

137400

United States General Accounting Office

GAO

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

October 1987

FEDERAL ELECTRIC POWER

Western Area Power Administration's Tracy/Livermore Transmission Project



134250

040357

.....

.....

.....

.....

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

B-229083

October 27, 1987

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 requested that the General Accounting Office (GAO) review the transmission activities of the Western Area Power Administration (Western). During subsequent discussions, your office requested that we obtain information concerning one project that Western is planning to construct—the Tracy/Livermore transmission line. On July 15, 1987, we briefed your office on the information we had obtained. At that time, your office requested that we provide the information in a letter to you. This report describes the planned project and provides the current justification for the project. It also contains the views of the Pacific Gas and Electric Company (PG&E) on the project and our initial observations on the information.

This project would provide a direct tie line between Western's Tracy substation and the Department of Energy's (DOE) Lawrence Livermore National Laboratory. The laboratory currently receives its electricity over the local utility's (PG&E) transmission system. DOE and Western said that the project would improve the reliability and security of the power service to the laboratory by providing a second delivery route; provide for meeting projected increases in power loads for the laboratory, as well as other DOE installations in the area; and save up to \$47.7 million by the year 2001. PG&E officials believe that the project is not needed and violates Western's authority and contractual relationship with PG&E.

In brief, we find no legal basis to question Western's authority to construct the Tracy/Livermore line. We noted that with a direct tie line, the Livermore Laboratory will have greater flexibility in obtaining its power from other utilities. In addition, the ultimate savings to be realized from the project will depend upon the extent to which a number of events anticipated by Western's analysis in support of building the line actually occur. The rest of this letter and appendixes I through III present the details of our findings.

Background

Western is a Department of Energy agency that markets electric power generated by federal hydroelectric dams in 15 central and western states. Western's power-marketing functions include the construction, operation, and maintenance of transmission lines and attendant facilities that deliver power to customers' receiving points. In 1986, Western was responsible for the operation and maintenance of about 16,000 miles of transmission lines and over 240 substations. In selling the federal power, Western is to establish its power and transmission rates at levels which provide sufficient revenues to recover the costs of producing and transmitting electric power, including the repayment of capital investment costs with interest.

The Planned Project

The Tracy/Livermore transmission line would provide for the direct delivery of power from the Western-owned Tracy substation to the Livermore Laboratory over federally owned transmission facilities. The total project consists of a 12.5-mile transmission line; new terminal modifications at Tracy; a new substation at the Livermore Laboratory; an on-site tie line to connect with the existing system; and related control, protection, and communication facilities at each end of the new line. The project is scheduled to be completed by 1989 and is estimated to cost \$18.6 million. Most of the cost (\$13.5 million) would be for the substation and on-site distribution system modifications at the Livermore Laboratory, which, according to DOE, are needed to correct existing deficiencies and meet future demands, regardless of whether the transmission line is built.

The Livermore Laboratory currently receives its electricity over the PG&E transmission system. Approximately 65 percent of that electricity is federal power from the Central Valley Project that is marketed by Western. The federal power is delivered over PG&E transmission lines from Western's Tracy substation through PG&E's Tesla substation. PG&E supplies the remaining power needs at the Livermore Laboratory.

Project Justification

DOE and Western justify the project on the basis that it will improve the reliability and security of the power service to the Livermore Laboratory; will assist in meeting future power loads for the DOE installations in the area; and will achieve significant cost savings.

The Livermore Laboratory is currently served by only the PG&E Tesla substation. According to DOE officials, a power failure at the substation could adversely affect research projects. The new line would provide th

primary delivery route for power, with the PG&E facilities serving as backup.

The project could also affect the power arrangements for three other DOE installations in the San Francisco Bay area: the Stanford Linear Accelerator Center, the Lawrence Berkeley Laboratory, and DOE Site 300. DOE has an allocation of federal power from Western's system, but it is insufficient to meet the power needs of the four installations. The installations purchase their supplemental power needs from PG&E. In 1986, the federal power served about two thirds of the installations' needs, with the remaining one third being purchased from PG&E. DOE is forecasting that its power needs will more than double by the year 2001. Western will be able to meet part, but not all, of these increases by importing power from the Pacific Northwest. According to the project justification, because of the high cost of PG&E power, DOE intends to purchase power from other California suppliers and deliver it over the new Tracy/Livermore tie line to satisfy Livermore Laboratory's needs. DOE could then reallocate its designated share of the federal power to the three other installations.

Western developed several different scenarios which estimate that the project could save the DOE installations from \$14.5 million to \$47.7 million during the period 1990 through 2001. Under each scenario, the project offers DOE installations increased flexibility for meeting their future power needs, both in terms of the source of power and the delivery path for that power. We noted that in two of the three scenarios the increased power needs would primarily be met from suppliers that Western assumed could supply power at lower cost than PG&E.

PG&E's Views

PG&E officials believe Western is violating its authority and its contractual relationship with PG&E because Western is trying to market more power than it is entitled to market or to permit other nonfederal suppliers to market power in PG&E's marketing area. PG&E officials said that the project would have a negative impact on PG&E's other customers because it would necessitate rate increases to cover PG&E's resultant losses. In addition, PG&E officials believe the planned line is not needed because it duplicates PG&E's electrical facilities and would not reduce the Livermore Laboratory's power costs.

GAO Observations

As agreed with your office, we did not perform a detailed examination of this project but are providing our initial observations on the information that we reviewed.

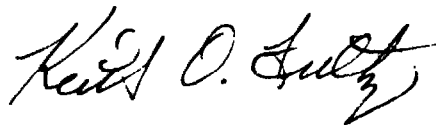
- Because the impetus for the line is the delivery of power from Western's system, we find no legal basis to question Western's authority to construct the line.
- The planned line will provide a direct federally owned delivery path to the Livermore Laboratory, thus allowing it greater flexibility in seeking out and obtaining its power from utilities other than PG&E.
- Western's cost-savings estimates depend upon a number of assumptions. The future availability of power and its relative cost when compared to PG&E's rates will determine the ultimate savings to be realized. Western assumes that the non-PG&E power would be less expensive than PG&E power, although Western has not identified the specific sources for such power. The ultimate savings to be realized also depends on the extent to which DOE's forecasted increases in power needs actually materialize.

In carrying out our work, we held discussions with appropriate DOE and Western officials. We reviewed pertinent records and the current justification documents from the files in the Western Area Power Administration's offices in Golden, Colorado. We also held discussions with officials from the Pacific Gas and Electric Company and obtained relevant information from them. We did not, however, independently verify the cost estimates and load demand forecasts for the project. We performed our work between May and August 1987.

As you requested, we did not obtain official comments on a draft of this report. We are sending copies of the report to the Secretary of Energy, appropriate congressional committees and subcommittees, and other interested parties.

The major contributors to this report are listed in appendix IV.

Sincerely yours,



Keith O. Fultz
Associate Director

Contents

Letter		1
Appendix I The Planned Tracy/ Livermore Transmission Project		8
Appendix II Project Justification	Improved Reliability and Security	12
	Future Growth	12
	Cost Savings	14
Appendix III PG&E's Views on the Project		19
Appendix IV Major Contributors to This Report	Resources, Community, and Economic Development Division, Washington, D.C.	21
	Denver Regional Office	21
Tables		
	Table I.1: Detailed Cost Estimates of Tracy/Livermore Transmission Project by Program Item	10
	Table II.1: Projected Electrical Load Demands for the DOE Installations (1986 Through 2001)	13
	Table II.2: Electrical Power Costs at the DOE Installations for Fiscal Year 1986	14
	Table II.3: Annual and Cumulative Savings for Each Scenario	17
Figures		
	Figure I.1: Percentages of Project Cost	11
	Figure II.1: Cumulative Savings Under Each Scenario	18

Abbreviations

DOE	Department of Energy
GAO	General Accounting Office
kV	kilovolt
kWh	kilowatt-hour
mW	megawatt
PG&E	Pacific Gas and Electric Company
WAPA	Western Area Power Administration

The Planned Tracy/Livermore Transmission Project

In May 1985, the Department of Energy's (DOE) San Francisco Operations Office proposed to the Secretary of Energy that a 230-kilovolt (kV)¹ transmission line be constructed between the Western Area Power Administration's (Western) Tracy substation and the Lawrence Livermore National Laboratory. The Secretary of Energy approved the project and granted Western the authority to request congressional appropriations in its fiscal year 1987 construction and rehabilitation budget request and to proceed with the preparation of a Facilities Development Report for the project.

Western's fiscal year 1987 budget included funds for preconstruction activities for the Tracy/Livermore project. However, the Congress has not appropriated funds for the construction of the project. During consideration of Western's request, the House Appropriations Committee made a specific reference to this project. In its report on the 1987 energy and water development appropriations bill, the Committee said:

"...within the limit of available funding and at an estimated cost of \$18,900,000, WAPA [Western Area Power Administration] is directed to proceed with completion of such facilities. WAPA shall recover the actual costs of construction, including interest, by establishing a special cost component to be added to the rates charged for Central Valley Project power sold to the DOE laboratories. These facilities are not to be used by or expanded by or for any other entity other than the Department of Energy laboratories without specific prior approval of Congress.

No such facilities shall be constructed for electric transmission or distribution service which the Secretary determines, on the basis of an offer of a firm fifty-year contract from a local, public, or private agency, can, through such contract, be obtained at less cost to the Federal Government than by construction and operation of Government facilities."

The Energy and Water Development appropriations for fiscal year 1987 were included in the Continuing Appropriations Act that was passed in October 1986. In the conference report accompanying the act, the conferees stated that they were deferring consideration of the project, but without prejudice, because they "continue to feel, however, that the potential benefits of such a line to the Federal Government could be very substantial."

The new transmission line would allow the laboratory's power to be delivered over federally owned transmission lines rather than over the local utility's transmission lines. The project would also provide DOE an

¹ A 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.

opportunity to change the source and delivery of power to its other installations in the San Francisco Bay area.

The Livermore Laboratory currently receives its electricity through the Pacific Gas and Electric Company (PG&E) transmission system. Approximately 65 percent of the electricity is federal power marketed by Western and delivered over PG&E transmission lines from Western's Tracy substation through PG&E's Tesla substation. Western pays PG&E a fee (referred to as a wheeling rate) for transmitting the federal power. PG&E supplies the remaining 35 percent of the laboratory's electrical needs.

The Tracy/Livermore project, as described in Western's June 1987 Facilities Development Report, is to consist of

- 12.5 miles of 230-kv transmission line from the Tracy substation to the Livermore Laboratory,
- a 230-kv line terminal at the Tracy substation,
- a new substation at the Livermore Laboratory,
- 1 mile of 115-kv tie line at the laboratory to interface with the existing system, and
- related control, protection, and communication facilities at each end of the new line.

The total project is scheduled to be completed in 1989 at an estimated cost of \$18.6 million. Most of the costs, \$13.5 million, are for the substation and on-site distribution system at the Livermore Laboratory. According to DOE, these facilities at the laboratory are needed to correct existing deficiencies and meet future needs, regardless of whether the transmission line is built. Table I.1 and figure I.1 compare, in more detail, the relative costs for the primary transmission line and modifications at the Tracy substation with the costs of the substation and modifications needed at the laboratory.

**Appendix I
The Planned Tracy/Livermore
Transmission Project**

**Table I.1: Detailed Cost Estimates of
Tracy/Livermore Transmission Project by
Program Item**

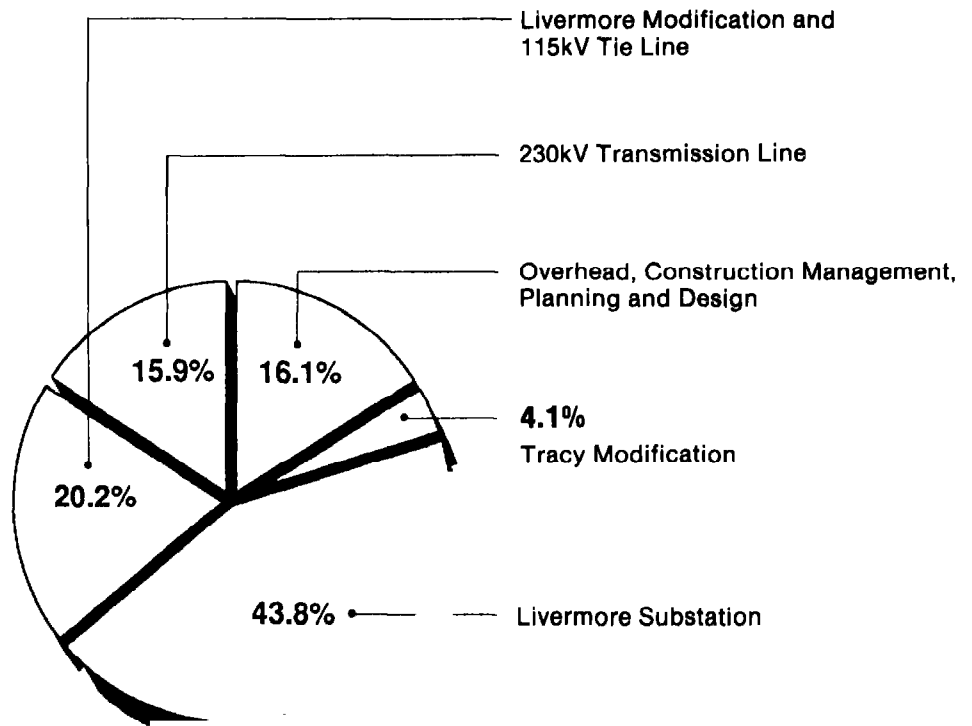
Dollars in thousands

Program item	Tie line and Tracy substation	Livermore substation	Total
Planning & Design:			
Planning	\$10.1	\$10.0	\$20.1
Environmental	96.4	24.1	120.5
Field Data	51.8	51.8	103.6
Land and Rights	576.8	21.0	597.8
Design & Specification	237.3	553.8	791.1
Total	972.4	660.7	1,633.1
Tracy 230-kV Modifications:			
Circuit Breaker	198.1	•	198.1
Construction	560.5	•	560.5
Total	758.6		758.6
230-kV Transmission Line	2,946.9	•	2,946.9
Livermore Substation:			
Circuit Breakers	•	1,012.0	1,012.0
Transformers	•	1,870.0	1,870.0
Construction	•	5,245.9	5,245.9
Total		8,127.9	8,127.9
Livermore Modifications:			
Distribution Modifications	•	2,357.1	2,357.1
Underground Cables and Materials	•	1,173.0	1,173.0
Total		3,530.1	3,530.1
115-kV Transmission Line and Terminals	•	229.4	229.4
Construction Management	115.8	228.2	344.0
Overhead	302.2	705.3	1,007.5
Total	\$5,095.9	\$13,481.6	\$18,577.5

Source: Western Area Power Administration.

**Appendix I
The Planned Tracy/Livermore
Transmission Project**

Figure I.1: Percentages of Project Cost



Source: Adapted by GAO from Western's documents.

Western intends to recover all project construction costs, including interest, by establishing a special cost component to the rates charged for the federal power sold to DOE. According to the Deputy Manager in Western's Sacramento Area Office, details of how the costs will be recovered have not yet been determined.

Project Justification

DOE has determined that significant benefits would accrue from the Tracy/Livermore project in terms of improving the reliability and security of the power service to the Livermore Laboratory, meeting the future power needs of its installations, and achieving savings in its electricity costs. Reliability and security would be improved by having an alternative delivery path for present and projected future increased power deliveries to the laboratory. Cost savings would accrue by avoiding the wheeling and other local utility service charges and by purchasing cheaper power from other utilities.

Improved Reliability and Security

DOE officials are concerned because the Livermore Laboratory is currently served by only one substation—PG&E's Tesla substation. According to Western's project justification, vital research programs at the laboratory could be affected by a failure at the substation because substantial time may be needed to make the necessary repairs. DOE believes it necessary that installations, such as the Livermore Laboratory, have dual power sources—that is, two transmission lines from separate locations—to prevent disruption or risk to essential research programs. This project would provide for the dual sources of power from two major substations. The new transmission line would be the primary delivery route with the existing PG&E lines serving as a backup power delivery route to be used in the event the new line fails.

Future Growth

In 1986, the Livermore Laboratory required 52 megawatts (mW)² of electric power. DOE is projecting that the laboratory's electrical loads conceivably could increase to as much as 140 mW by the year 2001. Based on the most likely continuation of the current programs, DOE is estimating that the electrical loads will increase to 93 mW. The proposed line would provide all the transmission capacity required by the laboratory.

The project could also affect the power arrangements for three other DOE installations in the San Francisco Bay area: the Stanford Linear Accelerator Center, the Lawrence Berkeley Laboratory, and DOE Site 300. Electrical power is now delivered to these installations through the PG&E transmission system.

²A watt is an electrical unit of real power or rate of doing work. One megawatt equals 1 million watts, or 1,000 kilowatts. One kilowatt equals 1,000 watts.

**Appendix II
Project Justification**

In 1986, the four installations required 133 mW of electric power and 652 kilowatt-hours (kWh)³ of electric energy. DOE expects these electrical loads to increase to 267 mW by the year 2001. PG&E has notified DOE that it cannot meet this projected load growth without major modifications to its system. The electrical load projections for each DOE installations are shown in table II.1.

Table II.1: Projected Electrical Load Demands for the DOE Installations (1986 Through 2001)

Figures in megawatts

Year	Stanford	Berkeley	Site 300	Livermore	Total
1986 ^a	49	29	3	52	133
1987	41	27	3	57	128
1988	60	28	4	58	150
1989	63	29	4	62	158
1990	63	30	5	69	167
1991	77	24	5	73	179
1992	77	32	5	75	189
1993	77	34	5	77	193
1994	77	36	5	79	197
1995	132	38	5	82	257
1996	132	40	5	94	271
1997	132	41	5	85	263
1998	132	42	^b	87	261
1999	132	42	^b	89	263
2000	132	42	^b	91	265
2001	132	42	^b	93	267

^aActual load demands

^bData is not available.

Source: Department of Energy

For its four installations, DOE currently has an allocation of 87 mW from the federal power system which it has suballocated to each installation. This power is generated primarily by the federal hydroelectric projects within the Central Valley Project in California. As the federal power marketer, Western transmits the power over its own transmission lines to its Tracy substation where the power is turned over to PG&E for delivery to the installations. The DOE installations purchase their additional power needs from PG&E.

³A kilowatt-hour is a basic unit of electrical energy that equals 1 kilowatt of power applied for 1 hour.

According to a February 1987 Facilities Development Report, Western stated that because of the high cost of PG&E power that DOE was actively pursuing long-term sources of energy in California and the Pacific Northwest for interconnection with the Central Valley Project. The new transmission line would allow Western to deliver this energy directly to Livermore Laboratory. In this way, DOE could reallocate the federal power to its other installations and replace PG&E as a power supplier to the laboratory.

Cost Savings

The actual cost savings resulting from this project will depend upon a number of assumptions. The principal assumption is the source and price of power to be transmitted over the line, that is, whether the power is from the federal power system marketed by Western, or is imported from the Pacific Northwest, or is purchased from other California suppliers. The availability and cost of power from sources other than PG&E will have a significant impact on the cost savings. Western developed several different scenarios which projected that the savings could range from \$14.5 million to \$47.7 million for the period 1990 through 2001.

DOE's 1986 electric bill for its four installations totalled nearly \$29.2 million, with the Livermore Laboratory accounting for over one half. Western received about \$16 million and PG&E received about \$13 million. (See table II.2.) In addition, Western paid PG&E \$1.15 million for wheeling the federal power to the installations.

Table II.2: Electrical Power Costs at the DOE Installations for Fiscal Year 1986

Dollars in thousands

Installation	Amounts paid for		Total
	PG&E power	Western power	
Livermore Laboratory	\$8,824 ^a	\$6,854	\$15,678
Berkeley Laboratory	4,275	1,684	5,959
Stanford Center	21	7,073	7,094
Site 300	^b	437	437
Total	\$13,120	\$16,048	\$29,168

^aDoes not include a \$6.550 monthly minimum charge for mirror fusion test facility pulse power.

^bLess than \$1,000.

Source: Department of Energy

DOE's current allocation of federal power for its four installations is 87 mW. PG&E wheels this power from the Western-owned Tracy substation.

PG&E's current wheeling rate for the federal power is, according to Western, \$1.43/kilowatt-month. In addition, Western is assessed capacity and energy losses of 4.5 percent to allow for PG&E transmission losses of the wheeled power. Western's calculations show that in fiscal year 1986, the average cost of federal power was \$0.0332/kWh compared with \$0.0777/kWh for the PG&E power delivered to the DOE installations.

In a February 1987 Facilities Development Report, Western estimated that the project would save about \$29.8 million during the period 1990-2001. This estimate was based on the importation of 90 mW of power from the Pacific Northwest region over the California-Oregon Transmission Project.⁴ Specifically, the laboratory would receive 14 mW of the Pacific Northwest power, with the rest of its power needs being furnished by alternate power suppliers, both of which are assumed to be cheaper than PG&E power. The remaining 76 mW of the Pacific Northwest power (along with DOE's current federal power allocation) would be wheeled by PG&E to the three other DOE installations. PG&E would provide any supplemental power needed.

Subsequently, Western developed other estimates to illustrate the cost savings for all four DOE installations. Three individual scenarios were developed to illustrate how much the cost savings would differ depending on how the line is used and how power is allocated among the four installations.

A. Baseline: The Tracy/Livermore project is not constructed, and present arrangements are not changed except electrical loads would increase as forecasted. All DOE power requirements that exceed current federal power allocations to each facility would be supplied by PG&E. PG&E would wheel the federal power to the DOE installations. Under this baseline case, Western estimates that the annual power costs for the four DOE installations would increase from the 1986 level of \$29.2 million to about \$82.3 million by the year 2001.

B. Scenario 1: The Tracy/Livermore project is constructed and operational in 1990. Western power allocations to the four installations would be pooled, and the total load for the Livermore Laboratory would be served by Western power until 1999. The other DOE installations would receive a combination of Western and PG&E power until 1999. At that

⁴The California-Oregon Transmission Project involves constructing and converting 330 miles of transmission lines between southern Oregon and central California. The projected in-service date is January 1991.

time, PG&E would provide supplemental power to the Livermore Laboratory and continue to serve the other DOE facility loads from its system. Under this scenario, Western estimates that savings of \$14.5 million would accumulate by 2001, primarily because of reduced wheeling costs to the Livermore Laboratory.

C. Scenario 2: The Tracy/Livermore project is constructed and operational in 1990. No federal power is used at the Livermore Laboratory. All of DOE's allocated federal power would be reallocated to the other three installations. The Livermore Laboratory would be served by an alternate California supplier using the Western transmission system, including the new line. PG&E would wheel all federal power to the other DOE installations and supply any supplemental power needed. Under this scenario, Western estimates that the power purchases from non-PG&E sources would be 90 percent of PG&E rates and that savings of \$46.2 million would accumulate by 2001, primarily because of the lower rates and reduced wheeling cost to the Livermore Laboratory.

D. Scenario 3: The Tracy/Livermore project is constructed and operational in 1990. In addition, the California-Oregon Transmission Project is completed in 1991, allowing DOE to import cheaper power from the Pacific Northwest. The Livermore Laboratory would receive some of this Pacific Northwest power but would be served primarily by other California suppliers using the Western transmission system, including the new line. The other three DOE installations would receive the majority of the Pacific Northwest power along with all of the DOE allocation of federal power over the PG&E transmission system. Western estimates that the power purchases from the Pacific Northwest and the other California suppliers will be at 90 percent of PG&E rates. Under this scenario, Western estimates that savings of \$47.7 million would accumulate by 2001, primarily because of the lower rates and reduced wheeling costs to the Livermore Laboratory.

Table II.3 shows the annual and the cumulative amount of the savings for each scenario. Figure II.1 shows the relative cumulative savings for each of the three scenarios at four specific points during the period of the estimated savings.

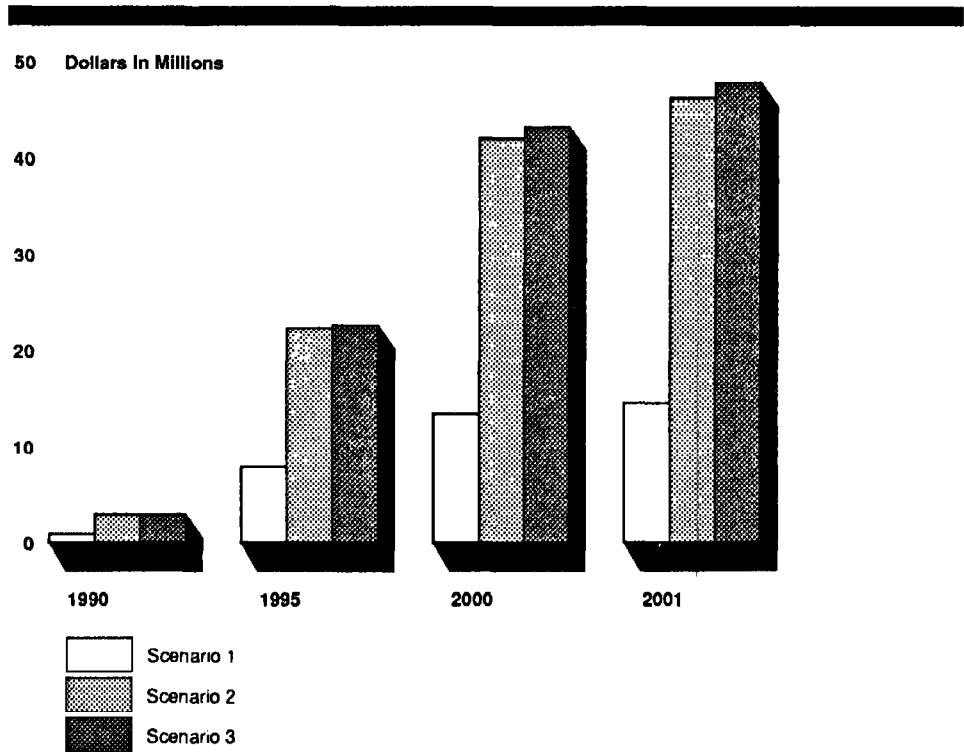
**Appendix II
Project Justification**

Table II.3: Annual and Cumulative Savings for Each Scenario

Dollars in millions						
Year	Scenario 1		Scenario 2		Scenario 3	
	Amount	Cumulative	Amount	Cumulative	Amount	Cumulative
1990	\$0.9	\$0.9	\$3.0	\$3.0	\$3.0	\$3.0
1991	0.9	1.8	3.2	6.2	3.2	6.2
1992	3.0	4.8	5.4	11.6	5.4	11.6
1993	1.0	5.8	3.4	15.0	3.5	15.1
1994	1.0	6.8	3.6	18.6	3.6	18.7
1995	1.1	7.9	3.7	22.3	3.9	22.6
1996	1.1	9.0	3.8	26.1	4.0	26.6
1997	1.1	10.1	3.9	30.0	4.1	30.7
1998	1.1	11.2	3.9	33.9	4.1	34.8
1999	1.1	12.3	4.0	37.9	4.2	39.0
2000	1.1	13.4	4.1	42.0	4.3	43.3
2001	1.1	14.5	4.2	46.2	4.4	47.7

Source: Adapted by GAO from Western's documents

Figure II.1: Cumulative Savings Under Each Scenario



Source Adapted by GAO from Western's documents

According to Western's Director, Division of System Engineering, the Tracy/Livermore transmission line would also achieve energy savings by reducing the amount of losses from wheeling power. PG&E currently assesses Western 4.5 percent for capacity and energy losses (losses due to heating of transmission system components) for the federal power PG&E wheels. For example, if 100 mW of power is needed at a given location, Western must deliver 104.5 mW of power to PG&E's transmission system at the Tracy substation. Western estimates that the power losses for the planned Tracy/Livermore transmission line would be about 0.5 percent for power delivered to the Livermore Laboratory. This would provide Western with additional power to sell. Under scenario 1, Western estimates that the cumulative energy savings associated with the reduction in power losses would be valued at \$7.4 million by the year 2001.

PG&E's Views on the Project

PG&E officials believe Western's proposed project represents a violation of its statutory authority and contractual relationship with PG&E in that Western is trying to market more power than it is entitled to market or trying to permit others to market power in PG&E's market area. PG&E officials believe the proposed line is not needed because it duplicates PG&E's own electrical facilities and would not reduce Livermore Laboratory's power costs.

PG&E has three existing lines from its Tesla substation to the Livermore Laboratory. One line, a 115-kilovolt (kV) line, is located on one set of towers, while the other two lines, a 230-kV line and a 115-kV line, are located on another set of towers.

- The 115-kV line located on its own set of towers was constructed in 1906 and has the capacity of about 65 mW. According to PG&E, this line can be reinforced at a cost of between \$1.75 million to \$2 million to increase its capacity rating to 159 mW with an emergency rating of 193 mW. (Emergency rating is for increased loading for periods up to 24 hours.)
- The 230-kV line is a specialized line built in 1978-79 to provide for a large pulse load to the Livermore Laboratory's Mirror Fusion Test Facility. DOE officials said that this line has had little use due to funding restrictions in the test program. However, the line cannot be used to serve the general needs of the laboratory because the test program will be restarted in 1988. The laboratory paid PG&E \$734,800 in connection charges and incurs a monthly minimum charge of \$6,550 for this line.
- In 1985, PG&E installed a 115-kV line on the same towers carrying the 230-kV line at a cost of \$650,000. According to PG&E, this line has a capacity rating of 159 mW and an emergency rating of 193 mW. The line may also be operated at 230-kV, with a rating of 317 mW, and would have an emergency rating of 386 mW.

According to PG&E, the peak monthly demand for electrical power in 1986 for the Livermore Laboratory was 52 mW. PG&E claims that its existing lines serving the laboratory have a transmission capacity of 215 mW and could be modified to provide between 318 mW and 634 mW. Western's planned line would be capable of delivering over 600 mW to the laboratory or more than four times the maximum load requirement forecasted for the year 2001. PG&E also points out that while Western is able to claim that the planned line would be more reliable than PG&E's existing service because of its size, Western has not shown that a reliability problem exists. If reliability is a problem, PG&E believes that less expensive alternatives involving its system could be explored.

PG&E also questions the cost savings that Western has estimated for the proposed line. PG&E pointed out that Western apparently did not include the cost of using PG&E's existing line as the backup delivery route in its cost justifications for the planned line. PG&E can provide this service and estimates that it would cost between \$3.3 million to \$10 million over the next 5 years, depending on the standby service actually used. In addition, PG&E said the estimated cost savings ignore that Western will charge the laboratory for wheeling. Furthermore, according to PG&E, part of the savings are based upon the assumption that the Pacific Northwest power would be available at rates similar to the current low levels even though the Bonneville Power Administration (presumed to be the principal supplier of the Pacific Northwest power) has been consistently increasing its rates.

PG&E said that the proposed transmission line would "strand" or idle its own transmission facilities serving the Livermore Laboratory. This would be unfair to its other customers because the cost of the stranded facilities would have to be passed on through higher rates to those customers. PG&E estimated that an additional \$2 million a year would have to be obtained from its other customers.

PG&E is also concerned that the unused capacity of the proposed Tracy/Livermore transmission line may be used to wheel power for other power suppliers. If this occurs, PG&E estimates that it would lose in excess of \$40 million per year. PG&E based this estimate on lost wheeling revenues of \$6.6 million a year and lost capacity (fixed cost) sales of about \$35 million a year.

In addition, PG&E had proposed a discount rate for its power sold to the DOE installations in exchange for DOE's allocated share of the Pacific Northwest power. PG&E said that this exchange would have allowed the installations to realize many of the benefits of the power allocation without the need for the Tracy/Livermore line. However, DOE's General Counsel has determined that the installations do not have the right to assign their federal power allocation to PG&E. If the DOE installations do not use the allocation, it reverts to Western.

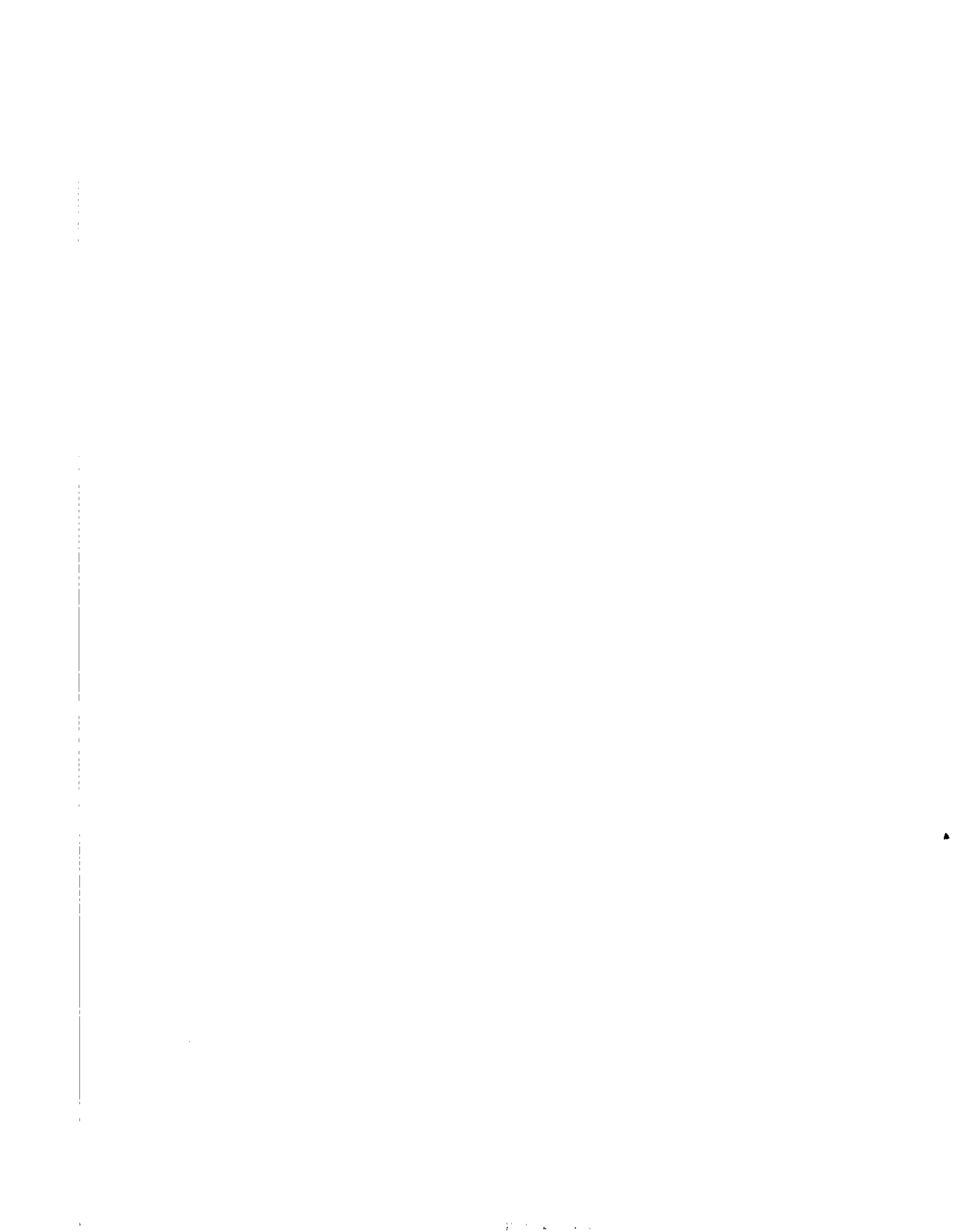
Major Contributors to This Report

**Resources,
Community, and
Economic
Development Division,
Washington, D.C.**

Keith Fultz, Associate Director, (202) 275-1441
Paul Grace, Group Director
Shirley Perry, Writer-Editor

**Denver Regional
Office**

Ted Baird, Regional Management Representative
Glen Baughman, Evaluator-in-Charge
Diane Sanelli, Reports Analyst



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Requests for copies of GAO publications should be sent to:

U.S. General Accounting Office
Post Office Box 6015
Gaithersburg, Maryland 20877

Telephone 202-275-6241

The first five copies of each publication are free. Additional copies are \$2.00 each.

There is a 25% discount on orders for 100 or more copies mailed to a single address.

Orders must be prepaid by cash or by check or money order made out to the Superintendent of Documents.

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

Official Business
Penalty for Private Use \$300

Address Correction Requested

First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100