



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON D C 20548

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ENERGY AND MINERALS  
DIVISION

DEC 15 1976

The Honorable Jack O. Horton  
Assistant Secretary, Land and  
Water Resources  
Department of the Interior

Dear Mr. Horton.

Because the United States faces a shortage of domestic oil and natural gas, both the President and Congress have emphasized the national goal of reducing the consumption of these fuels in order to decrease the Nation's dependence on unreliable foreign supply sources. One method to reduce the consumption of oil and natural gas is to give priority in selling surplus hydroelectric power to displace electricity generated with these fuels.

We reviewed the Bureau of Reclamation's Upper Missouri Region (UMR) and the Upper Colorado Region (UCR), and the Southwestern (SPA) and the Southeastern (SEPA) Power Administrations' marketing activities to assess their procedures for marketing surplus power and to determine the potential for Federal power operations to displace scarce fuel resources. We discussed the results of our review with SPA and SEPA officials.

The Federal power marketing agencies place different priority on accomplishing oil and natural gas conservation. When selling surplus hydroelectric power, several of the Bureau's marketing regions actively attempt to choose customers who will displace oil and natural gas as opposed to coal in their generation. Neither SPA nor SEPA, however, consider fuels being displaced when marketing surplus power. We found that surplus power sales by these agencies were often displacing coal-fired generation when concurrent oil and gas-fired generation was occurring and could possibly have been displaced.

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BUREAU OF RECLAMATION

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Two Bureau regions (UMR and UCR) have instituted oil conservation programs and two other regions (Lower Colorado and Lower Missouri) have participated in the programs. These programs have resulted in oil savings and increased the operating revenues of the regions. Increased revenues occurred because fuels with a higher economic value were displaced by the program and the rates charged were designed to recognize this value. The table below summarizes the results in the two regions.

RESULTS OF UMR'S AND UCR'S  
OIL CONSERVATION PROGRAMS

<u>Region</u>	<u>Period</u>	<u>Oil saved (millions of barrels)</u>	<u>Net increased revenue (millions)</u>
UMR	12/72-6/73	1.3	\$ 3.1
	7/73-6/74	2.9	10.0
	7/74-6/75	<u>4.3</u>	<u>12.6</u>
	Total	<u>8.5</u>	<u>\$25.7</u>
UCR	11/73-6/74	0.9	\$2.3
	7/74-6/75	<u>2.2</u>	<u>7.0</u>
	Total	<u>3.1</u>	<u>\$9.3</u>

The specific sales techniques used by the regions vary, but program results were similar. UMR has surplus power available for displacement sales because of above average water conditions and energy purchases. UMR purchases low-cost, coal-fired off-peak energy to meet part of their firm requirements, thus saving water which they would otherwise use to meet their loads and increasing the amount of excess hydro energy which they can sell during peak hours to displace oil and gas. UMR sells this energy to any utility under contract at 85 percent of the cost of the fuel it replaces.

Additionally, UMR sets a minimum sales rate for the surplus power based on existing market conditions. The minimum rate is set at a level designed to make it economically feasible only to purchase the hydro energy for displacement of the higher cost fuels (oil and natural gas). UMR has 18 customers willing to purchase surplus power under

such terms. Contract terms with these customers provide for the sale of surplus energy from time to time on an as available basis.

UCR's oil conservation efforts are primarily an outgrowth of their energy purchasing program. Each year UCR determines the amount of energy needed to meet firm requirements in the event of an adverse water year. The needed energy is then purchased as it becomes available from coal and hydro generating sources, starting at the beginning of each water year (October). Subsequently, if it is determined that an adverse water year will not occur, UCR's excess energy is available for oil displacement sales.

Also, UCR has arranged to receive off-peak coal-fired energy from customers. The energy is used by UCR to meet part of its firm requirements and to save water. The conserved hydro energy is returned later to those customers when they are experiencing a peak demand and displaces oil generation that would be used to meet those demands. A customer must normally have both coal and oil generating capability in order to participate in this program as energy is traded back and forth between the customer and the Region. Savings realized by a customer, through reduced fuel expenses, are split equally with UCR. The savings can be settled in either dollars or energy.

#### SOUTHWESTERN POWER ADMINISTRATION

The Southwestern Power Administration is responsible for marketing hydroelectric power in Arkansas, Louisiana, Kansas, Missouri, Texas, and Oklahoma. SPA markets an annual average of 5.4 billion kilowatt hours (kwh) of hydroelectric energy. SPA's generation, presently, represents about 2 percent of the total generation (200 billion kwh) in the southwest. During fiscal year 1975, SPA generated about 9 billion kwh, about 65 percent more than average.

Electric utilities in SPA's marketing area generate 80 to 90 percent of their power from oil and natural gas fuels. Consequently, SPA power sales frequently conserve these fuels. We believe, however, that opportunities still exist for SPA to increase the displacement of oil and gas-fired generation, because coal-fired generating capacity in SPA's market area will increase to about 35 percent by 1984. Therefore, SPA could be displacing additional coal-fired generation unless fuel displacement becomes a consideration in their surplus power marketing program.

An SPA official told us that except for certain contractual arrangements SPA has discretion in selecting customers

when selling its surplus energy. SPA has established priorities for marketing surplus power, but oil and gas displacement is not among this criteria. The priorities result in the displacement of some oil and gas, but we believe opportunities exist to increase the amount of displacement. During fiscal year 1975, surplus power was sold to three utilities having substantial coal-fired generating capacity, as shown in the following table.

SURPLUS POWER SALES BY SPA (FY 1975)  
TO UTILITIES WITH SIGNIFICANT  
COAL GENERATION CAPABILITY

<u>Utility</u>	<u>Percent coal generation to system generation</u> 1/	<u>Interruptible capacity purchased</u> (mwh) 2/	<u>Estimated potential fuel savings</u> Barrels/oil or gas (mcf) 3/ (000 omitted)	
Associated Electric Corporative, Inc.	100	711,525	1,186	7,187
City Utilities of Springfield, Missouri	84	127,750	177	1,071
Empire District Electric Com- pany	83	<u>46,695</u>	<u>65</u>	<u>391</u>
Totals		<u>885,970</u>	<u>1,428</u>	<u>8,649</u>

1/ Percentages shown are from a report filed with FPC "Quarterly Electric Utility Generation and Fuel Planning Report" and represent a 12 month projected average (October 1975-September 1976) of fuel consumption

2/ 1000 kilowatt hours equals 1 megawatt hour.

3/ Million cubic feet.

Because these utilities generate significant amounts of their load with coal, the SPA energy most likely was displacing coal-fired generation. The abundance of other utilities in SPA's market area using oil and gas, indicates, in our opinion,

that SPA could have displaced gas or oil generation with some or all of this power.

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SPA officials believe that selecting customers on the basis of type of fuel displaced would not be consistent with Flood Control Act of 1944 (16 U.S.C. 825s) provisions encouraging widespread use of Federal hydroelectric power at the lowest possible rates and giving sales preference to municipalities and cooperatives (preference customers). They also stressed that fiscal year 1975 was one of SPA's best years for generating surplus energy. Total generation from SPA projects during fiscal year 1975 was 8.95 billion kwh which compares to a normal year of 5.4 billion kwh. The large amount of energy available was a direct result of above average water flows.

Interior's Assistant Solicitor for Power stated, however, that the administration of UMR's oil conservation program is not inconsistent with the Flood Control Act of 1944. He noted that the law does not preclude the sale of surplus hydro energy and capacity to any customers under short-term arrangements. He did not believe that UMR's practice of selling surplus power at rates above the normal price of hydro energy violates the law, and concluded that the program serves important national purposes of conserving scarce fossil fuels, particularly oil and gas.

With respect to the rate charged for surplus energy, FPC staff told us that the pricing technique of sharing savings in fuel costs is a common utility industry practice. The FPC staff said they would have no objection to such a rate concept if it were used by the Federal power marketing agencies.

#### SOUTHEASTERN POWER ADMINISTRATION

The Southeastern Power Administration markets power in Kentucky, West Virginia, Virginia, North Carolina, South Carolina, Alabama, Georgia, Florida, Mississippi, and Tennessee. The power marketed by SEPA makes up a very small percentage of the power sold in the southeast. During fiscal year 1975, SEPA's hydro projects sold about 7.5 billion kwh.

SEPA's marketing operations are more restricted than either the Bureau's or SPA's because SEPA has no transmission lines. SEPA has contracted with utilities in the area to accept delivery of the Federal power at the point of generation. The utilities then provide the Federal power to its customers.

Contracts between SEPA and the investor-owned utilities specify how energy, firm and surplus, will be marketed. The contracts require SEPA to provide a minimum amount of energy each week to the utilities. The contracts also require the utilities to specify certain hours during each day of the week as peak hours and they are permitted to schedule the available SEPA power to optimally fit their load curves during their designated hours.

Power sold to the utilities outside the designated hours is surplus power. This occurs whenever SEPA has enough water to generate during all the specified hours and must still generate or else spill the water over the dam. Under such conditions the contract states:

"Whenever the Government, in the sole discretion of the Administrator, has dump energy 1/ available at [projects are specified] the Government may offer such energy to [company specified] and [company specified] in its sole discretion may accept or reject it." (Underscoring added.)

SEPA officials told us that in marketing surplus energy, they do not consider the type of fuel displaced. After determining that surplus energy is available, SEPA offers it to the utilities with whom they have contracts. The sales records for fiscal year 1975 showed that the companies always accepted the surplus energy when SEPA offered it. Sales records for SEPA's Kerr-Philpott system showed that surplus energy sales displaced nuclear and coal-fired generation. SEPA officials told us that surplus energy sales from their Georgia-Alabama system were also displacing coal-fired generation. These two systems accounted for about 46 percent of SEPA's overall energy sales. During fiscal year 1975, over 360,000 mwh of surplus energy was sold from these two systems to utilities which primarily use coal. If alternative sales arrangements could have been made for all of the surplus energy, the consumption of about 621,000 barrels of oil or 3,600,000 mcf of natural gas could have been conserved.

We believe that the contract provision for the sale of surplus energy allows SEPA discretion in marketing such power and that potential displacement customers exist. For example, the Florida Power Corporation met its load requirements primarily with oil and natural gas.

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1/ Dump energy is surplus energy.

SEPA could have its surplus energy wheeled 1/ to Florida Power Corporation. Based upon a Federal Power Commission report SEPA power has previously been wheeled to the corporation. A corporation official said that it would be interested in receiving surplus Federal power and that wheeling capability is available for SEPA to transmit such power to it.

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SEPA officials informed us that their power systems are already operating as a peaking resource. Contracts have been designed to permit private utilities to fit SEPA's generation into their systems economically. The officials also told us that their marketing operations are restricted by their lack of transmission facilities. With respect to the sale of surplus energy, the SEPA officials felt that the amount of surplus energy available was not significant and stated that interconnections with the Florida private utilities were limited. The SEPA officials told us, however, that since their surplus energy occurs during off-peak periods, it is more likely that transmission capability exists and at reasonable wheeling rates.

We recognize that SEPA does not have its own transmission facilities and would have to wheel surplus energy to displace oil and natural gas. We are aware that SEPA's potential savings of oil and natural gas resources will not significantly increase their availability, however, such conservation efforts could result in Federal hydroelectric energy displacing oil and natural gas. We believe that UMR's program demonstrates that there is a demand for both large and small amounts of energy to displace oil or gas generation and that wheeling arrangements can be made. Our analysis of UMR's monthly oil conservation sales for fiscal year 1975 showed that the amounts of energy sold to each customer varied significantly. The range of monthly sales was 3 mwh to 108,435 mwh. About 10 percent of these monthly sales were less than 50 mwh--the average unutilized line capability between Florida Power Corporation and Georgia Power Company. Also, we noted that 7 of the 18 oil conservation customers are not directly connected with UMR. These utilities have the power wheeled to them through intermediary systems.

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1/ Wheeling occurs when transmission facilities of one system are utilized to transmit power of another system.

CONCLUSION

We believe the opportunities exist to increase the displacement of oil and gas generation used by some Federal customers. We recognize that UMR's and UCR's surplus power marketing arrangements may not be completely adaptable to other marketing systems and that such sales will vary based upon (1) water conditions, (2) transmission line availability, and (3) purchasing needs of each utility. However, in our opinion, scarce fuel displacement should be considered when marketing surplus power.

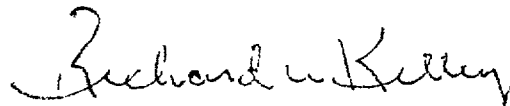
RECOMMENDATION

In view of the national importance of conserving scarce fuels, we recommend that you instruct the power marketing agencies to emphasize displacement of oil and natural gas in their sales of surplus power.

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We appreciate the cooperation received during our review and would like to be informed of any action taken on our recommendation. We would be glad to discuss this report with you or your staff.

Sincerely yours,



Richard W. Kelley  
Associate Director,  
Senior Level