be unattractive from both an economic and technical point of view. The rectifier tubes that would one day make such a project feasible had not yet been developed (Tollefson, 1989:131).

Although BPA chose not to further pursue a DC system, the concept was not entirely forgotten. After WWII, Swedish engineers began working with DC systems for long-distance transmission of electricity, successfully introducing a new technology called High Voltage Direct Current (HVDC) in 1952, over two decades after Ross had initially suggested such a system was possible. Now the advantages of a DC system, and the technology to show that it was indeed feasible, were clear. BPA's proposal to build a 1300-mile long intertie was still going to require some technological breakthroughs, however, since those early Swedish lines ran for considerably shorter distances.

The first investigations into a Pacific Northwest-Pacific Southwest Intertie were undertaken in 1949 by the Bureau of Reclamation. In 1953 the Federal Power Commission again looked at the advantages of the project. During that period, however, there was limited support for any expansion of the BPA/Federal role in terms of the grid and the intertie concept, which would have expanded BPA's role into California, went nowhere. Later, when a move for an intertie was proposed by Pacific Gas & Electric, an investor-owned utility serving California, Northwest concerns about the possibility of losing its priority on Columbia River power from BPA again made the intertie issue politically charged, if from a different perspective. Northwesterners, with some basis, began to see the intertie not as the benefit that would keep their own power costs low by creating new income for BPA, but as the first step in a gambit by the powerful congressional delegation of California to gain equal footing in securing Northwest power for their own use. Washington Senators Jackson and Magnusson, as well as the governors of the Idaho, Washington and Oregon, all raised serious questions about the potential impact on the Northwest priority for power generated on the Columbia, again delaying any action on intertie funding in Congress.

In February 1960 BPA, at the direction of Dr. Pearl, again reviewed the concept of a West Coast Intertie, at the request of Senate Committee on Interior and Insular Affairs.[79] Consistent with the Eisenhower-era approach at BPA, this report was seen by many as taking a very conservative view of the possible project, concluding there would be insufficient benefit to the Federal government and that the project was better left to investor owned utilities. Most western views of this report were critical. Typical was the response from Ralph M. Brody, a Special Counsel to California Governor Edmund "Pat" Brown on Water Problems.

> It is the State's tentative view that your preliminary draft represents an overly conservative appraisal of a resource development which holds tremendous potential…(Brody, 1960).

In 1961, with the signing of the Columbia River Treaty, the inauguration of John F. Kennedy, and the appointment of Charles F. Luce as BPA Administrator, the validity of the intertie was given renewed life. President Kennedy included the concept in his message to Congress on Natural Resources and in March 1961 Stewart Udall, Kennedy's Secretary of the Interior, appointed a Special Task Force to report on the concept. Luce was appointed its chairman.

The task force examined how other nations, particularly the Netherlands and the Soviet Union were succeeding in transmitting Direct Current over ever-longer distances between generation and demand. It further noted that while 345-kV lines were the highest in use in the United States, other nations, the Soviet Union in particular, had functional lines with voltages as high as 500-kV.[80] Entirely contrary to the earlier Pearl-era report, the task force determined that the intertie was desirable for both regions and recommended that it be built in one of three options including, most notably, an option that would utilize DC transmission.

> The report stated that three 750-kV DC lines would be the most economical alternative. The second choice was three 500-kV AC lines and the third, of three 345-kV [AC] lines was included as a 'poor choice' (Norwood, 1981:242).

The Special Task Force submitted its report to the Secretary on December 15, 1961. The report investigated the international precedents for High Voltage lines to transmit power Regional concerns about the possibility of the Northwest losing its priority remained, and the BPA Administrator published a five-part series of articles that was published in

[79] It should be noted that Sen. Henry M. "Scoop" Jackson, of Washington state, was a powerful member of this Senate committee for many years. Jackson became its chairman in 1963 and served in that role through the Committee's transformation into the Committee on Energy and Natural Resources until 1981.

[80] In 1961 there were about 2500 miles of 345 kV transmission lines in the United Stated, including some 325 miles within the existing BPA grid system. In 1959 the USSR had converted an earlier 400-kV line between Stalingrad and Moscow, about 560 miles, to 500-kV with success (USDI, 1961:68).

newspapers throughout the Pacific Northwest in January 1961, a few weeks after the Task

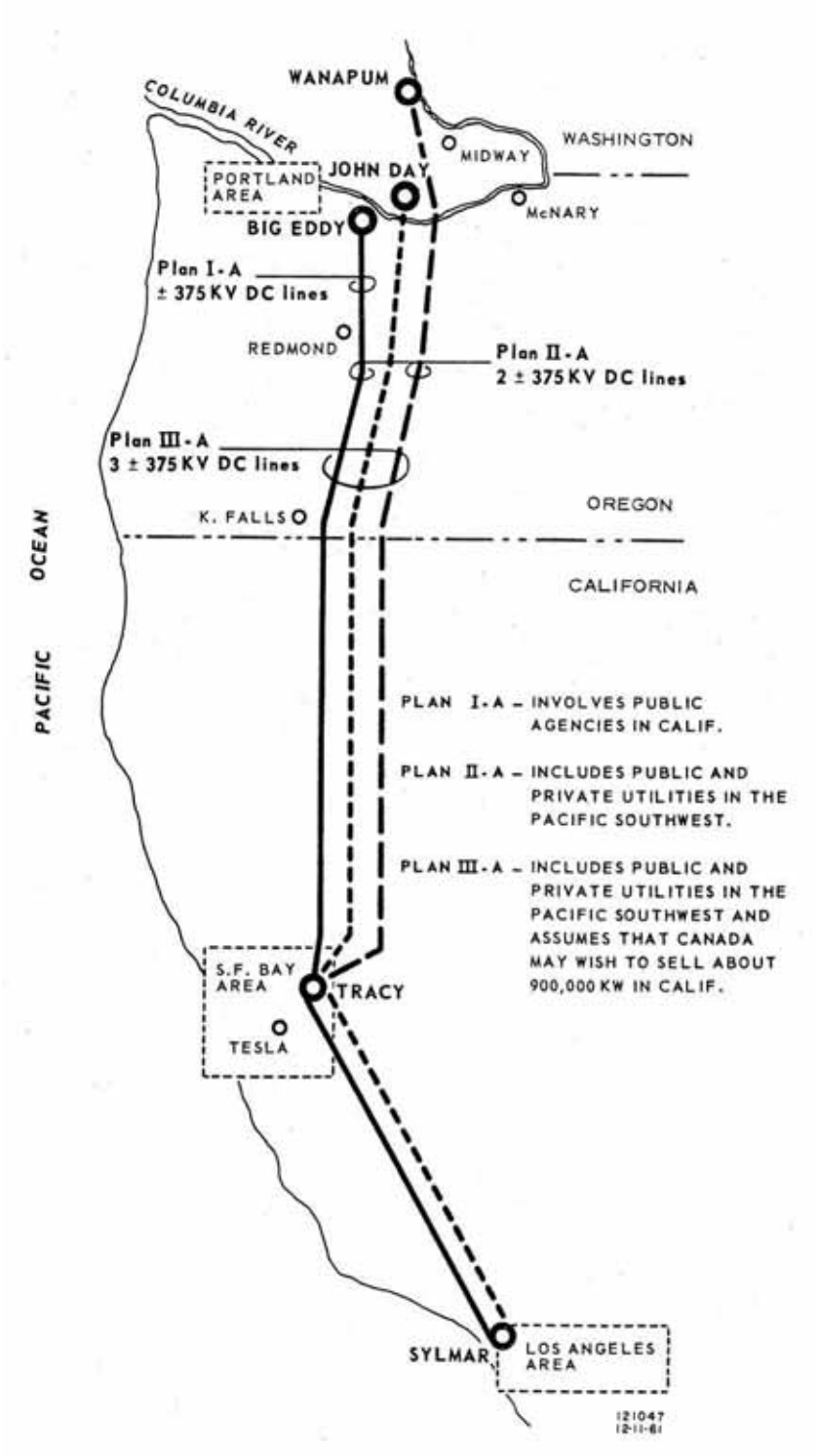

Figure 3.30 Proposed Options for the Pacific Northwest-Pacific Southwest Intertie
Source, BPA Annual Report 1962

Force Report was finalized. The headlines of the series, published daily between January 8th and January 12th, fairly well summarize the issues, and the benefits, surrounding the Intertie project.

> Part I, January 8, 1962: "Intertie Would Add Up to 400,000 KW in Firm Power for Northwest Region."
>
> Part II, January 9, 1962: Northwest Can Profit from Intertie and Still Protect its own Resources."
>
> Part III, January 10, 1962: "Secondary Power Hard to Guarantee, Easier to Adapt to California Use."
>
> Part IV, January 11, 1962: "Firm Power will Never be Shipped from this Area Via NW-SW Intertie."
>
> Part V, January 12, 1962: "Direct Current Line More Economical for Heavy Lad Over Long Distance."

A month later, on Valentine's Day 1962, Administrator Luce marked his one-year anniversary with a *Letter to all BPA Employees*, outlining the strides made toward the Administration's long-term goals of securing the Canadian Treaty, the Intertie, and improving long-term finances. Luce identified three major projects, what he termed then as "Birds in the Bush," that were beyond the control of BPA but that would have significant impact on the Administration's future financial stability and operation. The first was the Canadian Treaty, then still stalled in negotiations between the national government of Canada and the Province of British Columbia. The second was the proposed conversion of a portion of the Hanford Atomic Works for thermal generation[81] and, finally, the potential for the intertie.

> The proposed Pacific Northwest-Pacific Southwest intertie which requires, first, action by Congress on regional protective legislation to assure the consumers of each region first call on all federal power generated on its streams and second, a decision whether the lines will be constructed by the federal government, public agencies, the private utilities, or a combination thereof (Luce, 1962:4).

Despite Luce's conviction that Northwest priority would be maintained, and pending legislation introduced by Sens. Jackson and Magnusson of Washington that would assure that it would, concerns about the loss of any BPA power remained a major public hurdle

[81] This proposal was an early stage of a massive thermal generation program that BPA and most of the private and pubic utilities in the Northwest envisioned as augmenting the existing hydropower generation that supplied the region.

to approval of the intertie concept. Typical was the reaction of the *Ellensburg [WA] Record*, in an editorial column headlined "We Don't Like It."

> Our streams are our great natural resource…Power is a Northwest birthright, just as oil and climate are California birthrights. We would hate to see any legislation passed that would force the Northwest to sell its birthright for a mess of pottage (*Ellensburg Record*, 1-August-1962).

Amidst issues and objections such as these, the negotiations for the Intertie project dragged out, complicated in part by the corresponding delays in finalizing the Canadian Treaty and assuring the additional power that upstream storage would create. On September 2, 1964 President Lyndon Johnson finally signed a Congressional appropriation providing $45.5 million dollars to begin construction of the estimated $700 million dollar Pacific Northwest-Pacific Southwest Intertie project. The Federal government, through BPA, would commit almost $300 million toward the project, that would become the longest electrical transmission line in the world (Tollefson, 1989:338).

The final design of the Pacific Northwest-Pacific Southwest Intertie was a distillation of the original concept and, as finally completed in 1970, allowed for the transmittal of more than 4,000,000 kilowatts among British Columbia and eleven states. "It had essentially become the backbone of the largest electrical grid in the Western world" (Binus, 2008:105). The project as built included both Federal and privately-financed lines that ran for some 1300 miles between the northern starting point at the Celilo Converter Station, near The Dalles, Oregon, where Columbia River power was converted to Direct Current. "BPA built the 265 miles of the DC line, 267 miles of one AC line and 88 miles of the second AC line in Oregon. Portland General Electric built the remaining 179 miles" (Norwood, 1981:245). At Malin, Oregon, in Klamath County, near the Oregon-California line, the BPA system met lines that were built by investor-owned Pacific Gas & Electric that continued southward to the Sylmar Converter Station, north of Los Angeles, where the power was converted back to Alternating Current and tied into the southern California distribution system. Of course, during the winter or as needed, the entire flow could be reversed, sending Pacific Southwest power north.

The construction process for the Intertie included several significant technological hurdles and required years from approval to operation. Among the more significant elements of the project was the 1963 construction of the HVDC current tester at BPA's Big Eddy Substation, a $2 million project that was energized on November 4, 1963. "This facility, first and foremost of its kind in the free world, will establish engineering and operating standards for a new technology of long-distance, high-capacity, power transmission" (BPA Annual Report, 1963:1). The Big Eddy test center helped test new technologies that informed the design of both the Celilo and Sylmar converter stations.

Figure 3.31 Celilo Converter Station
Source, BPA Image D5031-18

The first portion of the Pacific Northwest-Pacific Southwest Intertie, one of the AC lines, was energized on September 20, 1968. The second AC line was energized in May 1969.[82] The first Direct Current line of the Intertie was energized in May 1970 and the Celilo Converter Station dedication was held on August 25, 1970. The DC line was the first, and longest, ultra-high voltage (800-kV) line in the world and marked a major technological milestone in electrical transmission history. "Total project capacity exceed 3.4 million kilowatts and included nearly 4,200 towers on the DC span running 845 miles (BPA, 2007).

In 1969, even before the cutting-edge DC line was operational, the Intertie AC lines were meeting the needs of both regions and boosting BPA's financial situation. BPA's 1969 Annual Report noted:

> The Intertie is performing valuable services for the two region's interconnects. It is enabling the marketing of surplus Northwest energy to California. It enables Northwest utilities to sell Canada's share of Canadian Treaty power to California. It makes possible for Northwest industries to maintain production by purchasing energy from California to replace curtailed interruptible deliveries from Bonneville. It permitted importation of up to 700,000 kilowatt during the 1968-69 winter cold snap to meet record high Northwest loads (BPA Annual Report, 1969:5).

[82] A third AC line was energized in 1993 (see BPA, July 2007).

Today, nearly four decades since its original concept was completed, the Intertie plays a role in unifying the west coast that mirrors, and extends upon historian Richard White's view of BPA as the "defining" entity of the Pacific Northwest (White, 1995:64). If BPA "defined" the Pacific Northwest, the Intertie that the Administration fought to construct and still operates, links the entire west into a system not terribly dissimilar from that J.D. Ross first envisioned and promoted in the 1920s.

> Since the creation of the Pacific Intertie, the lives of Westerners have become integrated through an electrical geography most often taken for granted, itself a reflection of the system's reliability. While power lines stretch overhead along our roads, across our mountains, between our homes and even underground, the connections they make between our lives and power systems and environments where the energy is produced go largely unnoticed. Regardless of the attention they draw, the connections are real nonetheless (Binus, 2008:106).

3.12.2 Southern Idaho Expansion

The abundance of new power made possible by the Canadian Treaty created generation capacity beyond that needed in southern California and so BPA again sought to develop new markets for its low-cost power. Attention turned to large industrial users, phosphate plants, located in Southern Idaho that were currently served by Idaho Power. "On June 18, 1962 officials of the Bureau of Reclamation [BOR] and the Bonneville Power Administration announced a joint study to determine the advisability of extending BPA power to southern Idaho" (Tollefson, 1989:347). In 1963 BPA was given marketing authority for the southern Idaho region, assuming the duties long held by BOR. This action was taken at the instigation of Idaho's U.S. Senator and the phosphate industry itself, which sought relief from the high costs of energy at its plants though access to low-cost BPA power. BPA took over control of 275 miles of Bureau transmission lines in the area, as well as 36 substations, while accepting responsibility for marketing the power produced at five BOR facilities in the area.

Idaho Power, the investor-owned utility that had so forcefully, and successfully, fought the formations of PUDs in that state, was vehemently against the expansion of BPA and its low-cost power within its service area. As the company's own historian noted, "[In 1963] BPA wholesale rates were the same as they were in 1938, and about 40 percent lower than those of Idaho Power or Utah Power and Light" (Stacey, 1991:156). Idaho Power continued to oppose the potential incursion of BPA into the state and fought the Administration's planned expansion with vitriol on the order of the 1930s power war era. Ideology-based ads revisited the same 'creeping socialism' trends of the earlier time, attacking BPA as an unfair government competition with private enterprise that was un-American in concept.

> [One Idaho Power] ad was titled 'It wasn't the Goths that defeated Rome — It was the Free Circuses. Still another: "Lenin said, 'Socialism is government electricity plus bookkeeping' (Stacey, 1991:157).

Partially Idaho Power's strong opposition was simply a continuation of its long-held interest in protecting its territory from public power competition. In the early 1960s, however, this interest was exacerbated by the company's own pending increase in generation capacity through the construction of its hard-won development on the Snake River. Were Idaho Power to lose the market for the southern Idaho phosphate industry not only would its sales drop but it would lose that consumption at the exact same time it was facing the short-term potential for excess power capacity as the result of its construction program.

When BPA proposed to build a HV transmission line to connect its main grid to southern Idaho, local interests fought against it in Congress with initial success. Ultimately, in 1965, BPA gained authority to build a new line from Dworshak Dam, in northern Idaho that would have gone to Montana and then turned south to southern Idaho, circumventing most of Idaho Power's primary service loads. Idaho Power and BPA worked out a wheeling arrangement and so the need for the HV line from McNary Dam to southern Idaho was eliminated. BPA never served the new industrial loads in southern Idaho that it envisioned, leaving them to Idaho Power. However, through the wheeling arrangement it was able to market its low cost power at the postage stamp rate to public utilities and rural cooperatives throughout Idaho.

3.12.3 "Beautility"

The 1960s at BPA, under the enthusiastic direction of Administrator Charles Luce, the congressional support of Sen. Jackson and, during the Administrations of both John Kennedy and Lyndon Johnson, saw significant progress on new dam construction, the Canadian Treaty and the Intertie, all projects that had been BPA goals since throughout the 1950s. Under Luce, however, particularly after Lyndon Johnson became president and almost certainly after Johnson's wife, Lady Bird Johnson, embarked on the "America the Beautiful Campaign," BPA for the first time gave greater emphasis to the way its facilities looked, in addition to the efficiency with which they performed. "Administrator Luce became increasingly upset by the appearance of BPA substations, particularly those located in developing residential areas" (Norwood, 1981:214).

> America has become beauty conscious. No longer is the public satisfied with just good electric service at reasonable rates. Americans want their cities and their countryside to be attractive. They do not want their landscape cluttered with ugly or unnecessary structures. And so designers of electric systems must add a new dimension to their designs; appearance or "beautility" (BPA Annual Report, 1965:V).

BPA hired a Portland architectural firm, Stanton, Boles, MaGuire and Church, to evaluate all of the Administration's existing and proposed facilities and make recommendations for siting, materials, landscaping, and other design characteristics that could allow them to better integrate in their surroundings. As BPA's 1966 Annual Report acknowledged, clearly reflecting the work of primary consultant Jack R. McFarland, from a visual standpoint, "…transmission lines are a necessary evil

associated with power development and a better life for our people" (BPA Annual Report, 1966:IV).

McFarland's report provided suggestions for paint colors and design of substations, treatment options for transmission corridors, all in recognition of the fact that transmission lines and rights-of-way were something like "scars" on the landscape. BPA adopted the new color chart and began to repaint substations as a part of project maintenance. Evaluating the Administration's existing facilities, McFarland made recommendations both to renovate and improve their appearance as well as developing standards and recommendations for all future BPA construction. "We propose the development of an integrated construction system based on modular components…such a building would be expandable to provide for future, unforeseen, requirements" (Stanton, 1966:33).

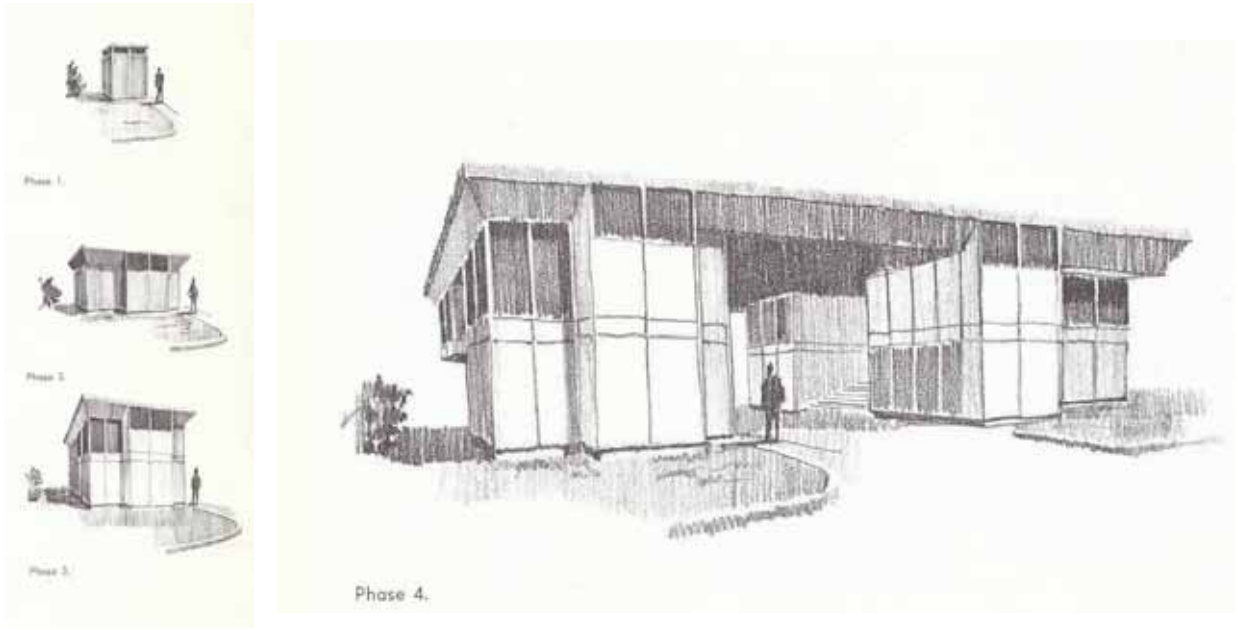

Figure 3.32 "Beautility" Modular Approach, 1966
Source, Stanton, Boles, Maguire and Church (BPA Library)

Under the beautility program, BPA made major landscape improvements to many of its existing substations and undertook a program of simplified near modernistic-inspired design for new projects. These included most of the major construction associated with the Intertie project, such as the Celilo Converter Station (shown below) new substations and the Dittmer Control Center, all of which clearly reflect the beautility approach.

Beyond BPA, McFarland's recommendations were distributed nationwide and reportedly had a major impact on the way other public and private utilities addressed their visual impact on the environment. "Requests for copies of the report have come not only from power systems throughout America, but also from abroad" (BPA Annual Report, 1966:IV).

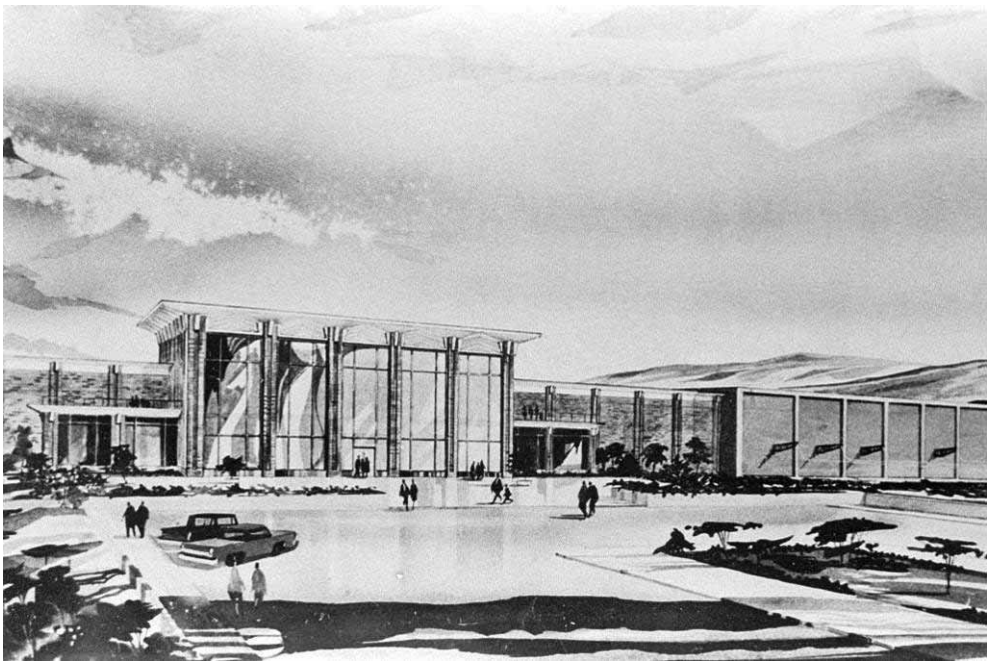

Figure 3.33 Proposed Celilo Converter Station, c1965
Source, BPA Image H457-6

In September 1966, BPA Administrator Charles Luce was appointed under secretary of the Department of the Interior by President Johnson, and left BPA to accept his new position in Washington. Less than a year later he left government and became the head of Consolidated Edison, the investor-owned utility that served New York City, one of the largest utilities in the world.[83] Luce's tenure as BPA Administrator was among the most productive in the organization's history, seeing many long-term goals brought to completion and beginning others, such as "Beautility" and the centralized control of the vast transmission network that now sprawled over the entire western United States, with more than 15,000 miles of lines and, at its peak, more than 300 substations.

3.12.4 Computerization - The Dittmer Control Center

As BPA was designing the Pacific Northwest-Pacific Southwest Intertie project, preparing for the completion of the Canadian storage projects and the new U.S. Army Corps and Bureau of Reclamation generation plants in the Northwest that would soon be supplying additional power, it was also building thousands of miles of new transmission lines and dozens of new substations, that would extend its system ever further beyond the boundaries of the original "Master Grid." The logistics of the management of the BPA

[83] Luce served at Con Ed as Chairman and Chief Executive Officer until his retirement in 1982. He died at the age of 90 in January 2008 (NY Times, 29-January-2008).

system were rapidly expanding from a logistical standpoint. To illustrate the point, between 1961 and 1964 the Administration added 2,130 new miles of transmission lines, almost a quarter of its total system of 8,997 miles. With the Intertie in the planning stages, BPA expected continued growth over the remainder of the decade both in transmission miles, substations, and new generation and water storage facilities (BPA Annual Report, 1964:9).[84]

In 1965, having added another 300-plus miles to its system, BPA announced what would become the last major change in its operations as the result of the Canadian Treaty—the centralized control of the entire BPA network by computer. In 1965 Administrator Luce reported that "BPA is on the threshold of solving problems of design and system operations, both with the aid of computers. We foresee the day when the entire Bonneville system, including water releases and switching operations, will be computer controlled" (BPA Annual Report, 1965:15). The next year BPA's new administrator, David Black, was even more to the point about the increasing need for computerized system control.

> The need for system automation within the next few years will exceed anything now utilized or known to the electric utility industry. Continued manual or semi-automatic operation of [BPA's] rapidly developing transmission grid and hydro generating system has about reached its practical limit, and our problems will be compounded by the Intertie, the Canadian Treaty storage projects and the advent of thermal generation in the region…*humans simply do not have the ability to receive and digest, within tolerable time limits, the growing amount of system data necessary to make accurate decisions for power scheduling and system control* (BPA Annual Report, 1966:VI, emphasis added).

Automated control of portions of the BPA system was nothing new. The Administration had installed an "AC analyzer network" in 1943 that was essentially an analog model of the master grid system in miniature. "Engineers simulated load conditions, analyzing the mini-system's dynamic response to applied faults and changes…. In 1955 power-oriented BPA mathematicians, using a digital computer, solved a complex problem of power flow and achieved a breakthrough of international import..." (BPA Annual Report, 1966:4). BPA was able to use that same solution to prove that the Intertie would be feasible from a technical standpoint and continued to increase its reliance on computers for modeling throughout the early 1960s. In the process the Administration established cutting-edge practices on the use of computers that were adopted throughout the international utility industry.

[84] During the early 1960s BPA was also expecting huge additions to its generation capability through the construction of a major Thermal (nuclear) program.

3.34 Proposed Control Center, Ross Substation, 1968
Source, BPA Image H494-4

The growing scope and complexity of the BPA network along with the Administration's increasing appreciation of computer technology led to a goal of a "computer center" that could control the entire BPA system from a single location. First mentioned in the 1965 Annual Report, a black out in the Northeastern United States in 1965 led to increased interest in assuring system reliability and helped push the project forward at BPA. The new facility, to be called the Dittmer Control Center after the highly regarded BPA Power Manager William Dittmer (who served from 1946-1953), was planned for construction at the J.D. Ross Substation in Vancouver, Washington. The Dittmer Center was designed in 1966-1967, following the precepts of the "Beautility" process, and was featured prominently in the 1967 Annual Report. Rep. Julia Butler Hansen, of Washington, presided over the groundbreaking ceremony on April 3, 1970. The 168,000 square foot building was estimated to cost about $5 million.

> The center will contain central units for BPA's advanced power system control and dispatch…It will house the power dispatching center, a central computer complex, power system control circuits and terminals, a supervisory (remote) control for substations in the Portland area, a substation operators training center, a viewing room for visitors and office space for support activities…more than half the floor space…will be underground to assure continuous operation of the control center by protecting its occupants and equipment against storms, earthquakes, fallout and other hazards (BPA Annual Report, 1967:9).

The original estimates, and estimated completion date for the Dittmer Center proved overly optimistic. By the time the stark, modernistic center was formally dedicated, it

had taken four years longer than anticipated and costs had risen to $20 million dollars. The building itself had come in exactly on-budget, the $5 million estimated in 1967 and was completed in January 1972, only slightly later than first anticipated. However "[t]he project is unusual in that time and money to equip the center are much greater than required for the building construction" (*Oregonian*, 20-August-1974, 7:4-8). Over $15 million dollars in equipment, including the computers, microwave towers and other "space-age" components cost three times the amount of the structure that housed them. The large dedication program for Dittmer was held on August 19, 1974.

> Dittmer adds a dimension of comprehensive electronic coverage to all facets of overseeing operation of more than 12,000 miles of transmission lines and more than 330 substations of the high-voltage electrical power network of BPA (*Oregonian*, 20-August-1974, 7:4-8).

Figure 3.35, Dittmer Control Center, Interior
Source, BPA Image Ditt0879

With its completion of the Dittmer Control Center, the process of expanded power generation and power distribution systems that BPA had initiated in the late-1950s with the Wheeling program and then continued through the 1960s, by first the Canadian Treaty and then the construction of the Pacific Northwest-Pacific Southwest Intertie, was complete. Paul Raver's years of imploring Congress for more funding and more generation capacity to meet demand, along with and more and more efficient ways to distribute it to an ever-expanding region, had been largely achieved by his several successors, particularly by Charles F. Luce.

In retrospect, the vision of J.D. Ross and Franklin Roosevelt, in expanding the goals of the Pacific Northwest to better utilize the phenomenal hydropower potential of the Columbia River to spur investment, development and better the life of the Northwest, was likely realized beyond either of their wildest dreams, and their dreams and visions for the Northwest were, for the times, fairly wild. What Charles Luce said in 1964, regarding Ross's 1930s grand vision for a national system of direct current transmission lines, a vision that largely became reality with the completion of the intertie, could just as easily be applied to the visions behind the Canadian Treaty, or the Dittmer Control Center, or even the very concept of a 15,000 mile BPA transmission network that now extends between two nations and six states, providing a significant share of the electrical power used by some 50,000,000 people in the western United States.

> Ross' contemporaries regarded his forecast as a little fantastic. In the language of today, Ross was 'way out.' He had stepped past the Outer Limits and entered the Twilight Zone. We know now, of course, that J. D. Ross was doing his homework (Luce, 1964).

3.36 Dittmer Control Center Dedication, 1974
Source: BPA Archive Image 1937

4.0 EVALUATION

The underlying purpose of this context statement, in addition to furthering the documentation of the Bonneville Power Administration and, in particular, expanding upon BPA's activities after the 1945 completion of the master grid, is to determine if the Administration's activities after World War II are significant under the evaluation criteria of the National Register of Historic Places. This section elaborates upon that potential and outlines a preliminary evaluation based on the historic narrative of Section 3.

4.1 NR-Evaluation Standards

The National Register process recognizes five basic types of properties that are eligible for listing—Buildings, Districts, Objects, Sites and Structures. Each property by definition will fall within one of these categories for the purposes of evaluation, and each property category brings with it varied requirements. In addition to the five basic property types, Park Service has created one additional category, for related resources that do not meet the requirements of a district (being spatial proximity). Such related but not spatially distinct resources can be documented using the *Multiple Property Submission* [MPS] process, a variant of a district that recognizes shared association independent of geographic location by reasons of type, function, or some other salient characteristic. Classic examples of MPS studies that illustrate non-geographically related association include, for example, the "Covered Bridges of Oregon MPS," the "Bridges of Washington State MPS" or the "County Courthouses of Idaho MPS." Other typical MPS submittals can be the scattered works of a particular architect independent of their physical location or a group of resources connected by a particular association, such as properties related to mining, the Chinese, or the use of a particular building material.

Within the five basic types, individual properties are evaluated for eligibility to the National Register of Historic Places using a multi-part process, that accounts for both the historic and physical aspects of the property. To be considered eligible for listing on the National Register a property must have some significant association to a documented aspect of history and it must retain sufficient integrity, or "the ability to convey its significance."

As defined by the National Park Service, historic *Significance* occurs when integrity remains and a property meets at least one of following four criteria:

A. A property is associated with events that have made a significant contribution to the broad patterns of our history; or

B. A property is associated with the lives of persons significant in our past; or

C. A property embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. A property has yielded or may be likely to yield, information important in prehistory or history.

In 1987, the Bonneville Power Administration Master Grid was documented and evaluated as a "Discontiguous Historic District," a particular variant of the of district nominations that has been somewhat supplanted by the Multiple Property Submission. The 1987 documentation, though never formally entered into the National Register of Historic Places, remains the primary basis under which BPA's built resources are currently evaluated under Section 106 of the National Historic Preservation Act of 1966. That document identified 2,863 individual resources; 32 buildings and 2,831 structures, that latter being entirely limited to transmission line towers and poles. According to Section 8 of that documentation, the master grid was considered eligible under National Register criterion A, B and C. Criterion B significance was related to significant association with J. D. Ross and Paul Raver (Holstine and Lenz, 1987).[85]

The National Register also requires a definition of Level of Significance, a determination as to whether a particular property is eligible for listing for significance on a local, regional, or national level. Properties must meet associational criterion that relate their significance to that level of effect, meaning that "National Significance" is the result of events that are significant within the history of the entire United States of America. Regional, or statewide significance, as well as local significance are accordingly held to a lesser evaluation standard in determining eligibility.

Integral to the evaluation of significance is the definition of a *Period of Significance*. The period of significance is a temporal boundary during which the property[86] achieved historic significance, remained in its historic use, or was associated with the individuals or themes that make it eligible under the Criteria for Evaluation. Periods of significance may vary from a single day, as in a property that is significant for association with a single, distinct, moment in time; a single year, for a property significant due to its construction and design; or for some longer period extending several decades or more, for a property associated with a significant person, a significant development period or usage or even, in the case of a specific building, an extended period of occupancy. Once defined, only elements of the property that were present during the period of significance "contribute" to the property's historic character. Other elements, including alterations, may be compatible or non-compatible but are "non-contributing" if built after the close of the defined period of significance.

[85] The Master Grid documentation also relied upon Criterion Consideration (Exception) G, since a portion of the documented resources were less than 50 years of age. See Section 4.2.4 of this document for additional discussion of this issue.

[86] For the purpose of this discussion "property" refers to all related historic sites and structures, including both singular and plural under an umbrella term, as implied by "Multiple Property Submittal."

The 1987 BPA Master Grid document defined Level of Significance at both the National and Statewide/Regional levels, due to its position within the development of the Federal electrical transmission system and the role that BPA played during World War II. The 1987 document defined a Period of Significance starting at 1939, the earliest construction date and 1945, the end of World War II and the completion of the master grid development (Holstine and Lenz, 1987).

It is critical to recognize that a contributing property may, and typically will, have some alterations or modifications that occurred after the close of the period of significance. The assessment of the impact of such alterations and modifications is included in the final element of the NR process — the evaluation of ***Integrity***. The National Parks Service has identified seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

> To retain historic integrity a property will always possess several, and usually most, of the (seven) aspects. The retention of specific aspects is paramount for a property to convey its significance. Determining which of the seven aspects are most important to a particular property requires knowing why, where, and when the property is significant (NPS, 1997:44).

To aid evaluation, the National Register of Historic Places has established defined ***Areas of Significance*** or ***Historic Themes*** for varying property types. This is intended both to streamline evaluation and to provide uniform data base entry terms. Use of Areas of Significance and Historic Themes are related to the four Criteria for Evaluation as presented above; i.e. a particular resource may be significant under Criterion "A" and related to one or more Area of Significance or Theme and, additionally, be significant under Criterion "B" or "C" and related to a second Area of Significance.

Based on the historic development pattern and the events detailed in Section 3.0 of this document, a preliminary evaluation of built resources associated with the Bonneville Power Administration, would appear to logically fall within one or more of the following Areas of Significance, depending upon the individual property and its particular development history, function, and association(s).

ARCHITECTURE: For properties that are significant under Criterion "C" for their design or planning characteristics,

AGRICULTURE: For properties that are significant under Criterion "C" for association with the expansion or development of irrigation, agricultural production, animal husbandry, or the processing or storage of food stuffs,

COMMERCE: For properties that are significant under Criterion "A" for association with the development of goods, services and commodities,

ENGINEERING: For properties that are significant under Criterion "C" for association with the practical application of scientific principles to design, construct, and operate equipment machinery and structures to serve human needs,

INDUSTRY: For properties that are significant for under Criterion "A" for their association with the development of industry, manufacturing, and labor to produce, extract or process goods or services, or

POLITICS/GOVERNMENT: For properties that are significant under Criterion "A" for association with Federal programs or activities, political issues, the development or expansion of government impacts.

The 1987 BPA Master Grid document identified as Areas of Significance Engineering, Energy Management and Utilization, and Politics/Government.

The issue of integrity is complex, as handled within the 1987 documentation. Whereas the document acknowledges the Criterion "A" significance of the Main Grid and the integrated function of the transmission lines, substations and their component parts as a "system" it applies what amounts to Criterion C evaluation to modification that precludes many built elements from eligibility. This complex approach, where some substations are considered eligible while the transmission lines that lead into and out of them are not, considerably complicates the issues of both integrity and, ultimately, management. Further complicating the matter, for other properties the reverse situation exists, i.e. the transmission lines entering a substation are considered to have sufficient integrity for National Register listing while the substation that serves as the line's beginning or end point, does not (Holstine & Lenz, 1987).

The evaluation of historic and cultural resources under the above process results in a two-step decision process. First, a property's significance is evaluated, within an appropriate and detailed understanding of the context in which it was created. Where significance is identified, the next step is to determine if sufficient integrity remains to relate that significance. Where significance is present, and integrity remains, the property is considered to be eligible for listing on the National Register of Historic Places.

4.2 Applying the Evaluation Process

4.2.1 PROPERTY TYPE

The multi-state, complex, network of built resources that comprise the Bonneville Power Administration system includes transmission lines (both corridors and the individual poles and towers within them), substations (including a variety of individual structures, elements and types), control houses, maintenance facilities, office spaces, converter stations, and a wide variety of other structures and sites across portions of seven states. Despite the widespread geographic character of the system it is, by nature, a connected one and that connection, for the most part, is physical in addition to a shared ownership, a shared development history and a commonly-held association.

It is tempting to consider the BPA system, characterized by its 15,000 miles of transmission line corridors, punctuated by substations, control points, and related operational facilities, as something akin to what is termed a "Linear Historic District." That format, often used for water-based districts such as canal routes or transportation corridors along rail lines, highways, or even pioneer or Native American trails, generally is singularly-linear; a district starts at one point and flows at most bi-directionally to an end point. The linear "corridor" is generally well defined and, while it can and often is bi-directional, it includes a direct link between two points and two points only.

The BPA system, of course, has multiple "beginning" points, starting with the thirty-one generation facilities in the Columbia River Federal Power System owned by the US Army Corps of Engineers and the Bureau of Reclamation, or at any of the substations, which generally mark the beginning, or end, of a particular segment of transmission line that connects the system into a unit. From a more distant viewpoint, however, the BPA system has no beginning or end, at least physically, as power can flow over most of the system in multiple patterns, even in opposite directions, depending on demand and supply. The Bonneville Power Administration transmission network as a whole is not "linear" in any normal sense of the term as used for evaluation under the National Register process, even though discrete elements of the system, the transmission lines, most certainly are.

Collectively, as a system, the BPA transmission *network* must be considered a unit, a related group of interconnected elements that collectively form the whole. Transmission lines lead to and from substations, which interconnect with each other via the Master Grid and its expanded main lines, before "ending" at interconnection with distribution systems owned and operated by other public and private utilities. BPA's substation-based control houses are interconnected to the Dittmer Control Center via transmission and communication lines into a complex entity that from the standpoint of National Register evaluation should be seen and treated as a whole; a single unified entity. That entity, the Bonneville Power Administration Transmission Network, contains literally thousands of individual parts but appears to be, under the National Register process, most appropriately documented as a "**Multiple Property Submission**."

4.2.2 PERIOD OF SIGNIFICANCE 1939-1974

The National Park Service requires that a fixed temporal window, or *period of significance*, be defined as a part of the National Register evaluation process. "Period of significance is the length of time when a property was associated with the important events, activities or persons, or attained the characteristics which qualify it for National Register listing" (NPS 1991:42). The 1987 Master Grid documentation established a period of significance of 1939-1945, encompassing the initial planning and construction period of the master grid and reflecting the BPA network's association with the establishment of a public power system in the Pacific Northwest, the technology of that system, and the significant role BPA's master grid played during World War II.

Now, as the result of this more comprehensive review of BPA's post-WWII development history, it is clear that BPA's history after 1945 was largely focused on the creation of a truly regional system along the lines first envisioned by J.D. Ross in the mid-1920s, utilizing the mammoth hydroelectric potential of the Columbia River basin to "power the nation." Guided by Paul Raver, and then implemented during the tenures of first William Pearl and then Charles Luce and David Black, BPA succeeded in constructing a far-flung system of high voltage and direct current lines that expanded the reach of low-cost public power and created a balanced distribution network that welded demand and supply points into a single system. Incorporating private power sources, and crossing the international boundary to assure efficient water use, BPA additionally created new transmission technologies to improve distribution and developed a complex internal control system reliant upon cutting-edge computer technology to assure smooth operation of the network.

Collectively, this process of incremental pursuit of the original Ross plan has created the modern BPA network, bringing Ross' New Deal dream to fruition, enhanced by new technologies, and providing the electrical backbone to an entire region of the United States. *As a result of this coordinated, multi-decade, effort, the Period of Significance appropriate to the BPA Transmission Network spans from its initial planning in 1939 through the completion of the Dittmer Control Center in 1974.*

4.2.3 APPLICABLE NATIONAL REGISTER CRITERIA

The BPA Transmission Network touches virtually every corner of Oregon and Washington, extending significantly into Idaho, western Montana and, through the intertie and other connections, portions of California, Wyoming, and Utah. The Administration's network is directly responsible for the delivery of public power that accounts for a significant percentage of the total capacity in the region. Through the wheeling program and its role in the Northwest Power Pool, BPA is additionally involved in the distribution of vast quantities of power produced by investor-owned utilities. The Administration distributes low-cost wholesale power to public utility districts, rural cooperatives, and municipally-owned providers, directly supporting cities, towns, and communities that are home to millions of residents. In the process, BPA helps create jobs, opportunity, and enables an entire range of activities throughout its service area. BPA's transmission system effects the quality of life in the Pacific Northwest and, to a

degree that is likely difficult to overstate, has played a major role in the development of the Pacific Northwest for the past seven decades.

The 1987 documentation of the BPA Master Grid identified three Areas of Significance (Architecture/Engineering, [Industry]Energy Management/Utilization and Politics/Government). At this time, based on the development context for BPA that continues from the 1945 end date of that document, it appears that these original recommendations remain valid. Quite possibly additional areas of Commerce and are present in BPA's role in the development of the aluminum industry. Significance under the them of Agriculture may also be identified through the Administration's role in the establishment of rural electrical cooperatives and expanded irrigation uses that significantly changed the character and economy of eastern Washington and Oregon.

Three eligibility criterion (A, B and C) were indentified in the 1987 documentation, relating to significance through association with Broad Themes (A), significant individuals (B) and for exemplary use of technology and architectural design (C). Extrapolating those criterion forward, to encompass the entire 1939-1974 Period of Significance, appears partially appropriate at this time.

As was noted in the earlier documentation, portions of the project exhibit significance under **Criterion C,** for their architectural character, particularly the early 1940 to 1950s-era Streamlined and Art Moderne substations previously noted by both Holstine and Lenz, as well as by Curran. Later, modernistic, styles reflecting the 1960-1970s effort toward "Beautility," are reflected, for example, by the Dittmer Control Station, substation design and the Celilo Converter Station. These later resources, as well as portions of the transmission lines themselves may additionally reflect engineering or technological advances appropriate under Criterion C.

As the result of the expansion of the period of significance, adding nearly three more decades of BPA development, the 1987 suggestion of **Criterion B** significance for association with John Delmage Ross and Paul Raver seems less appropriate. Ross, clearly a significant figure in the history of both the Pacific Northwest and, to a degree, the nation, played a pivotal if short-lived role at Bonneville. While his vision guided the Administration's establishment and later development, additional review would be necessary to determine if the BPA network as it was finally built and exists today retains sufficient association with him to qualify for NR-designation under Criterion B. The same can be said of Paul Raver, also a pivotal figure in BPA's development history, who was the person who more than anyone fought for Ross' original concept, although even did not remain with BPA to see that plan fully implemented. Like Ross, Raver will also require additional review to qualify for associative significance under Criterion B. And finally, if Ross and Raver are both determined significant individuals under Criterion B evaluation standards, it is entirely logical that Charles F. Luce, the Administrator who oversaw the completion of Ross's grand vision for a DC intertie and actually saw Raver's decade-long push for additional generation capacity come to fruition, should be considered as well. From an engineering standpoint, a similar case can be made for

Charles F. Carey, who devised the Master Grid to begin with and who played a major role in overseeing its construction.

In all cases, however, Criterion B significance for association with Ross, Raver and any others appear to be minimal and at any rate are largely unnecessary to establish the network's significance. For these reasons, retention of Criterion B significance is considered to be ill-advised and is not recommended.

National Register eligibility **Criterion A** includes properties that are "…associated with events that have made a significant contribution to the broad patterns of our history." In 1987 Holstine and Lenz accurately assessed the Criterion A significance of the BPA Master Grid and placed that portion of the BPA system into an evaluation context based on BPA's role in the region's development during World War II. There is little reasonable doubt that similar significance could be attributed to BPA's post-WWII development history, up to and including the completion of the Dittmer Control Center, as the culmination of a massive post-war expansion of the Bonneville Power Administration Transmission Network. While some aspects of this system are less than 50 years of age (being all those resources built in 1959 or later) the inter-related nature of the network as a cohesive system of multiple-parts, particularly given Dittmer's central role in the Administration's multi-state, multi-national reach, will logically justify a Criterion G exception for resources of less than fifty years of age, the NR-standard threshold.

4.2.4 APPLICABLE AREAS OF SIGNIFICANCE

Primary areas of significance related to the Bonneville Power Administration Transmission Network include most obviously Politics/Government, Industry, and Commerce.[87]

BPA is significant within the area of Politics/Government for its pivotal role in the development of public power in the Pacific Northwest, both through the Federal Columbia River Power System as well as the establishment and operation of dozens of local Public Utility Districts, Rural Co-Operatives and municipally owned utilities. BPA's controversial history on the national level, as a key element in the "Power Wars" of the 1930s through 1950s, is also of significance within the area of Politics/Government.

Significance under the areas of Commerce and Industry overlap, related to the role BPA has played in business creation throughout the region, most clearly demonstrated by the creation of WWII defense-related shipyards and aluminum plants but continuing through

[87] The 1987 use of "Energy" and "Energy Management and Utilization" are no longer used under current NR documentation standards with "energy facilities" now considered applicable under that main area of Industry.

the 1950s and 1960s as aluminum in particular remained a major economic force in the Pacific Northwest. The development of saw mills, mineral-processing, and other industries are also related to the availability of low-cost BPA power that drew such operations to the region and allowed them to expand and succeed.

Other potential areas of significance for the BPA Transmission Network include the following;

ARCHITECTURE: For properties that are significant under Criterion "C" for their design or planning. This would primarily relate to the design and construction of the Streamlined Moderne influenced substations and the Ross Complex buildings built between 1939 and the early 1950s. Some additional significance under this area may be appropriate for the influence of "Beautility" as used in the construction of BPA's post-1966-1974 structures.

AGRICULTURE: For properties that are significant under Criterion "A" for association with the expansion or development of irrigation, agricultural production, animal husbandry, or the processing or storage of food stuffs. This area of significance would largely relate to the role of increased irrigation and the development of the agricultural industry in the eastern portions of Washington and Oregon, transforming and expanding agriculture, playing an important role in the economic development of those areas.

ENGINEERING: For properties that are significant under Criterion "C" for their association with the development new engineering or technological processes. This area of significance would largely relate the development of Main Grid system in the 1940s, as well as the later innovations associated with the design and construction of the Pacific Northwest-Pacific Southwest Intertie and the computerized control systems that culminated with the construction of the Dittmer Control Center.

4.2.5 APPLICABLE LEVEL OF SIGNIFICANCE

While clearly of major significance within the history of the Pacific Northwest and easily eligible as a regionally significant resource, based on the Historic Context Statement developed in Section 3.0 of this document it appears that the BPA Transmission Network, especially certain elements within the network, rise to the level of national significance. Built as one of the key examples of Franklin Roosevelt's New Deal approach to develop a nationwide public power system, the original creation of the Bonneville Power Administration was seen as only a temporary measure before the formation of a more formal Columbia River Authority that was to be modeled after the New Deal's other major foray into public power — the Tennessee Valley Authority. Instead, BPA became the model for all subsequent Federal power development,

pioneering the "preference clause" and the "postage stamp rate" as essential elements in providing low-cost Federal power to spur industrial and economic development.

4.2.6 INTEGRITY

As an integrated system of resources, it appears clear that a significant portion of the BPA Transmission Network continues to function as originally intended, relying upon many of the elements (substations, transmission corridors, etc.) that were part of the original construction processes. As a part of the future evaluation of the elements within the network, specific resource evaluation of integrity will provide answers as to which elements of the network do indeed sufficiently relate the associations for which they are considered significant.

It must be stressed, however, as noted above, that reliance upon a standard "Criterion C" evaluation model that places high value of architectural character or specific retention of individual elements within the network is unlikely to be an appropriate strategy for the BPA Transmission Network as a whole. As a logical effect of significance through qualities that relate its inter-connected nature, the various changes to the individual structures within the network are expected to have far less an impact than would be the case on a more traditional, individual, property.

4.3 Evaluation Summary

This historic context statement reviewed the development of the Bonneville Power Administration Transmission Network within the framework of the public power movement during the first three decades of the 20th century and the rise of the Franklin Roosevelt's New Deal after 1932, tracing the efforts to develop low-cost public power in the Pacific Northwest as a boon to agricultural and economic development. It places the Administration within the populist-inspired drive for rural electrification, as well as within the rise of Public Utility District and municipal utilities in the aftermath of the "power wars" and the Great Depression. In doing so, this context, building upon earlier works, documents the role of BPA and the Federal transmission grid in transforming the Pacific Northwest into a key region within the United States' "Arsenal for Democracy" immediately before and during World War II and established BPA's significance in both the industrial development of the Pacific Northwest and, ultimately, the military success of the nation in defeating Germany and Japan.

BPA continued to play a significant role in economic development and the improvement of transmission technology throughout the 1950s and 1960s, culminating with the completion of the Canadian Treaty project that stabilized water flows and generation potential throughout the entire Columbia River Basin and enabled the construction of the technologically innovative Pacific Northwest-Pacific Southwest Intertie, still the longest High Voltage Direct Current transmission line in the world. The design and completion of the Dittmer Control Center, the master control center for the entire BPA network,

reinforces the single-entity, character of the BPA Transmission Network through the creation of single-point, master control that unifies BPA's operations.

Based on this historic context and evaluation of its BPA's development within the history of the Pacific Northwest and, in a larger sense, the United States, the BPA Transmission Networks appears to demonstrate significant association with the broad themes of history as defined under eligibility Criterion A of the National Register evaluation standards, with possible additional significance under Criterion C for the design and technology of specific elements within the network. Clearly of regional significance in the Pacific Northwest, it is anticipated that much of the Bonneville Power Administration will ultimately prove nationally significant for its role as the model for virtually all subsequent Federal power transmission systems.

Based upon this context statement, the Bonneville Power Administration Transmission Network should be ***considered eligible*** *for listing on the National Register of Historic Places, subject to individual resource evaluation to determine sufficient integrity to relate that association effectively*.

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The primary published sources on the history and development of the Bonneville Power Administration are the three histories prepared by long-time BPA employees Vera Springer, Gus Norwood and Gene Tollefson. Each takes its own approach to the project, Springer's largely a photo-essay prepared as part of the nation's bicentennial celebration, Norwood a detailed, policy and legal review of the Administration and Tollefson's an amply illustrated effort at a more publicly accessible work that puts the agency into a broader national context. All three were immensely helpful in gaining a general understanding of BPA's past and, in particular, the original interviews gathered by Mr. Tollefson from other long-time BPA officials provided a wealth of detail from the men and women who were there.

Beyond these three works, numerous other published histories of individual PUDs, of the various investor-owned utilities, of the "power wars" and the early electrical monopolies as well as the many many histories of the New Deal and its principle players offered a background on the mood of the nation and the forces that led to the creation of the Bonneville Power Administration and the Columbia River project. Two are of particular note; Paul Pitzer's fine Grand Coulee, which exhaustively details the battle between the pumpers and the gravity proponents in eastern Washington, and Power Struggle, by Rudolph and Ridley, which details the early development of the utility holding companies and the collapse of Samuel Insull. Magazine and newspaper accounts, particularly those penned by longtime Northwest commentator Richard L. Neuberger, were excellent source material on the public view of the projects during their development, as well as the hopes for its success and the criticisms of its proponents.

Finally, this project would simply not have been possible without the fine collection at the BPA Library in Portland and the help of the staff there in making it available. Beyond the Administration's own publications, including Annual Reports, commissioned studies, market analyses, and other internal documents, the library retains all of Tollefson's original interviews, files and bound volumes of the Administrator's speeches through the years, and well as numerous articles, clipping files and other material that significantly augmented available newspaper articles on microfilm. And, while not cited here, the huge and well-indexed collection of images managed for BPA by Nick Christmas, all conveniently available digitally, add significantly to the readability and visual interest of this project.

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