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REPORT TO THE
SUBCOMMITTEE ON BUDGETING,
MANAGEMENT, AND EXPENDITURES
COMMITTEE ON GOVERNMENT
OPERATIONS
UNITED STATES SENATE



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Survey Of Federal
And Electric Utility
Procurements Of Power Equipment

B-174317

UNITED STATES
GENERAL ACCOUNTING OFFICE

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AUG. 1, 1974

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

B-174317

AVAILABLE

The Honorable Lee Metcalf, Chairman
Subcommittee on Budgeting, Management,
and Expenditures
Committee on Government Operations
United States Senate

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Dear Mr. Chairman:

As you requested on June 7, 1973, we surveyed Federal and electric utility procurements of power equipment. Specifically, we obtained information on

- the reasonableness and comparableness of power equipment prices to the Federal Government and the electric utilities and
- the extent of Federal and State regulation and review of electric utility procurements of power equipment.

Because of their potential for reducing costs of power equipment procurements, we also looked into the benefits and problems of increasing foreign competition in procurements and increasing standardization of equipment, plant siting, and plant design.

Our work included an examination of selected Federal and electric utility procurements of power equipment and an analysis of State regulatory commissions' responses to our questionnaire on their audits of electric utility procurements and on their views regarding adequacy of competition among equipment suppliers and manufacturers. Through interview or questionnaire we contacted more than 100 organizations, including Federal agencies, State regulatory commissions, equipment suppliers and manufacturers, electric utilities, and various trade and professional associations.

We briefed your Subcommittee staff on the results of our work on May 3, 1974. The information we presented at this briefing is summarized below and is discussed more fully on the cited pages of the report.

Making meaningful comparisons of power equipment prices is a complex task which involves many technical matters and subjective decisions. Costs of somewhat comparable power equipment sometimes varied greatly in Federal procurements, in electric utility procurements, and between Federal and electric utility procurements. There

was no pattern to indicate, however, that electric utilities generally paid more or less than the Federal Government for comparable equipment. In instances where procurements appeared similar, a surface examination of equipment specifications and contract terms and conditions generally revealed differences which contributed to the differences in prices.

A number of problems precluded us from determining the reasonableness and comparableness of prices paid by the Federal Government and the electric utilities for nuclear and nonnuclear power equipment. Essentially, these problems relate to

- the general lack of Federal authority to examine suppliers' and manufacturers' records relating to such sales;
- the many complex and technical equipment specifications involved;
- the lack of criteria on how to measure in dollars certain necessary economic considerations, such as contract terms and conditions and the manufacturers' need for the business; and
- the fact that nuclear equipment is purchased on a total system basis and costs are not available on an individual component basis.

No determination concerning the reasonableness of equipment costs to the Federal Government and the electric utilities can be made without extensive access to the records of equipment suppliers and manufacturers. Mere comparisons of prices paid for equipment do not provide the data needed to address reasonableness of prices because suppliers and manufacturers could make "unreasonable" profits even if they charged the Federal Government and the electric utilities identical prices for the same equipment. (See pp. 2 to 13.)

The Federal Power Commission and regulatory commissions in most States regulate various activities of virtually all, if not all, electric utilities. However, neither the Commission nor many--if any--of the State commissions have authority to review or audit records of equipment suppliers and manufacturers. Therefore, they cannot determine that the utilities purchase power equipment at prices, terms, and conditions which are reasonable and the best obtainable. 258

Little attention--Federal or State--is given to individual procurements of power equipment. The utilities are generally not required by either the Federal Government or the State commissions to obtain competitive bids for the equipment they buy. None of the 41 State

commissions responding to our questionnaire took exception to a utility's cost of power equipment from January 1971 through December 1973. (See pp. 14 to 16.)

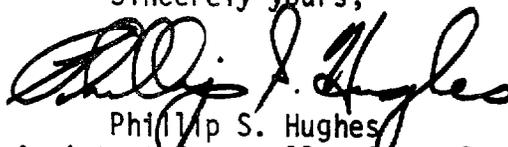
Although few State regulatory commissions questioned the adequacy of competition among equipment suppliers and manufacturers, 14 suggested steps they believe the Federal Government could take to improve such competition. (See pp. 16 to 18.)

Increasing foreign competition in procurements of power equipment and increasing standardization of equipment, plant siting, and plant design seem to hold significant promise for reducing costs and providing other benefits. (See pp. 19 to 23.)

By letter dated September 19, 1973, the Comptroller General advised you that we did not believe we should be assigned authority to examine utilities suppliers' records. We continue to believe that such authority--if it is deemed necessary by the Congress--would be more appropriately placed in the Federal Power Commission because of its responsibility for regulation of utility rates. Also, to the extent the Committee wishes, the Federal Trade Commission might be an appropriate agency to address the issue of adequacy of competition among equipment suppliers and manufacturers. Consistent with our responsibility for reviewing the effectiveness and efficiency of Federal programs, we could examine how the Federal Power Commission and the Federal Trade Commission carry out their work in these areas. 59

As requested by your office, we did not obtain written comments on this report from any Federal or private organization. We do not plan to distribute this report further unless you agree or publicly announce its contents.

Sincerely yours,


Philip S. Hughes
Assistant Comptroller General

C o n t e n t s

CHAPTER		<u>Page</u>
1	INTRODUCTION	1
	Scope of review	1
2	REASONABLENESS AND COMPARABLENESS OF POWER EQUIPMENT PRICES TO THE FEDERAL GOVERNMENT AND THE ELECTRIC UTILITIES	2
	Problems in determining the reasonableness and comparableness of power equipment prices	2
	Access to records authority	3
	Equipment specifications	4
	Economic considerations	4
	Unavailability of nuclear component costs	5
	Comparableness of Federal and electric utility nuclear power components	5
	Comparableness of Federal and electric utility nonnuclear power equipment	8
	Costs of certain Federal and electric utility procurements of nonnuclear power equipment	9
3	FEDERAL AND STATE REGULATION AND REVIEW OF ELECTRIC UTILITIES' PROCUREMENTS OF POWER EQUIPMENT	14
	Federal regulation	14
	State regulation	15
	State commissions' authority to audit	15
	Audits by State commissions	15
	State commissions' comments on competition among equipment suppliers and manufacturers	16
	State commissions' suggestions for improved competition	18
4	POTENTIAL TO REDUCE COSTS THROUGH INCREASED FOREIGN COMPETITION AND STANDARDIZATION	19
	Foreign competition	19
	Standardization	20

APPENDIX

Page

I	Letter dated June 7, 1973, from the Chairman, Subcommittee on Budgeting, Management, and Expenditures, Senate Committee on Government Operations	24
II	Organizations contacted	26
III	Summary of State regulatory commissions' responses to GAO questionnaire on their audits	29

ABBREVIATIONS

AEC	Atomic Energy Commission
BPA	Bonneville Power Administration
FPC	Federal Power Commission
GAO	General Accounting Office
REA	Rural Electrification Administration
TVA	Tennessee Valley Authority

CHAPTER 1

INTRODUCTION

At the request of the Chairman, Subcommittee on Budgeting, Management, and Expenditures, Senate Committee on Government Operations, we surveyed Federal and electric utility procurements of power equipment. (See app. I.) Specifically, we obtained information on

- the reasonableness and comparableness of power equipment prices to the Federal Government and the electric utilities and
- the extent of Federal and State regulation and review of electric utility procurements of power equipment.

Because of their potential for reducing costs of power equipment procurements, we also looked into the benefits and problems of increasing foreign competition in procurements and increasing standardization of equipment, plant siting, and plant design.

SCOPE OF REVIEW

Our work included an examination of selected Federal and electric utility procurements of power equipment and an analysis of State regulatory commissions' responses to our questionnaire on their audits of electric utility procurements and on their views on whether competition among equipment suppliers and manufacturers is adequate to ensure reasonable prices. We also interviewed representatives of various Federal agencies, companies, and organizations working on matters relating to power equipment prices, foreign competition, and standardization. Through interview or questionnaire we contacted more than 100 organizations, including Federal agencies, State regulatory commissions, equipment suppliers and manufacturers, electric utilities, and various trade and professional associations.

A list of the organizations we contacted is included as appendix II. We did not obtain written comments on this report from any Federal or private organization.

CHAPTER 2
REASONABLENESS AND COMPARABLENESS OF
POWER EQUIPMENT PRICES TO THE
FEDERAL GOVERNMENT AND THE ELECTRIC UTILITIES

Making meaningful comparisons of power equipment prices is a complex task which involves many technical matters and subjective decisions. Costs of somewhat comparable power equipment sometimes varied greatly in Federal procurements, in electric utility procurements, and between Federal and electric utility procurements. There was no pattern to indicate, however, that electric utilities generally paid more or less than the Federal Government for comparable equipment. In instances where procurements appeared similar, a surface examination of equipment specifications and contract terms and conditions generally revealed differences which contributed to the differences in prices.

A number of problems precluded us from determining the reasonableness and comparableness of prices paid by the Federal Government and the electric utilities for nuclear and nonnuclear power equipment. These problems, the comparableness of Federal and electric utility nuclear and nonnuclear power equipment, and the costs of certain Federal and electric utility power equipment procurements are discussed on the following pages.

PROBLEMS IN DETERMINING THE
REASONABLENESS AND COMPARABLENESS
OF POWER EQUIPMENT PRICES

Essentially, these problems relate to

- the general lack of Federal authority to examine suppliers' and manufacturers' records relating to such sales;
- the many complex and technical equipment specifications involved;
- the lack of criteria on how to measure in dollars certain necessary economic considerations, such as contract terms and conditions and the manufacturers' need for the business; and
- the fact that nuclear equipment is purchased on a total system basis and costs are not available on an individual component basis.

Access to records authority

No determination concerning the reasonableness of equipment costs to the Federal Government and the electric utilities can be made without extensive access to the records of equipment suppliers and manufacturers. Mere comparisons of prices paid for equipment do not provide the data needed to address reasonableness of prices because suppliers and manufacturers could make "unreasonable" profits even if they charged the Federal Government and the electric utilities identical prices for the same equipment.

We have virtually no authority to examine records of equipment suppliers and manufacturers. All but 2 of the 237 pieces of power equipment purchased by the Federal Government from July 1, 1970, through November 1973 (see p. 8), were purchased under formally advertised, firm-fixed-price contracts. Neither we nor the purchasing agency has authority under such contracts to audit the suppliers' or manufacturers' cost records. The only access to records we would have concerning major Federal purchases of power equipment during the above period relates to a \$126,470 negotiated contract for two power circuit breakers.

Neither the Rural Electrification Administration, which makes loans to rural electric cooperatives for the construction and purchase of plant and equipment; the Federal Power Commission (FPC); nor any of the 41 State regulatory commissions responding to our questionnaire had authority under which we could gain access to records of equipment suppliers or manufacturers.

We considered using a questionnaire to solicit--on a voluntary basis--from suppliers and manufacturers of nuclear and nonnuclear power equipment, information which would have enabled us to compare their return on Federal sales with their return on sales to electric utilities.

We did not send the questionnaire after discussing the potential for obtaining meaningful information with officials of FPC, the Atomic Energy Commission (AEC), the Cost Accounting Standards Board, the National Electrical Manufacturers Association, the Atomic Industrial Forum, and two of the major suppliers/manufacturers of nuclear and nonnuclear power equipment. The unanimous belief of these officials was that few, if any, suppliers or manufacturers would complete the questionnaire, especially sections dealing with company profits and equipment specifications.

The officials noted that the information is proprietary and confidential in nature and that, despite our assurance that information received would be reported without identification of the individual companies involved, the companies would fear information leakage which they believe could adversely affect their competitiveness.

Perhaps the best indication of the probable ineffectiveness of a questionnaire may be what an official of the Cost Accounting Standards Board told us. He said that the Board requested companies to submit sales data in return for an exemption which would clearly benefit the reporting companies. Although the Board's request was much less involved than ours would have been--both in terms of the amount of work required to respond and the proprietary and detailed nature of the requested information--the companies told the Board that they would not comply.

Equipment specifications

Precise comparisons of power equipment prices require comprehensive analyses of the equipment specifications, both major and detailed. This is a complex task which often involves many technical matters and subjective decisions. Even variances in specifications which seem insignificant to a layman can have a dramatic impact on the cost of the equipment, according to knowledgeable persons with whom we met.

Several factors which concern equipment specifications are equipment efficiency, initial and operating costs, and safety. Trade-offs are sometimes made between the various factors. For example, a powerplant with low fuel costs may purchase less efficient and less costly equipment than a plant with high fuel costs.

No two pieces of power equipment identified in our survey had identical specifications.

Economic considerations

There are no generally accepted criteria to measure in dollars the impact on power equipment costs of certain economic factors which must be considered in determining the reasonableness of such costs to the Federal Government and the electric utilities. The factors relate to such matters as

- contract terms and conditions,
- manufacturers' need for the business,
- delivery date,
- quality and extent of suppliers' or manufacturers' predelivery and postdelivery services, and
- purchase quantity.

Contracts often vary considerably concerning amount of spare parts included, price escalation provisions, and payment plans. Also, latent defects clauses--usually required in Federal contracts--hold sellers liable over the entire life of the equipment, whereas standard commercial contracts provide a 1-year "warranty." Other contract differences relate to consequential damage provisions and bid and performance bonds generally required in Federal contracts.

As an example of the effect of different contract provisions, one manufacturer has indicated that its price in one sale was increased about 11 percent because of provisions for nonstandard latent damages, additional liability, and delayed payment. In another case, a manufacturer once added 3 percent to its price for a generator because a Federal agency insisted on a nonstandard liability clause.

In addition, a buyer may be limited to one or two suppliers which can deliver the equipment in a short time. The buyer may be willing to pay more to a supplier if delivery can be made in a short time.

Estimating in dollars the impact on equipment costs of the above economic considerations would be subjective and open to argument.

Unavailability of nuclear component costs

As discussed in the following section, the Tennessee Valley Authority (TVA) is the only Federal agency which purchased nuclear equipment that may be comparable to nuclear equipment purchased by electric utilities. Price comparisons of TVA and electric utility nuclear components cannot be made however, because TVA has no information on what it paid for any individual component.

The only nuclear equipment price information available at TVA is the total purchase price for each of its 13 nuclear steam supply systems (i.e., the total price of the reactor vessel, steam generator, primary pumps, controls, instrumentation, valves, piping tanks, etc.). Representatives of various electric utilities indicated that utilities also purchase nuclear steam supply systems on a total system basis and that they had no information on what individual nuclear components may cost.

Meaningful comparisons of TVA and electric utility total systems costs cannot be made, according to various Federal officials, because of major differences in the siting, design, and construction of individual systems and plants.

COMPARABLENESS OF FEDERAL AND ELECTRIC UTILITY NUCLEAR POWER COMPONENTS

Three Federal agencies buy nuclear power components--AEC, TVA, and the Department of the Navy. Only components purchased by TVA may

be comparable to nuclear components purchased by electric utilities, according to officials of the three agencies.

AEC has purchased many research and development reactors. The "N" reactor is a dual purpose reactor used to produce special nuclear materials (e.g., plutonium for the AEC weapons program) and by-product power. AEC officials informed us that no comparable reactor has yet been purchased by an electric utility. AEC officials informed us also that the other AEC reactors are for specific research and testing applications, and are dissimilar in design and construction to nuclear reactors purchased by electric utilities.

The Department of the Navy buys nuclear components to power ships. Navy reactors are small. Other Navy nuclear components are "miniaturized" and have much higher quality assurance specifications than nuclear components purchased by electric utilities. For these reasons, according to Navy officials, nuclear components purchased by the Navy are not comparable to nuclear components purchased by electric utilities.

The table on page 7 contains Department of Commerce statistics on 1972 shipments of selected nuclear power equipment manufactured in the United States. The table shows the value of such shipments to the U.S. Government and other countries and other sources.

The Department of Commerce reported in January 1974 that new equipment orders and construction plans for a large number of nuclear powerplants indicate dramatic growth for the nuclear power equipment industry. According to the Department, however, no long-range growth projection was made because of inadequacy of data.

Value of 1972 shipments of selected atomic energy products

<u>Product</u>	<u>To U.S. Government</u>	<u>Export and other</u>	<u>Total</u>
		(000 omitted)	
Nuclear reactors, primary vessels and tanks	\$ 45,015	\$ 42,086	\$ 87,101
Control rod drive mechanisms and components, core structurals, fuel handling equipment, and accessory instrumentation for reactor control	54,265	99,196	153,461
Heat exchangers and condensers	33,618	67,262	100,880
Pressurizers, components, and auxiliary equipment; and pumps	31,601	103,131	134,732
Valves	<u>22,861</u>	<u>34,198</u>	<u>57,059</u>
Total	<u>\$187,360</u>	<u>\$345,873</u>	<u>\$533,233</u>

COMPARABLENESS OF
FEDERAL AND ELECTRIC UTILITY
NONNUCLEAR POWER EQUIPMENT

TVA, the Corps of Engineers, the Bonneville Power Administration (BPA), the Bureau of Reclamation, and the Southwestern Power Administration are the principal Federal agencies that procure major nonnuclear power equipment. We were advised by officials of each of these agencies that their respective agencies purchased major nonnuclear power equipment that was comparable to nonnuclear power equipment purchased by electric utilities. The volume and number of units of major nonnuclear power equipment purchased by the above agencies from July 1, 1970, through November 1973 is shown below.

<u>Agency</u>	<u>Hydro turbines & generators</u>	<u>Steam turbine - generators</u>	<u>Power transformers</u>	<u>Power circuit breakers</u>	<u>Total</u>
	(000 omitted)				
TVA	-	\$127,970	\$15,157	\$ 6,181	\$149,308
Corps of Engineers	\$56,369	-	3,678	-	60,047
BPA	-	-	11,863	4,712	16,575
Bureau of Reclamation	1,651	-	312	-	1,963
Southwestern Power Admin- istration	-	-	150	192	342
Total	<u>\$58,020</u>	<u>\$127,970</u>	<u>\$31,160</u>	<u>\$11,085</u>	<u>\$228,235</u>
Units	(40)	(4)	(104)	(89)	(237)

The table on the top of page 9 shows Department of Commerce statistics on total shipments of nonnuclear power boilers and turbines and turbine generator sets manufactured in the United States from 1970 to 1972.

Value of shipments of
nonnuclear power equipment

<u>Equipment</u>	<u>1970</u>	<u>1971</u>	<u>1972 (estimated)</u>
	(000,000 omitted)		
Power boilers	\$ 587	\$ 518	\$ 512
Turbines and turbine generator sets	<u>1,791</u>	<u>2,202</u>	<u>2,530</u>
Totals	<u>\$2,378</u>	<u>\$2,720</u>	<u>\$3,042</u>

Department of Commerce projections on the values of shipments of nonnuclear power boilers and turbines and turbine generator sets for 1973, 1974, and 1980 follow.

<u>Equipment</u>	<u>1973</u>	<u>1974</u>	<u>1980</u>		<u>Compound annual rate of growth 1973-80</u>	
			<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
	(000,000 omitted)					
Power boilers	\$ 512	\$ 506	\$ 604	\$ 655	2.4%	3.6%
Turbines and turbine generator sets	\$1,965	\$2,140	\$2,765	\$2,955	5%	6%

COSTS OF CERTAIN FEDERAL AND
ELECTRIC UTILITY PROCUREMENTS
OF NONNUCLEAR POWER EQUIPMENT

Costs of somewhat comparable nonnuclear power equipment sometimes varied greatly in Federal procurements, in electric utility procurements, and between Federal and electric utility procurements. For example, nine Federal procurements of various types of nonnuclear power equipment appeared somewhat comparable to nine other Federal procurements. Cost variances between the procurements ranged from 4 percent to 60 percent per "basic" unit of equipment measurement (e.g., megawatts for steam turbine-generators). The average variance was 27 percent.

There was no pattern to indicate that electric utilities generally paid more or less than the Federal Government for comparable equipment. Sometimes the utilities paid more for somewhat comparable equipment; sometimes they paid less.

The table on page 11 illustrates the cost variances among the Federal and electric utility purchases of steam turbine-generators identified in our survey. Similarly, the following table shows varying costs within and between Federal and electric utility procurements of power transformers in 1973.

Power transformer costs

1973 purchases

<u>Purchaser</u>	<u>Unit cost</u>	<u>Megavolt amp capacity</u>	<u>Cost per megavolt amp</u>
TVA	\$600,574	430	\$1,397
Corps	486,170	256	1,899
BPA	384,500	250	1,538
Utility	427,492	240	1,781
Corps	417,000	218	1,913
Corps	225,747	78	2,894
Utility	134,526	20	6,726

In instances where procurements appeared similar, a surface examination of equipment specifications and contract terms and conditions generally revealed differences which contributed to the differences in prices. For example, the high cost per megavolt amp of \$6,726 in one of the utility purchases of power transformers in the above table may be explained by the fact that the transformer was relatively small. We found only two Federal procurements of 20-megavolt amp transformers, both by BPA in 1971 at costs per megavolt amp of \$6,737 and \$6,475, respectively. The highest cost per megavolt amp we found for any power transformer was \$10,122 in a 1972 BPA purchase of a 12-megavolt amp unit.

The table on page 11 shows that two utilities purchased steam turbine-generators in 1973 for approximately the same dollar amounts--\$8,233,321 and \$8,248,654. The turbine-generators had capacities of 300 megawatts and 600 megawatts, respectively. The costs per megawatt in these procurements differed by about 100 percent. Further examination into this case showed that, although the 600-megawatt unit was purchased in 1973, it was ordered under an option in a 1968 contract which provided for the favorable price.

Steam turbine-generator costs

<u>Purchaser</u>	<u>Year purchased</u>	<u>Unit cost</u>	<u>Installed megawatt capacity</u>	<u>Cost per installed megawatt (note a)</u>
TVA	1971	\$29,378,000	1,300	\$22,598
TVA	1971	34,606,970	1,200	28,839
Utility	1966	^b 23,064,300	1,098.3	^b 21,000
Utility	1966	^b 27,457,500	1,098.3	^b 25,000
TVA	1967	^b 25,191,119	1,091	^b 23,090
Utility	1970	12,897,329	880	14,656
Utility	1971	13,881,595	880	15,775
Utility	1970	9,764,879	625.5	15,611
Utility	1971	10,496,083	625.5	16,780
Utility	1973	8,248,654	600	13,748
Utility	1973	8,233,321	300	27,444
Utility	1973	6,229,633	216	28,841

^a Approximate

^b Purchaser estimated cost per installed megawatt and GAO calculated unit cost by multiplying cost per installed megawatt by installed megawatt capacity

The chart on page 13 contains three additional examples of the cost variances noted and the principal reasons for the differences.

Our comparisons were rough and were based generally on major equipment specifications. Detailed examination of the equipment specifications and the various economic considerations in the procurements would likely reveal additional contributing factors. In our opinion, however, as discussed on page 3, an adequate assessment of the reasonableness and comparableness of power equipment prices to the Federal Government and the electric utilities cannot be made without extensive access to suppliers' and manufacturers' records.

Examples of cost variances in electrical equipment procurements

<u>Description</u>	<u>Year purchased</u>	<u>Purchaser</u>	<u>Unit Cost</u>	<u>Principal reasons for cost differences</u>
Power circuit breakers: 230 kilovolt 15,000 megavolt amps 3-cycle interrupting time	1971 1971	BPA BPA	\$ 46,000 68,000	The more expensive unit had a 3,000-amp rating compared to a 1,600-amp rating for the less expensive unit. Also, the more expensive unit was specially built whereas the less expensive unit was an off-the-shelf item.
1,098.3-megawatt steam turbine-generators	1966 1966	Utility Utility	23,100,000 27,500,000	Construction delays resulted in the bulk of the work on the higher-priced unit being done 2 or 3 years after the bulk of the work on the first unit. Cost escalation provisions added about 7 percent a year to the costs of the second unit.
Power transformers: 250 megavolt amps	1973	BPA	^a 1,538	The lowest-priced unit was bought from a foreign supplier.
240 megavolt amps	1973	Utility	^a 1,781	
256 megavolt amps	1973	Corps	^a 1,899	

^aPer megavolt amp

CHAPTER 3

FEDERAL AND STATE REGULATION AND REVIEW OF

ELECTRIC UTILITIES' PROCUREMENTS OF POWER EQUIPMENT

FPC and regulatory commissions in most states regulate various activities of virtually all, if not all, electric utilities. However, neither the Commission nor many--if any--of the State commissions have authority to review or audit records of equipment suppliers and manufacturers. Therefore, they cannot determine that the utilities purchase power equipment at prices, terms, and conditions which are reasonable and the best obtainable.

FEDERAL REGULATION

FPC is responsible for regulating the interstate electric power industry and has jurisdiction over interstate wholesale rates. FPC's jurisdiction covers almost all the approximately 200 privately-owned electric utilities and about 7 percent of the dollar value of electric power sales in the United States.

FPC has developed a Uniform System of Accounts, in cooperation with State regulatory commissions, to help provide appropriate information on utility companies for purposes of rate regulation. FPC has about 40 auditors and tries to audit most utilities at least once every 5 years. A primary purpose of these audits is to determine compliance with the Uniform System of Accounts. The audits focus on the portion of the utility's accounts that affect rate determinations. FPC auditors review also the work done by the utilities' internal auditors, the State commissions, and certified public accountants.

FPC does not receive data on the cost of individual items of equipment. Although rate reviews are based on analyses of general plant accounts, these analyses do not include evaluations of the reasonableness of costs of individual pieces of equipment.

FPC does not require electric utilities to obtain competitive bids for the equipment they buy. FPC requires only that the utilities file a statement of their procurement policies with the Commission. FPC auditors are to determine if the utility is following its stated policies and to decide whether the policies are reasonable. If competitive bids are obtained, FPC auditors are concerned primarily with whether the low bidder received the contract and, if not, why not.

FPC has no authority to review or audit records of equipment suppliers or manufacturers. According to FPC officials, FPC's work is not in sufficient detail to ensure that utilities purchase power equipment at prices, terms, and conditions which are reasonable and the best obtainable.

STATE REGULATION

To determine the extent of their regulation of power equipment purchases by electric utilities, we sent questionnaires to the regulatory commissions of each State, the District of Columbia, Puerto Rico, the Virgin Islands, and Jamaica. The questionnaire was designed to provide information on the commissions' (1) authority to audit records of electric utilities and equipment suppliers and manufacturers, (2) use of such authority, including frequency and content of the audits, and (3) views on whether competition among equipment suppliers and manufacturers is adequate to ensure reasonable prices.

The National Association of Regulatory Utility Commissioners assisted us in the mailing of the questionnaires and asked the commissions to cooperate in completing them. Forty-one commissions responded.

The information in this section represents our analysis of the commissions' responses which required their interpretation of our questions and the nature and extent of their jurisdiction. The extent of commission authority may vary not only with the language of the statutes but also with the interpretations of the laws by the commissions and the courts. Appendix III summarizes the commissions' responses to each question in our questionnaire.

State commissions' authority to audit

All 41 regulatory commissions responding to our questionnaire--except for those in Texas and Minnesota--stated that they have the authority to audit the electric utilities under their jurisdiction.

None of the responding commissions had authority to audit records of equipment suppliers or manufacturers. Eight commissions reported that they would have such authority if a supplier or manufacturer was affiliated with a utility. A National Association of Regulatory Utility Commissioners' representative informed us that to his knowledge no supplier or manufacturer is affiliated with a privately-owned electric utility.

Audits by State commissions

Mississippi, Nebraska, New Mexico, and North Dakota were the only States that reported they did not exercise their authority to audit electric utilities.

Although 17 commissions' reported that their audits included analyses of utilities' procurement practices, statements made by the commissions indicate that not many--if any--review or audit equipment

purchases in sufficient detail to determine that the prices, terms, and conditions are reasonable and the best obtainable. For example, New Mexico stated that it spot checks costs on company work orders. Michigan reported that original cost audits have been foregone in recent years due to other work of higher priority. Three of the 17 States--Georgia, New York, and Oregon--did not answer our question as to what extent their audits cover the reasonableness of costs included in the rate base.

None of the 41 commissions took exception to a utility's cost of nuclear or nonnuclear power equipment from January 1971 through December 1973.

State commissions' comments on competition among equipment suppliers and manufacturers

According to a 1973 FPC report,¹ only 5 of the 18 State regulatory commissions having authority to require open competitive bidding actually required such bidding.

The table on page 17 shows our categorization of the commissions' responses to our question on their views on whether competition among equipment suppliers and manufacturers is adequate to ensure reasonable prices to the Federal Government and the electric utilities for nuclear and nonnuclear equipment used in power systems.

One of the States which said competition was adequate indicated that pressure on utility management from inflation and consumer groups present incentive to keep costs, and thus rates, as low as possible. Another State said that its brief spot reviews of equipment purchases indicated competition and arm's-length bargaining have done a reasonably satisfactory job of providing reasonable prices. No other State supported its belief that competition was adequate.

There was no consensus among the five States that questioned the adequacy of competition. Their comments appeared to be based on conjecture with little substantive evidence provided.

Massachusetts indicated that, because of shortages of nonnuclear equipment and long leadtimes, utilities may have to purchase what can be most promptly delivered--a situation which could virtually eliminate competition.

Oregon stated that its staff economist, without any specific study on his part, believes that there may be substantial monopolistic control and excessive profits in the nonnuclear equipment supply and manufacturing industry.

¹"Federal and State Commission Jurisdiction and Regulation - Electric, Gas, and Telephone Utilities," 1973

<u>Response</u>	<u>Number of States</u>	<u>States</u>
Competition adequate	15	Alabama, Arizona, Florida, Iowa, Kansas, Kentucky, Maine, Michigan, Nebraska, New York, North Dakota, South Carolina, Washington, West Virginia, Wyoming
Competition not adequate	2	Massachusetts and Oregon
Reservations regarding adequacy	3	Missouri, North Carolina, and Virginia
No opinion	21	Alaska, Arkansas, California, Colorado, Connecticut, District of Columbia, Georgia, Idaho, Illinois, Indiana, Maryland, Minnesota, Mississippi, Montana, New Hampshire, New Mexico, Tennessee, Texas, Vermont, Virgin Islands, and Utah
Total	<u>41</u>	

Missouri stated that competition may not be adequate because of a lack of suppliers. The official who completed the questionnaire told us that he only had a feeling that there were not enough suppliers and gave, as an example, General Electric and Westinghouse being the only domestic suppliers of large-steam turbine-generators.

North Carolina said that the level of competition is acceptable for nuclear steam supply systems, fossil-fired boilers, internal combustion turbines, and other equipment supplied by many different suppliers. North Carolina doubted, however, that competition exists for many of the nonnuclear components manufactured and supplied by only one or two major suppliers. The official who completed the questionnaire informed us that his basis for doubt was the American Electric Power System's 1971 antitrust suit against General Electric and Westinghouse, charging conspiracy to eliminate competition in the large-steam-turbine business. This suit is still in litigation.

Virginia reported:

"Prices for nuclear components have been very high. This may be due to lack of competition, however, it is more likely caused by the very rigid standards of the Atomic Energy Commission and certifications which must be furnished with material. This also reduces competition since many suppliers prefer not to bid on nuclear projects.

"Competition appears adequate to ensure reasonable prices in nonnuclear related equipment."

State commissions' suggestions
for improved competition

Although few State commissions questioned the adequacy of competition among equipment suppliers and manufacturers, 14 suggested steps they believed the Federal Government could take to improve such competition.

The suggestions covered a number of areas. As were the States' comments on adequacy of competition, most of the suggestions appeared to be based on conjecture; none were supported by substantive evidence.

Four of the suggestions indicated that the Federal Government should enforce antitrust laws or make antitrust investigations similar to those made in the early 1960s. Three States said the Federal Government should continue to encourage open competitive bidding; one suggested solicitation of bids from foreign suppliers and manufacturers.

Two suggestions concerned disclosure of additional supplier and manufacturer financial data to enable more precise determinations of profit margins. One State liked the idea of product line financial statements; the other liked publication of bids for public and regulatory agency perusal.

Other States suggested increased standardization of equipment, the establishment and enforcement of a ceiling on profits, and Federal audits of equipment suppliers and manufacturers.

One State suggested that the Federal Government cooperate with other governmental units in developing standards and procedures to be used by utilities in procuring equipment and by regulatory bodies in evaluating utility procurements.

Finally, another State suggested that the Federal Government stay out of the area and leave this matter to private enterprise.

CHAPTER 4

POTENTIAL TO REDUCE COSTS THROUGH INCREASED FOREIGN COMPETITION AND STANDARDIZATION

Because of the need for the Federal Government and the electric utilities to receive prices, terms, and conditions which are reasonable and the best obtainable, we considered the potential benefits of increasing foreign competition in procurements of power equipment and increasing standardization of equipment, plant siting, and plant design. These areas seem to hold significant promise for reducing costs and providing other benefits.

FOREIGN COMPETITION

With few exceptions, domestic manufacturers have dominated the U.S. market for major nuclear and electrical power equipment. Foreign manufacturers made some impact in the 1960s, especially in sales to publicly-owned utilities. However, investor-owned utilities, as a whole, have shown a decided tendency to buy most equipment from domestic manufacturers.

Various Federal agencies have realized substantial savings through procurements of power equipment from foreign manufacturers. Since 1956, for example, TVA has purchased from foreign manufacturers turbine-generators, power transformers, and circuit breakers costing about \$200 million. TVA estimated it saved over \$88 million in these procurements in comparison to the low domestic bid for each item. TVA's estimated savings in fiscal year 1971 alone totaled almost \$25 million.

As of December 1972, BPA had bought 53 of its 90 power transformers and 59 of its 97 circuit breakers from foreign suppliers. During fiscal years 1971-73, BPA awarded eight contracts to foreign manufacturers for a total of \$6.8 million. Comparing these awards to the low domestic bids, we found that BPA saved about \$651,000 by buying overseas.

As of December 1972, the Bureau of Reclamation had purchased 13 of its 17 extra high voltage circuit breakers and 17 of its 20 extra high voltage transformers from foreign suppliers. During fiscal years 1971-72, the Bureau purchased two power transformers from foreign manufacturers for a total of \$694,680 less than the combined low domestic bids for each item.

Rural Electrification Administration (REA) officials informed us that no REA cooperative purchased a power transformer or circuit breaker from a foreign manufacturer in fiscal years 1971-73. However, two cooperatives saved a total of \$3.5 million in 1969 by buying steam turbine-generators from foreign suppliers.

Investor-owned electric utilities--which account for about 77 percent of the electricity generated in the United States--have purchased relatively little major power equipment from foreign manufacturers in comparison to Federal agencies. A. J. Surrey, Science Policy Research Unit of the University of Sussex, England, reported in 1972 that to that time only 12 of 198 investor-owned utilities in the United States had purchased foreign-made steam turbine-generators. Similarly, evidence presented to the U.S. Tariff Commission in the transformer dumping hearings in 1972 indicated that to that time only eight investor-owned utilities had purchased power transformers from foreign manufacturers.

Several international trade considerations affect the desirability and feasibility of foreign procurements of power equipment. The Buy American Act (41 U.S.C. 10) and Executive Order No. 10582 require Federal agencies to purchase American-made products unless their costs are unreasonable or their purchase would not serve the public interest. Agency heads may determine what constitutes an unreasonable domestic price; however, the price must generally exceed the delivered cost of the foreign product, including duty, by 6 percent or more to be excessive.

Except for the Corps of Engineers, which uses a 50-percent differential, Federal agencies and REA borrowers use a 6- or 12-percent differential to evaluate foreign bids for major electrical equipment. Despite its relatively high differential, the Corps has still purchased some foreign-made power equipment.

Other considerations relating to the potential for substantial increases in purchases of foreign-made power equipment include the effect on the U.S. balance of payments, the impact on domestic suppliers and manufacturers, and the uncertainties regarding foreign and domestic inflation and currency reevaluations.

STANDARDIZATION

Standardization is a very complex matter; however, significant cost reductions and other benefits are possible through increased standardization of equipment, plant siting, and plant design, according to knowledgeable persons with whom we spoke.

Total equipment costs sometimes vary greatly for electric utilities of approximately the same size and type. The following table illustrates such variances for a number of powerplants completed between 1969 and 1971.

<u>Comparison of</u>				
<u>total plant equipment costs (note a)</u>				
<u>Installed megawatt capacity</u>	<u>Year plant completed</u>	<u>Primary plant fuel</u>	<u>Equipment costs (per kilowatt)</u>	<u>Equipment cost variance (note b)</u>
817	1971	coal	\$166	20%
816	1971	coal	138	
626	1970	coal	140	18
621	1970	coal	165	
531	1970	coal	111	51
565	1970	coal	168	
351	1969	coal	103	15
346	1969	coal	119	

^aFederal Power Commission data, except as noted.

^bGAO computed, rounded to nearest percent.

Our readings and discussions with knowledgeable Federal and electric utility officials indicate that variances in total equipment costs are due largely to:

- Different equipment specifications.
- Site-sensitive features, including availability of water to dissipate the plant's waste heat and proximity to populated areas where esthetics, noise-abatement, and air-quality controls are important considerations.
- Trade-offs between capital costs and operating costs.

The AEC, individual utilities, regional utility associations, trade and professional associations, and the American National Standards Institute are among the numerous organizations working on various aspects

of standardization. In almost all cases, however, developed standards are so broad that several hundred thousand variations are possible within the framework of the standards.

The officials of AEC, Edison Electric Institute, American National Standards Institute, National Electrical Manufacturers Association, and the Institute of Electrical and Electronic Engineers with whom we spoke were unanimous in their belief that increased standardization of power equipment could be achieved. The officials were divided, however, as to whether increased standardization of plant siting and plant design would be desirable and feasible.

Perhaps the most significant benefit of standardization is economy. Several of the officials with whom we spoke estimated that further standardization could reduce equipment manufacturing costs by about 15 percent to 20 percent. The Oak Ridge National Laboratory reported in March 1974 that second-unit site labor costs could be reduced by 20 percent for structures and site facilities and by 10 percent for reactors, boilers, turbines, and electrical plant equipment.

Further equipment standardization should also increase equipment availability by reducing the number of equipment alternatives, thus enabling manufacturers to better anticipate and provide for equipment demand. Equipment interchangeability, the need for small utility and manufacturer inventories, improved performance, and increased safety are additional potential benefits of further standardization.

A potential problem with increased standardization is design stagnation. Some believe that increased standardization would discourage innovativeness and perpetuate mistakes.

The time and effort required to standardize equipment, plant siting, and plant design is another important consideration; however, much might be learned from AEC's ongoing efforts to standardize nuclear powerplants.

To speed up the nuclear plant licensing program, AEC announced in March 1973 that its regulatory staff would begin making licensing reviews of standardized plant designs and major plant systems. Under the AEC program, a number of utilities already filed applications to use standard plant designs. By January 1974, for example, Duke Power Company planned to build six identical plants on two sites and TVA planned four plants at one site. In addition, a number of major manufacturers have submitted proposals to AEC to standardize nuclear steam supply systems.

Another important consideration is that increased standardization may lessen the number of equipment manufacturers--and thus competition--by precluding technically adequate equipment and designs of certain

companies. For example, some companies whose equipment and designs would not meet new standards may drop from the market because they are unwilling or unable to incur the costs to retool or redesign. Officials of the American National Standards Institute and the National Electrical Manufacturers Association advised us that, for this reason partly, their policies preclude standards that exclude technically adequate equipment of any manufacturer.

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APPENDIX I

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VIC REINEMER, STAFF DIRECTOR
E. WINSLOW TURNER, CHIEF COUNSEL
161 RUSSELL BUILDING
(202) 225-1474

ROBERT BLAND SMITH, JR.
CHIEF COUNSEL AND STAFF DIRECTOR

United States Senate

COMMITTEE ON
GOVERNMENT OPERATIONS

SUBCOMMITTEE ON BUDGETING, MANAGEMENT, AND EXPENDITURES
(PURSUANT TO SEC. 7, S. RES. 44, 91st CONGRESS)

WASHINGTON, D.C. 20510

7 June 1973

The Honorable Elmer B. Staats
Comptroller General of the
United States
Washington, D. C. 20548

Dear General Staats:

This is a follow-up to our discussion yesterday concerning the "Auditing and Enforcement Act of 1973", to be introduced soon and referred to the Committee on Government Operations.

We discussed Senator Muskie's and my interest in having the General Accounting Office review the pricing practices of utility equipment manufacturers, particularly the pricing of nuclear power plants and their components. As I stated this morning, nuclear reactors used by the Navy are very similar to those used by electric utilities, but Navy equipment costs less than comparable equipment purchased by utilities. Navy audits the companies who build its nuclear plants and components; the mere threat of an audit by Admiral Rickover's people has on occasion led to substantial cost reductions to the government. But no one in government audits the books of the companies which charge higher prices, to utilities, for similar or identical equipment.

The Federal interest is substantial here, inasmuch as the Federal Government is the largest electric utility consumer in the country. Inflated costs in equipment become embedded in the rate base, with the result that all consumers pay more than they should for the life of the equipment.

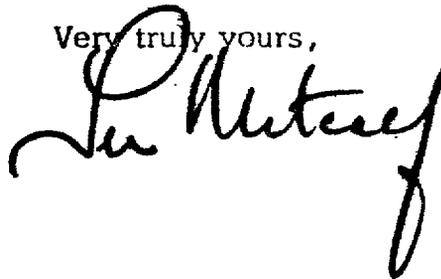
The Honorable Elmer B. Staats
7 June 1973
Page Two

BEST DOCUMENT AVAILABLE

I enclose, for convenient reference, Senator Muskie's 17 September, 1971 letter to you and your 20 December response to Senator Muskie's request for a GAO review in this area, in which you state that GAO does not have authority to examine records relating to contracts between the utilities and their suppliers. Also enclosed is Vic Reinemer's paper, dealing with this subject, presented at the Sierra Club Conference on Electric Energy last year.

I hope that you and your staff will review the enclosures and propose language that would provide GAO with authority to examine records relating to contracts between the utilities and their suppliers. I would also appreciate having your comments as to the extent to which this authority would be provided through Section 10 of S. 70, the Energy Policy Act of 1973, as approved by the Senate.

Very truly yours,



Enclosures

cc: The Honorable Edmund S. Muskie

ORGANIZATIONS CONTACTED

Federal agencies

AEC

Corps of Engineers, Army

Cost Accounting Standards Board

Department of Agriculture:
Office of the Inspector General
REA

Department of the Air Force

Department of the Army

Department of Commerce

Department of the Interior:
Alaska Power Administration
BPA
Bureau of Mines
Bureau of Reclamation
Southwestern Power Administration

Department of Justice

Department of Labor

Department of the Navy

Department of the Treasury

Executive Office of the President

Export-Import Bank

FPC

General Services Administration

Tariff Commission

TVA

Non-Federal regulatory commissions:

Each of the States

District of Columbia

Jamaica

Puerto Rico

Virgin Islands

Equipment manufacturers:

Allis-Chalmers Manufacturing Company

The Babcock & Wilcox Company

Brown-Boveri Corporation

Foster Wheeler Corporation

General Electric Company

Hitachi America, Ltd.

Westinghouse Electric Corporation

Electric utilities:

American Electric Power Systems

Consolidated Edison Company of New York, Inc.

Duke Power Company

Millstone Point Company

Philadelphia Electric Company

Potomac Electric Power Company

Public Service Electric and Gas Company

Virginia Electric Power Company

Washington Public Power Supply System

Associations:

American National Standards Institute

American Public Power Association

Atomic Industrial Forum, Inc.

Edison Electric Institute

Institute of Electrical and Electronics Engineers

National Association of Regulatory Utility Commissioners

National Electrical Manufacturers Association

National Institute of Governmental Purchasing

SUMMARY OF STATE REGULATORY COMMISSIONS' RESPONSES
TO GAO QUESTIONNAIRE ON THEIR AUDITS

Forty-one commissions responded to the questionnaire. The commissions are listed on page 17 and their responses to each question are summarized below.

A. Authority to audit

1. Does the Commission have the authority to audit any or all records of:

Electric utilities?	Yes <u>a39</u>	No <u>b2</u>
Electric utilities' suppliers?	Yes <u>-</u>	No <u>c41</u>
Equipment manufacturers?	Yes <u>-</u>	No <u>c41</u>

^aTennessee reported that it had jurisdiction over only one electric utility, and did not complete the questionnaire.

^bMinnesota and Texas do not regulate electric utilities.

^cEight States--Alaska, California, Illinois, Iowa, Kansas, Kentucky, New Hampshire, and Wisconsin--reported that they would have such authority if a supplier or manufacturer was affiliated with the utility.

2. Describe in detail the extent of the Commission's audit authority, if any, with respect to:

Electric utilities -

All of the commissions indicated rather broad authority to audit electric utilities. No commission reported restrictions to its access to a utility's records concerning the purchase of power equipment.

Electric utilities' suppliers -

None have authority to audit except the eight that would have authority where a supplier and utility are affiliated.

Equipment manufacturers -

None have authority to audit except the eight that would have authority where a manufacturer and utility are affiliated.

B. Use of audit authority

1. Does the Commission actually audit records of:

Electric utilities?	Yes	<u>32</u>	No	<u>9</u>
Electric utilities' suppliers?	Yes	-	No	<u>41</u>
Equipment manufacturers?	Yes	-	No	<u>41</u>

2. Answer the following questions for each type of company the Commission audits.

	<u>Utilities</u>	<u>Suppliers</u>	<u>Manufacturers</u>
How often are the audits conducted?	(a)	-	-
Number of audits in the last 3 years?	(b)	-	-
Number of audits in the last year?	(c)	-	-

^aThe responses of the 32 commissions which audit utilities varied greatly. Nine of the commissions reported that audits are conducted in connection with rate increases; 9 reported that audits were not conducted at any definite interval; and 11 stated time intervals ranging from annually to every 6 years. Three commissions did not answer this question.

<u>Number</u>	<u>Commissions</u>
0 to 10	16
11 to 30	6
Over 30	4
No answer	<u>6</u>
Total	<u>32</u>

<u>Number</u>	<u>Commissions</u>
0 to 5	21
6 to 10	3
Over 10	4
No answer	<u>4</u>
Total	<u>32</u>

APPENDIX III

3. Do audits of electric utilities include analyses of procurement practices? Yes 17 No 15

If yes, to what extent do the audits cover the

--reasonableness of costs included in the rate base?

Statements made by the commissions indicate that not many-- if any--review or audit equipment purchases in sufficient detail to determine that the prices, terms, and conditions are reasonable and the best obtainable. For example, New Mexico stated it spot checks costs on company work orders. Michigan reported that original cost audits have been pre-empted in recent years due to other work of higher priority. Three of the 17 states did not answer the question.

--reasons for awards to other than low bidders?

Ten commissions stated that they look into reasons; the extent ranged from " cursory" to "complete" examinations. Two commissions do not cover awards to other than low bidders, and five did not answer the question.

--adequacy of competition in procurements?

Six commissions reported some work in this area, ranging from " cursory" to "complete" examinations. One commission reported no such work and 10 did not answer the question.

If no, what assurances, if any, does the Commission have that the utilities' procurement practices result in prices, terms, and conditions which are reasonable and the best obtainable?

<u>State</u>	<u>Answer</u>
Alaska	"By comparison of prices between utilities Alaska Statute 42.05.461 requires each public utility with annual revenues exceeding \$100,000 to keep continuing property records. In addition, the commission (under the same statute) may require a public utility to establish, provide, and maintain as part of its system of accounts continuing property records segregated by the year of placement in service. Ordinarily a new utility seeking a certificate of public convenience and necessity to serve an area will be required to provide itemized statements of the plant with which it proposes to serve the public."

APPENDIX III

<u>State</u>	<u>Answer</u>
Colorado	"None other than testimony on the subject during rate cases."
Connecticut	"None"
District of Columbia	"The Commission relies on the Federal Power Commission's periodic audits to disclose major procurement practices that would produce unjust and unreasonable costs."
Illinois	"No absolute assurance, of course, but if the reputation of the Company and the quality of its management are good or excellent, and the general system of checks and counter-checks in key areas is better than merely 'adequate,' it would appear reasonable to assume that procurement practices fell in the general pattern."
Iowa	No response
Maine	"If the Commission had reason to believe that the procurement practices of utilities under its jurisdiction were not in the public interest, it could proceed on its own motion to investigate."
Maryland	"Integrity of company and its internal control system."
Massachusetts	"None."
North Carolina	"As part of engineering analysis associated both with rate cases and with public convenience and necessity certification proceedings, the staff evaluates procurement practices and the resultant costs of plant installed. In addition, in the last several rate cases the Commission has hired a consultant to evaluate the companies' coal procurement practices and present direct testimony relative to his findings."
Oregon	"Difficult to determine."
Utah	"Pursuant to the provisions of Section 54-4-26 Utah Code Annotated 1953, the commission has authority to require a public utility to submit

<u>State</u>	<u>Answer</u>
Utah (continued)	any proposed contract, purchase or other expenditures to the commission for its consideration and the commission may withhold approval if it finds such proposed expenditure is not for the economic benefit of the public utility."
Virginia	"Principally the presumption of prudence on the part of management. The Commission has full authority to take remedial action should cause be found."
Washington	"It is assumed that efficient management attempts to minimize capital investment."
Wyoming	"Utility auditing practices are investigated in rate cases and utility required to support them at that time. This is deemed sufficient since Wyoming intrastate utilities are small, and procurements of very limited and uncomplicated nature. Wyoming interstate utilities audited by federal agencies in which audits commission participates on a limited basis."

4. How often in the past 3 years has the Commission taken exception to electric utilities' cost of nuclear components and electrical equipment?

What were the results of these exceptions, if any? Give examples.

No exception was reported by any of the commissions.

5. If the Commission audits the records of electric utilities' suppliers and/or equipment manufacturers, describe the nature of and reasons for these audits.

No commission audits equipment suppliers or manufacturers.

6. For the purpose of obtaining specific contract information on the purchases of nuclear components and electrical equipment by electric utilities, may the General Accounting Office review the Commission's audit reports and other records relating to electric utilities, electric utilities' suppliers, and equipment manufacturers? Explain.

Yes a30 No b4 No answer 7

^aSix of these States--Colorado, Georgia, Kansas, Montana, New Mexico and South Carolina--indicated that they had little or no information which may be helpful.

^bIdaho, Iowa, Maryland, and Florida. The latter advised us it would supply data "deemed necessary and appropriate."

C. Adequacy of competition among electric utilities' suppliers and equipment manufacturers

1. Does the Commission believe that competition among utilities' suppliers and equipment manufacturers is adequate to ensure reasonable prices to the Federal Government and electric utilities for nuclear components and electrical equipment used in power systems?

See pages 16 to 18.

2. Has the Commission taken any steps to improve competition among electric utilities' suppliers and equipment manufacturers? If yes, please explain.

Only Michigan, Missouri, and New York answered yes. The Michigan commission "is much concerned in this area and in its latest Detroit Edison Order has ordered the company and the Commission staff 'to establish . . . performance goals . . . in the area of construction planning.' In addition, the Commission is in the process of staffing a newly established Performance Evaluation Unit which will have as some of its major functions the development of standards and review of accomplishments in the area of construction planning and execution and in the purchasing of equipment."

Missouri issued an order relating to purchasing and contracts.

New York has required a utility to expand its bidder lists and has issued orders to utilities generally which require certain minimum controls.

3. What steps does the Commission believe the Federal Government could take to improve competition among utilities' suppliers and equipment manufacturers?

See page 18.