

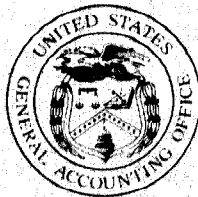
GAO

Report to the Chairman, Subcommittee on
Water and Power Resources, Committee
on Interior and Insular Affairs, House of
Representatives

December 1988

FEDERAL ELECTRIC POWER

Controversy Relating to Construction of Transmission Lines



**Resources, Community, and
Economic Development Division**

B-225290

December 6, 1988

The Honorable George Miller
Chairman, Subcommittee on
Water and Power Resources
Committee on Interior and
Insular Affairs
House of Representatives

Dear Mr. Chairman:

In your March 25, 1987, letter, you expressed your Subcommittee's concern that the Western Area Power Administration (Western) may be straying from its role as an agency responsible for marketing federal power. In that context you requested, among other things, that we review the transmission line construction activities of Western and, in particular, whether those activities comply with Western's legislative authority. We initially examined and, in October 1987, reported on the Tracy/Livermore transmission line construction project, a controversial project.¹

During subsequent discussions with your office, your staff noted that another Western transmission line construction project—the Craig/Bonanza project—had also been the subject of similar controversy in that an investor-owned utility questioned Western's role in the project.

On the basis of these discussions and as agreed with your office, we subsequently examined

- Western's justification for transmission line construction projects including joint construction projects where Western participates with other utilities in line construction, such as the proposed Craig/Bonanza line and
- Western's basis for determining its extent (percent) of participation in the costs and resulting line capacity for joint construction projects.

Overall, we found that Western justifies its transmission line construction projects primarily on the basis of improving the reliability of its

¹ Federal Electric Power: Western Area Power Administration's Tracy/Livermore Transmission Project (GAO/RCED-88-19, Oct. 27, 1987). The nature of the controversy surrounding this project involved whether Western, by constructing the line, was providing an opportunity for other suppliers to market power in an investor-owned utility's market area.



United States
General Accounting Office
Washington, D.C. 20548

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Western's Transmission Line Construction and Related Controversy

In our October 1987 report on the Tracy/Livermore project, we stated that because the impetus for this line was to deliver federal power from Western's system, we found no legal basis to question Western's authority to construct the line. As with the Tracy/Livermore line, 27 other Western transmission line construction projects that we reviewed are to be used to deliver federal power.² Thus, we have no legal basis to question Western's general authority to construct these projects since, according to Western, the lines are to be used to deliver federal power from Western's system.

Western's primary justification for constructing 21 of the 27 projects that we reviewed was to enhance the reliability of the federal transmission system. According to Western officials, Western operates and maintains its transmission system in conformance with voluntary reliability criteria established by the utility industry. Projects that are justified on the basis of improving system reliability generally do so by providing additional transmission capacity. Furthermore, through joint project construction, Western can obtain even greater line capacity than would likely result from independently constructed projects. This is particularly true if Western's participation in a joint project is based on the estimated cost of an independent project rather than the capacity that the independent project would have provided. (The results of our review of Western's construction activities is contained in app. II.)

According to Western, it has, in the past, typically sold transmission capacity excess to its needs to other utilities for their use in delivering power to their customers (wheeling arrangements). Western told us that it would likely continue to do so in the future because such use of excess transmission capacity results in additional revenue for Western. Capacity on most of the independent and joint construction projects we reviewed could be used to wheel power for other utilities.

A key element in the controversy surrounding the construction of the Tracy/Livermore and Craig/Bonanza transmission lines is the potential use of the capacity resulting from line construction. (See app. III for details on the Craig/Bonanza project.) In these two cases, investor-owned utilities expressed concern that the construction of these two lines may cause them to lose customers by providing an opportunity for

²With regard to the Craig/Bonanza project, one of the 27 projects, we are expressing no legal opinion with regard to Western's authority to construct that line as this is one of the issues in an ongoing federal court case.

other suppliers, through wheeling arrangements with Western, to deliver power in their markets. At the end of our review, Western had not yet determined how the planned additional capacity from construction of the two projects would be used.

While Western is aware of the private utilities' concerns over the use of its transmission capacity, Western believes its individual projects are justified because they enhance transmission system reliability and thus provide greater assurance that its contractual obligations in marketing federal power will be reliably and economically met. It would thus appear that in Western's decision to construct transmission lines, the goal of enhancing the reliability of its federal power marketing efforts is of primary importance even though some utilities may object to project construction on the basis that Western could sell the excess transmission capacity to other utilities that could potentially compete with them.

Matter for Congressional Consideration

In summary, Western generally justifies its transmission construction projects on the basis of improving the reliability of the federal transmission system. Transmission projects constructed on that basis generally increase the capacity of the transmission system. Further, a key element in the controversies surrounding the Tracy/Livermore and the Craig/Bonanza projects is Western's, as well as other utilities, potential use of the additional capacity that would result from these projects. Thus, in any further efforts to address the existing controversies or similar situations that could occur, the Subcommittee should consider examining (1) Western's transmission construction activities to improve system reliability and (2) how Western may use transmission capacity beyond that needed for its power marketing activities.

Western Needs to Document Construction Decisions

During our review, we noted that Western does not have a formal policy or procedures to guide and document its decisions on when to participate in joint construction projects and to what extent to participate, that is, the share of total project costs Western agrees to pay. Such guidance and documentation are needed to meet the Comptroller General's Standards for Internal Controls in the Federal Government—more specifically, the standards related to documentation and the execution of transactions and events.

Western officials told us that Western encourages participation with other utilities in joint construction because it helps lower operation and maintenance costs, minimizes environmental impact, and reduces the

need for federal appropriations. However, Western's project documentation did not demonstrate the degree to which the specific projects we reviewed resulted in these benefits and, thus, did not clearly demonstrate the reasons why Western decided to participate.

Western officials also told us that the extent (percent) of their participation in individual projects is based on the estimated cost or resulting line capacity of an independently constructed project. However, the 12 participation project case files we reviewed did not contain a description of the independent project that was used for negotiating Western's extent of participation. Western officials did provide additional documentation regarding its extent of participation when we requested such information. However, the additional information provided did not, in our view, clearly outline the basis for Western's extent of participation.

Recommendation

We recommend that the Secretary of Energy direct Western's Administrator to establish a formal policy and implement procedures to direct its involvement in joint transmission construction projects, including a requirement for documenting the basis for and the extent of its participation in individual projects.

Agency Comments

In commenting on a draft of this report, the Department of Energy concurred with our recommendation and stated that Western had already started the necessary actions to develop a formal policy and implement procedures to direct its involvement in joint construction projects. (See app. V.)

In its more detailed comments, the Department noted that Western must present to the Congress a detailed budget justification and testimony in support of every transmission line it intends to build. Therefore, according to the Department, Western has the approval of the Congress for each transmission facility which it ultimately constructs by reason of Congress' appropriation of construction funds.

We performed our work between October 1987 and May 1988 at Western's headquarters in Golden, Colorado, and at three of its five area offices. We discussed construction activities with Western officials and interviewed representatives from other utilities who are located within Western's service area. We reviewed project files, reports, and planning studies; budget documents; environmental impact statements; and joint

construction contracts (participation agreements) related to 27 construction projects, 23 of which were being constructed and 4 of which had been completed as of the end of our review. Appendix IV contains detailed discussions on our scope and methodology.

As arranged with your office, we will make no further distribution of this report until 30 days from its issue date, unless you release its contents earlier. At that time, we will send copies to the Secretary of Energy; the Director, Office of Management and Budget; and other interested parties. Copies will also be provided to others upon request.

This work was performed under the direction of Keith O. Fultz, Senior Associate Director. Other major contributors to this report are listed in appendix VI.

Sincerely yours,

A handwritten signature in black ink that reads "J. Dexter Peach". The signature is written in a cursive, flowing style.

J. Dexter Peach
Assistant Comptroller General

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Abbreviations

CRSP	Colorado River Storage Project
GAO	General Accounting Office
kV	kilovolt
MW	megawatt
NERC	North American Electric Reliability Council
UP&L	Utah Power and Light Company

Background

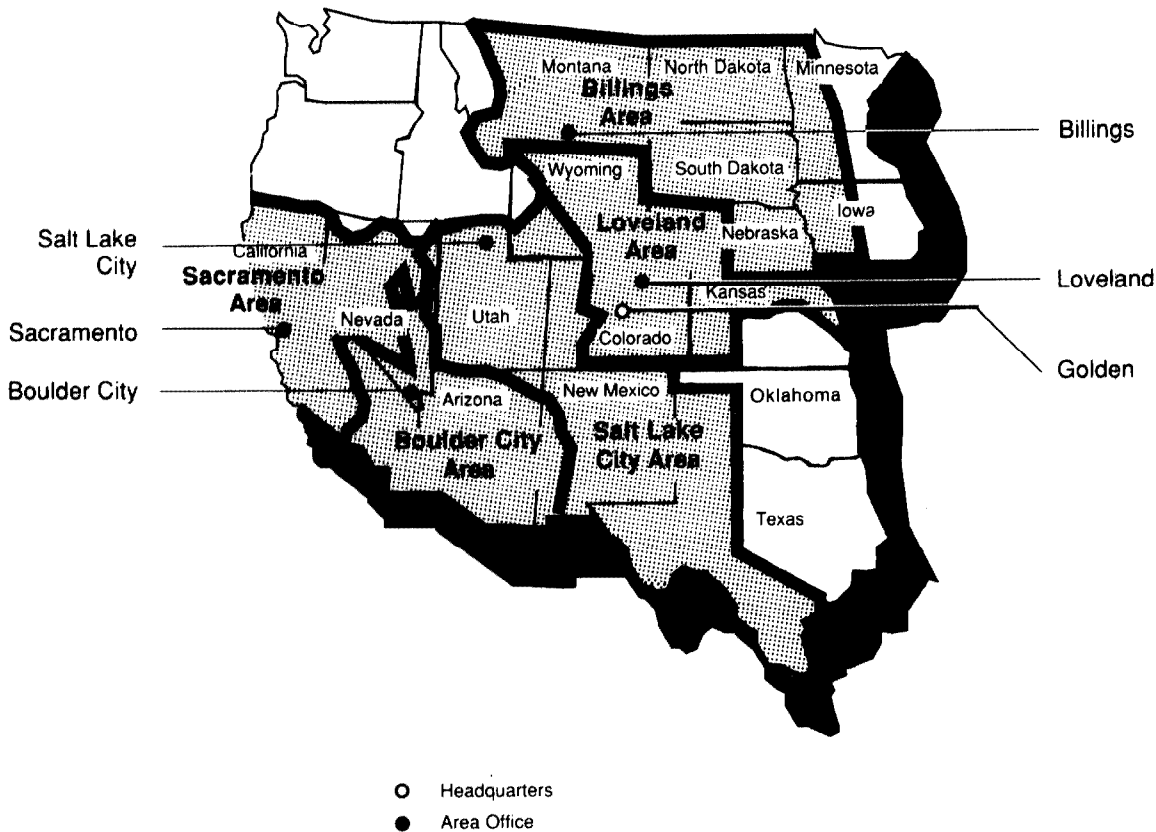
The Department of Energy Organization Act of 1977 transferred to the Secretary of Energy the power marketing functions of the Department of the Interior's Bureau of Reclamation. These functions include the construction, operation, and maintenance of transmission lines. The act also established Western to carry out these functions in 15 central and western states. Western's authority is contained in the Reclamation Act of 1902 and other acts, particularly the Reclamation Project Act of 1939 and the Flood Control Act of 1944. In addition, each federal hydroelectric project is governed by project specific legislation.

Western markets electric power generated by federal hydroelectric dams. Western summarizes its mission as the implementation of national energy policy by maintaining a viable and progressive power marketing program and providing efficient and reliable electric service to its customers.¹ Western, unlike other electric utilities, does not have the responsibility to serve the customers' new electric power or energy requirements (loads) or increases in those requirements. Any energy requirements that Western's customers may have in excess of energy available from Western must be acquired from other sources.

To accomplish its mission, Western established five area offices: Billings, Montana; Boulder City, Nevada; Loveland, Colorado; Sacramento, California; and Salt Lake City, Utah, as shown in figure I.1. The area offices are responsible for power system operation and maintenance, transmission facilities planning, and transmission project justification and construction.

¹Western must give preference in the sale of power to public entities and cooperatives, such as generation and transmission cooperatives, municipalities, public utility districts, irrigation districts, and state and federal agencies.

Figure I.1: Western's Marketing Areas



Source: Western Area Power Administration.

Western owned and operated 16,213 miles of transmission lines and 240 substations as of the end of 1987. In addition, Western either had plans for, or under construction, several transmission projects involving modifications to existing facilities or the construction of new facilities. As of January 1987, Western's three area offices that were included in our review had planned or under construction 23 transmission line projects. In addition, these area offices had completed four joint construction projects. Of these 27 projects, 15 involved replacement of existing facilities, 8 involved construction of new lines, and 4 involved a combination of the two. Total estimated Western costs for 25 of the 27 projects was \$314 million. Cost estimates for two of the projects were not available during our review.

Western's Transmission Line Construction Activities

According to Western, it plans, designs, and constructs transmission facilities to satisfy power marketing needs and to enhance system reliability. Most of transmission construction projects that we reviewed were justified on the basis that construction will improve transmission system reliability. However, construction generally results in increased system capacity for Western. Western often uses the additional capacity in the federal transmission system in its day-to-day operations. Western also sells the additional transmission capacity to other utilities through wheeling contracts.

Project Identification, Justification, and Results

Western officials told us that Western's transmission construction projects are normally identified as a result of independent or joint transmission system studies performed by Western and other utilities. These studies can be initiated as a result of transmission system operational problems or because Western or other utilities are planning changes to their respective systems. The studies evaluate the effects of planned system changes from an engineering perspective. From such studies, construction projects can be identified and evaluated. According to Western officials, Western will not construct transmission lines for the delivery of federal power if cost-effective transmission service can be purchased from other utilities.

For the 23 ongoing construction projects and 4 completed projects that we reviewed, 21 are being or were constructed primarily, in Western's view, to improve transmission system reliability. Justifications for the remaining projects included such reasons as resolving safety problems and replacing deteriorating lines. Transmission line construction can be required to satisfy power marketing needs such as integrating new federal resources (generation) into the system or delivering power to new customers. Increased generation capacity, available as a result of a power plant improvement, was cited as the justification for constructing one project. Changes to power marketing plans was not cited as a reason for construction, although each of the three area offices that we visited had recently revised their marketing plans and added new customers.

Western officials told us Western operates and maintains its transmission system in conformance with reliability criteria established by the

North American Electric Reliability Council (NERC) and regional reliability councils.¹ These criteria define and measure reliability in terms of power system performance under conditions of stress. Successful system operation should not depend on any single transmission line. In other words, taking any line out of service or losing the use of a line should not create a power outage or adversely affect the transmission system of an adjacent utility.

Construction to improve system reliability often results in additional transmission capacity. Increased capacity can accommodate unplanned electricity flows and can compensate for an unexpected loss of a line or other system component. In 23 of the 27 projects reviewed, completion of the planned project would result in additional federal transmission capacity.

In addition to the improved reliability afforded by increased capacity, Western officials stated that any additional capacity is used in day-to-day system operations for various purposes. For example, Western uses the additional capacity in the federal transmission system to deliver surplus energy, which is sold in above average water years, to receive energy purchased in low water years, and to transmit energy under its fuel displacement program.²

Western also sells the additional transmission capacity to other utilities through wheeling contracts. According to Western, some transmission line construction projects would not be cost-effective without the added revenues the new projects generate in terms of the sale of excess transmission capacity. Anticipated wheeling revenues were included in Western's economic analyses and justification for four of the projects that we reviewed. For example, Western officials estimated that its wheeling revenues from the proposed Craig/Bonanza project could exceed \$5 million annually. In another case, Western has sold 40 megawatts (MW)³ of its transmission capacity in the recently completed Rifle/San Juan line (a joint construction project) under 10-year contracts to other utilities.

¹NERC was formed by the electric utility industry in 1968 to promote the reliability and adequacy of the bulk electric power supply in North America. NERC consists of nine regional reliability councils encompassing virtually all of the power systems in the United States and Canada. Western is a member of NERC as well as two regional reliability councils—the Western Systems Coordinating Council and the Mid-Continent Area Power Pool.

²Western essentially uses its low-cost energy to meet high-demand periods and purchases low-cost thermal energy from other suppliers instead of generating hydropower during low-demand periods.

³A watt is an electrical unit of real power or rate of doing work. A megawatt equals 1 million watts.

Increasing Involvement In Joint Construction

Some transmission line construction projects involve participation agreements whereby Western and other utilities agree to jointly plan, construct, maintain, and operate transmission lines in exchange for a share in the line's capacity. Participation in joint construction is becoming more common at Western. Since 1977, Western's Billings, Loveland, and Salt Lake City area offices have entered into 12 participation agreements, whereas the Bureau of Reclamation had entered into only 1 participation agreement within the same geographical area prior to 1977. Of the 27 projects reviewed, 12 involved participation agreements—8 ongoing and 4 completed.

Western has not instituted a formal policy or established procedures to guide its decisions on when to become involved in participation agreements. However, various statements made by Western officials show that participation is encouraged. For example, during congressional testimony before the Subcommittee on Energy and Water Development, House Committee on Appropriations in March 1988, the Administrator advocated participation because, in his view, capacity expansion through participation agreements increases system reliability and efficiency, lowers operation and maintenance costs, minimizes environmental impacts, and reduces the need for federal appropriations. Earlier, in a 1984 letter to the Secretary of Energy, the Administrator stated that Western's intent is "... to make opportunities for non-Federal participation a prerequisite in any plans for improving or enlarging the Federal transmission system."

Western officials told us that Western enters into participation agreements with area utilities that can also benefit from joint construction projects through reduced costs and environmental impacts of line construction. Potential participants for joint projects include utilities within the geographical area where line construction will take place.

Once project participants have been identified, each participant negotiates its share of participation. According to Western's area office personnel, Western determines the desired extent of its participation in joint construction based on either the estimated cost or the transmission capacity of an independent project that would be needed to serve only its needs. For example, Western states that it typically analyzes the cost of or capacity need which could be obtained through an independently constructed project and enters negotiations with this cost or capacity need as the target from which it will negotiate. If Western participates on the basis of cost, it generally obtains more capacity. On the other hand, if Western's participation is based on its capacity needs, its initial

investment in the joint project is generally less than if it had independently constructed the line.

For the 12 joint projects reviewed, Western officials stated that the extent of participation was based on cost in six cases and on capacity in four cases. For the remaining projects, the basis for one was contractual delivery requirements while the other had not yet been defined during our review.

At our request, Western developed an analysis of its participation in the Rifle/San Juan project to demonstrate the basis from which it negotiated its extent of participation in construction. In this analysis, Western considered two alternatives: (1) construct an independent 230 kilovolt (kV)⁴ single circuit transmission line with capacity of 322 MW at a cost of about \$34 million or (2) participate in the construction of a single circuit 345 kV line with a capacity of approximately 1,147 MW at a total cost of about \$64 million. Table II.1 shows Western's cost comparison analysis for this project.

Table II.1: Cost Comparison Between the Rifle/San Juan Independent and Joint Construction Projects

	Voltage (kV) line size	Approximate average MW capacity	Approximate direct costs ^a	Cost per MW
Independent	230	322	\$34,253,000	\$106,376
Participation	345	1,147	64,486,000	56,221

^aFor comparative purposes, Western assumed that line corridor, terrain, conductor size, and line length are equal.

In the Rifle/San Juan case, if Western's participation was based on the cost of the independent project, then Western would negotiate its contribution to the cost of construction at about \$34 million of the total joint project costs. For this investment, Western would obtain about 53 percent of the line capacity (\$34 million divided by \$64 million). Thus, for about the same investment as the independent project, Western could obtain 608 MW, or 286 MW more capacity than it would from the independent project. On the other hand, if Western's participation was based on its need for the 322 MW capacity of an independent project, it would only negotiate a cost contribution of a maximum of 28 percent (322 MW divided by 1,147 MW) of the joint project cost or about \$18 million.

⁴A volt is a unit of electromotive force or electric pressure analogous to water pressure in pounds per square inch. One kilovolt equals 1,000 volts.

Western ultimately negotiated the extent of its participation in the Rifle/San Juan line based on the cost of the independent project at 50 percent of construction cost or \$32.2 million. Thus Western obtained, for about the same cost, 50 percent of the project's transmission capacity (about 573 MW) or 251 MW more than the independent project.

Because larger projects are generally less costly on a cost per MW basis, Western can obtain more capacity on larger joint projects for the same cost of smaller independent projects. As illustrated by this example, by basing its extent of participation on the cost of an independent project, Western obtained greater transmission capacity for about the same cost as an independently constructed project. Conversely, when Western's extent of participation is based on the transmission capacity provided through the construction of an independent project, Western can obtain the capacity it needs at a lower cost.

Although Western area office officials stated that their practice is to base Western's extent of participation on the cost or capacity of an independent project, we were also told that independent construction is not necessarily the best alternative to participation. More specifically, in the case of the Rifle/San Juan project and the other three completed projects, Western headquarters officials stated that the alternative to participation was not an independently constructed project, but rather no construction, because the independent alternatives were too expensive.

Craig/Bonanza Transmission Project

Western proposes to participate in a joint project to construct a single circuit 345 kV transmission line connecting the Craig Generating Station near Craig, Colorado, and the Bonanza Generating Station near Vernal, Utah, a distance of approximately 105 miles. Although the participation agreement had not been finalized as of May 1988, expected project participants were Western, Platte River Power Authority, Tri-State Generation and Transmission Association, and the Utah Associated Municipal Power Systems.¹ The estimated project cost for the proposed line is approximately \$34.8 million, with up to \$22.6 million representing Western's share. A construction contract was scheduled to be awarded later in 1988.

The Utah Power and Light Company (UP&L) objected to Western's participation in the construction of Craig/Bonanza. In October 1986, UP&L filed a lawsuit concerning Western's power marketing activities. Among other things, UP&L challenged Western's authority to promote the construction of, and transmission of power over, the Craig/Bonanza line. Western defended its legal authority to participate in the line construction since the proposed line is part of the Colorado River Storage Project (CRSP) transmission system and is necessary to market CRSP power.

In April 1988, the United States District Court concluded that Western's involvement in Craig/Bonanza was not beyond the scope of its legal authority. However, UP&L filed a Notice of Appeal before the United States Court of Appeals (10th Circuit) on June 3, 1988.

The Craig/Bonanza transmission project is typical of many joint construction projects with respect to project identification, justification, and planning. In July 1984, Western initiated the Colorado River Storage Project study to examine the CRSP transmission system. UP&L and other local utilities participated in the study. This study identified an east-to-west bottleneck on the existing system and suggested that an additional transmission capability be constructed between Colorado and Utah. In September 1985, Western and six utilities, including UP&L, entered a cost-sharing agreement to participate in preliminary project planning to alleviate the east-to-west bottleneck. Their efforts resulted in the Craig-Utah Transmission Project, Report of Preliminary Study (July 1986). Specifically, the study recommended pursuing the construction of the Craig/Bonanza 345 kV transmission line at the earliest possible date. In

¹Deseret Generation and Transmission Association is also expected to sign the participation agreement because it is responsible for the construction, operation, and maintenance of the terminal facilities at the Bonanza switchyard. However, Deseret is not participating in the cost of line construction.

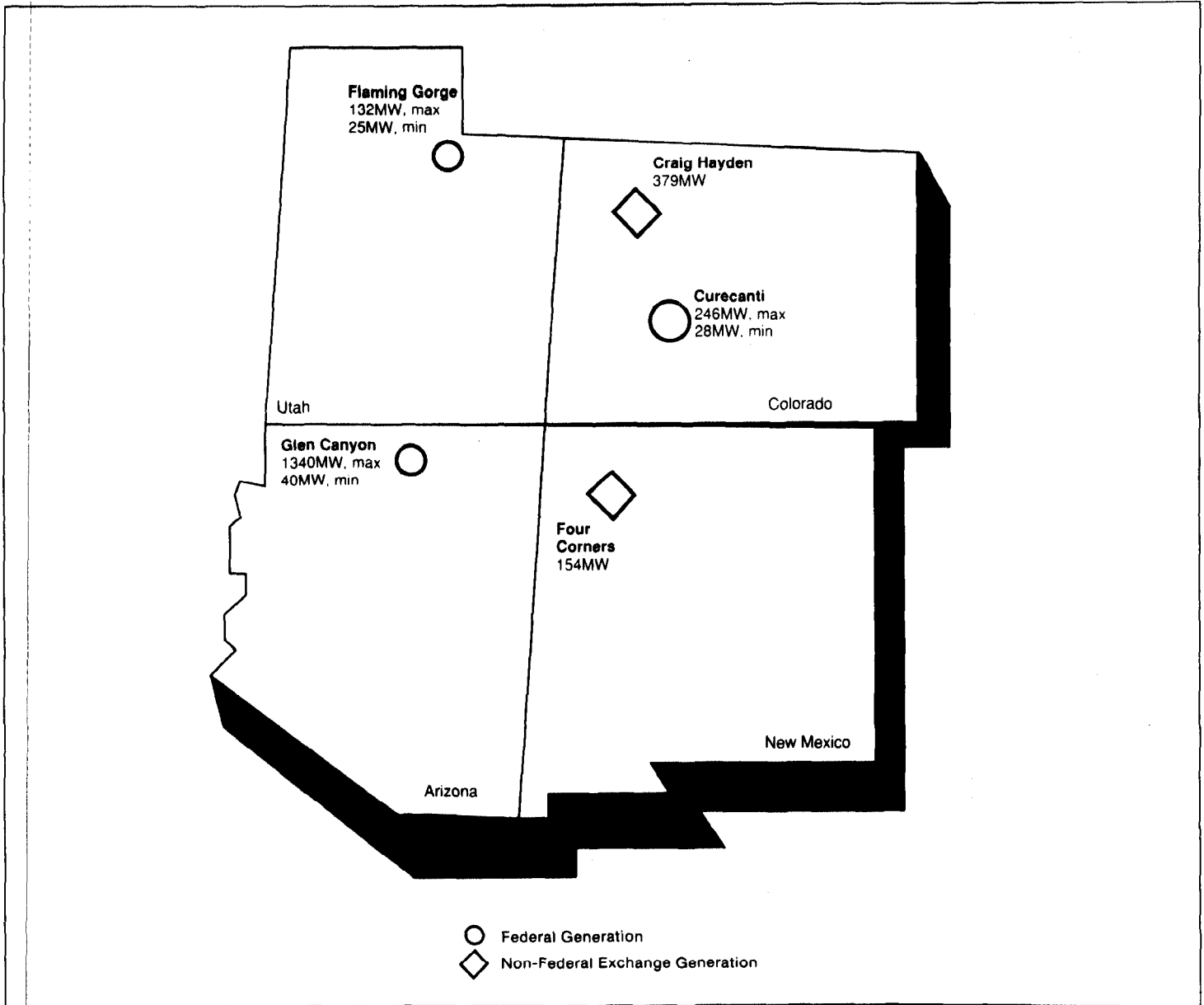
December 1986, these same utilities entered into a pre-construction cost-sharing agreement. Basically, the utilities agreed to share the costs of environmental studies, land acquisition activities, design activities, and to negotiate a construction cost-sharing (participation) agreement.

Project Background

The Colorado River Storage Project Act of 1956 provides for the development of water resources in the Upper Colorado River Basin. The act authorized construction of initial units consisting of dams, reservoirs, power plants, and transmission facilities. Under the act, the Bureau of Reclamation (Reclamation) constructed the Glen Canyon Unit, just below the Utah-Arizona border; the Flaming Gorge Unit, in northern Utah; and the Curecanti Unit, in central Colorado. Glen Canyon is the largest unit within the project and is capable of producing about four times as much energy as the two other units combined.

At approximately the same time, the Salt River Agricultural Improvement District participated in the construction of thermal (coal-fired) power plants in the Craig Hayden area of Colorado and at Four Corners, New Mexico, to serve loads in southern Arizona (see fig. III.1). Reclamation and the Salt River Agricultural Improvement District entered an energy exchange agreement. The primary reason for the exchange was to serve the region's loads with the nearest available generation regardless of ownership and thereby avoid transmission line construction. Salt River Project generation was located in Colorado and New Mexico and the load was located in southern Arizona. Federal generation was primarily located in Arizona (Glen Canyon), and the loads were distributed throughout the Colorado Basin. As the agreement stipulated, the Glen Canyon hydro project would serve Salt River Project loads in Phoenix and points south. The thermal plants in the Craig Hayden area would serve federal loads in Northern Utah and in Colorado. The Four Corners thermal plant would serve New Mexico loads.

Figure III.1: Colorado River Storage Project Generating Resources



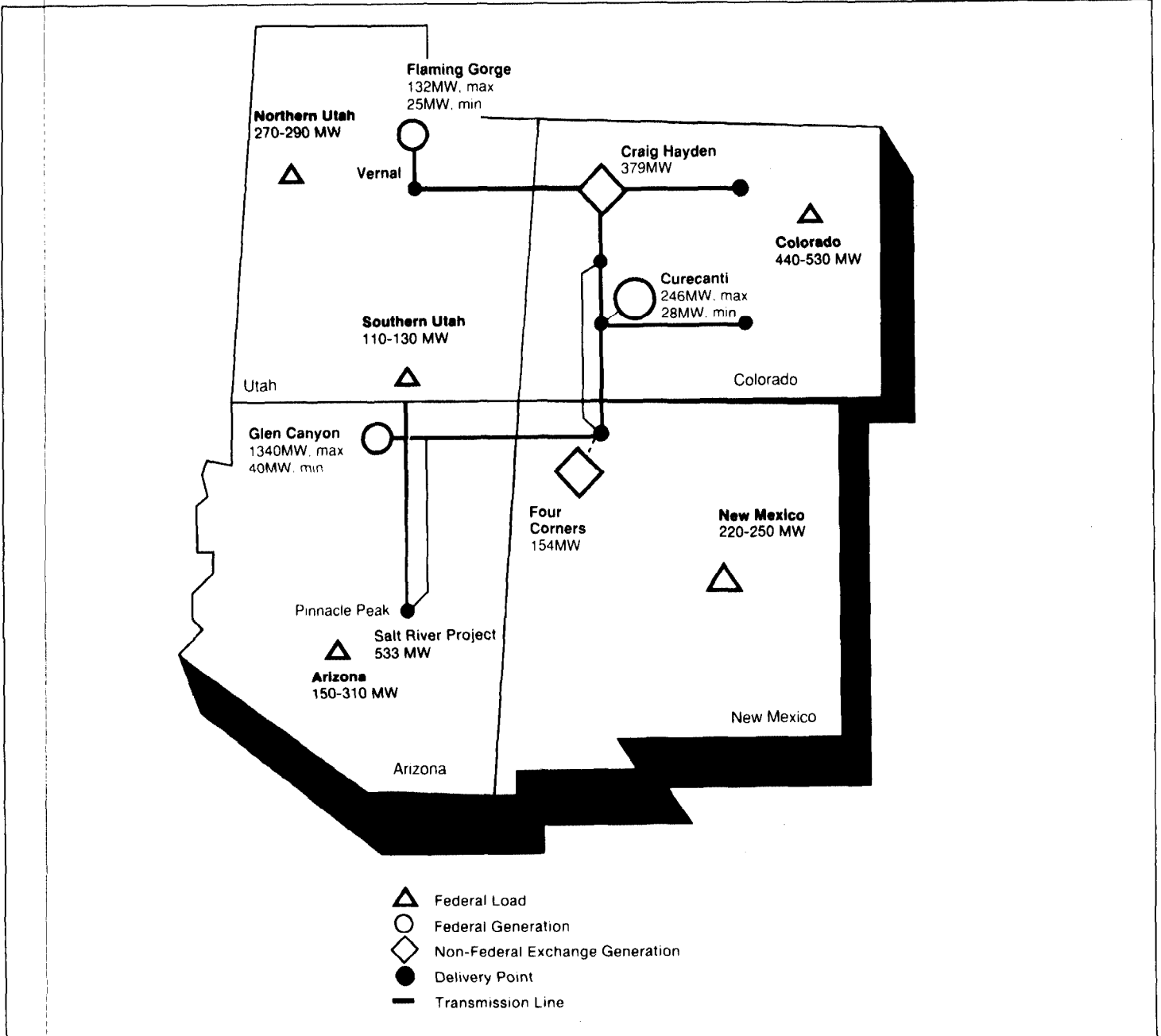
Source: Adapted by GAO from Western Publications.

On the basis of the location of federal loads, generation, and the Salt River Project exchange agreement, Reclamation designed and constructed the CRSP transmission system. This system delivers federal power to preference customers in the Colorado River Basin (see fig.

III.2). Basically, Utah and New Mexico have no federal transmission lines because Reclamation entered into wheeling arrangements with local utilities to serve loads in those states.

Appendix III
 Craig/Bonanza Transmission Project

Figure III.2: Colorado River Storage Project Generating Resources, Peak Loads, and Transmission Lines



Source: Adapted by GAO from Western Publications.

Project Justification

According to Western officials, the existing transmission system satisfies requirements when area generation is approximately equal to the area load. Table III.1 summarizes the generation and peak loads throughout the Colorado River Basin as presented in figure III.2. The table illustrates that in the northern and southern areas of the Colorado River Basin the distribution of power resources and loads are approximately equal.

Table III.1: Distribution of Generation Capability and Peak Loads Requirements in Colorado River Storage Project

Figures in megawatts

	Generation			Peak loads	
	Minimum	Maximum		Summer	Winter
Northern area:					
Flaming Gorge	25	132	Northern Utah	270	290
Craig Hayden	379	379	Colorado	440	530
Curecanti	28	246			
Total	432	757		710	820
Southern area:					
Glen Canyon	40	1,340	Southern Utah	110	130
Four Corners	154	154	New Mexico	220	250
			Arizona	310	150
			Salt River	533	533
Total	194	1,494		1,173	1,063

When generation and load are unequal, Western must use the transmission system to move the power to where it is needed. At times, Western is unable to move the necessary power to satisfy area loads due to limited line capacity in some areas. For example, when generation at Flaming Gorge is curtailed,² additional power must be transmitted into Utah from the Craig Hayden area. The existing Hayden/Vernal transmission line is inadequate to deliver the needed power. When the Hayden/Vernal line is fully loaded, Western must find an alternate transmission path to deliver the northern Utah loads. According to an analysis prepared by Western, over the past 7 months the Hayden/Vernal line was fully loaded approximately 20 percent of the time. During low water months when generation at Flaming Gorge was curtailed, this line was fully loaded nearly every day during 71 percent of the on-peak hours (300 out of 420 on-peak hours per month).

²Generation at Flaming Gorge is curtailed during the summer months to mitigate the impact on an endangered species of fish. Generation is also curtailed during plant maintenance and in low water years.

Northern Utah's peak loads are approximately 270 to 290 MW. When Flaming Gorge is generating at its minimum level of 25 MW and the Hayden/Vernal line can transmit up to 115 MW, then there is a 130 to 150 MW capacity shortfall. Consequently, as explained by Western officials, Western needs additional transmission capacity between Colorado and Utah to deliver loads to northern Utah. For this reason, Western proposed construction of the Craig/Bonanza transmission line (see fig. III.3). As shown on the map, two of Western's customers—Bridger Valley Electrical and Moon Lake Electrical—receive their power directly from the existing federal transmission lines. Therefore, the new line would be used for serving the remaining portion of the loads in northern Utah (210-220 MW).

The total capacity of the Craig/Bonanza line will be approximately 350 MW, of which Western expects to obtain 65 percent or 227 MW. Because Western justified the need for 130 to 150 MW to satisfy northern Utah summer peak loads, it will obtain an additional 77 to 97 MW of capacity above that needed. Western officials said that the additional capacity could be used to deliver purchases of low-cost energy during low water years, sales of surplus energy during above average water years, and sales of energy under the fuel displacement program. The additional capacity could also be sold to other utilities.

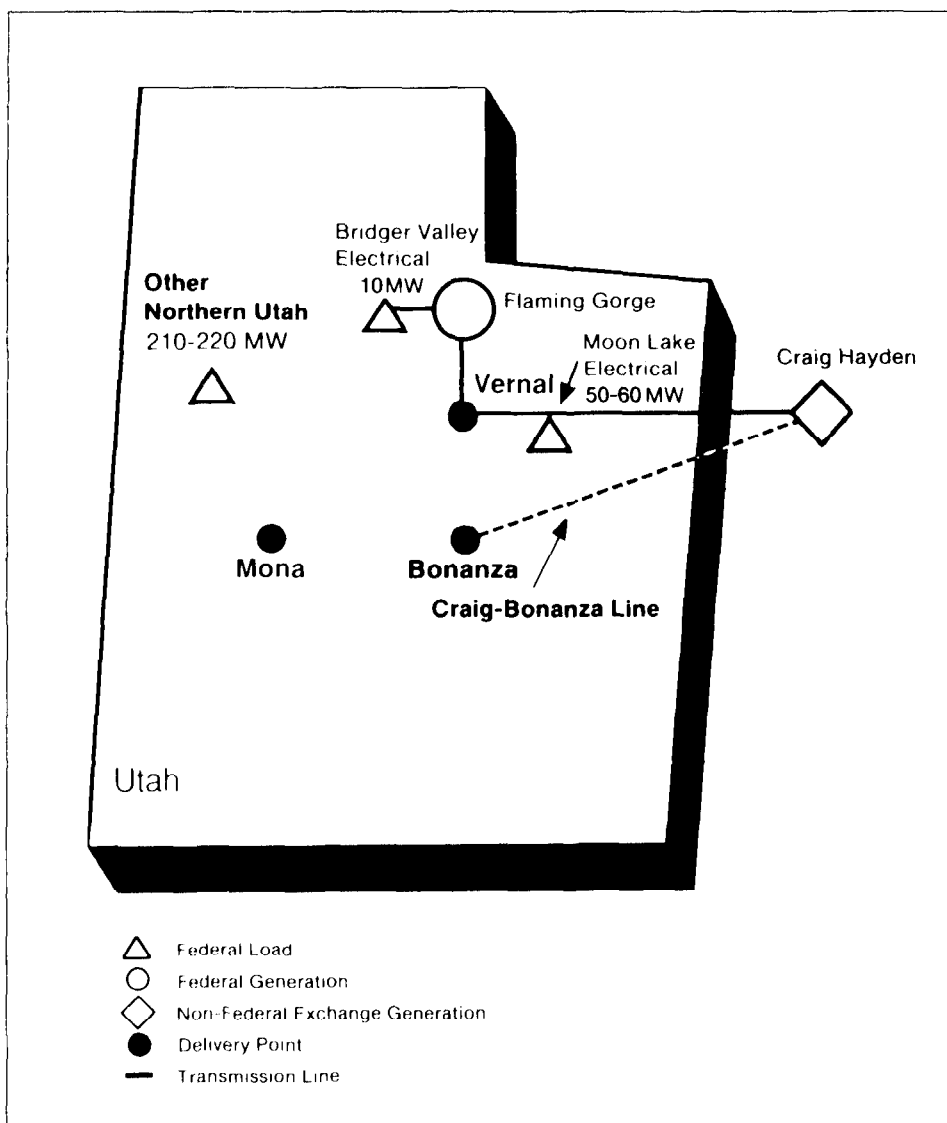
UP&L's Views

UP&L representatives do not believe Western should participate in the Craig/Bonanza line because, in their view

- Western does not need the line to meet northern Utah loads;
- federal power must be delivered at Vernal, Utah, not Bonanza, according to contractual wheeling agreements;
- the nonfederal transmission system out of Vernal can only accept deliveries of federal power up to 140 MW; and
- construction of the line could cause UP&L to lose customers.

According to UP&L representatives, Western is able to serve northern Utah loads even when generation at Flaming Gorge is curtailed. When the CRSP system was developed, the federal government contracted with UP&L to wheel federal power to Utah customers. Although the contract specified that northern Utah deliveries would be made at Vernal and southern Utah deliveries would be made at Glen Canyon, UP&L routinely accepts northern Utah power deliveries at Glen Canyon.

Figure III.3: Proposed Craig-Bonanza Transmission Line



Source: Adapted by GAO from Western Publications.

Because the new line is planned to terminate in Bonanza, Western will need to obtain a transmission path to the contractual delivery point at Vernal, approximately 26 miles to the north. However, even if Western obtains a path from Bonanza to Vernal, UP&L can only accept a maximum 140 MW at Vernal due to technical system constraints. On the other hand, UP&L can accept up to 300 MW at Glen Canyon.

In its lawsuit, UP&L asserted that Western is promoting the construction of a transmission line to assist in the transmission of electric power between cooperatives in Colorado and public power municipalities in Utah. UP&L representatives believe the Craig/Bonanza line will adversely affect their ratepayers because the line will enable public power municipals to purchase surplus generation and offer a lower rate to their customers. As a result, UP&L customers could switch over to the municipal suppliers. If UP&L loses power sales and customers, the rates charged to UP&L's remaining customers would have to increase to cover UP&L's investments in generation and transmission.

Representatives of two other utilities confirmed that they are, in fact, participating in Craig/Bonanza to gain access to new markets. These public utilities are in a surplus generation position and they see Craig/Bonanza as a transmission path to obtain sales to Utah and California. UP&L may also be concerned that the line would permit power from Colorado to flow through Utah to the 500 kv line in western Utah and on to California. As a result, UP&L could lose potential markets elsewhere.

Western's Views

Western agrees that Utah loads can be served through Glen Canyon; however, in its opinion, this is not the most efficient or economical manner to deliver northern Utah loads. When generation at Flaming Gorge is curtailed, Western will schedule deliveries "around the system." In other words, the power is scheduled from Craig/Hayden through Four Corners to Glen Canyon. Scheduling around the system contributes to line losses and can overload other lines in the system.

Western estimates that the Craig/Bonanza line could reduce line losses associated with scheduling 50 mw around the system by about \$1 million annually. Also, it calculates that the value of the additional capacity on Western Colorado lines, which could be used to sell or buy surplus power or for the fuel displacement program, could result in additional revenue of between \$0.5 to \$1 million annually. In addition, the transmission path used to move power from Craig to Glen Canyon can become overloaded when Western must import power to serve southern Arizona loads when Glen Canyon's generation is curtailed.

Western acknowledges that federal power must be delivered at Vernal, Utah, according to the wheeling contract with UP&L and that UP&L's transmission system can only accept up to 140 mw. To overcome these constraints, Western is currently negotiating with UP&L to establish an additional delivery point for federal power, possibly at Mona, Utah.

They are also negotiating with Deseret Generation and Transmission Association to obtain a transmission path from Bonanza to Vernal and Mona. When the transmission contracts are finalized, Western will deliver power to Mona and Vernal under wheeling arrangements.

Western officials do not dispute the fact that the Craig/Bonanza line will provide public power municipal systems in Utah a transmission path to seek alternative sources of supplemental power. However, most public power municipalities in Utah already have other opportunities besides Craig/Bonanza to obtain alternate power supplies. Western further stated that the federal capacity on Craig/Bonanza will be used to deliver federal power to federal preference customers. One Western official stated that Western does not construct lines on an entrepreneurial basis to usurp or compete in another utility's market.

Scope and Methodology

We performed our work between October 1987 and May 1988 at Western's headquarters in Golden, Colorado, and at three area offices: Billings, Montana; Loveland, Colorado; and Salt Lake City, Utah. We chose these offices because (1) they are responsible for most of Western's current transmission line construction projects and (2) they have initiated most of the completed, ongoing, and upcoming joint construction projects.

We discussed transmission line construction activities and participation agreements with Western officials at headquarters and the area offices. We also reviewed project files, reports, and planning studies; budget documents; environmental impact statements; and participation agreement contracts. We selected and performed detailed reviews of 15 independent and 8 joint projects currently under construction and 4 completed joint construction projects.

To identify current construction projects for further review, we obtained Western's January 1987 Transmission Line Tracked Report. From this report, we selected 25 projects representing additions to Western's transmission system and involving either line replacement, rehabilitation, or new construction. We eliminated those projects that did not involve the construction of transmission lines, such as projects for road or tower repairs, and those where the specific line to be constructed had not yet been defined. We also eliminated projects under construction for other federal agencies (reimbursable workload).

To identify current participation agreements, we obtained from Western a list of 16 participation agreements either completed, under construction, or in design since 1977. We eliminated five projects in the Boulder City and Sacramento Area Offices from this list, namely those lines associated with the Pacific Northwest/Southwest Intertie Project, because Western's participation was directed by legislation. We added two projects after discussions with area office managers.

For each ongoing independent and joint construction project, we determined Western's justification for construction, the estimated project cost, and the type of construction. In addition, for ongoing and completed joint construction projects, we determined the participants, their extent of participation, the criteria used to justify extent of participation, and the projects' status.

With regard to the Craig/Bonanza joint construction project, we also obtained information concerning the controversy surrounding this line.

Finally, we interviewed representatives of Utah Power and Light Company and other utilities located within Western's service area, some of whom are participating with Western in joint construction. We discussed joint construction and transmission system reliability issues.

We performed our work in accordance with generally accepted government auditing standards.

Comments From the Department of Energy



Department of Energy

Washington, DC 20585

OCT 18 1988

Mr. Keith O. Fultz
Senior Associate Director
Resources, Community, and
Economic Development Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Fultz:

We appreciate the opportunity to review and comment on the General Accounting Office (GAO) draft report entitled "Federal Electric Power: Construction of Transmission Lines and Related Controversy (GAO/RCED-88-219)."

While the Department of Energy is concerned with some of the factual representations within the GAO draft report, we concur with the recommendation that formal policies and procedures be developed regarding participation in transmission line construction projects. The Western Area Power Administration had begun to take the necessary action to develop a formal policy and implement procedures prior to GAO's recommendation.

We hope that these comments will be helpful to GAO in your preparation of the final report. Our editorial comments are being sent to GAO under a separate letter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lawrence F. Davenport".

Lawrence F. Davenport
Assistant Secretary,
Management and Administration

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