Information On Selected Aspects Of The Power Operations Of Tennessee Valley Authority

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-114850

The Honorable Bill Brock
United States Senate

Dear Senator Brock:

In accordance with your request of February 18, 1975, and subsequent discussions with your office, we obtained information on the following activities of the Tennessee Valley Authority: (1) the comparability of power rates and rate increases with other utilities, (2) the potential for and probable effect of peak pricing, (3) its nuclear program, (4) its coal reserves and the methods and costs of mining such reserves, (5) the organizational arrangements and methods for establishing labor rates, (6) the basis for and effect of decisions to perform construction or maintenance work with its own employees rather than contracting for such work, and (7) the procedures for establishing rates charged by the distributors of the Authority power and the distributors' procedures for billing their customers.

As agreed with your office, because of the time constraints for obtaining the requested information, our report generally is based on information obtained from the Authority. We did, however, make independent tests, where appropriate to verify the accuracy of the information. As you requested, we obtained the Authority's informal comments on the contents of this report and considered its views in preparing this report.

COMPARABILITY OF POWER RATES

With a few minor exceptions, the Authority's power rates are lower than the rates of its neighboring utilities and the average rate of utilities throughout the United States. The exceptions are primarily utilities in the Pacific Northwest where hydroelectric facilities produce most of the power supply and some utilities that receive large amounts of Federal hydroelectric power and also offer special rates to consumers who have all electric homes, or who use electricity for water or space heating.

For calendar year 1974, the average rate per kilowatt-hour paid by residential consumers in the Authority service area

was from 27.8 to 47.7 percent lower than the average rates paid by residential consumers served by the Authority's nine neighboring utilities. Compared to the national average rate, the rates were 44.9 percent lower.

The Authority's cumulative dollar rate increases between April 1972 and February 1975 generally were lower both in percent and dollar increase, than the cumulative increases of the Authority's neighboring utilities. Current information on rate increases was not readily available for comparison on a national basis. (See p. 3 of appendix.)

PEAKLOAD PRICING

Peakload pricing refers to the practice of charging higher rates for electricity during hours of the day or seasons of the year when demands on a utility are highest. The objective of such pricing is to discourage consumers from using electricity during such peak demand periods and thus reduce the amount of generating capacity which a utility must construct.

Proponents of peakload pricing argue that it will provide an incentive for consumers to use elctrical energy in a manner which will improve system load factors;[1] reduce system peaks, and permit better utilization of generation, transmission, and distribution facilities. These changes are desirable because any leveling of the electrical load on a system within certain limits will reduce, or defer the need to construct peaking capacity. However, there may be problems to be overcome in implementing peakload pricing and much discussion is ongoing within the utility industry and Government over the advantages and disadvantages of peakload pricing.

The Authority believes that it has achieved many of the advantages associated with peak pricing because of its high average daily load factors of about 80 to 90 percent (compared to a national daily average of about 62 percent), through interchange agreements with other utilities; by sale of interruptible power[2] to directly served customers; and by demand (or capacity) charges to its distributors and directly served customers. The Authority believes also that there is

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[1]The ratio of the average load over a designated period to the peakload in that period.

[2]Power made available under agreements which permit cessation or curtailment of delivery by the supplier.

insufficient knowledge and experience to accurately measure and evaluate the additional benefits which may be achieved from, and the costs to implement peak pricing.

The Authority has discussed with one of its distributors a proposal for studying the usage characteristics of selected residential customers to find out which usage most contributes to a peak. If implemented, the joint study is to provide information on hourly load characteristics and metering costs. The Authority advised us that additional studies would be needed to determine whether pricing differentials could achieve the desired changes in load characteristics.

The Federal Energy Administration has requested proposals from utilities for studying the effects of peak pricing. An official of that agency said that, although the high average daily load factor obtained by the Authority would indicate that there may be limited benefits from such pricing, the Administration would be receptive to a request from the Authority for funding a study of peak pricing in the Authority's system. (See p. 9 of appendix.)

NUCLEAR PROGRAM

The Authority estimates that the demand for electricity in its service area will about double between 1975 and 1985 and that the increased demand will be met primarily with nuclear generated power. As of December 31, 1974, nuclear generating capacity in commercial operation accounted for about 5 percent of the Authority's generating capacity. The Authority estimates that by December 31, 1984, about 45 percent of its generating capacity will be in nuclear units. The costs of the 17 nuclear units planned for operation by 1984 is estimated by the Authority at $9.3 billion. At June 30, 1974, $1.3 billion had been expended.

The Authority annually forecasts the demand for future plant needs over a 9-year period by considering such factors as past and present conditions and assumptions about the future. The Authority's methodology of forecasting includes a study of factors which affected past growth and economic patterns in relation to growth, economic, weather, and other conditions which the Authority believes can reasonably be expected in its region in the future. The Authority uses 9 years as a base period for forecasting its electric plant needs because this is the approximate leadtime for planning and constructing nuclear plants.

Part of the Authority's nuclear program includes arrangements for nuclear fuel materials and services necessary for nuclear power generation. A large part of these arrangements

has been made for the 17 nuclear units planned for operation by 1984. Most of the arrangements have not been made, however, for storage and reprocessing of spent fuel. The Authority expects to require reprocessing services about 1981. The Authority said, however, that firm plans had not been made for such services because the reprocessing industry was in an uncertain condition because of constantly changing environmental regulations and the resulting reluctance of reprocessors to invest the capital to build facilities or to enter into firm contracts to provide reprocessing services. (See p. 11 of appendix.)

COAL RESERVES

In order to assure adequate and continuing coal supplies for its coal-fired steam plants, the Authority stated that it began acquiring coal reserves in 1961. The Authority stated that acquiring coal reserves is to its advantage because (1) it would continue to use coal for power generation for years to come, (2) the use of coal by neighboring utility systems and others would increase substantially, (3) the degree of competition in the coal industry had declined and would continue to decline, and (4) the supply of coal had not kept pace with the increased demand. According to the Authority, the rate at which its reserves are offered for development by mining companies depends on the availability from the mining industry of coal sufficient to meet the Authority's requirements and the need to minimize increasing coal prices.

The Authority owns six coal reserves which it estimated contain 382 million tons of recoverable coal. The Authority does not mine any of the coal reserves with its own employees. Through lease-contract arrangements with mining contractors, the Authority received about 4.2 million tons of its 38 million ton annual coal requirement in 1974 from two of its reserves.

An isolated block of coal in a third reserve is being mined by an adjoining mine operator since, according to Authority officials, it would not be economical for the Authority to open a mine for this coal only. The Authority does not receive the coal; instead, the Authority receives a royalty on the coal sold to other parties.

The Authority has not made arrangements for mining the other three reserves. According to the Authority, the feasibility of mining one of these reserves is being studied as part of the Authority's overall program for use of its coal reserves; a second reserve, acquired as partial settlement of a court action, consists of a single seam which the Authority believes is probably not of sufficient thickness

to warrant economical mining using today's mining techniques; and the third reserve, acquired in late 1974 as a part of the acquisition of uranium reserves, has not been explored for purposes of estimating the coal reserves.

The Authority was negotiating for the purchase of additional coal reserves; however, it preferred not to disclose the details of its proposal because of possible adverse effects on its negotiations.

According to the Authority, ownership of coal reserves contributes to lower prices for coal delivered to its steam plants because, while it must pay the mining costs, it can avoid the profit margin which a supplier charges on its own reserves. In this connection, the Authority said that some investor-owned utilities also own coal reserves. (See p. 22 of appendix.)

ESTABLISHING LABOR RATES

The Authority negotiates with the Tennessee Valley Trades and Labor Council, comprising representatives of 16 national or international unions, to establish the prevailing wage rate in the Authority's vicinity for its trades and labor employees. Before negotiating, the Authority and the council independently make wage surveys at various cities and companies throughout the vicinity. After conducting the wage surveys, the Authority and the council negotiate the prevailing wage rate for each trade or craft. The agreed-upon rate applies throughout the Authority's vicinity; however, if the Authority and the council cannot agree on a wage rate for a particular trade or craft, the matter is referred to the Secretary of Labor for final determination. No wage rate matters have been submitted to the Secretary since 1971.

Each craft or trade in the Authority's work force is represented by a council member; however, there are several employees whose duties are unique to the type of work generally performed by trades and labor employees. In these instances, the employees are represented on a collective basis by the council.

The Authority has considered the requirement in the Tennessee Valley Authority Act to pay the wage rates prevailing in the "vicinity" to mean the watershed of the Tennessee River, the Authority power service area, and certain adjacent areas. This definition is incorporated in the collective bargaining agreement between the Authority and the council. The Secretary of Labor has ruled on two occasions that this definition of vicinity is appropriate. (See p. 27 of appendix.)

CONSTRUCTION BY FORCE ACCOUNT

The Authority constructs its power plants primarily with its own work force (force account) rather than by contract. The Authority believes that this is a more economical and more efficient means of attaining its program objectives. It does not, however, make cost comparisons on a project-by-project basis; therefore, information is not readily available for independent evaluation as to whether the method chosen for constructing individual projects is more economical and efficient. The Authority said that it has accumulated, over the years, many examples relative to cost of force account versus contract construction which Authority officials believe justify their position in choosing force account work for most of their activities. Historically, the powerplant construction work contracted for by the Authority has been limited to specialty work such as roofing, tile flooring, masonry, glazing, and certain other types of work for which it does not believe the maintenance of a specialized work force is warranted.

The Authority cited the following factors as justifying its decision to carryout its construction program primarily with its own employees:

--Concurrent design and construction, which results in earlier project completion.

--Mobility of workers and equipment to new projects from those being completed within the relatively compact geographic area of the Authority's activities.

--Use of a trained team and highly experienced construction supervisors and key workers which has been developed in the Authority's past construction program.

--Negotiation and application of trades and labor practices and rates common to contractors and the Authority.

--Flexibility in adjusting activities and schedules to unforeseen factors encountered during construction such as technological advances, improved construction methods developed on other projects, or funding modifications.

--Use of contracts for specialized types of construction where cost comparisons indicate contracts to be more advantageous.

In 1971, an Authority task force, comprised of three consultants and two former Authority officials, studied various aspects of the Authority's Office of Engineering Design and Construction operations. One aspect was force account versus contract construction. In its report, the task force concluded that:

--The Authority had not developed detailed comparisons to support its claim that construction by force account is competitive with private industry.

--Because of the limited cost data available for comparison purposes, no judgment could be made on the merits of force account versus contract construction.

--The Authority should offer a substantial project on a contract basis from time to time for the purpose of obtaining a better measure of its own performance.

Office of Management and Budget Circular A-76, dated August 1967, provides guidelines for implementing the Government's general policy of relying on private enterprise to supply its needs. The Authority believes that there is a substantial question as to whether the Circular applies to it but an official of the Office of Management and Budget said that he believes that the Circular does apply to the Authority.

Circular A-76 states that each agency is responsible for issuing implementing instructions and for providing management support and procedures for review and followup to insure that the provisions of the Circular are effective. The Authority had not developed any implementing instructions and did not believe such instructions were necessary.

The Authority defined its entire construction program as an "existing Government activity" and, therefore, not subject to the project-by-project comparisons required by the Circular for "new starts." As required by the Circular, the Authority prepared a report on review of the construction activity in September 1968 and, as authorized by the Circular for existing activity, waived the requirement for further review. In the 1968 report, the Authority enumerated six benefits relating to economies and efficiencies which it stated could be realized by performing construction with its own work force. The benefits reported by the Authority in 1968 are essentially those described in this report.

The Authority was unable to provide us with specific documentary support for its 1968 report. One Authority official said that an in-depth study probably was not made

and that the findings and conclusions in the report probably were based on the Authority's previous experience.

An Office of Management and Budget official told us that, for purposes of Circular A-76, each powerplant or other major project constructed by the Authority should be considered as a "new start" and that in the future the Authority should make evaluations for each construction project in order to determine whether such projects should be constructed by force account or by contract. (See p. 31 of appendix.)

POWER RATES CHARGED BY AUTHORITY DISTRIBUTORS

Section 10 of the Tennessee Valley Authority Act authorized the Authority to establish rules and regulations and to include in its power sales contracts such terms and conditions (including resale rate schedules) as the Authority deems necessary to carry out the purposes of the act.

The Authority has established 10 residential power resale rate levels, any one of which the Authority may authorize for use by each of its 160 distributors in billing consumers. The rates are intended to be as low as possible and still provide enough revenue to the distributors to operate on a self-supporting and sound financial basis. The Authority monitors the distributors' operations to insure that the rate schedules authorized are accomplishing the intended purpose.

In determining which rate schedule will enable a distributor to meet its financial responsibilities, the Authority and the distributor consider such factors as load characteristics and geography, customer load density, plant investment, and long-term debt service. The selection of a resale rate schedule takes into account (1) a wide variation in operating costs among distributors and (2) differences in the cost of the service provided to customers served by the distributor. Therefore, some distributors serving about the same number of customers may be authorized by the Authority to use different rate schedules.

The Authority's monitoring of distributors operations includes accumulating financial and operating information on a monthly basis for comparing current and past performance. In addition, Authority field accountants make periodic onsite reviews to verify the information reported in the monthly reports and to insure compliance with the terms of the Authority's power contracts with the distributors.

Since October 1970 distributors have been allowed to adopt the next higher or lower rate schedule without a prior determination by the Authority that a change is necessary. According to the Authority, this provision was necessary to allow distributors more flexibility in meeting changing revenue needs. However, before a distributor can adopt the next higher or lower rate schedule, the Authority must be notified in writing; and, under the terms of the standard power contract, the Authority can revoke the change if its later review shows that the change was not warranted.

From October 1970 through March 1975, 147 changes--89 increases and 58 decreases--in rate schedules were made by 100 of the 160 distributors. The Authority told us that most of these changes were made by distributors under the option to change to the next higher or lower rate schedules without the Authority's prior approval.

Power contracts between the Authority and its distributors provide that a customer's monthly bill will be increased or decreased in accordance with an adjustment addendum published by the Authority. The Authority's adjustment addendum provides that the adjustments to power rates are to be applied to all bills rendered as a result of meter readings made during billing cycles beginning on or after the effective date of the addendum. A "billing cycle" is defined as the complete cycle of meter readings for all meter routes from which monthly sales statistics and revenues are derived.

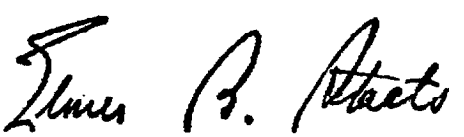
We reviewed the implementation of the adjustment addendum for selected billings primarily for November and December 1974 and for January and February 1975 at three distributors--Cleveland Electric System, Chattanooga Electric Power Board, and Middle Tennessee Electric Membership Corporation. The adjustment addenda were implemented correctly at Cleveland and Chattanooga; however, at Middle Tennessee, the adjustment addendum was implemented incorrectly based on billing cycle dates included in documents printed by Middle Tennessee. Middle Tennessee applied the adjustment addendum to be effective with the billing cycle beginning on or after December 2, 1974, to the billing cycle beginning November 25, 1974. The same type of incorrect procedures was followed for application of the adjustment addendum for the billing cycles effective on or after January 2, February 2, and March 2, 1975. The cumulative effect was an estimated overcharge of $222,000 for November 1974 through February 1975. Sufficient information was not available at the time of our review to estimate a probable undercharge for March 1975. The Authority said that the incorrect applications probably would have been detected

in the normal course of its routine audits of distributor operations. An official of Middle Tennessee indicated that the incorrect application of the adjustment addendum resulted from a misinterpretation as to its effective date. Subsequently, however, the Manager of Middle Tennessee advised us that he had previously advised his supervisors in a meeting to change the billing cycle dates to conform to the date of the Authority's adjustment addendum and, therefore, he believes that there is no overcharge. An official of the Authority advised us that he is considering whether additional instructions are necessary for formally establishing billing cycles.

Because of the situation disclosed by our review at Middle Tennessee, the Authority has asked its field accountants to intensify their review of the implementation of the adjustment addendum during their periodic visits to distributors. Also, the Authority told us that it would determine the extent of the erroneous billings by Middle Tennessee and would require appropriate adjustments to customer accounts unless the costs involved in making such adjustments exceeded the amount of the adjustments. (See p. 39 of appendix.)

We do not plan to distribute this report further unless you agree or publicly announce its contents.

Sincerely yours,



Comptroller General
of the United States

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ABBREVIATIONS

TVA	Tennessee Valley Authority
FPC	Federal Power Commission
NRC	Nuclear Regulatory Commission
FAP	Federal American Partners
OMB	Office of Management and Budget

INFORMATION ON SELECTED ASPECTS OF THE POWER OPERATIONS OF TENNESSEE VALLEY AUTHORITY

INTRODUCTION

As an independent Government corporation, created by the Tennessee Valey Authority (TVA) Act of 1933, 16 U.S.C. 831 et. seq. (1970), TVA generates, transmits, and sells electric power; helps to control floods; promotes navigation on the Tennessee River; develops fertilizers and munitions; and participates in developing recreational, agricultural, and other resources of the Tennessee Valley.

Of its several resource development programs, TVA's power program is the largest--accounting for about 87 percent of TVA's total assets of $6 billion at December 31, 1974. TVA's construction and investigation costs incurred for future projects totaled about $1.8 billion. Ninety-four percent, or $1.6 billion, of this amount relates to power facilities. Of the total 25,799 TVA employees (10,634 salary and 15,165 wage employees[1]) as of December 31, 1974, 20,892, or 81 percent, were in TVA's Office of Power and Office of Engineering Design and Construction.

TVA relies primarily on coal-fired steamplants, which require about 38 million tons of coal a year, to generate electric power. Hydroelectric units, gas turbine units, and, increasingly, nuclear-powered units produce the balance of TVA-generated electricity. TVA also buys and interchanges large amounts of electric power through its interconnections with other utilities.

Most of TVA's electric power is sold at wholesale prices to 160 municipal and cooperative electric systems which distribute the power to more than 2.1 million customers in seven States. TVA also serves directly 47 industrial customers with large or unusual power requirements and several Federal atomic, aerospace, and military installations.

In fiscal year 1974 TVA's system totaled 119.4 billion kilowatt-hours, as follows.

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[1]Of the 15,165 wage employees, 5,454 were permanent employees paid annual wages and 9,711 were temporary, hourly paid employees.

	Billions of kWh	Percent of total
System input		
TVA system:		
Hydro	23.5	19.7
Coal-fired steamplants	84.1	70.4
Nuclear plants	1.9	1.6
Gas turbine engines	.3	0.3
Purchased	1.1	0.9
Interchange received	8.5	7.1
Total input	119.4	100.0
System output		
Sales:		
Municipalities and cooperatives	64.2	53.8
Federal agencies	17.4	14.6
Industries	23.8	19.9
Electric utilities	.1	0.1
Interdivisional (TVA)	.7	0.6
Returned to Aluminum Company of America (note a)	1.8	1.5
Interchange delivered	8.4	7.0
Losses	3.0	2.5
Total output	119.4	100.0

[a]In return for energy delivered to the TVA system from power units of the Aluminum Company of America.

In a letter dated February 18, 1975, and in subsequent discussions with his office, Senator Bill Brock expressed to the General Accounting Office his concern about TVA's power rate increases and its constantly increasing costs for coal, money, labor, and its expanding nuclear program. He noted that such increases in rates and costs are of serious concern to the consumers of TVA power and requested the General Accounting Office to provide him with information on the following matters.

1. The comparability of TVA's power rates and rate increases with other utilities.

2. The potential for and probable effect of peak pricing by TVA.

3. TVA's nuclear program.

4. TVA's owned coal reserves and the methods and costs of mining such reserves.

5. The organizational arrangements and methods for establishing labor rates.

6. The basis for and effect of TVA's decisions to perform construction or maintenance work with its own employees rather than contract for such work.

7. The procedures followed by TVA in establishing rates charged by the distributors of TVA power and the procedures used by the distributors for billing their customers.

COMPARISON OF TVA'S POWER RATES AND RATE INCREASES WITH THOSE OF OTHER UTILITIES

With a few minor exceptions, TVA's power rates are lower than the rates of its neighboring utilities and the average rate of utilities throughout the United States. The exceptions are primarily utilities in the Pacific Northwest where hydroelectric facilities produce most of the power supply and some utilities that receive large amounts of Federal hydroelectric power and also offer special rates to consumers who have all electric homes or who use electricity for water or space heating.

Between April 1972 and February 1975, TVA's cumulative rate increases were lower than the increases of its neighboring utilities except for one utility, and that utility had a request for a rate increase pending in February 1975. Current information on rate increases was not readily available for comparisons on a national basis.

Comparison of power rates

For calendar year 1974 the average rate per kilowatt-hour paid by residential consumers in the TVA service area was from 27.8 to 47.7 percent lower than the average rates paid by residential consumers served by TVA's nine neighboring utilities (investor-owned). Compared to the national average rate, the rate paid by residential consumers in the TVA area were 44.9 percent lower. The following table compares the average rate per kilowatt-hour (in cents per kilowatt-hour) paid by residential consumers in the TVA area with the average price paid by consumers served by the nine neighboring utilities and by consumers throughout the United States for calendar years 1970-74.

APPENDIX

	Average cents per kWh				
	1970	1971	1972	1973	1974
TVA service area	1.09	1.27	1.27	1.34	1.56
Alabama Power	1.70	1.80	1.90	2.08	2.44
Appalachian Power	1.85	1.92	2.02	2.02	2.55
Arkansas Power and Light	2.07	2.08	2.09	2.19	2.84
Carolina Power and Light	1.64	1.80	1.98	1.98	2.64
Georgia Power	1.65	1.73	1.90	2.02	2.48
Kentucky Utilities	2.23	2.20	2.25	2.25	2.57
Louisville Gas and Electric	2.05	2.04	2.03	2.05	2.16
Mississippi Power	1.75	1.82	1.90	2.01	2.53
Mississippi Power and Light	1.80	1.80	1.87	2.01	2.98
United States	2.10	2.19	2.29	2.38	2.83

At February 28, 1975, the power rates for residential consumers in the TVA area were lower at monthly usage levels of 500, 1,000, and 1,500 kilowatt-hours than comparable rates of the nine neighboring utilities, except for the rate charged by Louisville Gas and Electric for 500 kilowatt-hours, as shown below.

	Usage levels		
	500 kWh	1,000 kWh	1,500 kWh
TVA service area	$12.96	$20.52	$28.07
Alabama Power	18.14	30.01	40.79
Appalachian Power	14.97	27.42	39.17
Arkansas Power and Light	15.79	28.69	37.72
Carolina Power and Light	17.89	31.72	47.45
Georgia Power	19.44	35.27	50.67
Kentucky Utility	16.48	28.12	39.76
Louisville Gas and Electric	12.75	22.55	32.34
Mississippi Power	16.23	27.70	39.18
Mississippi Power and Light	16.36	27.35	38.35

We selected usage levels of 500, 1,000, and 1,500 kilowatt-hours for comparison purposes to provide representative coverage of the rates most generally applied by TVA and its neighboring utilities. During 1974 residential consumers in the TVA service area used an average of 1,200 kilowatt-hours per month compared to an average of 750 kilowatt-hours per month for consumers served by neighboring utilities.

Comparison of cost per 1,000 kilowatt-hours to residents in selected cities in the United States showed in January 1975 that, generally, residents in the TVA region were charged relatively low power rates. A principal exception involves residents in the Pacific Northwest where power rates are lower than those charged in the TVA area because most of the power in the Pacific Northwest is produced by relatively inexpensive hydroelectric facilities whereas, only about 20 percent of TVA's power is produced by this method. Residents in several cities receive large amounts of Federal hydroelectric power and also special rates if they have all-electric homes or use electricity for water or space heating. Our comparison, which is based on the lowest rate charged by other utilities where they have more than one rate for their residential consumers, follows.

Location	Cost per 1,000 kWh
Portland, Ore.	[a]$16
Columbus, Neb.	[b] 16
Rapid City, S.D.	[c] 17
Shasta Dam area, Calif.	17
Beatrice, Neb.	[b] 18
Lincoln, Neb.	18
Midway, Minn.	19
Salt Lake City, Utah	[c] 19
Blaine, Neb.	[c] 20
TVA area	21
Louisville, Ky.	22
Northeastern Tex.	23
Omaha, Neb.	23
Pinoli, Calif.	25
Chicago, Ill.	26
LaVerne, Minn.	28
Los Angeles, Calif.	29
Pontiac, Mich.	29
St. Louis, Miss.	30
Little Rock, Ark.	30
Birmingham, Ala.	30
Atlanta, Ga.	31
Aurora, Ohio	32
Washington, D.C.	34
Akron, Ohio	35
Asheville, N.C.	38
Burlington, Vt.	41
Boston, Mass.	41
Brunswick, Ohio	43
Southwest Vt.	55
New York, N.Y.	63

[a]Pacific Northwest

[b]Special rate for residents with an all-electric home or who use electricity for water and/or space heating. The regular rate is also lower than TVA's rate.

[c]Special rate for residents with an all-electric home or who use electricity for water and/or space heating. The regular rate is higher than TVA's rate.

Comparison of rate increases

TVA's cumulative rate increases between April 1972 and February 1975 generally were lower, both in percent and dollar increase, than the cumulative increases of TVA's neighboring utilities.

Stated in terms of dollar increases, one neighboring utility, Louisville Gas and Electric Company, had cumulative rate increases for 500, 1,000, and 1,500 kilowatt-hours which were lower than TVA's during the period April 1972 to February 1975. However, the utility had a request for a rate increase pending in February 1975. In terms of percentage increases, two utilities had rate increases which were lower than TVA's rate increases for usage levels of 500, 1,000, and 1,500 kilowatt-hours and one utility's rate increase was lower than TVA's for 500 kilowatt-hours. It should be noted that, when the dollar increases are shown as percentages, TVA's increases may appear as a larger figure because TVA's rates were lower to begin with.

The following table shows the percent and dollar increases for TVA and its neighboring utilities from April 1972 to February 1975 based on representative usage levels of 500, 1,000, and 1,500 kilowatt-hours per month.

	Cost of 500 kWh		Increase		Cost of 1,000 kWh		Increase		Cost of 1,500 kWh		Increase	
	4-72	2-75	Percent	Dollar	4-72	2-75	Percent	Dollar	4-72	2-75	Percent	Dollar
TVA	$ 9.21	$12.96	40.7	$3.75	$13.71	$20.52	49.7	$ 6.81	$18.21	$28.07	54.1	$ 9.86
Alabama Power Company	10.87	18.14	66.9	7.27	17.59	30.01	70.6	12.42	24.30	[a]40.79	67.9	16.49
Appalachian Power Company	10.03	14.97	49.3	4.94	17.55	27.42	56.2	9.87	24.36	39.17	60.8	14.81
Arkansas Power and Light	11.73	15.79	34.6	4.06	17.96	28.69	59.7	10.73	22.45	37.72	68.0	15.27
Carolina Power and Light Company	11.52	16.89	46.6	5.37	19.67	31.72	61.3	12.05	28.31	47.45	67.6	19.14
Georgia Power Company	10.13	19.44	91.9	9.31	[a]17.18	[a]35.27	105.3	18.09	[a]23.93	[a]50.67	111.7	26.74
Kentucky Utilities Company	11.90	16.48	38.5	4.58	19.40	28.12	44.9	8.72	26.90	39.76	47.8	12.86
Louisville Gas and Electric	10.90	12.75	17.0	1.85	19.40	22.55	16.2	3.15	27.90	32.34	15.9	4.44
Mississippi Power Company	11.34	16.23	43.1	4.89	17.74	27.70	56.1	9.96	25.49	[a]39.18	53.7	13.69
Mississippi Power and Light Company	10.26	16.36	59.5	6.10	15.66	27.35	74.6	11.69	21.05	38.35	82.2	17.30
Arithmetic average--TVA	$ 9.21	$12.96	40.7	$3.75	$13.71	$20.52	49.7	$ 6.81	$18.21	$28.07	54.1	$ 9.86
Arithmetic average--others	$10.96	$16.34	49.1	$5.37	$18.02	$28.76	59.6	$10.74	$24.97	$40.60	62.6	$15.64

[a]Indicates winter rate. A higher rate is applied in summer.

APPENDIX

Three of TVA's neighboring utilities--Appalachian Power Company, Georgia Power Company, and Louisville Gas and Electric Company--had requests for rate increases pending before their public service commissions as of February 1975. If the requests are approved, the difference between their rates and TVA's rates will be greater.

POTENTIAL FOR AND EFFECT OF PEAKLOAD PRICING IN THE TVA POWER SERVICE AREA

Peakload pricing includes the concept of attempting to more accurately assign production costs to ultimate consumers by showing seasonal or hourly variations in a supplier's cost of providing service. It is the practice of charging higher rates for electricity used during hours of the day or seasons of the year when electrical demands on a utility are highest. Such pricing is to discourage consumers from using electricity during such peak demand periods and thus reducing the amount of generating capacity which a utility must construct.

Proponents of peakload pricing argue that it will provide an incentive for consumers to use electrical energy in a manner which will improve system load factors, reduce system peaks, and permit better utilization of generation, transmission, and distribution facilities. These changes are desirable because any leveling of the electrical load on a system, within certain limits, will reduce or defer the need to construct peaking capacity. However, there may be problems to overcome in implementing peakload pricing, and much discussion is ongoing within the utility industry and Government over the advantages and disadvantages of peakload pricing.

TVA believes that its powerload requirements and power supply arrangements are so structured as to already achieve many of the advantages associated with peakload pricing. TVA believes also that there is insufficient knowledge and experience at present to accurately measure and evaluate the additional benefits which may be achieved from, and the costs which would be incurred in implementing, peakload pricing.

TVA's powerload requirements are higher in winter than in other seasons. According to TVA, the seasonal variation in load requirements is largely compensated through its interchange agreement with other electric utilities. TVA receives power from the utilities primarily in the winter and provides power to them primarily in the summer. TVA officials said that this arrangement causes the powerload requirements placed on TVA's system in the winter and summer to be nearly equal and thus might provide as much

by implementing peakload pricing. Interchange agreements accounted for about 8 percent of the total kilowatt-hours of power passing through TVA's system in fiscal year 1974.

TVA also considers that its sale of interruptible power to directly served industries is a form of peakload pricing and so far, according to TVA, has found this to be a more practical method than other ways of influencing large power-load demands. Directly served industry accounted for about 20 percent of the kilowatt-hours of power sold by TVA in fiscal year 1974.

TVA said that its rates included a demand charge to distributors and directly served customers and that, since the charge was based on the highest demand registered during a month, it may have some of the effects desired in peakload pricing.

TVA has been considering whether peakload pricing could be applied at the retail level to encourage the desired effect of more nearly leveling daily powerloads. According to TVA, a pricing procedure of this type, referred to as time-of-day pricing, might be useful in achieving capacity and energy savings since it tends to encourage better daily and annual load factors. However, TVA identified several potential disadvantages and drawbacks to time-of-day pricing, including:

1. Price differentials that discourage power use during peak hours may also encourage new uses of electricity during offpeak hours. Thus, although time-of-day pricing may reduce capacity requirements, it will not necessarily conserve energy. If an increase in overall energy usage should occur, time-of-day pricing could result in a disbenefit.

2. Onpeaks and offpeaks of electricity usage have to be differentiated, and since TVA's power production costs vary throughout the day, additional time period differentials may be needed to closely tailor pricing to usage.

3. TVA estimates that the installation of even the simplest dual register metering equipment for 2.1 million customers in the TVA service area would cost about $200 million. Also, the costs of maintaining the equipment and billing on the basis of more complicated rate schedules would be higher than the cost of methods presently used.

TVA said that the evaluation of possible net advantages of time-of-day pricing for nonindustrial customers was impeded by the lack of information to substantiate the effectiveness of this concept. TVA believes that further study is needed to determine the benefits that might accrue from time-of-day pricing in the TVA area, since TVA's daily load factors, which average 80 to 90 percent, compared to a national daily average of about 62 percent, reduce the potential for peakload pricing. TVA officials said that expected improvements in metering technology and a reduced price for multiregister meters may eventually increase the benefit-cost margin and justify the application of time-of-day pricing to millions of small customers.

TVA has discussed with one of its distributors, Chattanooga Electric Power Board, a proposal for studying the usage characteristics of selected residential customers to find out which usage most contributes to a peak. If implemented, the joint study is to provide information on hourly load characteristics and metering costs. TVA told us that additional studies would be needed to determine whether pricing differentials during the day could achieve the desired changes in load characteristics.

The Federal Energy Administration has requested proposals from utilities for studying the effects of peakload pricing. An Administration official said that, although the high average daily load factor obtained by TVA would indicate that there may be limited benefits from such pricing, the Administration would be receptive to a request from TVA for funding of a study of peakload pricing in the TVA system.

TVA'S NUCLEAR PROGRAM

TVA estimates that the demand for electricity in its service area will almost double between 1975 and 1985 and that the increased demand will be met primarily with nuclear generated power. As of December 31, 1974, nuclear capacity in commercial operation accounted for about 5 percent of TVA's generating capacity. TVA estimates that by December 31, 1984, about 45 percent of its generating capacity will be in nuclear units. The cost of the 17 nuclear units planned for operation by 1984 is estimated by TVA at $9.3 billion. At June 30, 1974, $1.3 billion had been expended.

Basis for forecasting future plant needs

TVA forecasts the demand for future energy needs over a 9-year period taking into consideration such factors as past and present conditions and assumptions about the future. TVA's methodology of forecasting includes a study of factors which affected past growth and economic patterns

in relation to growth, economic, weather, and other conditions which TVA believes can reasonably be expected in its region in the future. TVA uses 9 years as a base period for forecasting its plant needs because this is the approximate leadtime for planning and constructing nuclear plants. TVA prepares a forecast annually and updates the forecast during the year if new information indicates the need.

TVA expects the demand for electricity to increase 95 percent between calendar years 1975 and 1985; and, to meet the increased demand, TVA plans to increase its generating capacity by 94 percent through December 1984. The following table shows TVA's estimate of peak power demands and planned generating capacity.

Year	Peak demand (note a) (mw (note b))	Capacity (note a)
1975	20,400	23,741
1976	23,000	26,526
1977	24,900	28,917
1978	26,500	30,051
1979	28,050	31,226
1980	29,650	33,608
1981	31,300	36,026
1982	33,100	38,436
1983	34,950	40,641
1984	37,100	43,241
1985	39,800	45,641

[a]TVA's peak demand month in January. The capacity shown is as of December.

[b]1,000 kW equal 1 mw.

The difference between system generating capacity and the demand placed upon the system is reserve capacity. According to TVA officials, the reserve capacity is necessary for (1) maintenance and emergency outages of generating capacity, (2) reduction in hydrocapacity due to adverse stream flow, and (3) unexpected variations in system load. Through interchange agreements with other utilities, TVA's reserve capacity is augmented in the winter peaking period by 2,060 megawatts and is reduced in the summer by 2,060 megawatts. Therefore, TVA's reserve capacity varies between summer and winter with the reserve capacity generally larger in the winter than in the summer.

TVA's reserve capacity compares favorably with that of other utilities in Federal Power Commission (FPC) Region III and the United States. The following table compares TVA's reserve capacity, expressed as a percentage of demand, with that of other utilities in FPC Region III and in the United States for 1972-80.

	Reserve capacity as a percentage of demand		
Period	TVA	FPC Region III (including TVA) (note a)	United States (note a)
Summer 1972	[b]13.9	[b]13.4	[b]19.6
Winter 1972-73	[b]15.0	[b]30.0	[b]35.4
Summer 1973	[b]22.9	[b]16.5	[b]20.8
Winter 1973-74	[b]30.0	[b]35.7	[b]49.4
Summer 1974	[b]20.3	22.4	28.0
Winter 1974-75	[b]35.7	40.0	44.1
Summer 1975	22.9	21.2	25.8
Winter 1975-75	24.3	39.7	45.4
Summer 1976	20.9	20.8	25.1
Winter 1976-77	24.4	38.7	44.1
Summer 1977	16.6	18.1	22.6
Winter 1977-78	21.2	35.8	40.5
Summer 1978	15.6	16.7	21.0
Winter 1978-79	18.7	33.8	40.1
Summer 1979	19.1	16.2	21.0
Winter 1979-80	20.3	32.3	39.6

[a]Data obtained from Edison Electric Institute.

[b]Actual percentages; all others shown are estimated.

According to an FPC official, a reserve capacity in the middle to upper portion of a 15 to 25 percent range is a reasonable reserve for TVA to maintain in order to meet its load requirements.

TVA estimates that 87 percent of its increase in generating capacity will be new nuclear capacity during the 10 years ending December 31, 1984, and that all additional scheduled capacity will be nuclear after December 31, 1976, as tabulated by year below.

December 31	System-wide		Nuclear			
	Capacity (MW)	Increase	Number units	Capacity (MW)	Increase	Percent total of system
1974	22,952	-	1	1,065	-	4.6
1975	25,461	2,509	2	2,130	1,065	8.5
1976	27,777	2,316	3	3,195	1,065	11.5
1977	30,057	2,280	5	5,475	2,280	18.2
1978	31,226	1,169	6	6,644	1,169	21.3
1979	32,395	1,169	7	7,813	1,169	24.1
1980	34.813	2,418	9	10,231	2,418	29.4
1981	38.436	3,623	12	13,854	3,623	36.0
1982	40,846	2,410	14	16,264	2,410	39.8
1983	43,251	2,405	16	18,669	2,405	43.2
1984	44,451	1,200	17	19,869	1,200	44.7

APPENDIX

Estimated cost of nuclear system

When completed, TVA's nuclear system will consist of 7 plants with a total of 17 units. The total cost of the 17 units is estimated at $9.3 billion; and, at June 30, 1974, TVA had expended $1.3 billion. The following table shows the expenditures at June 30, 1974, and the estimated cost to complete each plant.

Nuclear plant	Number units	Net generating capacity	Expenditures		
			At June 30, 1974	To complete	Total
		(MW)	(000 omitted)		
Browns Ferry	[a]3	3,195	$ 700,341	$ 114,659	$ 815,000
Sequoyah	2	2,280	431,798	243,202	675,000
Watts Bar	2	2,338	137,043	667,957	805,000
Bellefonte	2	2,426	36,317	963,683	1,000,000
Hartsville	4	4,820	6,750	2,493,250	2,500,000
Undetermined location	2	2,410	-	1,600,000	1,600,000
Undetermined location	2	2,400	-	1,900,000	1,900,000
Total	17	19,869	$1,312,249	$7,982,751	$9,295,000

[a]Units 1 and 2 at Browns Ferry were placed in commercial operation August 1, 1974, and March 1, 1975, respectively.

The $9.3 billion estimated cost of the 17 nuclear units includes about $2.9 billion of obligations and contract awards to date. The contract amounts for turbogenerators and nuclear steam supply systems--the two most expensive types of equipment--total about $1.5 billion or about 50 percent of the $2.9 billion. The remaining $1.4 billion is comprised mostly of obligations for interest construction, labor, general expense, and project procurements other than procurement of turbogenerators and nuclear steam supply systems.

At February 26, 1975, TVA had paid about $436 million against the contracts relating to turbine generators and nuclear steam supply systems for the 17 nuclear units, as shown below.

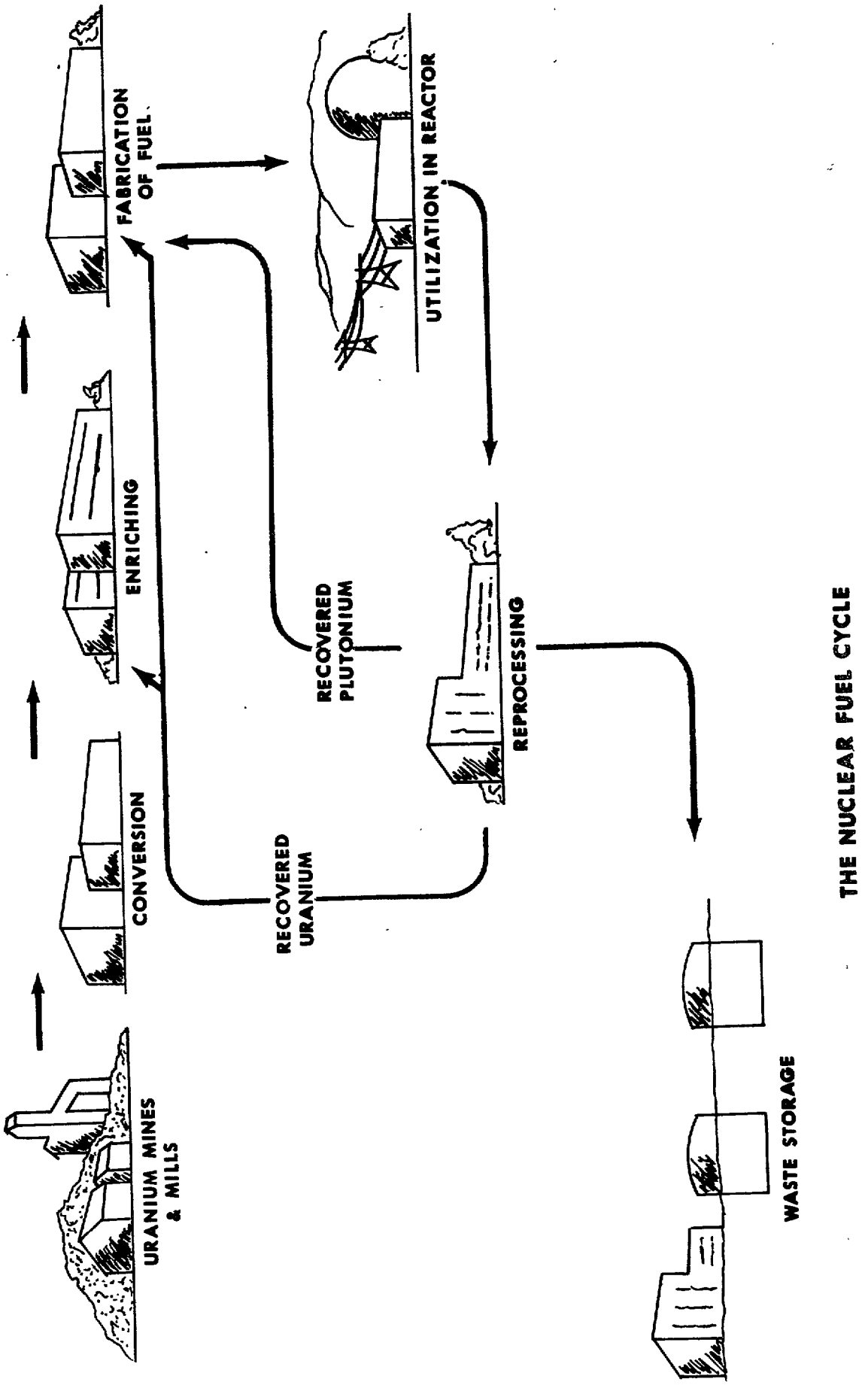
Project	Contract price	Payments through February 26, 1975
Browns Ferry units 1 and 2	$ 123,061,103	$119,595,396
Browns Ferry unit 3	62,184,793	58,643,046
Sequoyah units 1 and 2	138,104,847	126,059,781
Watts Bar units 1 and 2	155,633,698	98,515,221
Bellefonte units 1 and 2	144,139,307	26,418,417
Proposed Hartsville units	728,202,990	6,503,120
Projects not identified	143,276,000	100,000
Total	$1,494,602,737	$435,834,981

Nuclear fuel arrangements

Arranging for the nuclear fuel materials and services necessary for nuclear power generation is a major part of TVA's program. The nuclear fuel cycle, an expression which refers to the major procurement steps in processing and using nuclear fuel materials, consist of (1) obtaining uranium concentrates, (2) conversion of the concentrates to uranium hexafluoride, (3) enrichment of the uranium hexafluoride, (4) fabrication of the enriched uranium into usable fuel assemblies, and (5) spent fuel transportation, storage, and reprocessing or sale of spent fuel assemblies. (See diagram on p. 17.)

TVA has contracted with reactor manufacturers and suppliers of fuel cycle services to insure that these services are available when needed for a large part of its nuclear program. TVA also has nine agreements with eight companies for mining or exploration rights involving properties with known or potential uranium reserves.

APPENDIX



THE NUCLEAR FUEL CYCLE

Following is a brief description of the arrangements made by TVA to obtain nuclear materials and services.

Uranium concentrates

In arranging for the uranium concentrates required for its 17 proposed or existing nuclear reactors, TVA has contracted with reactor manufacturers to supply all or most of the uranium concentrates required for the first fueling of the first 9 reactors. For units 1 and 2 at Browns Ferry, the reactor manufacturer will supply all uranium concentrate required through the first refueling after July 1, 1982. For unit 3 at Browns Ferry, the manufacturer will supply the concentrate for 7 years and 3 months after the date the unit begins commercial operations. For four of the other six units, the manufacturers will supply the concentrate for the first fueling, and for the other two they will provide most of it for the first fueling.

TVA is responsible for providing uranium concentrates for the other eight units and for the first nine units after expiration of the contracts with the reactor manufacturers. To meet this responsibility, TVA has purchase commitments for uranium concentrates which provide full coverage of requirements through 1978 and from 53 to 15 percent coverage from 1979 through 1985, as shown below.

Year	Uranium concentrates required (1,000 pounds)	Percent covered by purchase commitments
1975	2,051	100
1976	2,795	100
1977	3,959	100
1978	6,014	100
1979	7,095	53
1980	7,278	47
1981	8,945	25
1982	10,254	19
1983	8,863	21
1984	9,876	19
1985	9,892	15

According to a TVA official, the balance of uranium concentrates required during the 1979-85 time frame will be provided from additional purchases or from mining of TVA owned or leased uranium reserves.

TVA has nine agreements with eight companies providing TVA with mining or exploration rights on certain properties in western States. A TVA official told us that the uranium reserves on these properties had not been quantified but

that the properties had potential for establishing or increasing identified reserves. Also, TVA is considering mining operations on some of its properties by 1977. TVA's description of its interests under the nine agreements follows.

American Nuclear Corporation (two agreements)--TVA owns 50 percent interest in the Corporation properties in Wyoming. In addition, TVA has the first right to purchase the Corporation's share of production.

Federal American Partners (FAP)--TVA has a mining lease on 100 percent of FAP's interest in the property primarily located in the Gas Hills area of Wyoming. TVA also has a contractural right to a uranium mill with a capacity of 950 tons a day.

Parker-Knupke--TVA has an option (not exercised as of March 1975) for the lease and exploration of certain properties in Starr County, Texas.

Susquehanna-Western--TVA has purchased a uranium-vanadium mill and has 100 percent interest in the claims and leases on uranium reserves in the Black Hills of South Dakota and Wyoming.

Rees, Hubbard, and Phillips--TVA has a option (not exercised as of March 1975) for the lease and exploration of uranium properties in Grand County, Utah.

American Copper and Nickel Company and David S. Robertson & Associates, Inc.--TVA has a right to a 50 percent interest in properties mainly located in the western United States. TVA has first right to purchase American's share of production obtained from uranium reserves which may be established in these properties.

Robert G. Rees--TVA has exclusive exploration and mining right on certain properties in Emery County, Utah.

Teton Exploration Drilling Company and United Nuclear Corporation--TVA owns 50 percent interest in properties consisting of claims and leases in Wyoming and New Mexico. These properties include minable reserves in Wyoming. In addition, TVA may acquire an additional 25 percent interest in leased uranium properties in McKinely County, New Mexico.

Conversion

Through agreements with reactor manufacturers and other suppliers, TVA has full coverage of conversion services

through 1980 and about 80 percent coverage from 1981-85 for the 17 nuclear reactors.

TVA has contracted with reactor manufactures to provide conversion services for the first nine units for the same period that reactor manufacturers provide uranium concentrates. TVA is responsible for providing conversion services for the other eight units and for conversion services for the first nine units after the contracts expire.

Enrichment

Enrichment services, as well as conversion services, will be provided by reactor manufacturers for the first nine units, generally for the same period as uranium concentrates. TVA is responsible for providing enrichment services for the other eight units and the first nine units when the contracts with reactor manufacturers expire. According to TVA officials, the Energy Research and Development Administration has been engaged to provide enrichment services, therefore, enrichment services for the 17 reactors are fully covered through the year 2000.

Fabrication

TVA contracted with reactor manufacturers for fabrication services for the 17 reactors. TVA officials told us that TVA has various cancellation rights under the contracts.

Reactor	Commercial operation date	Contract period
Browns Ferry:		
Unit 1	8-74	Until first refueling after to 7-1-82
Unit 2	3-75	Until first refueling after to 7-1-82
Unit 3	1-76	7 years 3 months after commercial operation begins
Sequoyah:		
Unit 1	1-77	Through 1984
Unit 2	9-77	
Watts Bar:		
Unit 1	11-78	Through 1990
Unit 2	8-79	Through 1991
Bellefonte:		
Unit 1	6-80	Through May 1990
Unit 2	3-81	Through September 1990
Hartsville:		
Unit 1	12-80	Through December 1990
Unit 2	12-81	Through December 1991
Unit 3	6-81	Through June 1991
Unit 4	6-82	Through June 1992
Additonal generating capacity:		
Unit location not identified	4-82	Through October 1992
Unit location not identified	4-83	Through October 1993
Unit location not identified	4-83	Through April 1993
Unit location not identified	4-84	Through April 1994

Spent fuel

The reactor manufacturers will purchase the spent fuel for all fuel provided under the contract for the three Browns Ferry units and for the first fueling supplied for the two Sequoyah units. TVA has responsibility for storing or reprocessing spent fuel for the 12 other units and for the first 5 units after the contracts with reactor manufacturers expire. TVA expects to require reprocessing services

in about 1981. However, TVA officials said that no firm plans had been made to obtain these services because the reprocessing industry was in an uncertain condition because of constantly changing environmental regulations and the resulting reluctance of reprocessors to invest the capital necessary to build facilities or to enter into firm contracts to provide reprocessing services.

TVA-OWNED COAL RESERVES

In order to assure adequate and continuing coal supplies for its coal-fired plants, TVA informed us that in 1961 it began acquiring coal reserves. TVA said that acquiring coal reserves is to its advantage because (1) it will continue to use coal for power generation for many years, (2) the use of coal by neighboring utility systems and others would increase substantially, (3) the degree of competition in the coal industry had declined and would continue to decline, and (4) the supply of coal had not kept pace with the increased demand. According to TVA, the rate at which its reserves are offered for development by mining companies depends on the availability from the mining industry of coal sufficient to meet TVA's requirements and the need to minimize increasing coal prices.

During 1961-65, TVA bought four coal reserves costing about $9 million and containing an estimated 382 million tons of recoverable coal. TVA also obtained two potential coal reserves indirectly--one as a result of a court settlement in 1962 and the other in connection with a purchase by TVA of uranium reserves in 1974. Information provided by TVA describing the six reserves is shown below.

TVA-OWNED COAL RESERVES

Name and location of reserve	Acres	Year acquired	Cost	Estimated recoverable coal: Millions of tons	Estimated recoverable coal: Percentage of total	Number of coal seams	Type of mining	Sulfur content	Heat content (note a)
Red Bird (Eastern Ky.)	40,220	1961	$ 825,000	25.0	6.5	13	Underground and surface	1 to 3.5	10,000 to 13,000
Koppers (Tenn.)	52,942	1962	672,000	67.0	17.5	20	Underground and surface	1 to 3.5	10,000 to 13,000
Straight Creek (Eastern Ky.)	8,800	1962	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Franklin County (Ill.)	6,350	1964-65	143,000	65.0	17.0	2	Underground	2 to 5	10,500 to 11,500
Camp Breckinridge (Western Ky.)	30,590	1965	7,410,000	225.0	59.0	3	Underground	3 to 5	10,500 to 11,500
Western (Wyo. and Colo.)	27,593	1974	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Total	166,495		$9,050,000	382.0	100.0				

[a]Heat content is expressed in the number of British thermal units (BTU's) per pound of coal. A Btu is the amount of heat required to raise the temperature of 1 pound of water 1 degree fahrenheit.

[b]TVA had not allocated costs to or otherwise assigned a value to the Straight Creek and Western reserves. No surveys have been made to determine the quantity and quality of the coal in the reserves.

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In March 1975 TVA was negotiating for the purchase of additional coal reserves in western Kentucky; however, TVA preferred not to disclose the details of its proposal because of possible adverse effects on its negotiations.

According to TVA, none of its coal reserves have been mined with its own work force. Portions of the Camp Breckinridge, Koppers, and Red Bird reserves are mined under contracts between TVA and independent coal mining companies, and the other three reserves (Franklin County, Straight Creek, and Western) are not mined.

Details on each reserve follow.

Camp Breckinridge--One seam of the Camp Breckinridge reserve is mined by the Peabody Coal Company under a lease and contract dated February 7, 1969. The lease, which continues for 15 years or until the seam is exhausted--or the contract for purchase of the coal is terminated--grants to Peabody the right to mine the coal, and the contract requires the contractor to sell to TVA the coal mined under the contract. Peabody is required to pay TVA a royalty of 15 cents for each ton of coal mined, and the annual production from the seam cannot exceed 140,000 tons a week, plus an additional 200,000 tons per year. The contract was awarded in 1969 at a base price of $3.95 a ton. Deliveries began in 1971 and the price has since escalated to $8.30 a ton. The contract price is subject to further price escalation. Present production from the seam is about 3.8 million tons a year.

TVA officials told us that a lease-contract arrangement, with an option in the contract for the contractor to sell coal to other buyers, was necessary in order to find a contractor willing to mine the coal. According to TVA, its preliminary contacts with prospective contractors indicated that none were willing to mine the coal unless an arrangement could be made which would permit them to take advantage of the depletion allowance for income tax purposes. TVA officials said that the quantity of 200,000 tons of coal, which Peabody had the option to sell to other buyers, was provided for to afford a basis for the contractor claiming a depletion allowance for income tax purposes. According to TVA, Peabody has not exercised the option as of March 1975.

Under a September 1974 supplemental amendment to the contract, Peabody will mine a second seam of the Camp Breckinridge reserve for TVA, with deliveries to begin about July 1977. Full deliveries of 300,000 tons weekly are to begin about July 1980. TVA agreed to pay all costs associated with mining the seam plus a management fee. The total cost and fee is estimated by TVA to be $12.05 a ton. A third

seam of the Camp Breckinridge reserve is not being mined at this time.

Koppers--TVA has entered into two arrangements for mining its Koppers reserves. Under a lease dated February 19, 1971, TVA leased to Long Pit Mining Company the right to surface mine six seams of the Koppers reserve, and the lessee is required to pay TVA a royalty of 25 cents for each ton of coal delivered to TVA. Present stripping operations are producing about 380,000 tons a year. The lease permits Long Pit Mining Company to sell not more than 10,000 tons annually to parties other than TVA, in which case TVA is to receive a royalty of 50 cents a ton. TVA officials said this arrangement was provided for to afford a basis for the contractor claiming a depletion allowance for income tax purposes. Through March 1975, the lessee had sold about 22,800 tons to other buyers. TVA and Long Pit Mining Company also signed a cost-plus-fixed-fee agreement on February 19, 1971, whereby TVA reimburses the contractor for all mining costs incurred plus $0.60 a ton management fee for coal shipped to TVA steam plants. The original mining cost was estimated at $5.40 per ton, including the royalty of 25 cents per ton to be paid to TVA, but excluding the management fee. The average of these same costs for all coal delivered under this contract during calendar year 1974 had increased to $14.73 per ton.[1]

TVA also signed a contract on March 7, 1975, with the Plateau Mining Company for underground mining of one seam of the Koppers reserve. All mined coal will be shipped to TVA. Deliveries are to begin in April 1975, with deliveries of 15,000 tons weekly by November 1975. An easement grant dated March 7, 1975, requires Plateau Mining Company to pay TVA a royalty of 25 cents on each ton of coal shipped to TVA. The contract price is $17.95 per ton including $2.70 per ton transportation cost, without deduction of the 25 cents per ton royalty payable to TVA.

Red Bird--TVA has not arranged to mine, for its own use, the coal in the Red Bird reserve because the reserve is in the Daniel Boone National Forest. TVA officials said that the U.S. Forest Service acquired the surface rights in the property (after TVA acquired the reserve) and was opposed to mining on the property.

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[1] This price includes costs estimated by TVA to range between $2.50 and $4.00 per ton for experimental reclamation performed by Long Pit Mining Company under the contract.

A portion of the Red Bird property is mined by the Shamrock Coal Company, and the coal is sold to third parties. The Shamrock Coal Company, which is also mining property adjacent to Red Bird, was granted permission in a lease dated April 5, 1973, to extend a portion of its mining into the Red Bird property in order to recover a portion of its underground reserve which TVA estimates to contain about 1.5 million tons. According to TVA, it would not have been economical for it to open a mine for this isolated block of coal. TVA receives a royalty of 20 cents per ton or 4 percent of selling price, whichever is greater, but is not receiving any of the coal. The royalty has ranged from $1.24 per ton in August 1974 to $1.51 per ton in December 1974. The lease arrangement prohibits any opening between the TVA-owned coal and the overlying surface within the Daniel Boone National Forest.

Franklin County--TVA officials said that in December 1974 they discussed with one major coal company the opening of a mine on the Franklin County reserve within the next few years. Only one meeting was held, and no additional meetings are comtemplated. TVA further stated that, while no specific action is being taken relative to mining the reserve, the feasibility of mining it is being studied as part of TVA's overall program for use of its coal reserves. The feasibility of mining the Franklin County reserve is still being considered and was prompted by the coal shortage in 1974.

Straight Creek--TVA acquired the Straight Creek coal reserves in 1962 as a partial settlement of a court action against an Eastern Kentucky coal company. TVA's coal rights are limited to a single seam of undetermined thickness. TVA has not explored the property, but it believes the seam is probably not thick enough to warrant economical mining, using today's mining techniques.

Western--TVA acquired leases and prospect permits for coal in Wyoming and Colorado in late 1974. TVA's coal rights are contained in an agreement with the American Nuclear Corporation for acquiring uranium reserves for its nuclear program. No costs were allocated to the coal reserve, and TVA had no detailed information on the coal reserve.

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According to TVA, its ownership of coal reserves contributes to lower prices for coal delivered to its steam plants because, while TVA must pay the mining costs, it can avoid the profit margin which a supplier charges on its own reserves. In this connection, TVA said that some investor-owned utilities also own coal reserves.

METHOD OF ESTABLISHING TRADES AND LABOR WAGE RATES

TVA negotiates with the Tennessee Valley Trades and Labor Council to establish the prevailing wage rate in the TVA vicinity for its trades and labor employees. Before negotiating, TVA and the council independently make wage surveys at various cities and companies throughout the vicinity. After conducting the wage surveys, TVA and the council attempt to negotiate the prevailing wage rate for each trade or craft. The agreed-upon rate applies throughout the TVA vicinity; however, if TVA and the council cannot agree on a wage rate for a particular trade or craft, the matter is referred to the Secretary of Labor for final determination. The TVA Act requires that TVA pay its laborers and mechanics the rate of wages for work of a similar nature prevailing in the vicinity and that where such work is done by contract, TVA's contractors must pay their laborers and mechanics not less than such prevailing rate of wages.

Composition of Tennessee Valley Trades and Labor Council

In 1940, TVA entered into a collective bargaining agreement with the Tennessee Valley Trades and Labor Council. The council, comprising representatives of 16 national or international unions, is recognized by TVA as the accredited representative of all trade and labor employees, and it is the only group that TVA negotiates with in determining vicinitywide wage rates for each craft or trade.

Each craft or trade in the TVA work force is represented by a council member; however, there are several employees whose duties are unique to the type of work generally performed by TVA. In these instances, the employees are represented on a collective basis by the council. The following table shows the number of trades and labor employees represented by each council member at October 20, 1973, and October 15, 1974. These two dates were selected in order to compare the work force which varies from time to time.

Tennessee Valley Trades and Labor Council members	Number of employees represented at Oct. 20, 1973	Oct. 15, 1974
International Brotherhood of Boilermakes, Iron Shipbuilders, Blacksmiths, Forgers, Helpers	783	749
Bricklayers, Masons, Plasterers International Union of America	3	1
United Brotherhood of Carpenters and Joiners of America	991	1,225
International Brotherhood of Electrical Workers	4,493	4,280
Laborers International Union of North America	2,344	2,562
International Association of Bridge, Structural, and Ornamental Iron Workers of America	629	747
International Association of Machinists and Aerospace Workers	858	873
International Association of Operating Engineers	[a]1,730	[a]1,775
International Brotherhood of Painters and Allied Trades	237	240
Operative Plasterers and Cement Masons International Association	92	108
Sheet Metal Workers International Association	230	192
United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada	1,259	1,646
International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America	793	753
International Association of Heat and Frost Insulators and Asbestos Workers	47	59
Wood, Wire, and Metal Lathers International Union	(b)	(b)
United Slate, Tile, and Composition Roofers, Damp and Waterproof Workers Association	8	4
Tennessee Valley Trades and Labor Council	[c]110	[c]109
Total trades and labor employees in TVA	14,607	15,323

[a]Also includes certain members of the Laborers International Union of North America which could not readily be separately identified.
[b]TVA officials said that the work force had included employees of this craft.
[c]Employees whose duties involve work in more than one craft and whose skills are not individually related to any of the crafts of the 16 unions are represented collectively by the council.

Procedure for determining wage rates

In carrying out section 3 of the TVA Act, TVA has established procedures which bring trades and labor employees, through their unions, into the process of establishing wage rates. TVA and the council determine the prevailing wage rate for each craft or trade in the TVA vicinity, as follows.

1. Either TVA or the council can request an annual review of wage rates.

2. Before a wage conference negotiates revisions to wage rate schedules, the following actions take place.

   --A joint wage data committee, comprising TVA and council representatives, agrees on the cities and companies which will be surveyed to obtain wage data for similar-type craft or trades performed by TVA trades and labor employees.

   --TVA and the council independently conduct wage surveys at the agreed upon sites.

3. The joint wage data committee meets to present the wage data collected during the survey and to resolve any differences in the data. When the differences are resolved, the committee reports the agreed-to wage survey data.

4. During the wage conference, TVA and the council negotiate the previaling wage rate for each craft or trade. If an agreement is not reached, the matter is submitted to the Secretary of Labor for final determination. According to a TVA official, a wage rate determination matter was last referred to the Secretary of Labor in 1971.

The collective bargaining agreement between TVA and the council states that TVA's board of directors must approve the negotiated rates before the rates are placed in effect and that the rates are not subject to revision more than once a year.

TVA's definition of vicinity

Section 3 of the TVA Act states:

> "All contracts to which the Corporation is a party and which require the employment of laborers and mechanics in the construction, alteration, maintenance, or repair of buildings, dams, locks, or other projects shall contain a provision that not less than the prevailing rate of wages for work of a similar nature prevailing in the vicinity shall be paid to such laborers or mechanics * * * Where such work * * * is done directly by the Corporation the prevailing rate of wages shall be paid in the same manner as though such work had been let by contract."

TVA has defined "vicinity" to mean the watershed of the Tennessee River, the TVA power service area, and certain adjacent areas. This same definition is incorporated in the collective bargaining agreement between TVA and the council. As described below, the Secretary of Labor has been asked on two occasions to rule on TVA's definition of vicinity.

In 1943 the International Association of Structural and Ornamental Iron Workers asked the Secretary to rule that TVA should pay the Knoxville local union rate, which was higher than the vicinitywide rate offered by TVA, on work in the Knoxville area. In 1946 another case was referred to the Secretary by a TVA contractor who asked for a finding that the Nashville union rate for electrical workers, rather than the higher vicinitywide TVA rate, was the proper rate for him to pay on work in the Nashville area.

In both cases, the Secretary found that, under the broad authority of the TVA Act, the construction and definition of vicinity used by TVA was appropriate. In the 1943 case, the Secretary rejected the union's contention that the higher Knoxville rate predetermined by the Secretary under the Davis-Bacon Act must prevail. The Secretary said that it was not unreasonable or arbitrary for TVA to define vicinity in a broader sense than locality or even district. In the 1946 case, the Secretary again held the TVA definition to be reasonable, after noting the difference between the language of the TVA Act and that of the David-Bacon Act. The Davis-Bacon Act requires that the rates be set upon the basis of "prevailing [rates] * * * in the city, town, village, or other civil subdivision * * * in which the work is to be performed * * *"

USE OF TVA WORK FORCE VERSUS CONTRACTS FOR CONSTRUCTION, OPERATION, AND MAINTENANCE

TVA generally considers that the construction of its powerplants, substations, communication facilities, transmission lines, and the operation and maintenance of facilities by its own work force (force account) is the most economical and most efficient means of attaining its program objectives. Therefore, TVA does not routinely solicit bids for such work. TVA does not make cost comparisons on a project-by-project basis and does not make specific evaluations as to whether the method chosen for constructing individual projects is the most economical and most efficient. According to TVA officials, such project-by-project cost comparisons would be expensive, extend project leadtime, and not disprove their position that, generally, the use of force account is more efficient and economical than contracting.

TVA officials said that, over the years, they had accumulated many examples relative to cost of force account versus contract construction which they believe justify their position in choosing force account work for most of their activities. In addition, they said that they were basically opposed to cost-plus type contracts and that advance preparation of detailed drawings and specifications for the purpose of soliciting firm price bids on major projects would lengthen project schedules and cause the work to be performed in later time periods with consequent increased cost.

Construction

TVA designs and constructs most of its powerplants, substations, transmission lines, and communication facilities by force account. However, for work of a specialty nature, TVA awards contracts to supplement force account.

At December 31, 1974, TVA's estimated present and future construction cost associated with power generating facilities was $12.4 billion. TVA could not readily determine how much of the $12.4 billion involves force account and contract because most of this amount represents future effort, and TVA does not contract for work until it is needed. However, TVA performs the vast majority of its work by force account. For example, $727 million of TVA's actual expenditures for the Browns Ferry nuclear plant, which was 92 percent complete at December 31, 1974, was for field labor, materials and equipment, land costs, general expenses, and interests and $27 million was for contractor effort.

TVA also relies principally on force account for construction of substations, transmission lines, and communication facilities. Between July 1, 1972, and December 31, 1974, total

construction costs, except for materials, relating to these facilities was $47.6 million, of which $44.1 million, or about 93 percent, represented force account.

Historically, contract construction involving powerplants has generally been limited to specialty work, such as roofing, tile flooring, masonry, glazing, and certain other types of work for which TVA does not believe the maintenance of a specialized work force is warranted. In its construction of substations, transmission lines, and communication facilities, TVA has limited construction by contract to right-of-way clearing and seeding; substation site grading; installation of microwave towers; and certain miscellaneous services.

Basis for using force account

TVA officials said that force account, supplemented by contract construction for specialty work, is the most economical and efficient means of providing the physical plants necessary for TVA's attaining program objectives. TVA believes that the following factors, cited in a 1947 TVA report as resulting in efficiencies and economies from using force account, still remain in effect today.

--Concurrent design and construction, which results in earlier project completion.

--Mobility of workers and equipment to new projects from those being completed within the relatively compact geographic area of TVA's activities.

--Use of a trained team and highly experienced construction supervisors and key workers, which has been developed in TVA's past construction program.

--Negotiation and application of trades and labor practices and rates common to contractors and TVA.

--Flexibility in adjusting activities and schedules to unforeseen factors encountered during construction, such as technological advances, improved construction methods developed on other projects, or funding modifications.

--Use of contracts for specialized types of construction where cost comparisons indicate contracts to be more advantageous.

In a 1947 study, TVA compared the construction cost by force account versus contract for 13 situations involving 17 projects. However, none of the projects were substations, transmission lines, or communication facilities. Instead

the study included projects such as power tunnel construction, grading for railroad construction, dredging, and highway construction. For dam construction, also included in the study, TVA concluded that the cost of construction by force account and contract was substantially the same. Also included in the study was the Watt Bar steam plant which cost $82 per kilowatt of capacity. TVA estimated $100 per kilowatt was considered a very good figure for construction of a plant of this type at the time it was constructed. TVA indicated that the $82 per kilowatt reflected the economies obtained by TVA using force account.

On the basis of the study, TVA concluded that:

> "* * * no categorical statement can be made to the effect that contract work is more economical than force account work or vice versa. The decision as to the method of handling the work must be based on a consideration of such factors as the extent of the proposed work program, its probable continuity, the availability of experienced personnel including supervisors and workmen, the availability of construction equipment, the need of getting the project started quickly, the uncertainties and hazards involved in the work, the relative value of flexibility in prosecuting the work, and the degree of exactness with which the work and the conditions to be encountered can be specified in advance."

In 1958 TVA made another study consisting of cost comparisons of the two methods of construction for 19 TVA projects--10 of which were the same projects compared in the 1947 study. However, the comparisons in the study did not include construction or rehabilitation of substations and transmission lines. TVA said that it must maintain its own construction organization for the construction and rehabilitation of substations and transmission lines so that interruptions in electrical service could be minimized. The study said also that the method of construction should be based on the most efficient and economical method for a particular job.

Although the 1958 study concludes that the method of construction should be determined on the basis of a particular job, neither the 1947 nor the 1958 study included cost comparisons for some of the type projects that TVA maintains can be most efficiently and economically constructed by force account--namely substations and transmission lines.

TVA officials told us, however, that they did compare the cost of constructing transmission facilities with the cost of those constructed by other utilities and that these

comparisons indicated that TVA's use of force account for construction of transmission facilities was the most economical method. Such comparisons, however, were not for the same project.

On several occasions, TVA has received bids for a part of the construction work on a project; and, in these few instances, TVA compared the bid price with its estimated cost of using force account. TVA provided the following examples to support its policy of not soliciting bids and of not making cost comparisons before starting new projects.

Example 1

TVA compared the construction cost per kilowatt of generating capacity for its Shawnee steam plant with the construction cost per kilowatt of installed capacity for contractor-built generating plant in the same general vicinity. Both plants were constructed during 1951-53. According to TVA officials, six units of the Shawnee plant were completed about 6 months earlier at significantly lower cost--$152 per kilowatt for the Shawnee plant, compared to $177 for the other.

Example 2

TVA received a bid from a contractor for installing boilers at its Paradise steam plant during the early 1960's time frame. According to TVA the estimated costs for installing the boilers by force account was substantially lower than the bid price--$3.3 million versus $3.0 million--and TVA therefore performed work by force account. TVA officials said that the actual cost incurred for this work on one of the two units was $581,000 lower than the bid submitted by the contractor.

Example 3

TVA received a bid from a contrator for installing turbogenerators at its Sequoyah nuclear plant. According to TVA, its estimate of the cost to perform the work by force account was substantially lower ($3.6 million bid price versus TVA's estimate of $3.0 million) and TVA proceeded by force account. TVA estimates that when the work is completed a savings of about $250,000 will be realized by doing the work by force account.

On at least two occasions in 1974, however, TVA awarded contracts for major projects after inviting bids from contractors. In these instances, TVA received bids for the sale and installation of gas turbines at the Johnsonville and Gallatin steam plants. TVA evaluated the bids, determined them to be reasonable, and awarded contracts for installation of the gas turbines.

TVA officials told us that they intend to invite bids in 1975 for construction of a substation and an associated tap line and that the information obtained will be used by TVA in its continuing evaluation of the use of force account for construction.

TVA pointed out that the Nuclear Regulatory Commission (NRC) has published data showing the cost of 44 nuclear plants constructed under contracts awarded in 1967 and 1968. This data shows that the cost at March 31, 1974, ranged from $109 to $720 per kilowatt of generating capacity. As of March 1974, TVA's Sequoyah nuclear plant, initiated during 1967-68, was expected to cost $276 per kilowatt of generating capacity. Thus, while the cost of TVA's plant is within the range of costs reported by NRC for contractor-built nuclear plants, we did not evaluate the comparability of the plants or the reasonableness of comparing different plants.

In 1971, a TVA task force, made up of three consultants and two former TVA officials, studied various aspects of TVA's Office of Engineering Design and Construction operations. One area reviewed was force account versus contract construction. In its report, the task force concluded that

--TVA had not developed detailed comparisons to support its claim that construction by force account was competitive with private industry;

--because of the limited cost data available for comparison purposes, no judgment could be made on the merits of force account versus contract construction;

--TVA should offer a substantial project on a contract basis from time to time for the purpose of obtaining a better measure of its own performance.

Office of Management and Budget (OMB) Circular A-76, dated August 1967, provides guidelines for implementing the Government's general policy of relying on private enterprise to supply its needs. TVA said that there is a substantial question as to whether the Circular applies to it because the electric power produced by TVA is primarily for public use rather than for Government use. An official of OMB told

us, however, that because the generating plants used to produce the electric power are for Government use, he believes that the Circular is applicable to TVA.

Among other things, Circular A-76 (1) identifies the circumstances in which the Government may provide on its own, products or services available from the private sector, (2) provides principles for making a comparative cost analyses required when an agency decides to provide a product or service on its own, if the decision involves relative cost, and (3) sets forth guidelines for administering the policy. The Circular requires each agency to:

1. Maintain an inventory of its commercial and industrial activities if annual cost of the output of the activity is $50,000 or more or if capital investment in the activity is $25,000 or more.

2. Not initiate any activities identified as "new starts" until commercial sources have been explored and until approved by the agency on the basis of factual justification.

3. Perform systematic reviews of commercial or industrial activities identified as "existing Government activities" at least once by June 30, 1968, and at least once every 3 years afterwards, unless the agency exempts the activity from the initial review and waives the requirements from subsequent reviews.

After receiving the Circular, TVA listed construction of facilities, along with 19 other activities, in its inventory of commercial and industrial activities. TVA defined its entire construction program as an "existing Government activity," prepared a report on review of the activity in September 1968, and waived the requirement for further review. In the 1968 report TVA enumerated six benefits relating to economies and efficiencies which it stated could be realized by performing construction with its own work force. The benefits reported by TVA in 1968 are essentially those previously described in this report.

TVA was unable to provide us with specific documentary support for its 1968 report. One TVA official said that an in-depth study probably was not made and that the findings and conclusions in the report probably were based on TVA's prior experience.

Circular A-76 also states that each agency is responsible for issuing implementing instructions and for providing management support and procedures for review and followup to

insure that the provisions of the Circular are effective. TVA had not developed any implementing instructions and believed such instructions were not necessary.

TVA advised us that it considered its powerplant construction program to be an "existing Government activity"--and therefore not subject to the project-by-project comparison required by Circular A-76 for "new starts"--because TVA's power construction program is a single continuing activity which has been in progress since the 1930s, is fully authorized by the basic TVA Act, and no new legislation is required to authorize any individual plant. TVA pointed out that shortly after issuance of Circular A-76, TVA provided OMB with information showing that TVA was not considering its powerplant construction program as "new starts" and that this interpretation was not questioned by OMB.

An OMB official, responsible for interpretating Circular A-76, told us that, for purposes of the Circular, each powerplant constructed by TVA should be considered as a new start. Although admitting that OMB might have been negligent in reviewing TVA's implementing instructions, he pointed out that OMB is a policy-setting organization and does not routinely police compliance with its circulars. He indicated that, in the future, TVA should make evaluations for each construction project in order to determine whether such projects should be constructed by force account or by contract.

Operation and maintenance

Operation and maintenance of TVA's powerplants, substations, transmission lines, and communication facilities are performed primarily by force account. However, TVA contracts for certain specialized maintenance functions. In no instance does TVA contract for operation of its facilities.

The following table shows the operation and maintenance costs, by force account and contract, associated with powerplants, substations, transmission lines, and communication facilities for July 1, 1972, through December 31, 1974.

	Powerplants		Substations, transmission lines, and communication facilities		Total	
	Force account	Contract	Force account	Contract	Force account	Contract
	(000 omitted)					
Operation	$133,329	$ -	$10,917	$ -	$144,246	$ -
Maintenance	133,773	7,857	17,500	1,636	151,273	9,493
Total	$267,102	$7,857	$28,417	$1,636	$295,519	$9,493

According to TVA officials, operation of its power-related facilities is performed by force account because of the necessity for maintaining a trained, qualified staff to insure that the equipment is operated in a safe and efficient manner. Also, TVA said that, with the advent of nuclear power facilities, the requirements for a properly trained staff were even more essential.

Maintenance work is generally performed by force account, TVA said, because of the necessity to maintain a skilled staff that will be available at all times to minimize interruptions of power service caused by unexpected problems and system failures. TVA officials said that contractors would not be able to respond as promptly or efficiently as TVA's own work force.

For scheduled maintenance work on powerplants, which is major and clearly definable in scope, TVA said that it does solicit bids from contractors, and if a contractor's estimate is lower than TVA's, the work is performed under contract. Many of the contracts for major maintenance work are labor-performance-type contracts for such things as:

--repairing gas ducts,
--modifying or repairing generator motors,
--splicing conveyor belts,
--installing refactory materials in furnaces,
--cleaning boilers,
--replacing stator bars,
--repairing stator windings,
--retubing condensors,
--removing fly ash,
--replacing railroad tracks, and
--replacing waterwall panels.

For scheduled maintenance work on powerplants which is not definable, TVA performs the work by force account. The reason for this, according to TVA, is that maintenance work that is not definable does not lend itself to firm fixed-price contracts, and TVA does not consider other type contracts to be cost effective. Also, TVA said that a versatile and readily available work force is needed to respond to emergency situations to insure maximum efficiency of the powerplants.

Contract maintenance work on substations, transmission lines, and communication facilities has been limited, for the most part, to specialty-type work, such as right-of-way clearing and mobile radio repair. According to TVA officials, this type work can usually be performed more economically by contractors than by TVA's work force. An exception is mobile radio repair in rural areas. In these cases, TVA's work force performs the repairs rather than incur the cost and time to transport the radios to the contractor's shop.

PROCEDURES FOR ESTABLISHING AND MONITORING RESALE RATES AND DISTRIBUTORS' BILLING PROCEDURES

TVA has established 10 power resale rate levels, any one of which may be authorized for use by each of TVA's 160 distributors in billing consumers. The rates are intended to be as low as possible and still provide enough revenue to enable the distributors to operate on a self-supporting and sound financial basis. TVA monitors the distributors' operations to insure that the rate schedules authorized are accomplishing the intended purpose.

Procedures for establishing and monitoring resale rates

Section 10 of the TVA Act authorizes TVA to establish rules and regulations and to include in its power sales contracts such terms and conditions (including resale rate schedules) as TVA deems necessary to carry out the purposes of the act. TVA's standard power contract with distributors states:

> "If the rates and charges provided for in said resale schedules do not produce revenues sufficient to provide for the operation and maintenance of the electric system on a self-supporting and financially sound basis, including requirements for interest and principal payments on indebtedness incurred or assumed by Municipality [and Cooperative] for the acquisition, extension, or improvement of the electric system, the parties [TVA and distributor] shall agree upon, and Municipality [and Cooperative] shall put into effect promptly, such changes in rates and charges as will provide the increased revenues necessary to place the system upon a self-supporting and financially sound basis. If the rates and charges in effect at any time provide revenues that are more than sufficient for such purposes, the parties shall agree upon a reduction in said rates and charges, and Municipality [and Cooperative] shall promptly put such reduced rates and charges into effect."

TVA has established 10 residential resale rates--R through R-9--with the R schedule providng the highest rate and R-9 the lowest rate. At June 30, 1974, the 160 distributors in the TVA region served about 2.1 million residential customers. The following table shows the rate schedules used by the distributors, the number of residential

customers to which these schedules were being applied, and the basic rate, excluding fuel adjustments, charged under each schedule at a usaage level of 1,000 kilowatt-hours a month.

Rate schedule	Rate for 1,000 kWh	Number of distributors	Number of residential customers (note b)
R	$15.89	7	50,784
R-1	15.23	13	165,544
R-2	14.61	34	610,004
R-3	14.14	23	558,677
R-4	13.71	22	204,856
R-5	13.31	17	106,667
R-6	12.88	18	166,748
R-7	12.51	15	88,582
R-8	12.01	6	57,763
R-9	11.52	8	79,878
Total		[a]163	[b]2,089,503

[a]Three distributors have two residential rates (one urban rate and one rural rate) and are counted twice.

[b]49,973 residential customers are not included because 3 distributors have more than one residential rate.

In determining which rate schedule will enable a distributor to meet its financial responsibilities, TVA and the distributor consider such factors as powerload characteristics and geography, customer-load density, plant investment, and long-term debt service. The selection of rate schedule takes into account (1) a wide variation in operating costs among distributors and (2) differences in the cost of the service provided to customers served by the distributors. Therefore, some distributors who serve about the same number of customers may be authorized by TVA to use different rate schedules.

Distributors furnish TVA monthly and year-to-date income statements, balance sheets, and statistical information on power purchases, power sales, and other factors affecting their operations. Each distributor also provides TVA with an annual report accompanied by an audit report of certified public accountants. TVA's Power Accounting Branch compares the distributors' current performance with past performance and refers any major change in their reports, or any matters not satisfactorily explained in the annual report, to the distributor for explanation. TVA field accountants also perform onsite reviews of distributor operations to verify

the information in the distributors' monthly and annual reports and to insure compliance with their contract terms with TVA. The field accountants use a standard work program which is carried out over a 2-year period and which includes a review of the following distributor operations.

Plant accounting:
- Reporting procedures
- Material reporting procedures
- Payroll procedures
- Construction costs
- Work order closings

Stores accounting:
- Inventory procedures
- Purchasing and receiving procedures

General accounting:
- Maintenance of records
- Financial statement presentation

Customer accounting:
- Customer ledgers
- Application of penalties

Customer billing-rate application:
- Meter reading and billing practices
- Review and test of meter books
- Verification of billing rates

Internal control:
- Cash and accounts receivable
- Disbursements
- Deposits
- Securities-investments
- Inventories
- Materials and supplies
- Sale of scrap
- Purchases
- Property, plant, and equipment
- Payroll

When discrepancies or questionable practices are noted by the field accountant, he attempts to resolve the matter onsite. When a matter is not resolved onsite, it is referred to the District Manager-Power Marketing, who attempts to resolve the matter through direct contact with the distributor and its governing board. If corrective action or reconciliation is not accomplished through the efforts of the Office of Power, the matter is referred to the TVA Division of Law for appropriate legal action.

According to TVA officials, most matters are resolved onsite or at the District Manager level, and legal action is required only occasionally. TVA's Power Marketing division determines whether a distributor's rate schedule should be changed based on the information and reports provided by the distributor and the reviews performed by field accountants.

Since October 1970 distributors have been allowed to adopt the next higher or lower rate schedule without a prior determination by TVA that a change is necessary. According to TVA, this provision was necessary to allow distributors more flexibility in meeting changing revenue needs. However, before a distributor can adopt the next higher or lower rate schedule, TVA must be notified in writing; and under the terms of the standard power contract, TVA can revoke the change if its later review shows that the change was not warranted.

From October 1970 through March 1975, 147 changes--89 increases and 58 decreases--in rate schedules were made by 100 of the 160 distributors. TVA told us that most of these changes were made by distributors under the option to change to the next higher or lower rate schedules without TVA's prior approval.

Distributors' billing procedures

Power contracts between TVA and its distributors provide that a customer's monthly bill will be increased or decreased in accordance with adjustment addenda published by TVA. An adjustment addendum effective July 2, 1974, provided that beginning in August 1974 charges for power each month would reflect increases or decreases in the actual costs of fuel burned in TVA powerplants. An adjustment addendum effective January 2, 1975, provided, among other things, that monthly charges for power would reflect the cost of purchased power, as well as changes in the cost of fuel burned. These adjustment addenda provided that the adjustments are to be applied to all bills rendered on meter readings made for billing cycles beginning on or after the designated date, in each case the second day of the month. A "billing cycle" is defined as the complete cycle of meter readings for all meter routes from which monthly sales statistics and revenues are derived. The amounts reflecting changes in cost for fuel, as well as purchased power, are calculated by TVA each month and furnished to the distributors for application to bills for each billing cycle beginning on or after the second day of the month.

According to TVA officials, the date on which a rate adjustment is first applied is determined by the date on which each distributor's billing cycle begins. For example,

if an adjustment addendum is effective January 2 and a distributor's billing cycle is scheduled to begin January 1, the January 2 adjustment addendum would not be applied until the billing cycle beginning February 1. Therefore, the initial application dates of a rate adjustment depend on each distributor's billing cycle. Distributors' monthly billing cycles are established at the discretion of each distributor.

We visited three distributors, accompanied by a TVA official, and selected a sample of customers' accounts to determine whether adjustment addenda had been applied correctly. We were concerned with distributors' application to monthly bills of amounts calculated pursuant to the effective addendum. We reviewed the application of such amounts for the billing cycles beginning on or after November 2 and December 2, 1974, and January 2 and February 2, 1975. The following table shows the three distributors we visited. The date on which each addendum was applied, and the amount of each rate increase.

Amounts added to monthly residential bills as calculated under the then effective adjustment addendum

Distributor	11-2-74		12-2-74		1-2-75		2-2-75	
	Effective	Amount (note a)	Effective	Amount (note a)	Effective	Amount (note a)	Effective	Amount (note a)
Cleveland Electric System	11-25-74	.333	12-25-74	.319	1-25-75	.590	2-25-75	.591
Chattanooga Electric Power Board	11-25-75	.333	12-27-74	.319	1-28-75	.590	2-27-75	.591
Middle Tennessee Electric Membership Corporation	11-25-74	.333	12-27-74	.319	1-28-75	.590	2-26-75	.591

[a]Cents per kWh.

The Cleveland Electric System serves about 14,000 residential customers. We selected seven customers' accounts for billing cycles beginning in November and December 1974 and in January and February 1975 and independently computed their electric bills applying the appropriate amounts calculated pursuant to the then effective adjustment addendum. In all cases the amounts of the bills computed by Cleveland Electric System agreed with our computations. We also verified the computation of electric bills for two customers whose meters were not read during the regular billing cycle but were read shortly after the beginning of the next billing cycle. One customer's meter should have been read January 24, 1975--near the end of a billing cycle--but was not read until January 27, 2 days after the beginning of the next billing

January 27, 2 days after the beginning of the next billing cycle. The customer's bill was properly computed on the basis of when the meter should have been read in that the rate applicable to the billing cycle beginning December 25, 1974, was used to compute the customer's bill. Another customer's meter was read after the beginning of the next billing cycle. Our computation showed that the correct rate had been applied.

The Chattanooga Electric Power Board serves about 100,000 residential customers. We selected 42 customer accounts for billing cycles beginning in November and December 1974 and in January 1975 and computed the customers' electric bills applying the appropriate amounts calculated pursuant to the then effective adjustment addenda. In all cases our computation agreed with the computations made by the Chattanooga Electric Power Board. We found no instances in which customers' meters were not read during the scheduled billing cycle.

Middle Tennessee Electric Membership Corporation serves about 36,000 residential consumers. We selected for examination customer accounts with billing cycles beginning in November and December 1974 and in January and February 1975. The accounts were selected from 12 of the 15 districts comprising the service area. Customer accounts were not selected from the other three districts because, at the time of our visit, meters in the three districts were being read or bills were being processed. Since a resale rate is applied uniformly throughout a billing cycle, we selected for verification the billings to one customer from each of the 12 districts for the billing cycles cited above.

Our computations showed that Middle Tennessee Electric Membership Corporation had incorrectly applied the then effective addendum to customers' bills for November 1974 through February 1975 based upon billing cycle dates in documents printed by it. As shown below, Middle Tennessee applied the adjustment addendum to be effective with the billing cycle beginning on or after December 2, 1974, to the billing cycle beginning November 25, 1974. The same type of incorrect procedure was followed for application of the adjustment addendum for the billing cycles effective on or after January 2, February 2, and March 2, 1975.

Billing cycle beginning	Adjustment addendum applied (cents per kWh)	Correct adjustment addendum (cents per kWh)
Nov. 25, 1974	.319	.333
Dec. 27, 1974	.590	.319
Jan. 28, 1975	.591	.590
Feb. 26, 1975	[a].576	.591

[a]Amount to be applied to billing cycle beginning on or after March 2, 1975.

The following table shows our estimate of the effect of the incorrect application of the adjustment addendum.

Billing cycle beginning	Estimated over or under charge from incorrect application
Nov. 25, 1974	$ -9,558
Dec. 27, 1974	230,852
Jan. 28, 1975	707
Feb. 26, 1975	(a)

[a]Sufficient information was not available as of March 1975 to estimate a probable undercharge.

The supervisor of TVA's field accountants agreed that the amounts applicable under the adjustment addendum were incorrectly applied. The Manager of Middle Tennessee Electric Membership Corporation said that, in the future, the billing cycle would be adjusted to coincide with the effective date of TVA's adjustment addenda. He indicated that the incorrect application of the adjustment addendum resulted from the misinterpretation as to its effective date. Subsequently, however, the Manager of Middle Tennessee advised us that he had previously advised his supervisors in a meeting to change the billing cycle dates to conform to the date of TVA's adjustment addendum and, therefore, he believes that there is no overcharge. An official of TVA advised us that he is considering whether additional instructions are necessary for formally establishing billing cycles.

The supervisor of TVA's field accountants told us that the TVA field accountant had reviewed selected aspects of the distributor's operations during the period involved but that verification of rate application was not one of the aspects reviewed. As discussed previously, TVA field accountants perform cyclical reviews of a distributor's operations over a 2-year period and verification of rate application is a part of the overall review. The supervisor said that the incorrect application of amounts applicable under the adjustment addenda would probably have been detected by TVA when the rate application segment of the review was performed. He stated that he was not aware of any other instances where a distributor had incorrectly applied such amounts.

TVA said that Middle Tennessee Electric Membership Corporation would be required to make an appropriate adjustment to customer accounts, unless the cost involved exceeded the adjustment. Also, TVA agreed to have its field accountants determine the extent of the misapplication of these amounts by Middle Tennessee. Also, because of the situation disclosed by our review at Middle Tennessee, TVA has asked its field accountants to intensify their review of the implementation of adjustment addenda during their periodic visits to distributors.