Transmission Division
Pick-Sloan Missouri Basin Program

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Table of Contents

Introduction

The Missouri River is the fourth largest river in the United States. Its drainage area covers 529,350 square miles, encompassing all or portions of ten states—Montana, Wyoming, Nebraska, North and South Dakota, Colorado, Kansas, Iowa, Minnesota, and Missouri—including 9,715 miles of Canadian territory. Formed by the confluence of the Gallatin, Madison and Jefferson rivers in southwestern Montana, the Missouri River travels south and east about 2,460 miles to its confluence with the Mississippi River.[1] The river has been the central feature to the Anglo-American development of the western plains as a major conduit for trade and transportation and a foundation for settlement.

This centralizing feature has imbued the Missouri River with romantic and nostalgic sentiments as the gateway to United States expansion into the American West. The river basin is representative of one those sectional areas of the United States touted by nineteenth-century historian Fredrick Jackson Turner where American expansion into the frontier was the central feature for spreading American ideals and structures. Turner argued, "The existence of an area of free land, its continuous recession, and the advance of American settlement explain American development."[2] For many Americans, this legacy begins with the heroic exploits of Merriweather Lewis and William Clark (1804-1806) and their epic journey upriver to find the elusive path to the Pacific Ocean. Fur trappers soon followed fostering the development of a commercial fur trade and the first exploitation of the basin's resources by Anglo-Americans,

[1] U.S. House of Representatives, *Missouri River Basin: Letter from the Secretary of War Transmitting a Letter from the Chief of Engineers, United States Army, Dated December 31, 1943, Submitting a Report, Together with Accompanying Papers and Illustrations, on a Review of Reports on the Missouri River, for Flood Control along the Main Stem from Sioux City, Iowa, to the Mouth, Requested by a Resolution from the Committee on Flood Control, House of Representatives, Adopted on May 13, 1943*, H.Doc. 475, 78th Cong., 2nd sess., March 2, 1944 (Washington, D.C.: United States Government Printing Office, 1944), 20.
[2] Frederick Jackson Turner, *The Frontier in American History* (New York: Holt, Rinehart and Winston, 1962).

characterized by the activities of John Jacob Astor's American Fur Company and Manuel Lisa's Missouri Fur Company. These business ventures helped to construct the mythology of the fur trapper and mountain man who became vanguards of America's western conquest, personified in the adventures, and exploits of noted adventurers such as Jim Bridger, Jedediah Smith, and Kit Carson. A 1969 Missouri Basin Inter-Agency Committee report summarized this aspect, claiming that "the historic beginnings of the West appear here. This is the country of the 'voyageurs,' fur traders, and pathfinders for westward expansion."[3]

For much of the 19th century and well into the 20th, the Missouri River acted as thoroughfare for trade and immigration. Travelers first made their way in canoes and pirogues, but in 1819 the first steam ship made its way up the river. Although these early endeavors with steam power only went as far as Council Bluffs, Iowa, it was not long before this technology reached deeper into the Missouri River basin.[4] As more Americans ventured into the Great Plains, communities along the river took root. Initially agriculture was the leading industry and flourished along the Missouri River below Sioux City, Iowa. Moving west along the river, aridity and geography made farming much more challenging. Arable lands set on bench lands above the river's main stem made irrigation prohibitive, requiring the use of expensive pumping apparatus that was often beyond the reach of most farming communities. As a result, dry farming and livestock predominated in the western plains. There was, however, some success in the western regions of the Missouri River basin where irrigation succeeded along the major tributaries.

[3] Missouri Basin Inter-Agency Committee, *Comprehensive Framework Study Missouri River Basin Appendix: Historical Perspective of the Missouri River Basin*, June 1969, 1, 30.
[4] *Ibid*., 32,

Irrigation agriculture in the region received a substantial boost with the passage of the 1902 Reclamation Act. The act called for the federal government, under the aegis of the United States Reclamation Service, to construct irrigation facilities—dams, canals, etc.—to assist the settling of the arid West. Some of the Reclamation Service's (Reclamation) earliest projects were developed along Missouri River tributaries. These included the Shoshone Project (1904) on the Shoshone River in Wyoming; North Platte Project (1903) on the North Platte River in Wyoming and Nebraska; and the Riverton Project (1918) on the Wind River in Wyoming; and the Belle Fourche Project (1904) on the Belle Fourche River in South Dakota. During these early years Reclamation engineers quickly discerned the connection between irrigation development and hydropower production benefits. In the 1930s and 1940s, Reclamation began to greatly expand the Missouri River basin's power potential within with construction of the Colorado-Big Thompson Project in eastern Colorado and the Kendrick Project in Wyoming. By the 1940s, power production was a key feature in any water resources development plan, and the Missouri River had much to offer.

Pick-Sloan Missouri Basin Program

In the Flood Control Act of 1944, Congress authorized what became known as the Pick-Sloan Missouri Basin Program [PSMBP]. The program enacted by Congress was a joint effort between the Corps of Engineers [Corps] and the Bureau of Reclamation for water resources development within the entire Missouri River basin.[5] At the time many considered the union of these two rival engineering agencies as a "shotgun marriage." Prior to Congress passing the act,

[5] For more information on the Flood Control Act of 1944, "Flood Control Act of 1944 [An Act Authorizing the Construction of Certain Public Works on Rivers and Harbors for Flood Control, and for other purposes (Act of December 22, 1944, Ch. 655, 58 Stat., 887)" in United States Department of the Interior, Bureau of Reclamation, *Federal Reclamation and Related Laws Annotated*, Volume III of Three Volumes through 1958, Richard K. Pelz, editor (Washington, D.C.: United States Government Printing Office, 1972), 796-814.

both the Corps and Reclamation had produced reports outlining their proposals for basin-wide development. The two agencies did not come together with a unified plan until threatened by the administration of President Franklin D. Roosevelt to create a Missouri River Authority, a TVA-like entity that would direct all basin water resource development, leaving both the Corps and Reclamation out of the picture.[6] With this threat looming both the Corps and Reclamation shelved their rivalry, integrated their plans, and proposed the Pick-Sloan Missouri Basin Program.

The general plan for Missouri River basin development gave the Corps responsibility for flood control and navigation on the main stem of the Missouri River. Reclamation was tasked with developing irrigation and hydropower facilities on the river's primary tributaries. In both cases hydropower development was a major feature of the Corps and Reclamation proposals. The integrated plans of both agencies sought to create a secure and dependable electric grid throughout the basin. According to a 1947 Reclamation Report,

> The Missouri Basin development, consisting of power plants at multiple-purpose dams, a few plants at dams operated primarily for power, and a large number of irrigation pumping plants, will require interconnection of plants in order to utilize effectively the power generated. The plan therefore provides for a high voltage transmission grid in the basin. While this transmission network will serve the irrigation pumping plants, it will also supply rural electric cooperatives, municipalities, and potential industrial development.[7]

The legislation Congress passed in 1944 designated Reclamation the agency responsible for marketing electricity throughout the basin, making the construction of the transmission grid a key feature in overall basin development.

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[6] The Bureau of Reclamation's proposal for Missouri River development was outlined in S. Doc. 191, 78th Cong., 2nd sess., April 1944, while the Corps of Engineers' plan is found in H. Doc 475, 78th Cong., 2nd sess., March 1943.
[7] Department of the Interior, Bureau of Reclamation, "Part 2, Missouri River Basin: Justification for Appropriations Fiscal Year ending June 20, 1947," 46, in RG 115, Records of the Bureau of Reclamation, Engineering and Research Center, Project Reports, 1910-1955, Acc #8NN-115-85-019, Box 616, National Archives and Records Center, Rocky Mountain Region, Denver, Colorado.

During a period in American history when major concerns existed about the role of government in the production and distribution of electrical energy, the Pick-Sloan plan was novel. Few questioned the traditional assumption regarding hydropower development and marketing helping to repay construction costs. Indeed, Reclamation assured Congress, "net revenues from the sale of power are estimated to be large enough to repay the cost of all power features with interest at 3 percent, and [*sic*] provide substantial surplus applicable to other project costs."[8] Nevertheless, the federal government was taking a leading role is supplying electricity to homes, communities, and industry throughout the basin. For the Bureau of Reclamation this responsibility meant constructing an integrated transmission grid that would not only tie together Reclamation and Corps power facilities, but also those belonging to rural cooperatives, public, and private power corporations.

Power Development

The history of the Bureau of Reclamation PSMBP Transmission Division is incomplete without considering the breadth and scope of hydropower development in the basin. Reclamation planned for an interconnected grid system that included tying in transmission lines to Corps facilities at Fort Peck, Garrison, Randall, Gavins Point, Big Bend, and Oahe powerplants. In addition, Reclamation looked to construct 17 powerplants: 6 in Montana, 8 in Wyoming, and 3 in South Dakota. In total these hydroelectric units would have an installed capacity of 758,500 kilowatts capable of generating 3,809,200,000 kilowatt-hours of firm energy.[9] This effort also included the string of Colorado-Big Thompson Project powerplants,

[8] United States Senate, *Missouri River Basin: Conservation, Control and Use of Water Resources of the Missouri Basin in Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Iowa, and Missouri* (Report by Secretary of the Interior Harold L. Ickes on the Bureau of Reclamation's Plan for Basin Development) S.Doc. 191, 78th Cong., 2nd sess., April 1944, 25.
[9] *Ibid*., 23-24.

which were eventually tied into the PSMBP transmission grid; along with existing power facilities already in use on existing Reclamation projects, such as Shoshone, North Platte, and Riverton. The goal of the Transmission Division was to keep pace with powerplant construction to ensure connections were in place as they went online. Accordingly, Reclamation meant to have in place "approximately 6,600 miles of lines in voltage from 230,000 to 33,000 volts, and 170 substations with approximately 1,620,000 kva [kilo volt amperes] by 1956. Planned interconnections between powerplants and additional lines to reach new markets will increase by approximately 8,300 the mileage of the transmission system by the end of fiscal year 1959."[10]

Electricity from these new facilities would serve multiple purposes. Because many of Reclamation's PSMBP units contained an irrigation element, power for pumping irrigation water was the first priority. Reclamation would then market any excess power for domestic, municipal, commercial, and industrial uses. The Transmission Division responsibilities were crucial to connecting these multiple sources of electricity, rural cooperatives, public and private utilities with federal facilities, into one integrated system. What was envisioned was "a continuous chain of transmission lines . . . from Great Falls, Montana, to Sioux City, Iowa. By lease of excess lines capacity in the Montana Power Company system between Great Falls and Canyon Ferry . . . the output of Canyon Ferry can be integrated with Fort Peck, Garrison, Oahe, Fort Randall and Gavins Point. This interconnection . . . is the principal 'backbone' system connecting ultimately 1,600,000 kilowatts of installed capacity."[11]

This type of coordination among power facilities was not new to the Bureau of Reclamation. On the western edge of the Missouri River basin, Reclamation operated its own

[10] United States Department of the Interior, Missouri Basin Field Committee, "Program for the Missouri River Basin, an Annual Restatement," December 1950, 74, in RG 115, Engineering and Research Center, Acc # 8NN-115-89-019, Box 533.
[11] *Ibid*.

interconnected system. In its report to Congress outlining proposals for Missouri River basin development, Reclamation noted its existing interconnected transmission grid system. In Wyoming alone, Reclamation operated five hydroelectric plants and owned and maintained approximately 800 miles of high voltage transmission lines. This transmission system covered not only most of Wyoming, but also interconnected with northern Colorado over a 115,000-volt line extending from Cheyenne to Greeley, Colorado. Lines then extended into western Nebraska connecting to the Consumer Public Power District's team-generating plant in Scottsbluff, Nebraska. "This grid is also connected and coordinated with the transmission lines and generating facilities of the Montana State Power Co., and with several municipalities, other privately owned small utility systems, and several isolated fuel-burning generating plants operated by large industry."[12]

The Bureau of Reclamation's Pick-Sloan Missouri Basin Program Transmission Division oversaw construction, maintenance, and operation of this integrated grid throughout the Missouri River basin. In the beginning the division was divided into two divisions: Region 6 headquartered in Billings, Montana [at the time referred to as the Upper Missouri Region] managed the Eastern Division; while Region 7 [Lower Missouri Region] in Denver, Colorado, oversaw the Western Division. Region 6 covered "power marketing areas in Montana and Wyoming east of the continental divide, in North and South Dakota and western Minnesota." Eastern Division responsibilities primarily involved developing the power grid to interconnect Corps of Engineer facilities on the main stem of the Missouri River. Region 7 consisted of transmission facilities in western Nebraska, Colorado, and Wyoming. This system included marketing power from existing Reclamation powerplants on the North Platte, Shoshone,

[12] Senate Doc. 191, 78th Congress, 2nd session, 1944, 126.

Kendrick, Colorado-Big Thompson projects, along with PSMBP projects such as Canyon Ferry, Yellowtail, and Kortes powerplants.[13] Within each division, Reclamation formed geographic districts: the Missouri-Oahe District, the Upper Missouri District, the Yellowstone District, the Big Horn District, and the North/South Platte District.

North/South Platte River District

The Bureau of Reclamation's Lower Missouri Region (Region 7) in Denver, Colorado, began construction of transmission lines in the North Platte River District in 1947-1948. Power-wise the district had a sound foundation but needed additional power sources to expand the system. Existing powerplants included the Shoshone Powerplant on the Shoshone Project and the Pilot Butte Powerplant on the Riverton Project, both in Wyoming. These facilities were joined by the Guernsey and Lingle powerplants on the North Platte Project in Wyoming/Nebraska and Seminoe Powerplant on the Kendrick Project in Wyoming. At the time a major addition to the districts power resources was eagerly awaited with the completion of the Colorado-Big Thompson Project in eastern Colorado, which included the addition of six powerplants and power transmission facilities connected to nearly 677 miles of transmission lines, 35 permanent substations, 2 mobile substations. In addition, construction on the PSMBP began in earnest which significantly added to the districts power capabilities with the construction of Kortes Dam and powerplant and Glendo Dam and powerplant on the North Platte River in Wyoming.[14]

[13] United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History, Transmission Division, Missouri River Basin Project," Volume 14, 1960, in RG 115, Records of the Bureau of Reclamation, Entry 10, Project Histories and Feature History Reports, Box 362.
[14] United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri River Basin Project Transmission Division, Region 7–North Platte River District," 1947-1948, in RG 115, Entry 10, Box 372.

Line work in the district began by running transmission lines from existing facilities to new powerplants then under construction. For example, the Seminoe-Kortes to Casper 115-kV Transmission line extended east from Casper, Wyoming, through Glendo and Guernsey into Nebraska and Colorado connecting to the Colorado-Big Thompson Project. By 1950 Reclamation had reported that many of these lines had been completed, such as the Cheyenne-Pine Buffs 115-kV Line and the Gering-Allaince 115-kV line. Reclamation was also busy executing the second phase of its responsibility in securing dependable power service to rural communities and marketing PSMBP power. Power delivery contracts had been signed with Lusk and Pine Bluffs, Wyoming, multiple rural cooperatives in Nebraska and Wyoming , and with one government agency, the U.S. Army's Sioux Ordinance Depot in Nebraska. The district reported, "The power system of the rural cooperatives in the market area expanded considerably during the year 1950. For example, the Wheat Belt Membership Association awarded a contract for the construction of 435 miles of electric power lines," and "the Panhandle Rural Electric Membership Association awarded a contract . . . for the construction of 332 miles of lines to serve 172 customers and the town of Arthur"[15]

In 1951 the Bureau of Reclamation completed construction the Kortes Unit of the Missouri Basin Program, on the North Platte River in Wyoming. The dam and powerplant were the first facilities built by Reclamation under the PSMBP and an important addition to the Transmission Division's efforts. The completion of the Kortes Powerplant was quickly followed by the construction of the Alcova Powerplant, the second unit on the Kendrick Project, which

[15] United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri River Basin Project Transmission Division, Region 7–North Platte River District, 1949, 19; United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri River Basin Project Transmission Division, Region 7 – North Platte River District, 84-85, in RG 115, Entry 10, box 372.

exemplifies the interconnectedness built into the transmission system.[16] Further expansion of the Pick-Sloan power grid within the district area was somewhat delayed due to concerns about the effect the proposed Glendo Dam, on the North Platte River in Wyoming, would have on the 1945 North Platte Decree. The 1945 Decree directed North Platte River water use and allotment among the states of Wyoming, Colorado, and Nebraska. In June 1953 the states reached an agreement and modified the decree to allow the construction of Glendo Dam and Powerplant, which began in 1954.[17] In 1952, the Transmission Division connected the Kendrick Project power facilities, near Casper, Wyoming, with those of North Platte, Shoshone, and Riverton projects, creating a network of power lines almost 1,400 miles in length. At this time also, the division consolidated marketing efforts with the integration of power systems within the Missouri River basin and the Kendrick facilities, referred to as the Missouri River Basin Projects-Western Division.[18]

In 1953 work began on connecting North Platte District facilities with those of the Colorado-Big Thompson Project and the Big Horn District. This integration among geographical areas was an effort to consolidate all Western Division facilities. The Colorado-Big Thompson Project became a major Bureau of Reclamation power producer for districts in the division's southern area; what was called the South Platte District.[19] Power facilities in the

[16] For more information on the Kortes Unit and Alcova Powerplant on the Kendrick Project, see Wm. Joe Simond, "Kortes Unit, Oregon Trail Division, Pick-Sloan Missouri Basin Program," Denver: Bureau of Reclamation History Program, 1996; Leisl A. Klajic, "The Kendrick Project (Casper-Alcova)," Denver: Bureau of Reclamation History Program, 2000, www.usbr.gov/history/projhist.html.
[17] United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri Basin Project Transmission Division, Region 7 – North Platte River District, 1951, 54-55, in RG 115, Entry 10, Box 372; United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri Basin Project Transmission Division, Region 7 – North Platte River District, 1952, 12-13, in RG 115, Entry 10, Box 373; For more information on the modification of the 1945 North Platte Decree, see "North Platte Article," http://www.hagemanlaw.com/_pdf/writings/North_Platte_Articles.pdf (Accessed July 2016).
[18] United States Department of the Interior, Bureau of Reclamation, "Project History of Missouri Basin Project Transmission Division, Region 7 – North Platte River District, 1952, 64, 70, in RG 115, Entry 10, Box 373.
[19] For more information on the Colorado-Big Thompson Project, see Robert Autobee, Colorado-Big Thompson Project," Denver: Bureau of Reclamation History Program, 1996, www.usbr.gov/history/projhist.html.

Big Horn Basin, covering much of the northwest area of the Western Division included Pilot Butte, Shoshone, Heart Mountain, and Boysen powerplants. Eastern Division transmission lines ran form northeastern Nebraska to Sioux City, Iowa. Power for these lines came primarily from Corps of Engineer powerplants along the Missouri River's main stem. This system represented an interconnection between Region 7 facilities with those of Region 6.[20]

The North Platte District, indeed the whole Western Division, anticipated the inclusion into the system of Yellowtail Dam and Powerplant. Although construction of those facilities did not begin until 1963, Transmission Division plans were already in the works. Not only would the proposed 250,000-kilowatt powerplant significantly add to the division's already impressive power production capability, but Reclamation also looked to expand its power marketing beyond the Missouri River basin. In 1957 Transmission Division Annual History reported that an interconnection with the Northwest Power Pool was made with Pacific Power and Light when a "line between Billings and Yellowtail was placed in operation December 20, 1956."[21]

Yellowstone District

In 1933 the Corps of Engineers began construction of Fort Peck Dam in northeastern Montana. It was the first large power development along the main stem of the Missouri River. The Corps designed the multipurpose project to develop hydropower, stabilize river navigation, and provide flood control. In 1938 Congress passed the Fort Peck Project Act primarily to ensure funding for the dam's completion. But the act also directed the Bureau of Reclamation to

[20] United States Department of the Interior, Bureau of Reclamation, Region 7 – North Platte District, 1953, 45, in RG 115, Entry 10, Box 373; United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History Calendar Year 1965 Transmission Division, Missouri River Basin Project in Two Section: Section I North Platte System, Section II South Platte-Lower Platte System," Volume Number 9, 1956, 2, in RG 115, Entry 10, Box 373.

[21] United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History Calendar Year 1957 transmission Division, Missouri River Basin Project in Two Sections: Section I North Platte System, Section II South Platte-Lower Platte System," Volume Number 10, 1957, 2, in RG 115, Entry 10, Box 374.

construct transmission lines for the operation and marketing of all electrical power. Fort Peck Powerplant became the foundation for an interconnected transmission system, especially for the PSMBP Transmission Division's Yellowstone District.[22]

The mission of the Yellowstone District was to construct transmission lines along the Yellowstone River in Montana. These lines extended east and south out from Miles City, Montana, toward Williston, North Dakota. One of the districts priorities was integrating Fort Peck power to the hydro-plant at Garrison Dam, another Corps of Engineer's facility on the Missouri River in central North Dakota. To accomplish this, Reclamation began construction of the Williston Substation in 1946 to serve "as a tie line between generating plants."[23]

Similar to what occurred throughout Transmission Division activities, the district oversaw the interconnection of new lines with existing facilities. These activities included the district running lines to REA cooperatives in southwestern North Dakota and northwestern South Dakota. The district also connected federal transmission lines with private companies such as the Montana-Dakota Utilities Company and Montana Power Company. In some cases, Reclamation utilized these power facilities through either direct connections or wheeling arrangements that transmitted Reclamation power over private power lines.[24]

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[22] For more information on the construction of Fort Peck Dam, see David P. Billington, Donald C. Jackson, and Martin V. Melosi, *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams* (Denver, Colorado: U.S. Department of the Interior, Bureau of Reclamation, 2005), 235-265; for information on the Fort Peck Project Act, see "An act to authorize the completion, maintenance, and operations of the Fort Peck project for navigation, and other purposes (Act of May 18, 1938, ch. 250, 52 Stat. 403), in United States Department of the Interior, Bureau of Reclamation, *Federal Reclamation and Related Laws Annotated* Volume I of Three Volumes through 1942, Richard K. Pelz, editor (Washington, D.C.: United States Government Printing Office, 1972), 604-607.

[23] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division Yellowstone District, Missouri River Basin Project," Volume I, 1948, 2-3, in RG 115, Entry 10, Box 363; for more information on Garrison Dam, see *The History of Large Federal Dams*, 278-287.

[24] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division Yellowstone District, Missouri River Basin Project," Volume II, 1949, 4, in RG 115, Entry 10, Box 363.

By the early 1950s, Congress began to question whether this help or assistance to rural cooperatives or more significantly private power corporations was appropriate. In 1953 the Missouri Basin Field Committee stated that "the Federal Government is assuming the obligation of meeting essentially all future commitments for power supply and . . . must schedule expansion within the limitations imposed by the framework and procedures of congressional appropriations on an annual basis." While Congress routinely supported efforts to expand the Missouri River basin's power grid, it often did not move on components as quickly as Reclamation would have wished, such as delaying authorization of Yellowtail Dam and Powerplant in Montana. Nevertheless, some members of Congress openly wondered whether private and public corporations were just taking advantage of government programs. Congressman Ben Jensen of Iowa asked, "Are we justified in taking the taxpayers' money and building that backbone transmission system which is going to cost millions of dollars just because the private utilities now agree to let the Bureau of Reclamation build it and hence they will be relieved of that expense?"[25]

Congressman Jenson's question basically went to heart of the whole Missouri River basin power transmission plan. Was the federal government's power grid system meeting project needs or subsidizing private power interests by doing work they refused to do to serve customers? As an example, in its 1952 appropriations request, Reclamation had asked for funding to construct transmission lines from Sioux City, Iowa, to Omaha, Nebraska, which Congress denied. For the 1953 budget, Reclamation once again requested funds to construct the same line. Jenson wondered if it was prudent "to build a line into a state that pays no Federal

[25] Missouri Basin Field Committee, March 1953, VI-15, in RG 115, Project Reports, Acc# 8NN-115-89-019, Box 534; U.S. House of representatives, Subcommittee of the Committee on appropriations, *Interior Department Appropriations for 1953*, Hearings, 82nd Cong., 2nd sess. (Washington, D.C.: United States Government Printing Office, 1952), 1031.

taxes from power generated from their facilities . . . and here you are asking the taxpayers of America to spend millions of dollars to transmit power from Government-financed dams into a state which is one of the public power States and does not pay Federal taxes; they are not required to pay any federal taxes." Reclamation officials responded claiming that construction of the transmission systems was necessary to keep up with production and the powerplants. Assistant Commissioner Harvey F. McPhail stated that "when you match plant capacity on the one hand and the market requirements on the other hand, it is necessary to construct facilities capable of handling the capacity of the plants and further provide reasonable service in line with the type of service people in this country have become accustomed to."[26]

In the Yellowstone District, Transmission Division activities tended to both assist private and public power corporations and fulfill other aspect of project purposes. In 1950 Reclamation began construction of the Forsyth Substation, in Montana. These facilities would supply electricity the "to the Mid-Yellowstone Rural Cooperative and to irrigation facilities of the Montana State Water Board in the vicinity of Myers, Montana." In the end, and one that would play out throughout the entire basin, the grand vision was an interconnected system that integrated all power producers, of which a key component was the proposed Yellowtail Unit. A 1952 district report stated, "In the Yellowtail District, required Transmission Division facilities consist mainly of the system needed in connection with the proposed Yellowtail Unit near Harding, Mont. . . . The proposed transmission system includes lines from Yellowtail to Hot Springs, S.Dak., Lovell, Wyo., and Miles City, Livingston, and Billings, Mont. These lines will

[26] *Interior Department Appropriations for 1953*, Hearings, 1031-1032.

interconnect Yellowtail with Oahe, Fort Peck, Bighorn Basin, and Canyon Ferry power systems."[27]

Big Horn District

The Big Horn District of the Transmission Division centered its area of operations in Montana and Wyoming. Reclamation power facilities at Heart Mountain and Shoshone powerplants on the Shoshone Project and Pilot Butte Powerplant on the Riverton Project were the primary power resources.[28] As in other areas throughout the Missouri River basin, Reclamation claimed, "Power requirements in the Big Horn Basin have already greatly exceeded power production in the basin. . . . The power demand created by an increase on the oil development in the basin . . . and applications on file by REA cooperatives, greatly exceeds the present capacity of all plants." To ease this shortage, power productions capabilities increased with the addition of Boysen Powerplant on the Wind River in Wyoming, which was completed in 1952. The Big Horn District was also actively involved in carrying out project requirements in creating an integrated system throughout the basin. In 1949, connections between the Region 6 and Region 7 were accomplished by the construction of 100-mile Boysen-Alcova transmission line. [29]

During the early 1950s, delays in construction of transmission lines in the Big Horn District were often due to lack of building materials. Resource shortages were the result of the

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[27] "Annual Project History Transmission Division Yellowstone District, Missouri River Basin Project," Volume II, 1949, 4;in RG 115, Entry 10, Box 363; U.S. Department of the Interior, Bureau of Reclamation, Region 6, "Missouri River Basin Project in the Yellowstone District, February 1952.

[28] For more information on the Shoshone and Riverton projects, see Eric A. Stein, "Shoshone Project," Denver: Bureau of Reclamation History Program, 1996; Robert Autobee, "Riverton Unit, Pick-Sloan Missouri Basin Program," Denver: Bureau of Reclamation History Program, 1996, www.usbr.gov/history/projhist.html.

[29] United States Department of the Interior, Bureau of Reclamation, "Part 2, Missouri River Basin: Justification for Appropriations Fiscal Year Ending June 20, 1947," 13, in RG 115, Project Reports, 1910-1955, Acc# 8NN-115-85-019, Box 616; United States Department of the Interior, Bureau of Reclamation, "Missouri River Basin Project in the Big Horn District," 1959, 3, in RG 115, Project Reports, Acc# 8NS-115-95-083.

Korean War and priorities for materials established by the Defense Electrical Power Administration. Despite these setbacks, the district continued to make progress completing the Boysen-Thermopolis 115-kV line and the Thermopolis Substation in 1951. Progress was also interrupted for other reasons such as lack of funding provided by Congress. In 1952 Reclamation noted, "Award of contracts for construction of the Lovell-Yellowtail transmission line was delayed because funds were not allowed by Congress for construction of Yellowtail Dam and the Billings-Yellowtail transmission line." That same year the district also ran into trouble when the Crow Indian Tribe refused to grant an 18-mile right-of-way through the reservation, forcing the line's relocation.[30]

Similar to other districts within the Transmission Division, the Big Horn District was responsible for marketing electrical power produced at Reclamation powerplants. In the early 1950s while awaiting completion of PSMBP facilities, the district accomplished part this through leasing portions of established Reclamation project features connected to Pilot Butte, Shoshone, and Heart Mountain powerplants. These consisted of transmission lines, substations, and switchyards to help serve outlying areas "in Big Horn, Washakie, Hot Springs, and Fremont Counties in northwest Wyoming." For example, the district leased 163.35 miles of transmission lines and five substations from the Shoshone Project, and 75.81 miles of lines and three substations from Riverton. While the revenues accrued to the Missouri River Basin Project Transmission Division, the projects were "reimbursed for their generation on the basis of Annual Average Rate and Repayment Study for each project."[31]

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[30] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division, Big Horn District, Missouri River Basin Project," Volume III, 1951, 1, 4, in RG 115, Entry 10, Box 363; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division, Big Horn District, Missouri River Basin Project," Volume IV, 1952, 2, in RG 115, Entry 10, Box 363.

[31] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division, Big Horn District, Missouri River Basin Project," Volume IV, 1952, in RG 115, Entry 10,

Missouri-Oahe District

The Missouri-Oahe District of the Transmission Division was centered in South Dakota and the marketing areas included all of South Dakota and western Minnesota. Similar to other districts within the divisions, plans were to expand the area's current transmission capabilities, through construction of a 230-kV backbone system, along with a supporting transmission system of 115-kV and 69-kV lines. In 1952 Reclamation reported, "Potential power installation at multi-purpose dams proposed for construction in the Missouri-Oahe District is in excess of 1,000,000 kilowatts." This integrated grid was to provide power to rural cooperatives, municipal power systems and federal and state institutions.[32]

Corps of Engineer main stem dams and powerplants supplied the bulk of the division's power. Early Corps powerplants to come online were Fort Randall in southeastern South Dakota and Gavins Point along the Nebraska/South Dakota border downstream of Fort Randall. These facilities were later interconnected with Oahe Dam north of Pierre, South Dakota, and Big Bend Dam in central South Dakota. District goals were to keep transmission line development ahead of powerplant construction to ensure delivery when those plants went online. The impetus for this development was motivated by a lack of reliable power throughout the district's service area.[33]

Box 364; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division, Big Horn District, Missouri River Basin Project," Volume V, 1953, 1, in RG 115, Entry 10, Box 364.

[32] United States Department of the Interior, Bureau of Reclamation, Region 6, "Missouri River Basin Project in the Missouri-Oahe District," February 1952, 3; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division Missouri-Oahe District, Missouri River Basin Project," Volume I, 1949, 1, in RG 115, Engineering and Research Center, Acc# 8NN-115-90-011, Box 93.

[33] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division Missouri-Oahe District, Missouri River Basin Project," Volume I, 1949, 1, in RG 115, Engineering and Research Center, Acc# 8NN-115-90-011, Box 93; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Transmission Division Missouri-Oahe District, Missouri River Basin Project," Volume II, 1950, 6, in RG 115, Engineering and Research Center, Acc# 8NN-115-90-011, Box 93.

In 1950 this urgency led Congress to provide additional funding for what became known as the Advanced Construction Program. This effort consisted on two transmission systems deemed essential for overall development. The first was referred to as the East Loop with power provided by the Fort Randall Powerplant. Second was the Rapid City-Wasta-Midland Line which was powered by existing Missouri River Basin Project facilities until interconnected to a 230-kV backbone line running from Oahe Powerplant. By 1953 the Advanced Construction Program had completed the "Gavins Point Tap-Sioux Falls and Sioux Falls-Brooking section so the East River Loop; Midland, Philip, Wall, and Wickensville Substations, and first stage construction of the Armour, Huron, Mount Vernon, Sioux Falls, Tyndall, Watertown, and Woonsocket Substations."[34]

In 1954 generating units at Fort Randall went online, adding 40,000 kilowatts to the system. Power production at Fort Randall marked the beginning of the end of the Advanced Construction Program, as the plant began to supply power to 37 project customers which included municipalities, rural cooperatives, and private utilities. By 1956 the interconnectedness of the entire basin program was beginning to take shape. Region 6 and 7 reached an agreement over O&M responsibilities for the Sioux City Substation, which received some electricity from facilities along the Platte River. The agreement was worded so that "O&M funds for the substation will be programmed by Region 7 with operation of the substation to be the responsibility of the Missouri-Oahe Project Office with costs to be reimbursed by Region 7."[35]

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[34] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe District, Transmission Division, Missouri River Basin Project," Volume II, 1950, 8; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe District, Transmission Division, Missouri River Basin Project," Volume IV, 1952, 10; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe District, Transmission Division, Missouri River Basin Project," Volume V, 1953, 9-11, in RG 115, Entry 10, Box 367; "Missouri Basin Power Line in Iowa," *Reclamation Era*, 38 (October 1952): 236.

[35] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe District, Transmission Division, Missouri River Basin Project," Volume VI, 1954, 15-16 RG115, Entry 10,

The broad geographic expanse and responsibilities of the Transmission Division within the Missouri River basin took its marketing efforts beyond the seventeen western states Reclamation historically had handled. A 1950 report from the Missouri Basin Field noted, "The planning of the Missouri river power system, unlike other parts of the integrated Basin Program, is not confined to the Basin as to geographic scope. Much of the transmission system will be outside the Basin, in areas of concentrated population and power requirements . . ." This aspect of novel duties for the Bureau of Reclamation was best exemplified in the activities of the Missouri-Oahe District, where one marketing area was western Minnesota.[36]

By 1951 there were sixteen electric cooperatives and three private electric companies in Minnesota had requested the Bureau of Reclamation to develop and construct transmission facilities to tie into their systems. Much of the power for western Minnesota customers came from Gavins Point Powerplant and a "230-kilowatt transmission loop between Fort Randall and Garrison power plants." As time went on, Reclamation marketing efforts in the Eastern Division of the Transmission Division branched out even farther. In 1958 portions of western Iowa were included as part of the power marketing area and, by 1965, eastern Nebraska and northern Missouri were receiving electricity from PSMBP hydro-plants.[37]

Box 367; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe District, Transmission Division, Missouri River Basin Project," Volume VIII, 1956, 27, in RG 115, Entry 3, Box 368.

[36] United States Department of the Interior, Missouri Basin Field Committee, "Program for the Missouri River Basin, an Annual Restatement," December 1950, 74, in RG 115, Engineering and Research Center, Acc# 8NN-115-89-019, Box 533.

[37] *Interior Department Appropriations for 1953*, Hearings, 1025; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe Project, Transmission Division, South Dakota, Missouri River Basin Project," Volume X, 1958, 1, in RG 115, Entry 10, Box 369; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe Projects, Transmission Division, South Dakota, Missouri River Basin Project," Volume XVI, 1964, 1, in RG 115, Engineering and Research Center, Acc# 8NN-115-92-130, Box 8; United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe Projects, Transmission Division, South Dakota, Missouri River Basin Project," Volume XVII, 1965, 1, in RG 115, Engineering and Research Center, Acc# 8NN-115-92-130, Box 21.

By the end of the 1950s, the Transmission Division's Eastern Division had made substantial progress in constructing an integrated circuit that supplied power throughout the eastern portion of the Missouri River basin. In 1959, Reclamation constructed a central control room, or dispatching office, to oversee all operations within the Eastern Division. The Power System Operations Office in Watertown, South Dakota, became the nerve-center for all power distribution in the marketing area. Reclamation noted that the office "regulates the production of 795,000 kilowatts of power at the mainstem powerplants presently in operation and distribution of that power over 3,700 miles of transmission lines, through more than 80 Federal substations, to over 125 wholesale customers in an area covering more than 270,000 square miles."[38]

Transmission Division

As mentioned throughout, the Bureau of Reclamation envisioned a widespread integrated transmission system that tied to all power producing facilities within the Missouri River basin. By 1960 construction costs amounted to over $55 million dollars, and the Transmission Division estimated that the final price tag at almost $168 million dollars. Along with the Corps of Engineers' main stem dams, the Bureau of Reclamation constructed two large facilities that added to the PSMBP power output. The inclusion of Canyon Ferry Dam and Powerplant, located just fifty miles downstream from where the Madison, Jefferson, and Gallatin rivers form the Missouri River in Montana, in 1954 added another 50,000 kilowatts to the system. In 1961 Reclamation began construction of Yellowtail Dam and Powerplant on the Big Horn River ninety miles southeast of Billings, Montana. Completed in 1966, the Yellowtail Powerplant held

[38] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe Projects, Transmission Division, South Dakota, Missouri River Basin Project," Volume XI, 1959, 9, in RG 115, Entry 10, Box 369.

four turbines with an installed capacity to produce 250,000 kilowatts and marked the "northerly end of the integrated system."[39]

As mentioned earlier, both Eastern and Western Divisions of the Transmission Division collaborated on ensuring a reliable power grid and stable supply system. However, each division had its own constraints on how that power was produced. In 1962 Reclamation reported that in the Western Division "analysis of runoff forecasts develop guides to power production from irrigation systems; whereas, in the Eastern Division the operation is a marketing one, in conjunction with Region 6, with power produced at the Corps of Engineers' main stem powerplants." Much of this had to do with the greater irrigation pumping requirements within the Western Division, the top priority of power production from Reclamation hydro-plants, but it was also dependent on snowfall amounts in western mountain ranges. In other words, in periods of low runoff the Western Division power grid relied upon Corps of Engineers' main stem powerplants. For example, in 1965, "the outlook for power production indicated that energy would be required from outside sources in rather large quantities. Off peak energy was received at the maximum rate at the beginning of the year. MRB Eastern Division was the chief supplier."[40]

This example shows how the integrated transmission system was designed to work. Over time Reclamation's transmission grid expanded and coordinated efforts beyond the area of

[39] United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History, Transmission Division, Missouri River Basin Project," Volume 14, 1960, 10, in RG 115, Entry 10, Box 362; for more information on Canyon Ferry Unit and Yellowtail Unit, see Eric A. Stene, "Canyon Ferry Project, Pick-Sloan Missouri Basin Program," Denver: Bureau of Reclamation History Program, 1994; Carolyn Hartl, "Yellowtail Unit, Pick-Sloan Missouri Basin Program," Denver: Bureau of Reclamation History Program, 2001, www.usbr.gov/history/projhist.html.

[40] United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History, Transmission Division, Missouri River Basin Project," Volume 15, 1962, 12, in RG 115, Engineering and Research Center, Acc# 8NN-115-88-053, Box 115; United States Department of the Interior, Bureau of Reclamation, Region 7, "Annual Project History, Transmission Division, Missouri River Basin Project," Volume 18, 1965, 13-14, in RG 115, Engineering and Research Center, Acc# 8NN-115-92-130, Box 21.

encompassing the Missouri River basin. At the opening of the Power Systems Operations Office, the Missouri-Oahe District opined that the office "is probably the most important single installation in the Eastern Division power system at the present time. It is also one of the key features of a possible gigantic interconnected power network of the future that may someday stretch from the Atlantic to the Pacific." While this statement might appear a little hyperbolic, it was not too far off the mark. The Bureau of Reclamation was very much interested in integrating its vast hydropower network with other power producers throughout the West. For example, during the late 1960s, Reclamation constructed the Pacific Southwest/Pacific Northwest Intertie that connected power facilities at Hoover and Grand Coulee dams to those of West Coast public and private power producers.[41]

By 1970 the Bureau of Reclamation's transmission system was virtually complete and interconnected throughout the Missouri River basin. The Power Systems Office reported,

> As of December 31, 1970, the physical facilities included 2,348,000 kilowatts of hydrogenation at eight plants, 5.1 million kva of transformer capacity in 90 substations and 7,100 miles of 345-, 230-, 161-, 115-kv and lower voltage transmission lines located in Eastern Montana, North Dakota, South Dakota, Western Minnesota, Northern Nebraska, Western Iowa, and Northwestern Missouri. The operation of the system includes the scheduling and dispatching, the accounting and billing of all power and energy from Federal Powerplants for 363 customers.

And as promised when construction of the transmission grid began in the late 1940s, this system was a revenue generator as the net income for 1970 reached $55,451,303.56. In addition, sales of electricity went beyond basin customers to include purchases made by

[41] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History Missouri-Oahe Projects, Transmission Division, South Dakota, Missouri River Basin Project," Volume XI, 1959, 9, in RG 115, Entry 10, Box 369; for more information on the Pacific Northwest/Pacific Southwest Intertie, see Toni Rae Linenberger, "Pacific Northwest-Pacific Southwest Intertie," Denver: Bureau of Reclamation History Program, 2013, www.usbr.gov/history/projhist.html.

Bonneville Power Administration, Parker-Davis Project, and Colorado River Storage Project.[42]

Conclusion

Unlike water, which can only be transported a relatively short distances, electricity can travel over extensive areas. Transmission Division lines and substations interconnected to multiple Corps of Engineer and Bureau of Reclamation powerplants, moved and delivered power over a broad expanse. While power generation and delivery has been a staple of Reclamation projects almost from the very beginning, it took on new importance in the context of the Pick-Sloan plan. It was the key to any success the program might show. The revenues from power production helped to offset construction costs and continued water resources development. Irrigation development promised in the early years of the PSMBP construction never reached expectations. For example, both the Garrison and Oahe projects in North and South Dakota respectively proposed expanding agricultural opportunities in both states. Both projects fell victim to environmental and economic concerns and, by the mid-1970s, were drastically scaled back.[43] Yet the power production from both hydropower facilities continue to play key roles meeting electrical needs throughout the Great Plains and beyond.

In 1977 Congress passed the Department of Energy Organization Act, creating a new federal agency mandated with managing and coordinating the nation's energy policy. Out of this legislation came the birth of the Western Area Power Administration (WAPA) and the transfer of

[42] United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History, Missouri River Basin Project, Power System Operations Office," Volume XII, 1970, 1-2, 9, in RG 115, Engineering and Research Center, Acc# 8NN-115-92-053, Box 130; Region 6, "Power Supply, Sales, and Revenue Missouri River Basin Project Calendar Year 1970," February 1971, 1, in United States Department of the Interior, Bureau of Reclamation, Region 6, "Annual Project History, Missouri River Basin Project, Power System Operations Office," Volume XII, 1970, in RG 115, Engineering and Research Center, Acc# 8NN-115-92-053, Box 130.

[43] Congress authorized the Garrison Unit of the PSMBP in 1965 to irrigate one million acres in east-central North Dakota. The irrigation phase of the Oahe Project, authorized in 1968, proposed to irrigate 190,000 acres in the north-central part of eastern South Dakota.

power marketing functions within the Department of the Interior to the Department of Energy.[44] For the Bureau of Reclamation, this transfer not only removed all marketing responsibilities throughout the Missouri River Basin, but also conveyed ownership and maintenance of all Transmission Divisions power lines and substations to WAPA. While the creation of WAPA affected hydropower activities throughout Reclamation, it proved to be the end of the PSMBP Transmission Division.

Achievements of the PSMBP Transmission Division produced tremendous results. It aided in the stabilization of electrical distribution throughout the eastern Rockies and the Great Plains. Power-deficient rural electrical association, public and private corporations received much needed boosts of electricity to insure steady deliveries to rural customers. Moreover, Pick-Sloan Missouri Basin Program power production served larger commercial and urban centers, some of which are outside the seventeen western states that Reclamation normally operates. Finally, the PSMBP Transmission Division revealed the interconnectedness between water development and power production, which became the mainstay of Bureau of Reclamation activities throughout the second half of the 20th Century. Cities and agriculture were bound together by a series of canals and transmission lines.

[44] "Department of Energy Organization Act," United States Department of the Interior, Bureau of Reclamation, *Federal Reclamation and Related Laws Annotated* Volume IV of Four Volumes 1967-1982, Louis D. Mauro and Richard K. Pelz, editors (Washington, D.C.: United States Government Printing Office, 1989), 3048-3075.

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