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Record Nos. 7514, 7515

In the
Supreme Court of Appeals of Virginia
at Richmond

COMMONWEALTH OF VIRGINIA
against Record No. 7514
VIRGINIA ELECTRIC AND
POWER COMPANY

VIRGINIA CITIZENS CONSUMER
COUNCIL, INC.
against Record No. 7515
VIRGINIA ELECTRIC AND
POWER COMPANY

FROM THE STATE CORPORATION COMMISSION

RULE 5:12—BRIEFS

§5. Number of Copies. Twenty-five copies of each brief shall be filed with the clerk of this Court and three copies shall be mailed or delivered by counsel to each other counsel as defined in Rule 1:13 on or before the day on which the brief is filed.

§6. Size and Type. Briefs shall be nine inches in length and six inches in width, so as to conform in dimensions to the printed record, and shall be printed in type not less in size, as to height and width, than the type in which the record is printed. The record number of the case and the names and addresses of counsel submitting the brief shall be printed on the front cover.

HOWARD G. TURNER, Clerk.

IN THE

Supreme Court of Appeals of Virginia

AT RICHMOND

Record No. 7514

VIRGINIA:

Before Chief Justice Harold F. Snead, Justice Lawrence W. I'Anson, Justice Harry L. Carrico, Justice Thomas C. Gordon, Jr., and Justice Alex. M. Harman, Jr., of the Supreme Court of Appeals of Virginia on Thursday, the 25th day of June, 1970, in vacation of said Court:

COMMONWEALTH OF VIRGINIA, Appellant,

against

VIRGINIA ELECTRIC AND POWER COMPANY, Appellee.

From the State Corporation Commission

Upon the petition of the Commonwealth of Virginia an appeal of right is awarded her by the undersigned Justices on June 25, 1970, from an order entered by the State Corporation Commission on the 10th day of June, 1970, in a certain proceeding then therein depending entitled, Re: Application of Virginia Electric and Power Company for an increase in electric rates, no bond being required.

On further consideration of the petition and the oral argument presented by the Attorney General of Virginia before the undersigned Justices in support of the award of a writ of *supersedeas* as prayed therein and the oral argument of counsel for Virginia Electric and Power Company for denial of a writ of *supersedeas,* the undersigned being of opinion that a *supersedeas* should not be awarded, it is adjudged and ordered that the petition of the Commonwealth of Virginia for a writ of *supersedeas* to the order entered by the State Corporation Commission on June 10, 1970, be, and the same is hereby, denied, upon the following conditions which have been agreed to by Virginia Electric and Power Company:

That Virginia Electric and Power Company is hereby directed forthwith to amend the Company's terms and conditions of service on file with the State Corporation Commission of Virginia so as to provide that it will maintain records of all collections made pursuant to the rates authorized by order of the State Corporation Commission entered June 10, 1970, and if the rates finally established consistent with the mandate of this Court should in any respect differ from those established by the order of June 10, 1970, the Company will make a prompt refund of any excess of the rates actually collected by the Company over the rates so finally established, with interest at the rate of 6% per annum until paid, and will make prompt collection of any excess of the rates so finally established over the rates actually collected; and

That a copy, certified by the clerk of the State Corporation Commission, of the amendment referred to above, be filed with the clerk of this court.

IN THE

Supreme Court of Appeals of Virginia

AT RICHMOND

Record No. 7515

VIRGINIA:

Before Chief Justice Harold F. Snead, Justice Lawrence W. I'Anson, Justice Harry L. Carrico, Justice Thomas C. Gordon, Jr., and Justice Alex. M. Harman, Jr., of the Supreme Court of Appeals of Virginia on Thursday, the 25th day of June, 1970, in vacation of said Court:

VIRGINIA CITIZENS CONSUMER COUNCIL, INC., Appellant,

against

VIRGINIA ELECTRIC AND POWER COMPANY, Appellee.

From the State Corporation Commission

Upon the petition of Virginia Citizens Consumer Council, Inc., an appeal of right is awarded it by the undersigned Justices on June 25, 1970, from an order entered by the State Corporation Commission on the 10th day of June, 1970, in a certain proceeding then therein depending entitled, Re: Application of Virginia Electric and Power Company for an increase in electric rates; upon the petitioner, or some one for it, entering into bond with sufficient security before the clerk of the said court below in the penalty of $300, with condition as the law directs.

Upon further consideration whereof, it is adjudged and ordered that the petition of Virginia Citizens Consumer Council, Inc., for a writ of *supersedeas* to the said order entered by the State Corporation Commission on the 10th day of June, 1970, be, and the same is hereby, denied.

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Records Nos. 7514-7515

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BEFORE THE STATE CORPORATION COMMISSION

APPLICATION
OF
VIRGINIA ELECTRIC AND POWER COMPANY

Case No. 18759

APPLICATION FOR INCREASE IN RATES

Virginia Electric and Power Company (Vepco) respectfully shows:

1. As the principal supplier of electric service for two-thirds of Virginia Vepco has as its basic objective, as well as its legal duty, to provide reliable electric service at reasonable rates. Beyond this, Vepco's objective is to provide the highest quality electric service at the lowest practicable rates, in a socially responsive manner. This means that the Company must have installed and in operation all of the facilities necessary to render service when the need for that service arises.

2. The substantial population increase and rapid economic growth of Virginia, together with the significant increase in consumption of electricity per customer within the Vepco service area in recent years, has resulted in immense growth in the demand for electric service from Vepco's system. These trends will continue in the future, and as a result enormous new demands will be made on Vepco for electric service for new housing, new industry, new schools, new hospitals and a host of other expanded uses.

page 2 } 3. This growth has been of great benefit to Vepco, its customers and Virginia as a whole. The growth has permitted Vepco to realize economies of scale that have aided in offsetting the effect of inflation and in making possible high quality electric service without any increase in electric rates since 1954. In fact, as a result in part of such growth and the resulting economies, Vepco has

been able to pass onto its customers electric rate reductions aggregating on a cumulative basis over $57,000,000 in revenues that Vepco would otherwise have received. This has kept the cost of electricity in Virginia somewhat below the national average.

4. Vepco's growth has required a 1969 investment which will approximate $241 million by the end of this year. Anticipated growth will require an additional investment of $1.7 billion in the 5-year period 1970-1974. Of that amount, approximately $1.2 billion will have to be raised from the investing public through the sale of securities.

5. These are not matters on which a decision can be postponed from year to year, because it now takes 5 to 7 years to acquire the site, obtain permits and licenses, design, construct and place in operation a new generating unit. This means that commitments for the new facilities must be made that far ahead so that Vepco will be able to obtain them from the manufacturers and be in a position to meet the demands for electric service as they arise.

6. Construction and financing programs of this size mark a major change in the position of Vepco. They are more than three times the level prevailing until a few years ago, but they are absolutely essential if Vepco is to discharge its responsibility to meet the needs of its customers for electricity.

page 3 } 7. Vepco thus faces its greatest need in history for new capital. Unfortunately this occurs at a time when the cost of capital has been rising very rapidly. The last bonds sold by Vepco before its last rate increase in 1954 were at a cost of 3.2% per year. The last bonds sold before the filing of this application were at a cost of 7.8% per year. The trend of interest costs has continued higher since that time.

8. Concurrently with the rapid increase in the cost of capital there has been an acceleration of inflation, involving higher prices and wages, and this has resulted in substantially higher operating costs.

9. During this same period, as a result of the substantial increase in summer oriented electric loads having poor load factors, Vepco's summer peak demand has increased at a much more rapid rate than its winter peak demand, with the result that Vepco's annual system load factor, which is a measure of the extent of utilization of its facilities, has declined substantially.

10. During this period Vepco has diligently attempted to realize all possible economies by the installation of the most advanced facilities and modern technology. But the factors

mentioned above have combined to produce a reduction of Vepco's coverage of debt service and return on equity capital, thereby increasing the risk to holders of both debt and equity securities.

11. This trend is very damaging to Vepco's ability to attract the necessary capital from the investing public to finance its required construction program. Vepco cannot conscript capital. It must attract it in competition with other investment opportunities. Where the risks to security holders are increasing, capital can be raised only at increased cost.

page 4 } 12. Vepco's customers have a substantial interest in its ability to raise capital at low cost because, in the long run, the customers must pay that cost of capital. This interest is not protected by the absolutely lowest electric rates, but by the lowest rates consistent with that financial health of the enterprise which will enable it to continue to provide service of high quality at reasonable charges over the long term. This means electric rates that will produce a sufficient return to investors to make Vepco's securities competitive and thereby assure the availability of funds and reduce the long-term capital costs that the customers must pay.

13. For these reasons Vepco believes that the long-term best interests of customers and investors now require that Vepco receive a rate increase, the first in 15 years and only the second in 48 years.

14. At the same time, Vepco believes it is essential that its rates be modernized and restructured in order to stimulate increased sales in the winter, and thus help to retard or reverse the continued erosion of its load factor, and to require the summer oriented uses of electricity, which are the cause of that deterioration, to bear a fairer share of the cost burden that they impose. Thus Vepco proposes new rate schedules that include higher rates during the summer months than during the remainder of the year. This has been done by several other companies in the United States.

15. The rate schedules proposed by Vepco are filed herewith as Exhibit A. They propose uniform rates throughout the territory served by Vepco. They are designed, in the light of present tax rates, to increase Vepco's total operating revenues from electric service in Virginia (other than that subject to Federal authority) by approximately 10%, or $25,000,000 before taxes.

page 5 } 16. In the light of the conditions that have now developed, Vepco's present rates for electric service have become insufficient, unjust and unreasonable. The rates proposed in Exhibit A are just and reasonable and

should be approved and permitted to become effective on January 1, 1970. The rates proposed in Exhibit A also reflect differences in cost, demand and other economic factors with a view to promoting growth in sales and income for the best interests of all customers. But in terms of use by the average residential customer, the increase will amount to only about 4 cents per day and the average residential rate per kilowatt hour will still remain below the level approved by this Commission in the 1954 case.

VEPCO, therefore, prays that the Commission, after hearing, permit the rate schedules filed herewith as Exhibit A pursuant to §§56-237 and 56-238 of the Code of Virginia to become effective on January 1, 1970.

Dated November 25, 1969.

Respectfully submitted,

Virginia Electric and Power Company

By John M. McGurn
President

* * * * *

page 6 } State of Virginia
City of Richmond, to-wit:

I, Helen R. Reed, a Notary Public in and for the State and City aforesaid, hereby certify that this day appeared before me John M. McGurn who, being by me duly sworn, made oath and said that the matters contained in the above application are true to the best of his knowledge and belief.

Given under my hand and notarial seal this 24th day of November, 1969. My commission expires August 24, 1973.

Helen R. Reed
Notary Public

(Notarial Seal)

page 7 } EXHIBIT A

page 8 } Virginia Electric and Power Company

Schedule No. 1

RESIDENTIAL SERVICE

I. APPLICABILITY

This schedule is applicable to separately metered and billed supply of alternating current electricity to any customer for use in and about (a) a single-family residence, flat or apartment, (b) a combination residence and farm, or (c) a private residence used as a boarding and/or rooming house with no more than one cooking installation nor more than ten bedrooms.

This schedule is not applicable to (a) individual motors rated over 15 HP, (b) commercial use as in hotels, public inns, motels, auto courts, tourist courts, tourist camps, or trailer camps, or (c) separately metered service to accessory buildings or equipment on residential property that are not themselves intended or suitable for residence.

II. 30-DAY RATE

(a) First 90 kwhr at 5.0¢ per kwhr
Next 120 kwhr at 2.5¢ per kwhr
Additional kwhr at 1.8¢ per kwhr, except for meter readings taken in November through June, the
Excess of 600 kwhr at 1.2¢ per kwhr
(b) Where customer notifies Company that an electric storage water heater is in normal daily use and Company approves that installation as to type, design, tank size, heating element ratings and thermostatic control so that the connected load per water heater shall not exceed 5500 watts, then up to 390 kilowatthours of those in excess of the first 210 kilowatthours of monthly use shall be at 0.4¢ per kilowatthour less than stated in subparagraph II(a).
(c) The minimum charge shall be $3.00 per billing month and includes 60 kwhr.

III. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid

balance, will be added to the current bill. No late payment charge is imposed on an interim bill.

IV. METER READING AND BILLING

(a) Meters may be read in units of 10 kilowatthours and bills rendered accordingly.
(b) The Company shall have the option of reading meters monthly or bimonthy. When the meter is read at other than monthly intervals, the Company may render an interim monthly bill based upon estimated kwhr use during periods for which the meter was not read.
(c) Where the billing period between successive meter readings is other than 30 days, the kwhr in each block and the minimum charge of the 30-day rate will be multiplied by the actual number of days in the billing period and divided by 30.

V. TERM OF CONTRACT

Open order.
Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

page 9 } Virginia Electric and Power Company

Schedule No. 5

SMALL GENERAL SERVICE

I. APPLICABILITY

This schedule is applicable to the supply of electricity to any customer. This schedule is not applicable for breakdown, relay or parallel operation service.

II. 30-DAY RATE

(a) First 210 kwhr at 5.0¢ per kwhr
Next 300 kwhr at 4.0¢ per kwhr
Next 2490 kwhr* at 3.0¢ per kwhr for meter readings taken in July through October
or at 2.4¢ per kwhr for meter readings taken in November through June
Next 1950 kwhr* at 1.4¢ per kwhr
Additional kwhr at 0.9¢ per kwhr

*Add 195 kwhr for each KW of Demand over 10 through 30 KW, and add 105 kwhr for each KW of Demand over 30 KW.
(b) The minimum charge shall be $1.95 per KW of demand but not less than $3.00 per billing month and includes 60 kwhr.
(c) Where direct current electricity is supplied to the customer, a surcharge of 10% will be added to the above charges.

III. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid balance, will be added to the current bill. No late payment charge is imposed on an interim bill.

IV. DETERMINATION OF DEMAND

When the use of electricity under this schedule exceeds 3000 kwhr for two consecutive monthly billing periods, the KW of demand will be determined as the highest average KW load measured in any 30-minute interval during the billing month.

V. METER READING AND BILLING

(a) Meters may be read in units of 10 kwhr and bills rendered accordingly.
(b) The Company shall have the option of reading meters monthly or bimonthly. When the meter is read at other than monthly intervals, the Company may render an interim monthly bill based upon estimated kwhr use during periods for which the meter was not read.
(c) Where the billing period between successive meter readings is other than 30 days, the kwhr in each block and the minimum charge of the 30-day rate will be multiplied by the actual number of days in the billing period and divided by 30.

VI. TERM OF CONTRACT

Open order, unless the Customer or the Company requests a written contract. In such case, the term of contract for the purchase of electricity under this schedule shall be such as may be mutually agreed upon, but not less than one year.

Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

page 10 } Virginia Electric and Power Company

Schedule No. 6

LARGE GENERAL SERVICE

I. APPLICABILITY

This schedule is applicable for the supply of 50 KW or more of alternating current electricity to any customer.

II. 30-DAY RATE

(a) KW Demand Charge
First 50 KW of demand or less $180.00
Next 650 KW of demand at $2.10 per KW
Next 4300 KW of demand at $1.80 per KW
Additional KW of demand at $1.71 per KW
(b) Plus RKVA Demand Charge
All RKVA of Demand at $0.10 per RKVA
(c) Plus Energy Charge
First 24,000 kwhr at 0.9¢ per kwhr
Next 186,000 kwhr and any additional kwhr up to 210 kwhr per KW of demand at 0.6¢ per kwhr
Additional kwhr at 0.4¢ per kwhr

III. DETERMINATION OF KW DEMAND

(a) Except as provided under III(b), the KW of demand billed shall be the highest of:
(1) The highest average KW measured in any 30-minute interval during the current billing month, or
(2) 95% of the highest KW of demand used for billing during the billing months of June through September of the preceding eleven billing months, or
(3) 50 KW.

(b) Where the KW of demand under III(a)(2) is 1000 KW or more, the KW of demand billed shall be the highest of:
(1) The highest average KW measured in any 30-minute interval during the on-peak hours of 7:00 a.m. to 10:00 p.m., Mondays through Fridays, plus 30% of the excess of this amount determined in a similar manner during any other period during the current billing month, or
(2) 95% of the highest KW of demand used for billing during the billing months of June through September of the preceding eleven billing months, or
(3) 1000 KW.

IV. DETERMINATION OF RKVA DEMAND

The RKVA demand shall be billed only where the KW of demand is determined under III(b). The RKVA of demand billed shall be the highest average RKVA measured in any 30-minute interval during the current billing month.

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Schedule No. 6—(Continued)

LARGE GENERAL SERVICE

V. METER READING AND BILLING

When the actual number of days between meter readings is more or less than 30 days, the KW Demand Charge, the RKVA Demand Charge, and the quantity of kwhr in each block of the Energy Charge of the 30-day rate will each be multiplied by the actual number of days in the billing period and divided by 30.

VI. SERVICE AVAILABLE

Normally the Company will supply the equipment necessary and will deliver to the Customer, in accordance with the Company's applicable Terms and Conditions at One Delivery Point mutually satisfactory to the Customer and the Company, 60 cycle alternating current electricity of the phase and voltage desired by the Customer at said Delivery Point, provided electricity of the phase and voltage desired by the Customer is available generally in the area in which electricity is desired.

VII. BREAKDOWN, RELAY OR PARALLEL OPERATION SERVICE

A customer having a power plant may contract for breakdown, relay or parallel operation service under this schedule, notwithstanding the provisions of Paragraph Fourth of the "Agreement for the Purchase of Electricity", under the following conditions:

(a) Suitable relays and protective apparatus shall be fur-

nished installed, and maintained at the Customer's expense in accordance with specifications furnished by the Company. The relays and protective equipment shall be subject, at all reasonable times, to inspection by the Company's authorized representative.

(b) The contract demand to be billed under this Paragraph VII shall be the maximum number of KW which the Company is to supply. Contract demands may be changed by mutual agreement as to the amount of change and term of agreement. In case the maximum measured KW demand exceeds the contract demand, the measured demand becomes the contract demand for that month and for the next succeeding eleven months.

(c) The monthly charge for electricity supplied under this Paragraph VII shall be not less than $2.00 per KW of contract demand as determined in this Paragraph VII.

VIII. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid balance, will be added to the current bill.

IX. TERM OF CONTRACT

The term of contract for the purchase of electricity under this schedule shall be such as may be mutually agreed upon, but for not less than one year.

Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

page 12 } Virginia Electric and Power Company

Schedule No. 7

ELECTRIC HEATING

I. APPLICABILITY

This schedule is applicable to any general service customer purchasing alternating current electricity for storage water heating, for clothes drying, or for space heating (but not for process heating), where the customer also purchases electricity for other purposes at the same location in accordance with a general service schedule.

Where electricity is used for space heating, and the same space is cooled by air conditioning equipment that serves no additional space, the air conditioning equipment may be served on this schedule through the same meter.

This schedule is not applicable for any use other than those specified above.

II. 30-DAY RATE

(a) Energy Charge
All kilowatthours at 3.0¢ per kwhr for meter readings taken in July through October except where the customer notifies the Company that an electric storage water heater is in normal daily use then one half of the monthly use shall be at 1.5¢ per kwhr.
All kilowatthours at 1.2¢ per kwhr for meter readings taken in November through June.
(b) Plus Demand Charge
First 100 KW of demand or less Included in Monthly Energy Charge
Next 200 KW of demand at $3.00 per KW
Additional KW of demand at 2.00 per KW
(c) Minimum Charge
$3.00

III. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid balance, will be added to the current bill. No late payment charge is imposed on an interim bill.

IV. DETERMINATION OF DEMAND

The KW of demand will be determined as the highest average KW load measured in any 30 minute interval during the billing month.

V. METER READING AND BILLING

(a) Meters may be read in units of 10 kwhr and bills rendered accordingly.

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Schedule No. 7—(Continued)

ELECTRIC HEATING

(b) The Company shall have the option of reading meters monthly or bimonthly. When the meter is read at other than monthly intervals, the Company may render an interim monthly bill based upon estimated kwhr use during periods for which the meter was not read.

(c) Where the billing period between successive meter readings is other than 30 days, the demand charge and the minimum charge of the 30-day rate will be multiplied by the actual number of days in the billing period and divided by 30.

VI. EQUIPMENT SPECIFICATIONS

The type, design and size of tank, the size and number of heater units, and the method of water heater operation are subject to approval by the Company.

The type, design, capacity, method of operation, and installation of the electric space heating and air conditioning equipment are subject to approval by the Company. The electric space heating design and installation, and the air conditioning equipment design and installation, shall conform to good engineering practice and provide for satisfactory operation and comfort.

The type, design, capacity, method of operation, and installation of the electric clothes drying equipment are subject to approval by the Company.

VII. TERM OF CONTRACT

The term of contract for the purchase of electricity under this schedule shall be such as may be mutually agreed upon, but not less than one year.

Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

page 14 } Virginia Electric and Power Company

Schedule No. 25

UNDERGROUND DECORATIVE LIGHTING SERVICE

I. APPLICABILITY

This schedule is applicable to any Customer for underground decorative lighting service except where installations are prevented by any public authority having jurisdiction or are otherwise unlawful or where electricity is being supplied by overhead facilities. This schedule is not applicable to lighting installations aggregating less than an initial 100 pole assemblies of the types described under Paragraph V.

II. 30 DAY CHARGE

Pole Assembly Type F-2 at $9.30 per pole assembly
Pole Assembly Type F-3 at 7.80 per pole assembly
Pole Assembly Type F-3B at 11.40 per pole assembly

III. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid balance, will be added to the current bill.

IV. BILLING

Where the period between successive billing dates is other than 30 days, the 30-day charges will be multiplied by the actual number of days in the billing period and divided by 30.

V. LIGHTING EQUIPMENT AVAILABLE

A detailed description or sketch of the special lighting facilities available under this schedule will be furnished upon request. The specific pole assemblies that will be installed under this schedule are generally described as follows:
(a) Pole Assembly Type F-2 including one fixture lamped with eight 100 watt, 120 volt clear incadescent lamps operated at one-half voltage, mounted approximately 10′ above grade.

(b) Pole Assembly Type F-3 including one fixture lamped with one 175 watt mercury vapor lamp, mounted approximately 15′ above grade.
(c) Pole Assembly Type F-3B including two fixtures per assembly, lamped with one 175 watt mercury vapor lamp per fixture, mounted approximately 15′ above grade.

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Schedule No. 25—(Continued)

UNDERGROUND DECORATIVE LIGHTING SERVICE

VI. TERMS AND CONDITIONS

(1) With the exception of trenching, backfilling and any necessary repaving, all of which is to be done by the Customer at the Customer's own expense, the complete installation is to be furnished, maintained and operated by the Company, and will remain the property of the Company.
(2) The installations shall be supplied electricity through underground wiring and the fixtures will be installed on private property. In no case will such fixtures be installed on streets dedicated to public use.
(3) If any pole or fixture is relocated or removed at the Customer's request, the cost of relocation or removal shall be paid by the Customer.
(4) The Company shall not be obligated to construct or own any facilities to provide underground decorative lighting service, the cost of which shall exceed four times the continuing annual revenue anticipated from such installation.

VII. TERM OF CONTRACT

The Term of Contract for service under this schedule shall be such as may be mutually agreed upon but not less than five (5) years.

Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

page 16 } Virginia Electric and Power Company

Schedule No. 26

OUTDOOR LIGHTING SERVICE

I. APPLICABILITY

This schedule is applicable to any customer for outdoor lighting service except where installations are prevented by any public authority having jurisdiction or are otherwise unlawful.

II. FLAT CHARGE

Yearly basis, payable in 12 equal monthly installments
All Night (Approximately 4,000 hours per year)
3,300 lumen mercury vapor at $30.00 per lamp per year
7,000 lumen mercury vapor at 42.00 per lamp per year
11,000 lumen mercury vapor at 54.00 per lamp per year
20,000 lumen mercury vapor at 75.00 per lamp per year
33,000 lumen mercury vapor at 105.00 per lamp per year
53,000 lumen mercury vapor at 141.00 per lamp per year

III. PAYMENT

Current bills are due and payable from bill date. When bills are not paid in full on or before the next bill date, a late payment charge of 1½% per billing month, based on the unpaid balance, will be added to the current bill.

IV. TERMS AND CONDITIONS

The complete installation is to be furnished, maintained and operated by the Company and will remain the property of the Company. The type of fixture and method of installation shall be in accordance with Company standards. Normally, overhead lights will be installed on Company wood poles or on other wood poles on which the Company has installed standard attachments. Installations on buildings or structures belonging to the Customer or to others will not be permitted.

The Company shall not be obligated to construct or own any line extension or other facilities to provide outdoor lighting service, the cost of which shall exceed four times the continuing annual revenue anticipated from any such line extension. If the cost of installing the line extension or other fa-

cilities is in excess of four times the anticipated continuing annual revenue, the Customer will pay to the Company in advance of the construction of the extension or other facilities an amount equal to the excess cost.

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SCHEDULE NO. 26—(Continued)

OUTDOOR LIGHTING SERVICE

IV. TERMS AND CONDITIONS—Continued

Outside the areas designated by the Company as underground distribution areas, when the Company is requested by the Customer to install underground units for outdoor lighting service, the Company will make such an installation provided the Customer pays to the Company in advance the amount by which the cost of the installation exceeds four times the continuing annual revenue anticipated from the installation. The Customer, however, shall install, own and maintain all fixed items such as conduit, pads, handholes and pole foundations. Poles will not be considered fixed items. Within the areas designated by the Company as underground distribution areas the Company shall not be obligated to construct or own any facilities beyond the property line of the Customer.

The Customer shall report to the Company, as promptly as possible, any and all lights that are out or not burning properly. The Company will endeavor to replace or repair such lights on the next following regular working day. Should the Customer request the repair or replacement of the lights during hours other than normal routine schedule, a service charge of $5.00 will be made.

V. TERM OF CONTRACT

Open order where the fixtures and other service facilities are in place. In all other cases, the term of contract shall be such as may be mutually agreed upon, but not less than one year.

page 18 } Virginia Electric and Power Company

TERMS AND CONDITIONS

XXIII. TEMPORARY SERVICE

Upon request of the Customer, temporary service shall be supplied under the following conditions:

(a) The Customer shall pay to the Company, prior to connection of the service, a Temporary Service Charge which shall be the estimated net cost (including all applicable overhead costs) of installing and removing the service facilities furnished by the Company both on and off the Customer's premises, but in no case shall such charge be less than $10.00 except as modified by Paragraph (b) following.

(b) Where temporary service is furnished at a permanent service location, the Temporary Service Charge will be the net cost to the Company, including overhead costs, which is in excess of the estimated cost of furnishing the permanent service.

Filed 11-25-69
Electric—Virginia This Filing Effective 1-1-70

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At Richmond, November 25, 1969

Application Of
Virginia Electric and Power Company

Case No. 18759

For an increase in electric rates.

This Day came the applicant, by counsel, and presented its application dated November 25, 1969, for approval of certain schedules of rates and charges for electric service, executed and verified by John M. McGurn, President, and presented therewith the new schedules of rates and charges.

And, It Appearing that the new schedules provide for certain increases and changes in the rates and charges presently filed and currently effective for use by the applicant in this State; that the public interest will be affected thereby; and that it is proposed that the new schedules become effective on and after January 1, 1970;

It Is Ordered

(1) That the application and new schedules of rates and charges referred to above be filed; that a proceeding be instituted, assigned Case No. 18759, docketed and set for hearing at 10:00 A. M. on May 4, 1970, in the Courtroom of the State Corporation Commission, Blanton Building, Richmond, Virginia; and that an investigation of the reasonableness and justice of the proposed rates and charges be entered upon;

(2) That the applicant file with the Commission by March 9, 1970, the direct testimony and exhibits proposed to be offered by witnesses for the applicant in its presentation in chief at the hearing;

(3) That the staff of the Commission file with the Commission and deliver to the applicant by April 6, 1970, the direct testimony and exhibits proposed to be offered by witnesses for the Commission in their presentation in chief at the hearing;

(4) That persons desiring to intervene and be heard should file with the Commission by April 20, 1970, a notice showing his name, address, interest and position;

page 20 } (5) That, in view of the impossibility of concluding the investigations and hearing within sixty days after December 31, 1969, the Commission hereby suspends the enforcement of all of the proposed new schedules of rates and charges until June 1, 1970, reserving its right of further suspension for such moderate and reasonable periods as may be requisite and necessary to complete the investigation;

(6) That notice of the time, place and general object of such hearing and investigation be published by the applicant at least once a week for four successive weeks, each publication to be at least one week apart, in a newspaper or newspapers of general circulation in each of the cities of Alexandria, Buena Vista, Charlottesville, Chesapeake, Clifton Forge, Covington, Colonial Heights, Emporia, Fairfax, Falls Church, Franklin, Fredericksburg, Hampton, Harrisonburg, Hopewell, Lexington, Newport News, Norfolk, Petersburg, Portsmouth, Richmond, South Boston, Staunton, Suffolk, Virginia Beach, Waynesboro, and Williamsburg, such publication to be completed prior to the hearing provided for herein, and to be substantially in the following words and figures:

"NOTICE TO THE PUBLIC"

"Notice is hereby given to the public that Virginia Electric and Power Company on November 25, 1969, filed with the State Corporation Commission new schedules of rates

and charges. The proposed new schedules will result in increased charges for electric service. An investigation of the proposed charges has been entered upon by the State Corporation Commission and a hearing on the new schedules has been set for 10:00 A. M. on May 4, 1970, in the Courtroom of the Commission, Blanton Building, Richmond, Virginia, at which time and place members of the public generally may appear and present such relevant data as may be desired and be heard. The new schedules may be seen at the office of the State Corporation Commission, Blanton Building, Richmond, Virginia, and may be reviewed at any business office of the company where bills may be paid. The applicant has been ordered to file with the Commission a copy of the testimony it proposes to offer to the Commission by March 9, 1970. The staff of the Commission
page 21 } has been ordered to file with the Commission a copy of the testimony it proposes to offer to the Commission by April 6, 1970. Any person in interest may review the above testimony at the offices of the Commission Persons desiring to intervene and be heard should file with the Commission by April 20, 1970, a notice showing his name, address, interest and position.

"Virginia Electric and Power Company"

(7) That copies of the application and the proposed new schedules of rates and charges be served by the applicant by certified mail with return receipt on the Commonwealth's Attorney and Chairman of the Board of Supervisors of each county, or on the County Manager in each county having that form of government, in this State in which the applicant operates and on the Mayor or City Manager and the City Attorney of every city in this State in which the applicant operates; and

(8) That due proof of such service and publication of such notice be made at the hearing.

An Attested Copy hereof shall be sent to the applicant, attention, John M. McGurn, President, 7th and Franklin Street, Richmond, Virginia, and its General Counsel, George D. Gibson, 700 East Main Street, Richmond, Virginia, and the Chief Engineer and Chief Accountant of the Commission.

* * * * *

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* * * * *

At Richmond, April 22, 1970

Application of
Virginia Electric and Power Company

Case No. 18759

For an increase in electric rates.

This day came Virginia Citizens Consumer Council and moved that the hearing of this case be continued for sixty days on the ground that "the time is not adequate for the Virginia Citizens Consumer Council to prepare completely cross-examination and direct and rebuttal testimony by May 4th," and that it "is in the process of securing witnesses."

It appearing that the public, including the members of the Council, had notice of the May 4th hearing date about five months ago, the motion is denied.

Attested copies of this order shall be mailed to William R. Durland, Box 3103, Alexandria, Virginia 22302 and to George D. Gibson, 700 E. Main Street, Richmond.

* * * * *

page 23 }

OFFICIAL REPORTER'S MINUTES

VIRGINIA

BEFORE THE STATE CORPORATION COMMISSION

Case No. 18759

Application by Virginia Electric and Power Company for Increase in Electric Rates

page 24 } The Bailiff: Case No. '18, 759, Application of Virginia Electric & Power Company for an increase in electrical rates.

Mr. George D. Gibson, Mr. John W. Riely, Mr. George C. Freeman, Jr., Mr. Evans B. Brasfield, and Mr. Guy T. Tripp, III, counsel for the applicant.

The Honorable Andrew P. Miller, Attorney General of the

Commonwealth, and Anthony F. Troy, Assistant Attorney General, appearing as individual intervenor.

Mr. Peter Parker, for the Ad Hoc Committee on VEPCO rates for cities and counties, Intervenor.

Mr. Leslie G. Fleet, counsel for Washington Gas & Light Company, Intervenor.

Mr. Harry T. Marshall, counsel for the City of Virginia Beach and others, Intervenor.

Mr. Thomas M. Batchelor County Executive, Albemarle, Individual Intervenor.

Mr. R. O. Graham Guthrie, III, counsel for Arlington, Intervenor.

Mr. William W. Stevenson, appearing as an Individual Intervenor.

page 25 }

Mr. Michael J. Dunsford, appearing as an Individual Intervenor.

Mr. A. Grey Staples and Mr. Richard Rogers, counsel for the Commission.

* * * * *

page 96 } JOHN M. McGURN was called as a witness on behalf of VEPCO and, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Will you state your name and position?

A. My name is John M. McGurn and I am Vice Chairman of the Board of Directors and Chief Executive Officer of Virginia Electric & Power Company.

Q. Mr. McGurn, would you briefly describe your background?

A. I graduated from New Mexico State University in 1934 with a B. S. degree in Electrical Engineering. Upon graduation I was employed by the El Paso Electric Company in power station operation and mechanical test engineering work. In 1941 I joined Virginia Electric & Power Company at Norfolk as a test engineer at the Reeves Avenue Power Station. From 1941 until 1958, I held various operating and engineering positions in VEPCO's power stations and in the System Production and System Operating Department in Richmond. In 1958 I became Assistant District Manager of the Richmond District and in 1959 I became District Manager of Norfolk.

John M. McGurn

In 1961 I was appointed Operating Manager, and I was elected Vice-President in 1963. I became Senior
page 97 } Vice-President in 1966. In April, 1967, I was elected President, Chief Executive Officer and a member of the Board of Directors. On April 15, 1970, I became Vice Chairman of the Board and Chief Executive Officer.

Q. With what professional or public service activities are you associated?

A. I am a Director of the Edison Electric Institute, the Southeastern Electric Exchange, the Carolinas-Virginia Nuclear Power Associates, Inc., and the North Carolina Engineering Foundation, Inc., and I am President of the Public Utilities Association of the Virginias.

I am also a member of the Governor's Advisory Board on Industrial Development and the Advisory Board of the Institute for Business and Community Development of the University of Richmond and the National Industrial Conference Board.

Q. Please describe briefly the business of Virginia Electric & Power Company.

A. Virginia Electric & Power Company is a public service corporation organized under the laws of Virginia and is engaged in the electric and gas utility business. It furnishes electric service at retail in 67 counties, 27 cities and 90 towns in Virginia, 22 counties and 41 municipalities in North Carolina, and 5 counties and 8 municipalities in West Virginia.

I have had prepared under my supervision
page 98 } and direction a map of VEPCO's electric system, showing the areas in which it furnishes electric service at retail or at wholesale, and showing major generating and transmission facilities in the system.

I would like to file this map as an exhibit.

Chairman Hooker: Exhibit 1 received. We are going to mark these exactly as the evidence is set forth.

Mr. Gibson: As marked on the exhibit?

Chairman Hooker: As it is marked on the exhibit.

Mr. Gibson: Then this would be JMM-1.

Chairman Hooker: That's right.

Mr. Gibson: And is that received in evidence?

Chairman Hooker: Yes.

(The map referred to was marked, for identification Exhibit No. JJM-1 and received in evidence,)

John M. McGurn

Q. Does VEPCO render any other utility service?

A. VEPCO also renders gas utility service in six cities and two counties in the Tidewater area of Virginia, but VEPCO's gas operations and gas rates are not involved in page 99 } this proceeding.

Q. Mr. McGurn, would you please describe VEPCO's corporate philosophy as it relates to electric rates and service?

A. The basic objective of the Virginia Electric & Power Company is to provide the highest quality electric service at the lowest practicable cost, in a socially responsive manner. To meet these goals VEPCO must have rates which yield revenues sufficient to enable it to obtain capital in competition with other companies, it must so structure its rates as to produce a mix of business which will permit it to keep cost to all customers at the lowest practicable levels consistent with the provision of reliable service and the observance of sound financial principles.

For these purposes it is our responsibility to take such steps as are required to assure that the company is financially able to meet all expenses and to raise such capital as it requires to supply our customers' increasing needs for electric service now and in the future, when they demand it, where they demand it, and in the quantity in which they demand it.

Q. How is VEPCO presently meeting its responsibility of supplying its customers' needs for electric serv- page 100 } ice?

A. VEPCO presently operates eight fossil fueled power stations and two major and three minor hydroelectric stations and has begun construction on two major nuclear power station projects, two major additions to existing fossil fueled stations and minor installations of combustion turbine capacity. The system has a present total generating capability of over 5 million kilowatts and a network of electric power lines totaling 39,600 miles in length. We employ over 5,700 people in our electric and gas operations.

Q. What has been the company's experience with the respect to growth in the use of its product?

A. Since 1954 when VEPCO last obtained rate relief, total kilowatt sales by VEPCO have increased nearly fivefold, from 4.4 billion kilowatt-hours in 1954 to 21 billion kilowatt-hours in 1969. This increase exceeds the threefold increase experienced by all electric companies in the United States.

I have had prepared under my supervision and direction an exhibit showing this graphically.

John M. McGurn

Mr. Gibson: We offer this as Exhibit JMM-2, if it please the Commission.

page 101 } Chairman Hooker: Exhibit 2 is received.

(The document referred to was marked for identification, Exhibit No. JMM-2 and received in evidence.)

Q. What have been the growth trends affecting your residential class of service?

A. During this period the number of residential customers served at year end by VEPCO rose from 546,624 in 1954 to 878,206 in 1969, an average consumption per residential customer more than doubled, increasing from 2,838 kilowatt-hours in 1954 to 7,932 in 1969.

This is shown graphically on another exhibit which has been prepared under my supervision and direction.

Mr. Gibson: I offer that as Exhibit JMM-3, may it please the Commission.

Chairman Hooker: Exhibit 3 received.

(The document referred to was marked for identification, Exhibit No. JMM-3 and received in evidence.)

By Mr. Gibson:

Q. To what do you attribute the growth shown on Exhibits JMM-2 and JMM-3?

A. Some of the growth experienced by VEPCO has resulted from economic growth in its service territory, a *procees* to which the company has contributed through its promotional efforts to attract new industrial and

page 102 } commercial establishments.

A portion of the growth is due to increasing use of electricity by existing customers, aided in part by VEPCO's efforts to promote greater use of electricity, particularly those uses which help increase our off-peak loads; but, despite these efforts, our system load factor has declined in recent years.

Q. What has happened to the average rate paid for electricity by residential customers?

A. I have had prepared a chart which shows the reduction in average payment per kilowatt-hour during the course of this growth.

John M. McGurn

Mr. Gibson: I offer that as Exhibit No. JJM-4, may it please the Commission.

Chairman Hooker: Exhibit 4 received.

(The document referred to was marked for identification, Exhibit No. JMM-4 and received in evidence.)

Q. Would you please comment on this exhibit?

A. You could see from this exhibit that during the course of this growth we have been able to reduce the average charge per residential kilowatt-hour from over 2.6 cents at the time of our 1954 rate increase to below 2 cents in 1969, and even if the requested rate relief is granted, to an estimated 2.1 cents in 1970.

page 103 } This is in contrast to a steady increase in the cost of other things the consumer buys.

Another chart which I have prepared illustrates this.

Mr. Gibson: I offer that as Exhibit JMM-5.

Chairman Hooker: Exhibit 5 received.

(The document referred to was marked for identification, Exhibit No. JMM-5 and received in evidence.)

By Mr. Gibson:

Q. What does this chart show?

A. This chart contrasts the trend in VEPCO customers' average unit cost for electricity through the trend in the consumer price index, and shows that since 1950 the consumer price index has risen nearly 53% while the average unit cost of electricity to residential customers has declined over 30%.

I have also had prepared in exhibit form a chart from the January 19, 1970, issue of U.S. News and World Reports which shows the impact of inflation on the cost of many services.

Mr. Gibson: I offer that as Exhibit JMM-6.

Chairman Hooker: JMM-6 received.

page 104 } (The document referred to was marked for identification, Exhibit JMM-6 and received in evidence.)

John M. McGurn

By Mr. Gibson:

Q. What effect has that growth in demand for electric service had on VEPCO's capitalization?

A. To meet the enormous growth experienced by VEPCO, we have had to raise substantial sums of money. It requires a greater investment in facilities to produce $1 of revenue for the electric utility industry than for any other business or industry. VEPCO's expenditures for construction of facilities in the past 15 years totaled $1.42 billion, of which $1.38 billion was for construction of electric facilities.

During this period it was necessary for the company to raise almost $795 million through the sale of securities.

Q. What has been the company's cost experience during this period?

A. During this period of growth we have attempted both to keep costs to a minimum and to provide service of a maximum quality.

In addition, as I will discuss later, we have attempted to be responsive to public views concerning the impact of our operations on the environment.

page 105 } Operating and maintenance expenses per kilowatt-hour sold were 50% greater 15 years ago than they are today. We have managed by installing larger generating units to reduce plant costs per kilowatt of generating capacity from approximately $150 in 1954, when we were installing 90,000 kilowatt units, to about $110 for our more recent coal-fired additions, when the size of our newest unit is about 7 times the 1954 level. This has been accomplished despite a 26% increase in electrical machinery and equipment prices and a 68% increase in electric utility construction costs in the period 1954 to 1969.

Mr. Staples: Excuse me. Is he amending his testimony from 28 to 26 in that answer?

Mr. Gibson: Yes.

By Mr. Gibson:

Q. What has been the company's rate experience during this period?

A. Since 1954 VEPCO was able to pass on to its customers electric rate reductions aggregating on a cumulative basis through 1969 more than $73 million in revenues that the company otherwise would have received. This has kept the cost of *electricty* in Virginia somewhat below the national average for customers of various types and sizes.

John M. McGurn

Q. Do you expect that technological advances
page 106 } will continue as they have in the past?

A. Through coordinated research and development the electric utility industry and electrical equipment manufacturers have and are continuing to achieve many technological advances that improve the efficiency and economy of our operations. In the field of conventional steam-electric generation this has been achieved primarily through economies of scale and improved design.

For example, the largest generating unit on our system at the time of our previous rate case in 1953 had a capacity of only 90,000 kilowatts. In 1969 the addition to our Chesterfield station was a 694,000-kilowatt unit, or about 7 times the size of the largest unit in service in 1953, and it was about 7% more efficient.

While advances in the technology of this particular concept may not be as rapid in the future, many new concepts have and are being developed. Perhaps the most important of these is in the area of nuclear power, which from a technological standpoint is only in its infancy, but more efficient units of significantly greater size than the 850,000-kilowatt units we are presently installing will be contingent on further growth of our system and the development
page 107 } of technological improvements that are not now available.

Other technological advances that we can look forward to in the future will be in the area of transmission and distribution facilities. We expect some of these to be achieved within the next few years through continued improvement in installation techniques and work methods, as well as the development of new materials and equipment. Others will be dependent upon highly intricate technological refinements still in the experimental stage.

So, taking a long view, we may expect that the multiplying pressures of an expanding economy will stimulate further technological innovations, but this is a gradual process and subject to many uncertainties.

In contrast, the increased costs I have mentioned are both actual and rapid. We have to face the present facts if we are to supply reliable service.

Economic changes have converged upon us with such force that it is no longer possible for us to continue our previous pattern of rate reductions. We must now for the first time in 15 years, and only the second time in 48 years,
page 108 } seek a rate increase. The rapidly increasing cost

of debt capital has seriously impaired, and will continue to impair, our earnings.

In 1954 6.0% of VEPCO's revenues represented interest payments, and as recently as 1963 the percentage had grown to only 6.5%. In 1969, however, our interest payments were 10.5% of our total revenues, and we know that we will be required to borrow enormous sums over the next few years at interest rates materially higher than our imbedded costs.

At the same time our electric operating ratio, that is the ratio of electric operation and maintenance expenses to total operating revenues, after decreasing for many years turned up in 1967 with a substantial acceleration of the rate of increase through 1969 because of the rapid advance in the costs of fuel, labor, and material.

This is shown on the chart that I have prepared.

Mr. Gibson: We offer that as Exhibit JMM-7, if Your Honor please.

Chairman Hooker: Exhibit JMM-7 is received.

page 109 } (The document referred to was marked for identification, Exhibit JMM-7 and received in evidence.)

Q. What are the trends in the capital markets which you deem important?

A. I have already touched on this matter briefly, and I am sure the Commission is familiar with the emerging trends in the capital markets. Mr. Justin Moore will address himself to this in detail. I need only refer to the fact that the rate paid by utilities for debt money is now in the range of 8% to 9%, and shows no signs of returning to anything like the level of our present imbedded cost of debt or even the cost in recent years.

Parallel to this, the return expected by equity investors is rising. With high-grade bonds providing yields up in the range of 8% to 9%, investors in common equity have come to expect higher returns in the form of either a growing dividend payment or enhanced possibilities of growth in the value of the equities they purchase. If the return on common equity is declining rather than increasing, it will clearly be more difficult to raise the required capital.

Q. What has been the company's experience with regard to load factor?

John M. McGurn

A. Prior to 1957 VEPCO, like many other electric utilities, was a winter-peak company; that is, the
page 110 } greatest peak load demand occurred in the wintertime, usually on a dark December evening around 5:30. This was the maximum peak load that was encountered during the entire year, and determined the facilities that had to be installed to meet the demand.

However, with the widespread acceptance and use of air-conditioning in the 1950's, the summer peak load of the company began to increase at a rate greater than the rate of increase in the winter peak; since 1957, VEPCO has been a summerpeak company, and this controlling summer-peak load has continued to increase at a greater rate than the winter peak.

The startling fact is that since this shift in peak, and because of the rapidly increasing imbalance between our summer and winter peaks, our annual load factor has deteriorated substantially. Annual load factor is the ratio of average load to peak load during the year. It is a measure of the degree of utilization of installed facilities, and the higher the load factor, the greater the utilization and overall economy.

Since the peak shifted our load factor has gone from 62% in 1957 to 56.7% in 1969, with the last five years ac-
page 111 } counting for most of this drop.

This sounds like a very dry statistic, but translate this into capital requirements and its significance becomes all too clear.

In 1969 our output totaled 23 billion kilowatt-hours. If these kilowatt-hours had been supplied under the 1957 load pattern, our installed generating capacity could have been reduced by some 500,000 kilowatts, with a corresponding reduction in transmission facilities.

Mr. Charles H. Frazier in his testimony will show that our inability to make such a reduction results in an annual cost burden exceeding $15 million. It is clearly imperative that we take every possible step to improve our system load factor.

Q. Has the company taken steps to remedy this condition?

A. VEPCO has not been idle during this period in attempting to correct this imbalance. Since the early 1960's technology external to the industry and VEPCO's active policy of selectively promoting the use of electrical energy have coincided, and the result has been a substantial increase in winter electricity consumption.

page 112 } The development of new electrical space heat-

ing equipment, which has been attractive, economical, practical, and reliable, the reduction by the company of its electric rates, education of the public as to the advantage of electric heat, and promotional efforts have attracted large numbers of customers to electric heat.

The result has been that, whereas we had some 3900 space heating customers at the end of 1960, we had about 55,700 at the end of 1969.

But while winter-peak load has been increasing, it is not keeping pace with the growth of the summer load. In that nine-year period our summer peak has increased by 162%, our winter peak by only 135%. Thus despite our vigorous efforts our imbalance continues to increase and our load factor continues to deteriorate.

Q. What does this mean in terms of the profitability of serving summer-oriented loads?

A. Heavy summer loads such as air conditioning tend to fall in the last block of our rate schedules, and consequently the electricity furnished is at VEPCO's lowest rates. But unlike space heating and water heating usage,

page 113 } which tend to decrease our costs per kilowatt-hour, air conditioning tends to increase our costs per kilowatt-hour. This is true also of other summer-oriented loads. This is most obviously the case for a company like VEPCO with its summer-peak demand. Moreover, since all types of power supply equipment from the generating plant to the point of delivery to the customer have lower capacities in the warmer months, the capital costs per kilowatt of peak demand and operating cost to produce each kilowatt-hour in the summer are greater than for a similar demand and energy production in the winter.

It has now become clear that summer-only loads are being served below cost. This is an unfair burden on other customers. Those summer loads are imposed directly on the system peak, and because of their short seasonal duration are at a very low load factor.

Q. What does the company propose to do to correct this condition?

A. As I have indicated, the increased summer load has created two separate but interrelated problems: The deterioration of load factor and the resulting increased cost to serve summer-only loads to a point where electricity for such loads is sold below its cost.

page 114 } We recognize the need to correct both of these conditions, and to this end we are proposing a

major alteration of our rate structure: A seasonal differential in rates. Such a feature has been adopted by several other electric utilities in this country, and we believe it will be beneficial in this instance by minimizing the present discrimination in favor of air conditioning and other summer-oriented loads by permitting us to continue to provide an incentive to install winter-oriented loads. This differential will put the charges for service more in line with the cost of furnishing it.

Sound electric rate-making takes into consideration both cost and marketing factors. Loads that impose special cost burdens should supply the basis for an important part of a rate increase. Because a substantial part of the revenue increase required for VEPCO is due to the deterioration of the load factor, which in turn is predominantly due to the addition of more and more low-load factor summer-oriented load coming exactly on the summer peak, it is proper to revise the rates so that the summer-oriented load carries a significant part of the revenue increase.

In the case of rates which have a demand component, this result can be effected by using the summertime demand as the key element in measuring the demand charts for the rest of the year.

page 115

Where, however, there is no demand element in the rate schedule, as in the residential and small commercial rates, there is only one basic remedy, and that is to charge more during the 4 peak months of summer-oriented use for the follow-up blocks, where most of the air conditioning is used, then is charged in the winter.

It should be emphasized that this is not to discourage summer use—as a later witness will show, this service is basically price inelastic—but rather to charge for both the basic summer load and new summer load a price more nearly adequate to cover the cost burden of the low-load factor load being added.

The deterioration of load factor through increased summer demand has prevented VEPCO and its customers from realizing the full economic benefit of technological advances and economies of scale. The proposed seasonal rates will bring closer together our costs per kilowatt-hour and our revenues per kilowatt-hour, thus reducing the urgency of the need for repeated rate relief.

page 116

We hope and expect that this will result in lower average rates to all customers in the long

run. This is one of the most important and fundamental features in our present rate application.

Q. Has competition for winter load resulted in any litigation?

A. Yes. Washington Gas and Light Company sued Virginia Electric & Power Company in the United States District Court for the Eastern District of Virginia alleging that the underground service plant, by which the incremental cost of underground installation above overhead installation was waived if the amount of anticipated revenue warranted, was in violation of the Antitrust Laws. The trial judge on January 30, 1970, held that it was.

This is the first decision by any court on this question, though the practice has been prevalent throughout the industry for years. The decision is being vigorously appealed.

Reversed by 4th Cir. Feb. '71

Q. Please comment on the advance in the costs of labor, material, and supplies.

A. We have faced persistent inflation since our last request for rate relief. Labor and service costs have been increasing continually, and this trend has accel-
page 117 } erating rapidly in recent years. The cost of coal, another major element in our operating expense for many years, declined, offsetting other cost increases; but since 1966 it has been rising rapidly and at an accelerating pace in recent months.

Freight rates, which amount for about half the total cost of delivered coal to our in-system stations, have been increasing despite our attempts to encourage the railroads to limit or postpone these increases. Late last year coal freight rates to our in-system stations were increased 6%, following increases of 5% in 1968 and 3% in 1967.

The increase in the cost of electrical machinery and equipment through 1969 has been noted earlier, as has the increase in electrical utility construction costs.

Thus from 1954 to 1969 electrical machinery and equipment price increased ~~28%~~ 26%, and the Handy-Whitman Index for electric utility construction costs, the most commonly used indicator of construction costs, increased 68%.

Another factor which is increasing the cost of station facilities is the increased lead time which is required in the construction of larger and larger units, particularly
page 118 } nuclear-powered and pumped storage units. The time between order and delivery has lengthened as equipment has become more intricate and complex, thereby requiring longer periods for design and manufacture; and

this is aggravated by shortages of skilled labor and technological problems that plague our suppliers.

Regulatory approvals now require more time, and the time between the delivery and the full capacity operation has increased as the shakedown process has become more and more complicated.

The factor of interest during construction is added to the purchase cost of the facility to produce the cost which is included in the rate base. This, in turn, is affected by the length of the construction period and by the cost of money. With each of these last two factors increasing, the book cost of each kilowatt of capacity thus increases.

Fortunately we have been able, until recently, to offset the effects of inflation with technological improvements, improved operating efficiency, and economies of scale. But in the last few years the pace of inflation has accelerated, as will be shown by Dr. Phillips, to such an extent as to exceed the economies we have been able to effect. This is evidenced by the increase of our electric operating ratio from
page 119 } 37.7% in 1967 to 42.1% for the year 1969, as shown on Exhibit 7.

The increase in our electric operating expenses and costs of plant facilities imposed by inflation is now contributing materially to the impairment of our return.

Q. Mr. McGurn, how have environmental control problems affected VEPCO and contributed to its need for rate relief?

A. It has become increasingly apparent that the public demands, even at the expense of increased costs, that industry make a substantial effort to preserve and protect the environment. As a corporate citizen VEPCO has a responsibility to meet these demands, and at the same time continue to expand its facilities for generating, transmitting, and distributing electricity. In fact, our duty in this regard is not only to follow the examples of others, but to be among the leaders. This will, however, be very costly.

As the growth in demand for electricity that I mentioned is realized, the required power production and transmission facilities may of necessity have some adverse effect on the environment. VEPCO must do everything reasonable to minimize these intrusions, including where fea-
page 120 } sible the undergrounding of new electric distribution lines, beautification of above-ground facilities, such as by landscaping, planting, and substitution of ornamental poles for traditional steel and wood transmission structures, installation of equipment to control power station

stack emissions, and development and implementation of methods of cooling power station discharge waters. In many cases the most economic and practical location or route for a utility facility may be impossible to utilize by reason of environmental considerations.

Q. Can you give us any indication as to the magnitude of the cost of environmental control measures?

A. The magnitude of this cost can only be suggested in a very general way, but it is clear it will be substantial.

The undergrounding of new electric distribution lines, for example, will be a major item of additional investment in our effort to protect the environment. As a rule of thumb it presently costs approximately five times as much to install a 35,000 volt bulk power feeder underground as it would to install it overhead.

page 121 With respect to transmission lines, the Citizens Advisory Committee on Recreation and Natural Beauty, in its 1968 Annual Report to the President and to the President's Council on Recreation and Natural Beauty, noted that "The average cost ratio of underground to overhead appears to be about 20 to 1 under conditions of normal terrain, and much higher under special circumstances."

Under existing technology extra-high voltage lines can be placed underground only for short distances, and in the case of VEPCO's highest voltage, 500,000 volts, material and equipment have not yet been developed to permit undergrounding.

Nevertheless, some undergrounding of transmission lines has become necessary. At a minimum we estimate that four underground transmission projects scheduled by VEPCO to be constructed through 1972 will cost the company about $2,900,000 more than it would have been required to pay for the installation of comparable facilities overhead.

The company has already incurred costs of more than $8 million for underground substation getaway and bulk power distribution feeders.

page 122 Control of power station stack emissions is another item of substantial cost. We are now installing precipitators with collection efficiency for particulate matter of more than 99% on new coal-fired generating units.

For our latest fossil fueled unit the precipitator and associated flyash handling system cost in excess of $1.6 million.

We estimate that the precipitator and ash-handling sys-

tem on our next coal-fired unit alone will cost about $3.4 million.

In 1968 the precipitator system on one unit at Yorktown was upgraded to 99.5%, and this single improvement cost approximately $1.3 million.

VEPCO is in the process of modifying its fuel and ash-handling systems at one of its generating stations at a cost of over $1 million to minimize the effects of air pollution.

If it should ever prove necessary, the removal of sulphur gases from stack emissions would be a problem of much greater proportions. Under present technology such removal is still in the pilot plant stage and has not yet been accomplished on large units.

page 123 } Accordingly the installation and operating costs are unknown at the present time, but they will undoubtedly be substantial.

Furthermore, the cost of installing such equipment as modifications of existing plants is much more expensive than on initial installation during construction. In addition the plant must be out of service for extended periods.

The capital costs and replacement energy costs of equipping VEPCO's present fossil fuel generating capacity of about 4.3 million kilowatts with such system would impose a staggering burden on VEPCO and its customers.

These costs estimates are extrapolated from costs on small pilot plants, and no one now can accurately say how much greater the actual cost may be when all the difficulties of scaling-up are finally surmounted.

Various governmental and research agencies are now investigating the effects, if any, from oxides of nitrogen in the atmosphere. We cannot now even estimate the capital operating expenses necessary to control emissions of oxides of nitrogen, if such controls should ever be required.

page 124 } The costs associated with the control of water temperatures and flow at thermal generating stations are additional burdens which the company has had to incur. The water cooling system at VEPCO's North Anna Station, for example, costs about $50 million. A significant portion of this expense can be attributed to maintaining lake temperatures consistent with Virginia water control laws.

It is apparent that the imposition of the costs associated with the environmental protection on the 4-million *killowatts* of new generating capacity which VEPCO must build in the next five years will place an increasing burden on the com-

pany and its customers. It is important to note that these costs are not revenue producing in themselves; they are merely an additional burden over and above the cost of generating and transmitting electricity, which the company and its customers must bear for the public good.

VEPCO is also proceeding to make significant investments for beautifying the environment. Traditional wooden distribution poles are being replaced by steel ones in some instances, and shrubs and trees are being planted around highways where transmission lines are located, and in areas around substations. These improvements have cost the company over $500,000 to date, and additionally will be at least double that amount from 1970 to 1975.

page 125 } VEPCO desires to do what it reasonably can to preserve and improve the environment. Even if we did not have this desire, we would be forced to make many of the investments and expenditures I have mentioned. But we want to do more than this; we want to take a leading position in the war on pollution and ugliness. Substantially increased revenues, however, are necessary to accomplish this.

Q. Mr. McGurn, I notice that in the application you state that the amount of rate increase has been calculated in the light of tax rates at that time prevailing. Has there been any change in those rates?

A. Yes. Congress has modified the surtax by reducing the rate to 5% effective January 1, 1970, and terminating it on June 30, 1970, which produces an effective surtax rate of 2½% for this year.

Q. Does this call for any change in your proposed rate schedule?

A. Initially I had thought that the modification and reduction of the surtax would enable us to make some reduction in the amount of our requested rate relief. This was in the expectation, shared by many at that time, that the restraints imposed by monetary authorities would be effective to restrain inflation. But as I was careful to point out

page 126 } in my statement the day after the President signed the Tax Reform Act, it would be necessary to keep our eye steadily on the course of the economy.

It now develops that despite higher interest rates the price-cost push has persisted and indeed accelerated in many areas. In addition to increases in wages and fuel costs, we face immense expenditures for capital and operating expenses in

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order to carry out the programs for environmental protection that we now envisage.

We expect that there will be other changes adversely affecting our net income.

As I indicated in our filed testimony, we would be prepared to discuss these in detail at this public hearing today.

We estimate that these in the aggregate will more than absorb the savings resulting from the elimination of the surtax.

Q. As you indicated in your initial filing, would you now proceed to discuss these matters?

A. As I indicated the price-cost push had by no means leveled out as we hoped it might. On the contrary, wages, material, supplies, fuel and other operating costs, have continued to rise at a very rapid rate.

page 127 } The Commission is aware, I am sure, of our most recent bond sale of April 21, 1970, at an effective interest cost of 9.09%, about 16% more than the cost of the next preceding bond sale only 11 months ago.

This cost is 75% greater than our present imbedded cost of 5.28%, which itself has risen from 4.85% at the time our application was filed.

A sharp increase in coal costs, a series of increases in railroad freight rates, and the deteriorating quality of coal have all greatly increased the cost of our fuel. To date we have been able to offset most of this increase by utilizing No. 6 fuel oil in 12 of our units, and we expect that by early 1971 the conversion of the two remaining units at Chesterfield to oil will be completed.

This is being done for both environmental as well as economic reasons, and it will tend to offset any further immediate increase in coal costs.

For this reason we do not propose any adjustment in fuel cost at this time.

Q. Will you give us an outline of the known increase expenses and revenue requirements that VEPCO

page 128 } now faces?

A. Yes. I have asked our engineering and accounting staff to prepare an estimate summarizing in Exhibit No. 8 the additional annual revenue requirements that increased wage costs and environmental programs impose upon us.

Mr. Gibson: We offer that, if the Commission please, as Exhibit JMM-8.

John M. McGurn

Chairman Hooker: Exhibit 8 is received.

(The document referred to was marked for identification, Exhibit JJM-8 and received in evidence.)

By Mr. Gibson:

Q. Have you any comment on this exhibit?

A. The basic wage and salary level reflected in our exhibits filed in this case understates the levels that will prevail during the early years in which the rates that we request are in force.

During 1969 our basic salary and wage level increased by 6.8%. Had the increases granted during 1969 been in effect during the entire year, electric operation and maintenance expenses would have been $806,000 higher than shown.

page 129 } In addition, other scheduled increases will raise the salary and wage level an additional 8.0%, increasing electric operation and maintenance expenses by an additional $2,405,000.

Thus, the total increase in 1969 electric operation and maintenance expenses necessary to reflect known increases on the salary and wage levels is $3,211,000.

Q. Could you now discuss the environmental costs shown on Exhibit 8?

A. I mentioned earlier that we face immense new expenditures for capital and operating expenses for environmental protection.

While VEPCO has always tried to be sensitive to environmental needs, these needs have recently received greater increased emphasis and have become a matter of urgent public policy. Higher standards of environmental protection are being set day by day, and our responses to them must necessarily be under constant review.

Even since our Application was filed in this case on November 25, 1969, rapid developments in Federal and State regulations have required us to re-examine our programs for environmental protection, and we are continuing to do so. But one thing remains clear, the resulting changes in our program will affect all aspects of VEPCO's operapage 130 } tions, generation, transmission, and distribution.

Q. Will you discuss those areas in turn?

A. Well, turning first to generation, we will be faced with a number of major non-revenue-producing expenditures.***

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By Mr. Gibson:

Q. Mr. McGurn, on Page 7 of your prepared testimony you refined the 28% figure to 26. Was it your intention to make, or not to make, a similar parallel change on Page 15?

A. It was my intention to do so on Page 15. The 28% should be 26%.

Q. When the Commission adjourned you were beginning to discuss transmission costs associated with environmental protection. I wonder if you would be good enough to proceed?

A. As you know, the industry has historically tried to minimize the length of its transmission lines and to use the least expensive type of construction for these facilities. But new sensitivity to aesthetics has led to the use of more attractive structures and locations designed to minimize the intrusion of the transmission line on the environment. The same is true of our substations. Substations were once deemed by communities to be a mark of community progress and affluence, but now those same communities deem most

page 132 } desirable those substations which are the most unobtrusive. This has resulted in increased costs due to a reduction of substation size, the elimination of tall structures, screening equipment from view, and the provision of landscaping. These new non-revenue-producing expenditures add substantially to substation costs.

Q. What of distribution costs?

A. Here, as in the case of other facilities, a high premium is now being placed on aesthetics. Considerable sentiment exists for underground construction of new distribution facilities, in consequence of which 70% of the new homes now being connected by VEPCO are served underground. There is also considerable sentiment for a program of undergrounding our existing overhead lines, which we propose to do, if sufficient funds are made available, by placing selected lines underground at the appropriate time in connection with highway widening, street improvements and general neighborhood improvements. We plan to finance this latter effort by devoting an amount averaging 1% of our gross sales of electricity, less sales for resale, for the prior year to this activity, seeking community participation along the way in various forms.

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Q. How do you propose that account be taken of the factors you have just mentioned?

page 133 } A. The first full year in which any rate increase would be effective throughout the period would be the year 1971 and that is also the first full year in which the surtax would be completely inoperative. I therefore propose that the revenue requirements sought in this case should be adequate to cover the additional operating expenses and the carrying charges on the additional capital investment required by these environmental considerations. If we do not obtain sufficient revenues to support the programs I have described, these increasingly heavy non-revenue-producing expenditures will cause a constant attrition of our rate of return and more frequent rate cases than would otherwise be the case. Should public desire for environmental quality take the form of stringent sulphur fuel limitations, requirements for precipitate installation of flue gas desulfurization equipment, or thermal standards enforced without an adequate mixing zone, such immense sums are involved that the process of attrition would vastly accelerate and the revenues required to support those expenditures might well prove so substantial that further rate relief would be required on that account alone. But we have not yet reached the point, either in governmental regulation or in technological development, when it is realistic

page 134 } to include at this time allowances for those items. The steps I have enumerated, and propose for present recognition, will represent important steps toward the protection of our environment and will maintain VEPCO as a leader in that public movement.

Q. Mr. McGurn, you have now discussed the four principal factors which you state have necessitated VEPCO's application for rate relief: trends in the cost of capital, deterioration of system load factor, rapid inflation in the cost of labor, materials and construction and environmental control problems. Would you please comment briefly on how the company determines the way in which the various classes of customers should contribute to this rate relief?

A. A stereotype view of an electric company is that if its costs go up, it is very easy to add a reasonable percentage increase to the rates and collect the higher costs from the customers. If this stereotype were once true, it certainly is no longer. In the design of rates to recover the added revenue we should have from the Virginia jurisdictional cus-

tomers, we need to be particularly careful to place the cost burden where it belongs and to design those rates so that the company's competitive position is not damaged. It will do no good to charge more if all this does is turn away
page 135 } sales. Thus, while VEPCO still maintains exclusive rights to sell electricity to the public in its franchise area, it now faces competition in many markets.

In the space heating market, which is of particular importance because of the load-balancing economies it offers, electricity is struggling to break the monopoly position heretofore held by gas and oil, and this is true of commercial and industrial service as well as residential. In water *hearing,* the new technology of quick-recovery electric heaters and other advantages such as space-saving and flexibility of placement have combined with wider public acceptance to propel us into an important market position.

The importance of developing full use on the part of the domestic customer is that there are very significant economies of scale which can be realized at the distribution end. Thus if we can upgrade an average customer using six thousand kilowatt-hours a year to a house heating, full use customer, we can supply his requirements of more than three times the average quantity for only a 50% increase in distribution cost as will be shown by another wit-
page 136 } ness.

Our basic objective, which I defined as being to provide the highest quality electric service at the lowest practicable cost, in a socially responsive manner, requires that we readjust our rate schedules to reflect these modern developments. That necessarily requires us to make selective, rather than uniform, increases in residential, commercial and industrial rates so that the burden will fall where it properly belongs and the company will not lose the business but remain competitive.

By remaining competitive in the great markets for space heating and water heating, we have the greatest opportunity to attain a seasonal balance of our load. Through these same means we have the greatest opportunity of attaining the benefits of the economies of scale that result from increasing usage per customer. This is the approach that will work best for the long-term interests of all our customers. It provides the most effective shield we can devise against the burden of inflation and the most hopeful base, should conditions change, from which rate reductions could originate.

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page 144 } MR. T. JUSTIN MOORE, JR., called on behalf of VEPCO, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Please state your name and address.

A. My name is T. Justin Moore, Jr. My address is 9 Maxwell Road, Richmond, Virginia.

Q. By whom are you employed?

A. I am employed by Virginia Electric & Power Company.

Q. What is your position with Virginia Electric & Power Company?

A. I am President and my responsibilities include those of principal financial officer of the company.

Q. Mr. Moore, please summarize your education and professional background and your experience with Virginia Electric & Power Company.

A. I received my secondary education here in Richmond and did my undergraduate work at Princeton University. After graduating from Princeton I attended law school at the University of Virginia and received an LL.B. degree in 1950.

page 145 } I practiced law in Richmond from 1950 until I joined Virginia Electric & Power Company as Senior Vice President in 1967. I was elected Executive Vice President in April 1969 and became President of the Company on April 15, 1970. From 1959 until 1967 I served as Associate General Counsel for the company, and in that position I participated in the marketing of all of the company's securities issues. During that period the company issued bonds, convertible debentures, preferred stock and common stock, for aggregate proceeds of $367 million. Since becoming an officer of the company, my principal responsibility has been the planning and execution of sales of the company's securities, including bonds, preferred stock, common stock, bank loans and commercial paper. This work requires me to be in constant contact with financial institutions and security analysts throughout the country. In addition, I have attended numerous industry seminars and conferences on the subject of utility financing. Since I joined the company, long term securities of various kinds with aggregate proceeds of nearly $300 million have been sold under my supervision. In the first four months of 1970 another $150 million to $160 million are scheduled to be sold.

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I am a member of the Richmond Bar Association, the Virginia State Bar Association, and the American Bar Association. I am a Director of The Central National Bank of Richmond and Universal Leaf Tobacco Company. I
page 146 } am also a director of Williamsburg Restoration, Inc. and on the advisory board of First Fund of Virginia, a mutual fund.
page 147 } Q. Mr. Moore, as the chief financial officer of the Company, would you now focus particularly on the rate increase proposed in the filed schedules that are the subject of this proceeding and tell the Commission why this increase is necessary?

A. This increase is necessary to improve the Company's earnings so that it may raise the necessary capital from the money markets to discharge its public obligations.

Q. How do you determine the amount of capital required to discharge your public obligations?

A. This determination necessarily involves a determination of the Company's needs for new plant investment over some future period. The former practice was to make plans for plant investment for a 5-year future period. But developing technology with the accompanying elaboration in the techniques required for modern facilities has made it necessary to lengthen this period to 7 years, at least so far as nuclear generating facilities are concerned. In other words where new nuclear generating facilities are involved, unless you know what you want 7 years ahead and make a commitment in time for it, you won't get on the production schedules of the manufacturers and you will not have the facilities when the demand exists. It is necessary, therefore, for us to have a forward looking approach to capital needs, even though we recognize that the precision of
page 148 } budget estimates declines as the forecast period lengthens. But on an overall basis it is necessary to make plans for at least a five-year period.

Q. What are the company's construction requirements for the next five years?

A. The total construction requirements of the company for the five-year period 1970-1974 to make the necessary additions to its plant is approximately $1.9 billion. For the seven-year period 1970-1976, our construction requirements approximate $1.19 billion for generating facilities alone and will likely total $2.2 billion for this period when transmission and distribution investment is included. These amounts of money must be raised, if Vepco is to be able to complete its

construction program that is necessary to meet the tremendous growth in demand for electricity that is now occurring and clearly will continue through these periods in our service area. The urgency of meeting these needs is shown by the fact that during the seven-year period 1963 through December 31, 1969, our additional investment in plant was only $949 million of which $932 million was in electric plant. During that period we found it necessary to raise only $560 million through the sale of securities. These were large sums for us at the time but they are completely dwarfed by the necessities we now face.

Q. What has been the cause of this increase in construction requirements?

A. Virginia Electric and Power Company has
page 149 } experienced greatly increased electric loads on its system in recent years. In 1962 our peak load was 2,081,000 kilowatts. By 1968 our peak load had more than doubled to 4,253,000 kilowatts, which exceeded the 4,570,000 kilowatt peak we had estimated for that year.

Our studies indicate that this rapid growth in demand will continue and that our peak load will almost double again by 1975. To meet this increase in demand our construction program in 1969 required expenditures of $245.9 million, excluding expenditures of $9.6 million for nuclear fuel. The construction program that we have planned for the next five years, excluding nuclear fuel, will require the expenditure of approximately $336 million in 1970, $325 million in 1971, $388 million in 1972, $447 million in 1973 and $391 million in 1974.

These expenditures for the five-year period total $1.887 billion. Of this total approximately 75%, or $1.419 billion will have to be raised through the sale of the company's securities. The remainder of these expenditures will be met with funds generated internally, in large part through earnings reinvested in the business and depreciation accruals. In addition, if the company elects to own rather than lease nuclear fuel, another $81 million will have to be raised from outside financing.

Q. How does this program compare with the
page 150 } company's previous experience?

A. The construction and financing programs I have described mark a major change in the position of the company. When I assumed my post as Senior Vice President of the company less than three years ago, its construction expenditures were averaging about $100 million a year. But

for 1969 and the five years next following, our construction expenditures will, in round numbers, more than triple that amount to an average of about $350 million a year. This will oblige the company to go to the securities markets repeatedly in each of those years for new money in an average amount of about $260 million a year. These needs are of a dimension completely unprecedented in the history of the company. To accomplish such financing it is essential that the company increase its earnings so that its securities will be readily marketable.

Q. What factors now concern you most as you plan Vepco's financing program for the next several years?

A. The financial community is continually studying both our company and other available investments in the context of current and prospective economic circumstances. Increased weight is now being given to recent major changes that have occurred in the economy which change the fundamentals of earning power.

Q. Would you discuss those changes?

page 151 } A. Certainly. First, the increase in the cost of debt capital has been so drastic as to revolutionize the conditions in which the company must do its financing. The last bonds sold by the company before the beginning of its last rate case in 1953 were our Bonds of Series J and they were sold at a cost of money of 3.20% per year. In contrast, the last bonds sold before filing the rate application in this proceeding, the Bonds of Series X that were sold last June, bore an effective interest cost of 7.83% per year, well more than twice the previous figure. And only a few days later the prime interest rate was increased by a full point from 7½% to 8½%, indicating a further increase in the cost of borrowing money.

The current interest rate for prime loans is still around 8% or over. Commercial banks, from which the company borrows on a short-term basis, require that we maintain with them substantial balances, thus increasing the amount we must borrow and our total interest charges. Double A rated electric utility bonds are currently selling at an interest cost of between 8% and 9%.

Q. How has the increased cost of debt capital affected Vepco?

A. The increased cost of debt capital has had a particularly severe impact on the company for a number of reasons.

page 152 } We have had to borrow more and more money each year at higher and higher *intrest* rates to

pay the cost of our unprecedented construction program. Our repeated borrowing of these very large sums at very high current interest rates is pushing our embedded cost of debt capital upward at a rapid pace. For example, in 1954 our embedded cost of debt capital was 2.98%; as of December 31, 1969, it had risen to 4.85% and will undoubtedly rise to over five percent with our next bond sale in April, 1970. And there is nothing the company can do to avoid incurring increased capital costs. Unregulated industries can delay expansion and wait for a more favorable money market. But as a public utility we have no choice except to build, even at very unfavorable capital costs, the facilities that will be necessary to serve the peak demands of our customers.

Q. Now interpolating at that point, you said when you filed this initial testimony that the next bond sale in April would undoubtedly raise the embedded cost of interest capital. In my opening statement I put that at 5.28%. Is that a correct figure?

A. That figure is correct.

Q. Excuse me. Go ahead.

A. It is clear to me as the company officer responsible for marketing securities, that we cannot reasonably expect investors to continue indefinitely to lend money to the company under present circumstances unless there is substantial rate relief. During the three years 1967-1969 additional capital invested in the company totalled $437.6 million. During the same period net income before interest charges increased $26.3 million. Thus the return on the additional investment was only 6.02%, though 60% of the additional investment was obtained through the issuance of long-term debt at an annual cost of 6.93%.

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Moreover, as interest charges have risen more of the company's total return is required to pay those charges. This reduces the net earnings that otherwise would be available for common stock, and produces two highly adverse effects. First, it reduces the company's debt coverage, thereby increasing the risk on the company's debt. Second, it increases the risk borne by the holders of common stock more directly and substantially. Both of these effects are being felt at a time when investors are demanding a higher return on equity as a result of the increasing interest rates. The aggregate effect of all of this is to make it much more difficult and costly for the company to raise capital.

Q. What other recent changes are considered to be having an important effect on Vepco's financing program?

T. Justin Moore, Jr.

A. We have been affected in several ways by the recently accelerated pace of inflation as Mr. McGurn has already testified. I would like to emphasize that this
page 154 } trend in costs has proved irresistible. For example, we have done our best in negotiating with the railroads and intervening before the Interstate Commerce Commission to resist increased coal freight rates, since freight costs account for about half the total cost of delivered coal in our in-system stations. And we have attempted to offset the effect of increased coal freight rates by special rates for train-load lots and by developing alternative supplies.

Our first effort at an alternative supply was to construct a generating station in the mine fields of West Virginia and transport the energy by extra-high voltage lines to our load centers. Our next alternative was to turn to nuclear generation, as its economies became more definite and pronounced. Nuclear stations, however, require much greater capital outlays than fossil-fueled stations and a longer time to build. We must expend large sums of money on these nuclear projects during their construction years even though they are producing no revenue.

In recent months we have been able to offset to a considerable degree increases in coal cost by substituting Bunker C residual oil for coal at certain generating stations.

These measures have helped us in part to offset the effects of inflation, but they are not now sufficient.

Electric utilities are a capital intensive industry because they require so large an investment in plant for
page 155 } each dollar of revenue. The typical manufacturing industry invests less than $1 in plant for each $1 of revenue per year. But Vepco must invest more than $4 in plant for each $1 of revenue per year. In 1962 Vepco's investment in electric plant was $4.20 for each $1 of revenue. The increasing costs of the new facilities have raised that figure to $4.54 in 1969 and it is well on the way toward $5, despite the economies that we have been able to develop.

Q. Has the recent rise of inflation had any other impact on the company's financing program?

A. Yes. In a period of inflation such as we have had, where unregulated industries are free to adjust prices to keep pace with cost changes while regulated industry cannot, investors tend to find the securities of regulated companies relatively less attractive.

Q. Is there any other trend of fundamental importance for the future earnings outlook?

A. Yes. The rapidly increasing density of population has *intestified* public concern over the preservation of the environment. Mr. McGurn has already discussed this. But I could not give you a realistic outline of financial prospects without pointing out that very large and steadily increasing outlays will be necessary, wholly in non-revenue producing assets, to protect the environment against stack
page 156 } emissions, thermal effects or other impairment of natural resources, and to improve the aesthetic quality of our facilities. All this tends to accelerate the increase in the almost 5-to-1 ratio of plant to revenue that I have mentioned and at the same time tends to reduce the realized rate of return.

None of these fundamental trends is within the power of the company to reverse or retard. We have no recourse, therefore, except to apply to this Commission for a needed rate increase.

Q. Mr. Moore, have these or other factors had a measurable effect on the company's earnings performance in recent years?

A. Yes. The company's earnings showed good progress in the early 1960's. The per cent increase in earnings per average share over each preceding year was 13.2% in 1961, 13.6% in 1962, 2.6% in 1963, 9.2% in 1964 and 12.2% in 1965, for an average of 10.1% per year. But the rate of increase in earnings per share fell to only 5.4% in 1966, 3.9% in 1967, 2.5% in 1968 and 4.8% in 1969, for a four-year average of 4.2%. Investors in common stocks look for potential growth in a company's earnings when they evaluate a stock. The recent but continuing decline in the rate of growth in the company's earnings certainly would not be likely to encourage investors to pay as much, relative to present earnings, for the company's stock as they would pay for the stock of
page 157 } another company with comparable present earnings and an increasing rate of growth in earnings. Were the earnings growth rate to continue to decline as it has during the past few years, we might face such a deterioration in the value of our equity as to threaten our ability to raise new equity capital without dilution for existing stock.

This illustrates a very important point that is often overlooked by those who criticize utility rates. The consumer is the one who benefits most of all when capital is obtained on economical terms, because the consumer ultimately must pay for it. But capital is not attracted to a company whose rate

of growth in net income is deteriorating. Capital seeks out those companies that demonstrate a potential growth in earnings. It is therefore important to all customers of the company that it be able to show a healthy continuing growth in earnings per share of common stock. This not only makes the common stock marketable on more favorable terms, but also tends to improve the credit rating of all senior securities and assists in marketing them on more favorable terms. Without this the company and the customer inevitably will have to pay higher capital costs, and the effect is that rates necessarily will be higher in the long run.

Q. Have you any comment on the future technological improvements mentioned by Mr. McGurn?

page 158 } A. I share his belief that the industry will continue to develop new facilities and procedures. But from the practical point of view of financing the large additional facilities that this rapidly growing utility company must promptly put in place, the question is one of the relative certainty and speed in these two opposing trends. We cannot pay increased expenses merely with future hopes.

No utility management would be fulfilling its responsibility to the consumers if it were to ignore the urgent necessity of the present because of probable trends in the future that cannot be definite either in time or in amount. If there were any utility management prepared to ignore the present, you can be sure that the financial markets certainly would not do so. Clearly therefore we have no recourse except to appeal to this Commission for an increase in our rates, the first in 16 years despite the radical increase in other items that affect the over-all cost of living.

Q. What effect would the proposed increased rate schedules have had on the company's gross revenues and net operating income from customers whose rates are subject to the jurisdiction of this Commission if these rate schedules had been in effect during 1969?

A. Under the proposed rate schedules gross revenues subject to the jurisdiction of this Commission would

page 159 } have been increased in 1969 from 245.7 million to $271.5 million, an increase of approximately $25.8 million, or about 10%. Such an increase in gross revenues would have produced additional net operating income of $11.7 million. This figure is determined by subtracting income taxes and gross receipts taxes associated with this revenue increase from the additional gross revenues.

Q. How did you determine the specific amount of additional revenue that is needed?

A. In determining the amount of increase that is necessary, I started from the premise that there is no single or mathematical formula that automatically leads to a precise result. I had the benefit of advice from several financial and economic advisers. These gentlemen used several methods to determine the fair return which the company should earn on its investment and make it able to attract investors to its securities. They also used their judgment as to the present and developing state of our national economy and the attitudes of investors in the financial community. These gentlemen will testify later and describe to the Commission the methods and approaches they used.

As long as the current cost of bond financing exceeds our embedded cost, it is perfectly obvious that the rapid growth of the company and the huge amounts of new page 160 } capital that will be required to sustain it will progressively diminish the net income available for common stock. Where the embedded interest cost is being forced upward so rapidly, the classic method of looking to any test period in the past necessarily leads to results that are out of date before they can be applied. Accordingly, we must supplement the old method by a realistic recognition of the rapidly rising burden of interest cost. Since there is no way of avoiding great additions to plant investment and no way in which we can reduce the cost of borrowed money, it may well be that we shall be forced to return to the Commission for additional rate relief. This is strikingly emphasized by the opinions of our expert advisers, who are of the view that the over-all rate of return should be not less than 8.3% and might well range up to 8.66%. In contrast, the rates requested in our application would have produced a rate of return on the Virginia jurisdictional business of about 8% in 1969. As Mr. Clement will show, the exact figure is 7.91%. We believe this is a very moderate request. In fact, Carl Seligson, Chief Utility Analyst of Kuhn, Loeb and Company, will testify that our application, if granted in full, is barely adequate at the present time. Indeed, he says that it is completely incapable of arresting the continued erosion of our interest coverage and our rate of return on common stock equity, unless the modernization of our rate page 161 } structure and the related effort to build up winter load, which are major objectives in this proceeding, will generate sufficient additional revenue to retard this process.

In determining the level of our request, I have necessarily

had to give weight to the fact that inflation shows, as yet, little sign of abating materially, that substantial periods of time are required to process and complete any request for rate relief, and that the demand for our service is growing rapidly.

On the other hand, Vepco has always respected the importance of rate stability and recognized the undesirability of large and abrupt changes in rate levels. In recognition of this principle and the established Virginia doctrine that, in the case of a rapidly growing company that requires huge amounts of new capital under inflationary conditions, an end-of-period rate base is the appropriate approach, I have limited our request to the minimum that I think necessary for our immediate financing needs. This represents an average increase of approximately 10% on the Virginia jurisdictional business, though, of course, the proportion will differ by customer classification and in individual cases in accordance with the differences in cost and competitive factors that Mr. McGurn mentioned. A solution along these lines will give the company an opportunity and a challenge to page 162 } see how much of the additional earnings warranted by the fair return standard it can, in fact, attain by its modernization of rate structure and more nearly balanced load. Meanwhile it cushions the consumer against any larger change than the immediate facts necessitate.

So we must now ask the Commission to authorize rates that will produce this level of return. We believe that the rate schedules that we have filed with the Commission will do so. It is our hope that we can, by economics and load-balancing sales efforts, "make do" with this minimum rate relief, supplemented with relief in other jurisdictions, which relief we shall seek promptly. But we must point out that if this measure of relief proves inadequate, during the coming periods of heavy financing, to insure the attraction of capital at reasonable rates, we may have to return for additional rate increases.

Q. What other factors did you weigh?

A. I also considered the fact that space heating, which we must seek in order to balance our winter load with our summer peak in the interest of all our customers, is the target of much competition. In view of Vepco's fundamental philosophy, announced by Mr. McGurn, to provide the highest quality of electric service at the lowest practicable cost, we are always reluctant to raise any rate. We are particularly

reluctant to raise any rate where this might result in losing profitable business to competitors. By limiting
page 163 } our request to the figures I have stated and introducing a seasonal pattern of rates as Mr. McGurn has recommended, we hope to build up our share of the winter space heating business and progress materially toward balancing our winter and summer peaks. Our application is, in other words, a package request, by which we ask the Commission for the revenue increase that we deem urgently necessary at the present time for the financing necessities of the company, and for an opportunity to augment our net earnings by a modernized rate structure that will tend to balance our load, encourage off-peak use and require appropriate compensation from consumers who use the most expensive on-peak service.

This package proposal has a double advantage to the customer in that (1) it limits our present request for a rate increase and (2) at the same time provides an opportunity for us to see whether the modernized rate structure will enable us to forego or at least delay any further application. We have tried to balance all affected interests so that approval of our request will clearly be in the long term best interests of all consumers and investors, whether present or prospective, so that the benefits will flow to the people of Virginia as a whole and not to any limited segment.

Q. Do you believe this increase best balances
page 164 } the interests of the consumers and the company?

A. Yes. The consumers' interest is not in the lowest possible rates, but in the lowest rates consistent with continued service of high quality over the long term. This means, of course, that rates must not be so low as to impair the attraction of capital to build needed facilities.

The General Assembly of Virginia recognized this principle in 1968 by raising a time-honored ceiling on return on investment when it increased the maximum lawful interest rates chargeable to individuals from 6% to 8%. It made this 33 1/3% increase not out of a desire to see consumers pay more for credit, but out of a recognition that it was necessary to attract capital to the consumer loan market and was in the consumer's interest to do so. For the same reason in 1970 the General Assembly eliminated the ceiling altogether on loans secured by first deeds of trust. In the case of Vepco, the approximately 10% increase in rates we are requesting after 16 years of steadily reduced electricity charges, combined with a continued drive for a greater ef-

ficiency, hopefully will provide sufficient incentive to potential investors to enable us to maintain the company as a healthy agency of public service.

* * * * *

page 166 } A. M. CLEMENT a witness called on behalf of Vepco, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Please state your name and address.

A. My name is Alvis M. Clement. My address is 2211 Buckingham Avenue, Richmond, Virginia.

Q. What is your position with Virginia Electric and Power Company?

A. I am Senior Assistant Treasurer and Assistant Secretary of Virginia Electric and Power Company.

Q. Mr. Clement, would you briefly summarize your educational and professional background and your experience with Virginia Electric and Power Company?

A. I received the degree of Bachelor of Science in Business Administration from the University of Richmond in 1939. My major subject was accounting. I am a Certified Public Accountant and a member of the American Institute of Certified Public Accountants. For a number of years I was on the faculty of the evening school of the University of Richmond as an instructor in accounting. I have been with Vepco since 1939 and held various supervisory positions in the Accounting Department before being appointed Assistant Treasurer in 1953. I was appointed page 167 } Assistant Treasurer and Assistant Secretary in 1963, and promoted to my present position of Senior Assistant Treasurer and Assistant Secretary in 1965.

Q. Mr. Clement, as Senior Assistant Treasurer and Assistant Secretary of the Company, what are your responsibilities?

A. My duties are the supervision of the tax, depreciation and statistical accounting departments of Vepco. In addition, I am generally responsible for accounting functions related to financing and special studies. For over twenty years I have worked closely with company officers and counsel and representatives of underwriters of securities and

their counsel on security sales. I have also worked closely for more than twenty years, with the firm of independent certified public accountants which has certified financial statements of Vepco. I have testified before this Commission, the Public Service Commission of West Virginia and the Atomic Energy Commission with respect to securities issued and the ability of the company to finance its facilities. In the absence of the Treasurer I am the officer of the company with principal authority over the areas covered by my testimony.

Q. Will you present exhibits in the course of your testimony?

A. Yes.

page 168 } Q. Have they been prepared under your supervision and direction?

A. Yes, they have, and they are correct to the best of my knowledge and belief.

Q. Mr. Clement, have you prepared balance showing the company's financial condition at December 31 of each year 1964 through 1969?

A. Yes.

Q. Is that this exhibit of two pages that has been marked AMC-1?

A. Yes.

Mr. Riely: If it please the Commission, AMC Exhibit 1.

Chairman Hooker: AMC-1 is admitted in evidence.

(The document referred to was marked, for identification, Vepco Exhibit AMC-1 and received in evidence.)

Q. What does this exhibit show?

A. These balance sheets include all the assets and liabilities of the company including those pertaining to electric operations in Virginia, North Carolina and West Virginia and gas operations in Virginia. Approximately 95% of the company's assets are related to its electric operations. Assets are show on page 1 of this exhibit, and liabilities are shown on page 2.

page 169 } Q. Please discuss the more significant items on page 1 of the exhibit.

A. On page 1, Column A describes the nature of each asset. Columns B through G show the amount of each asset at December 31 of each year 1964 through 1969.

Lines 1 through 10 show the company's investment in utility plant less depreciation reserve. It can be seen from

line 10 that at December 31, 1964 the total net investment in utility plant was $873,544,000. By December 31, 1969, the net investment had grown to $1,456,601,000, an increase of $583,057,000, or 67%.

Current assets are shown on lines 14 through 20. Accounts receivable and materials and supplies on lines 15 through 18 increased $19,312,000 or 61% between 1964 and 1969. On line 19 it can be seen that there was an increase of nearly $11,000,000 in the prepayments account during the year of 1969. Prepaid insurance increased approximately $1,200,000. The principal increase, however, is due to a change in tax law enacted by the 1968 Virginia General Assembly. The new tax law requires the company to make quarterly prepayments on the 15th of April, June, September, and December of each year beginning in 1969 of the estimated Virginia gross receipts taxes for the following year. As a result, the prepayments account at December 31, 1969, included $9,565,000 representing prepayments during 1969 of the estimated Virginia gross receipts taxes for the year 1970.

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Finally, one 24 shows the company's total assets at the dates indicated. At December 31, 1964 total assets were $915,031,000. By December 31, 1969, the total assets had increased to $1,531,253,000, an increase of $616,222,000, or 67% during the five years.

Q. Mr. Clement, please discuss the figures you consider significant on page 2 of this exhibit, showing the company's liabilities.

A. The company's capitalization is shown on page 2, lines 1 through 9. The total capitalization at December 31, 1964, as shown on line 24, which is obtained by adding the amounts shown on lines 1, 4, 8 and 9, was $831,266,000. By December 31, 1969, the total capitalization had increased to $1,419,013,000, or 71%. The increase of $587,747,000 includes $95,464,000 of earnings reinvested in the business and $495,733,000 obtained through the sale of stock and debt securities, less $3,450,000 of debentures reacquired for sinking fund purposes.

Lines 18 and 19 represent deferred tax credits. My next exhibit will show that these credits are being amortized by crediting tax expense on the company's books over the service lives of the properties that gave rise to the credits.

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Q. Mr. Clement, have you prepared statements of income and of earnings reinvested in the business?

A. Yes.

Q. Is that the statement entitled Exhibit A under AMC-2 consisting of one page?
A. Yes.

Mr. Riely: If it please the Commission, Exhibit ANC-2.
Chairman Hooker: The exhibit is admitted.

(The document referred to was marked, for identification, Exhibit No. AMC-2, and received in evidence.)

Q. What does this exhibit show?
A. On this Exhibit Column A identifies each item. Columns B through G show the actual figures for each item for the years 1964 through 1969. This exhibit covers both electric and gas operations. As I pointed out earlier, the company's gas operations represent a very small part of the company's business. For example, revenues from gas operations average less than 7% of total revenues.
Q. Mr. Clement, please point out any figures on this exhibit which you think are of particular importance.
A. Line 3 shows the growth in total operating revenues from $212,426,000 during 1964 to $326,440,000 for the year 1969. This represents an increase in annual revenues of 54%. Operation and maintenance expenses, the total of lines 4 and 5, show an increase from $88,055,000 to
page 172 } $142,189,000 during the same period, an increase of 61%. Depreciation expense, shown on line 6, increased from $24,072,000 to $41,015,000, or 70%.
Lines 8 through 12 deal with Federal income taxes. Line 8 shows the current tax for the period. Line 9 shows the adjustment necessary to defer the current year investment tax credit, while line 10 shows amortization of the accumulated total balance of investment tax credits deferred in prior years. These two adjustments are made so that the investment tax credits are amortized over the lives of the property which gave rise to the credits, and thus the adjustments accomplish what is commonly referred to as "service-life-flow-*trhough*" of the investment tax credits.
Line 11 shows amortization of the tax reductions derived from accelerated amortization allowed for tax purposes in lieu of straight line depreciation on certain properties.
Prior to 1959 Congress authorized certain properties essential to the national defense to be amortized over a five-year period rather than depreciated over their service lives. This resulted in a deferral of income taxes, with tax re-

ductions during the period of amortization and compensating tax increases during the remainder of the service life of the property when no depreciation could be taken for income tax purposes. This special tax benefit, which is no longer available, should not be confused with liberalized

page 173 } depreciation which is still available under some circumstances and which I will discuss in a moment. The tax reductions that Vepco experienced as a result of accelerated amortization are being amortized over the remaining lives of the property which gave rise to the tax deductions, thus "normalizing" the taxes over the life of the property. Line 11 shows these normalizing entries for each year. Line 12 shows the net Federal income taxes as recorded on the company's books for each year, 1964 through 1969. Line 13 shows taxes other than Federal income taxes, which include principally gross receipts and property taxes.

Line 14 shows an increase in total operating expenses and taxes from $157,576,000 in 1964 to $242,871,000 for the year 1969, an increase of 54%. Net operating revenues, Line 15, show an increase of 52%, from $54,850,000 to $83,569,000. A substantially greater *incrase* is shown in the net total of interest and other charges on Line 21. This item increased from $10,611,000 in 1964 to $20,318,000 for the year 1969, an increase of $9,707,000, or 91%. The deteriorating effect of the large increase in interest costs can be seen in the net income shown on Line 22. Net income shows an increase of only 43% during this five-year period, or from $44,239,000 in 1964 to $63,251,000 for the year 1969.

Q. Mr. Clement, are the company's Federal in-

page 174 } come tax and net income affected in any way by the use of liberalized depreciation as distinguished from accelerated amortization which you have just discussed?

A. Yes. The company has, for all property additions beginning in 1960, computed depreciation for Federal income tax purposes on the basis of the double declining balance method, rather than the straight line method. This is permitted by §167 of the Internal Revenue Code and the accounting for it was approved by this Commission. Its effect is to increase the depreciation deduction for Federal income tax purposes in the early life of an asset, thereby decreasing Federal income taxes and increasing net income for that period. In the later life of the asset, depreciation is comparably decreased and taxes for that period are increased. But as long as a company continues to grow, as in the case

of Vepco, a continuing tax reduction is effected through the use of liberalized depreciation, unlike the case of accelerated amortization where only a tax deferral was achieved. Vepco's practice has been to "flow through" the benefit of liberalized depreciation on its books, and thus the reduction in taxes and increase in net income each year are reflected in the statements of income on Exhibit Number AMC-2.

Q. Please explain the credits shown on Lines 18 and 19 for "Interest Charged to Construction" and "Interest Charged to Nuclear Fuel."

page 175

A. Line 18 shows the actual amounts for the years 1964 through 1969, which the company charged to construction and credited to income in accordance with the uniform system of accounts prescribed by this Commission which provides that "the net cost for the period of construction of borrowed funds, and a reasonable rate on other funds when so used" is chargeable as a component of construction cost. This is a well established accounting practice that recognizes the fact that capital is tied up and unproductive during the construction period. Interest charged to nuclear fuel relates to nuclear fuel in process of fabrication and is treated in the same manner. Line 19, Column G shows the total amount which the company charged to nuclear fuel and credited to income during 1969 based on the expenditures made in the purchase and fabrication of such fuel for the company's Surry Nuclear Power Station now under construction.

Q. Mr. Clement, please comment also on the Statement of Earnings Reinvested in the Business shown on the lower portion of this Exhibit.

A. Line 24 shows the net income for each year. The net income for the six years 1964 through 1969 totaled $321,823,000. Preferred dividend amounted to $26,685,000. After deducting this amount and the net of miscellaneous charges and credits, net income remaining for common stock was $294,464,000.

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Mr. Staples: Is that an intended amendment? Here it is $294,465,000.

Q. $294,465,000 is correct, is it not?

A. I believe that is correct.

Mr. Riely: It was not an intended change, Mr. Staples.

Mr. Gibson: Thank you very much.

A. M. Clement

By Mr. Riely:

Q. Proceed, please, Mr. Clement.

A. Common dividends totaled $184,435,000, representing a common dividend payout during the six years of approximately 63% of available net income. The remaining 37% of net income was retained and *revinvested* in the business. In 1967 as shown on Line 29, $60,000,000 of retained earnings was transferred to the common stock account.

Q. Mr. Clement, have you prepared a statement showing the rate of return from the company's electric operations for the year 1969?

A. Yes, I have.

Q. Is this a one-page statement which is shown as Exhibit AMC-3?

A. Yes.

Mr. Riely: If it please the Commission, AMC page 177 } Exhibit 3.

Chairman Hooker: Exhibit 3 is received.

(The document referred to was marked, for identification, Vepco Exhibit No. AMC-3 and received in evidence.)

Q. What does this exhibit show?

A. This statement shows the rate of return from the company's electric operations for the year 1969 on its net original cost electric rate base at December 31, 1969. The exhibit is divided into three sections, namely: Net Operating Income, Rate Base and Rate of Return. Column B is captioned "System" and shows figures for the company's entire electric operations. Column C is captioned "Virginia Jurisdictional Service" and shows figures applicable only to the electric service over which this Commission has jurisdiction.

Q. Please discuss the "System" figures in the first section dealing with income.

A. The company's system electric operating revenues during the year 1969 totaled $305,770,000 as shown on Line 1. Lines 2 through 9 show deductions for operation and maintenance expenses, depreciation and taxes. In regard to Federal income taxes, the Investment Tax Credit and the Accelerated Amortization Credit on Lines 5, 6, and 7 are treated here the same as I explained in my previous discussion of the income statement. Also, the benefits of liberalized depreciation have, as I indicated, been flowed through to net income.

Line 10 shows net operating revenues of $80,

page 178 } 762,000. Interest during construction, including interest attributable to payments for nuclear fuel, is added on Line 11. *One* Line 13 a deduction is made for donations to charitable and educational institutions. Net operating income is shown on Line 14 to be $94,132,000.

Q. Please discuss the "System" figures in the next section of the exhibit which deals with the rate base.

A. On Lines 15 through 21 electric utility plant and the electric portion of common utility plant are added together, and from that total the accumulated provisions for depreciation and the contributions in aid of construction are deducted. Line 22 then shows the net electric plant investment of $1,411,978,000. Working capital required for electric operations is added to this total: $19,413,000 for materials and supplies and $13,100,000 for cash working capital. The total electric working capital of $32,513,000, and the net electric plant investment produce the total electric rate base, shown on Line 26, of $1,444,491,000.

Q. Mr. Clement, how did you arrive at the figures for working capital?

A. Materials and supplies, on Line 23, consist of fossil fuel supplies in the amount of $9,871,000 and electric general supplies (including construction materials) in the amount of $9,542,000 that were actually on hand at December 31, 1969.

page 179 } The cash working capital of $13,100,000 is the amount calculated to be necessary to maintain adequate bank balance and to pay operating expenses prior to being reimbursed by the customers. It also covers the prepayment of Virginia gross receipts tax and insurance premiums which I previously discussed in reference to my Exhibit AMC-1.

Q. What was the system electric rate of return?

A. As shown on Line 27 the system electric rate of return for the year 1969 was 6.52%.

Q. Mr. Clement, Column C of this exhibit is headed "Virginia Jurisdictional Service." How were the figures in Column C derived?

A. The amounts in Column C represent allocations of the amounts in Column B as determined by Mr. T. L. Sharkey of Ebasco Services, Inc., who will testify later as to the methods employed in making these allocations. My department of the company furnished to Mr. Sharkey the figures taken from the company's books shown in Column B of this exhibit. Mr. Sharkey then made his allocations from these figures, and the indicated rate of return was computed by my department.

A. M. Clement

Q. What does Column C show?

A. The figures in Column C, representing Virginia Jurisdictional income, rate base and rate of return, were used in the same way that figures in Column B representing System income, rate base and rate of return were used. Because

page 180 } I have already reviewed with you the computations made in Column B, a detailed review of Column C is not necessary. Column C, Line 14, shows net operating income of $75,529,000. Line 26 shows a rate base, used and useful in serving the Virginia Jurisdictional customers, of $1,102,400,000. Therefore the rate of return from Virginia Jurisdictional electric business for the year 1969 was 6.85%.

Q. Mr. Clement, in determining the company's rate base you have used the total of all electric plant accounts as they existed at December 31, 1969. Would you please explain why you included the account for construction work in progress?

A. In answering this question I refer to the large increase in electric plant from 1964 through 1969, which is set forth on page 1, Line 1 of my Exhibit AMC-1. During those five years electric plant increased from $991,140,000 to a total of $1,689,569,000, an increase of $698,429,000 or 70%. In the year 1969 alone there was an increase of $233,639,000. As Mr. Moore has pointed out, an even greater increase is scheduled for the next five years. With this rapid growth the company always has at any specified time a large investment in facilities under construction. The cost of construction of such facilities has, of course, already been financed, and the company is paying carrying charges on such cost. Obviously, provision must be made for these carrying charges from either current or subsequent earnings, or partly from both.

page 181 } Since new facilities are constructed to meet the demands of present customers as well as future customers, I believe the carrying charges should be provided in part from current earnings and in part from future earnings. One method of accomplishing the latter is the inclusion of construction work in progress in the rate base and the addition to operating income of the interest charged to construction during the year which I have done on Line 11 of this exhibit. This is the method that was used by this Commission in the company's last electric rate case.

Q. Mr. Clement, would you now tell us why you consider end-of-the-period figures to be proper in the circumstances of this case?

A. Use of an end-of-the-period rate base was also ap-

proved by this Commission in the company's last electric rate case. Furthermore, this was subsequently approved by the Supreme Court of Appeals of Virginia. As the Commission pointed out in its opinion in that case, rates are made for the future. It is proper then to set rates on the basis of the most recent figures available for the company's electric utility plant. This is particularly true at the present time because the company is being required to spend vast sums of money for construction of new facilities which will not produce full revenues until some time after being placed in service. An end-of-the-period rate base is the only fair measure in such a situation.

page 182 } Q. Mr. Clement, had the proposed new rate schedules been in effect during the year 1969, what would have been the effect on the company's operations?

A. I have prepared an exhibit, consisting of two pages, showing the effect the proposed new rates would have had if they had been in effect during 1969.

Q. And that is the exhibit that has been entitled Exhibit AMC-4, is that correct?

A. That is correct.

Mr. Riely: If it please the Commission, AMC Exhibit 4.

Chairman Hooker: Exhibit 4 received.

(The document referred to was marked, for identification, *Vetco* AMC Exhibit 4 and received in evidence.)

Q. Please explain this exhibit, Mr. Clement.

A. This exhibit is a proformed rate of return statement following the same format as in Exhibit AMC-3 that I just reviewed with you. Page 1 of this exhibit shows proformed figures for the company's System electric department and Page 2 shows proformed figures for the company's Virginia Jurisdictional business. Therefore on Page 1 of this exhibit, Column B captioned "Actual" repeats the figures found in Column B of Exhibit AMC-3. On Page 2 of this exhibit, Column B captioned "Actual" repeats the figures shown in Column C on Exhibit AMC-3.

page 183 } Looking now at Page 1 of this Exhibit AMC-4, you can see that Column C indicates the changes that would have occurred had the proposed rates been in effect during the year 1969, and Column D shows what the total figures would have been in each account under the proposed rates. Page 2 of this exhibit shows the same data

with respect to the company's Virginia Jurisdictional business.

On Page 1 of this exhibit, Line 1 shows that system operating revenues would have increased from $305,770,000 to $333,219,000, an increase of $27,449,000. This increase in revenue in 1969 would have caused increases in Federal income taxes, state income and gross receipts taxes and local gross receipts taxes. These changes are shown on Lines 4 and 8. As shown on Line 9, total operating expenses and taxes would have increased $15,091,000. Finally, Line 14 shows that the net operating income under the proposed rates would have increased only $12,358,000. The proformed system rate of return would have been 7.37% as shown on Line 27.

Now turning to Page 2 dealing with the company's Virginia Jurisdictional business, you can see on Line 1 that under the proposed rates operating revenues during 1969 would have increased from $245,701,000 to $271,524,000, an increase of $25,823,000. Again, the proforming adjustments for gross receipts and federal income taxes are shown on Line 4 and 8 of Column C. As shown on Line 9 page 184 } of Column C, total operating expenses and taxes under the proposed rates would have been $14,111,000 higher. Line 14 shows that under the proposed rates net operating income would have increased from $75,529,000 to $87,241,000, an increase of only $11,712,000.

Had the company realized this net operating income during 1969, the rate of return on this portion of the company's business would have increased from the 6.85% shown in Column B to 7.91% as shown in Column D.

Q. Mr. Clement, you have given us a number of rates of return in your testimony, and I understand that in computing all of them you "flowed-through" the benefits of liberalized depreciation to net income. Is there another accepted accounting treatment for such benefits, and if so what effect would the use of the treatment have on the rates of return you have mentioned?

A. Many utilities, with the consent, and sometimes at the direction, of their state *commisions,* have elected to "normalize" rather than "flow through" the effects of liberalized depreciation. Under normalization, an adjustment is made to increase Federal income taxes to what they would have been if straight line depreciation had been used, and an equal amount if placed in an account for deferred income taxes. This, of course, has the effect of reducing net income and thereby reducing the computed rate of return.

If such "normalizing" adjustments had been
page 185 } made in my exhibits as to the company's rate of return during the year the actual system electric return of 6.52% would have been 5.95%, and the Virginia Jurisdictional Service actual rate of return of 6.85% would have been 6.27%. Furthermore, after proforming for the proposed changes in rates, the proformed system electric rate of return of 7.37% would have been 6.80%, the proformed Virginia Jurisdictional Service rate of return of 7.91% would have been 7.34%.

The flow-through method of accounting for liberalized depreciation thus substantially increases the computed rate of return and, in effect, passes all of the benefits of liberalized depreciation to the company's customers. We believe, however, that these benefits were intended to be equitably shared between the customer and the company.

Q. If this is so, why has the company used the flow-through method in this case?

A. We believe that the flow-through method of accounting is preferable to the normalization method because, as I pointed out, liberalized depreciation can produce a continuing tax reduction. Moreover, if we were to normalize for purposes of this case we would, under the 1969 Tax Reform Act, endanger our right to continue to take liberalized depreciation, and this would be very damaging to the company and its customers. The flow-through method used in this exhibit computes our tax expense for the purpose
page 186 } of establishing the cost of service in the same manner in which we have regularly reflected operating results in our regulated books of account. But this is not to say that there should be no consideration of an equitable sharing of the benefits that result from liberalized depreciation.

* * * * *

By Mr. *Reile:*

Q. When we broke for recess you were discussing the relative treatment of flow-through of liberalized depreciation—no; I beg your pardon—you were discussing why the company used flow-through in this case, and you had just said that perhaps it should be an equitable sharing of the benefits. Will you continue with your discussion on this matter?

A. On the contrary it seems only fair that the consumer and the company should mutually share in them.

Q. That they would mutually benefit from liberalized depreciation?

A. That is correct.

Q. Why?

A. Since the purpose of the provision was to provide an incentive to investment.

page 187 } The simple way in which this could be done is for the Commission to allow some increment in the rate of return otherwise allowable.

Q. Mr. Clement, is it your view then that the flow-through method is not entirely free from risk to a regulated public utility?

A. That is correct. My previously stated views are premised on the continued allowance of liberalized depreciation for tax purposes and continued growth of the utility.

When the Tax Reform Act of 1969 was before the Ways and Means Committee of the House of Representatives, that Committee seriously considered repeal of the allowance of liberalized depreciation to regulated public utilities. Fortunately, it was not repealed.

Loss of liberalized depreciation would mean there would no longer be available for income tax purposes the higher than straight line depreciation allowances on new property to offset the decreasing allowances on property installed in prior years. Since the lower income taxes paid in prior years would have been passed on to customers in those years, then the utility must bear the burden of higher taxes in later years to the extent it cannot be passed on to its customers through higher rates. Hopefully, the entire burden would be passed on, but experience has shown that, at least to the extent of any time lage, it would be borne by the utility.

* * * * *

page 189 } T. L. SHARKEY, a witness introduced on behalf of *Vetco,* being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Please state your name and address.

A. My name is Thaddeus L. Sharkey. I reside at 3503 Raymond Street, Chevy Chase, Maryland.

Q. By whom are you employed?

T. L. Sharkey

A. Ebasco Services Incorporated, Two Rector Street, New York, New York.

Q. In what capacity are you presently employed?

A. My present position is General Utility Consultant.

Q. Please give a brief description of your firm and its work related to public utilities?

A. Ebasco Services Incorporated is a firm of engineers, constructors and utility consultants. For over 60 years it has provided engineering and consultant services to electric, gas, water and transportation utilities in the United States and in many foreign countries.

Q. What is your educational and professional background?

Massachusetts Institute of Technology and graduated from

A. I studied civil Engineering at Tufts University and Massachusetts Institute of Technology and graduated from The George Washington University. I am a registered professional engineer in the District of Columbia.

page 190 } During my employment with Ebasco, which began in 1951, I have held several positions connected with rate and related services to utilities in the United States and Latin America. Prior to joining Ebasco, I held positions of similar nature with Potomac Electric Power Company for about 20 years.

Q. In your present position, what are your major responsibilities?

A. In my present position, I am responsible for coordination of consulting services to utilities, mainly in rate and marketing activities. This covers the development of marketing programs and rate structures designed to fit operating and financial requirements of electric and gas utilities, with related economic and engineering studies.

Q. Have you testified before any regulatory authorities?

A. Yes. I have appeared before the Federal Power Commission, the Public Service Commission of Maryland, the Virginia State Corporation Commission, the Florida Public Service Commission, the North Carolina Utilities Commission, the Department of Public Utilities of Massachusetts, the Board of Water and Power Commissioners of Los Angeles, the City Council of Los Angeles and the National Electricity Commission of Nicaragua. I have testified in Federal Court on utility matters and appeared before civic and business groups and technical societies in connection with utility marketing and rate problems. I have

page 191 } lectured on utility rates, cost analysis and tax matters at an annual summer seminar for utility

executives conducted at Georgia Institute of Technology and sponsored by the Southeastern Electric Exchange. I am a past member of the Residential Sales Committee, the Rate Research Committee of the Edison Electric Institute and the Load Research Committee of the Association of Edison Illuminating Companies.

Q. In the prepared testimony of Mr. A. M. Clement, Senior Assistant Treasurer and Assistant Secretary of Virginia Electric and Power Company, specific reference was made to Column C of the second section of Exhibit Number AMC-3. This column is headed "Virginia Jurisdictional Service." Mr. Clement stated that the dollar amounts shown in these columns represent allocations as determined by a study made by Ebasco Services Incorporated. For what period were these allocations determined?

A. The study was prepared for the calendar year 1969.

Q. Did you participate in the development of this allocation study?

A. Yes, it was made under my supervision.

Q. Is this your first association with Virginia Electric and Power Company?

A. No, on several occasions since 1954 I have worked with members of the company's staff on rate and regulatory matters and various related studies, including estimates of cost of furnishing utility service.

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Q. I hand you a document entitled "Virginia Electric and Power Company—Allocation of Revenues, Expenses, Taxes and Rate Base to Virginia Jurisdictional Service—12 Months Ended December 1969" and ask you if this represents the results of the study made under your supervision?

A. Yes, it does.

Mr. Riely: May it please the Commission, Exhibit TLS-1 is offered.

Chairman Hooker: TLS Exhibit 1 is received.

(The document referred to, marked TLS-1, for identification, was admitted in evidence.)

By Mr. Riely:

Q. Please explain what is meant by Virginia Jurisdictional Service.

A. Virginia Jurisdictional Service is electric service furnished under the various schedules of rates of charge subject to the approval of this Commission.

T. L. Sharkey

Q. Would you explain the general organization of Exhibit TLS-1?

A. This study deals exclusively with the electric system of Vepco. The second column (B) designated as Total Electric System shows the dollar amounts of revenue, op-
page 193 } eration and maintenance expense, provision for depreciation, taxes and components of rate base for the 12 months ended December 1969. Portions of these amounts were assigned or allocated to the class designated as Virginia Jurisdictional Service.

Q. Were the dollar items contained in the column designated as Total Electric System (Column B) derived from the official accounting records of the company?

A. Yes. However, VEPCO maintains its accounts in accordance with the Uniform System of Accounts as prescribed by the State Commissions for electric utilities. Such accounts are not susceptible to allocation to a class of service as they appear on the company books. Therefore, some realignment of the dollar amounts of plant, operating expense and revenue is required.

Q. In general, what were the procedures and methods employed in the preparation of this exhibit?

A. The first step was to analyze the electrical system to determine the plant items which are directly assignable to a class of service. This step served to *segregare* plant assignable to a specific class of service from plant which is in joint service requiring allocation. Then plant and expense accounts and certain sub-accounts were classified according to their primary operational functions, such as: Power Production, Transmission, Distribution, and Gen-
page 194 } eral and Common Plant. These functionally assigned accounts were further classified as demand (kilowatt) or energy (kwhr) related for purposes of allocation. The maximum kilowatt demand occurring during the period of study and the demand at the time of the system peak for each transmission substation, each transmission voltage delivery and each class of service were derived from a combination of metered and estimated data. Both kilowatts of demand and kilowatt-hours of usage were adjusted for electrical losses within appropriate components of the system; such as, power production, transmission and distribution. From these data, allocation factors for Virginia Jurisdictional Service were developed for application to demand related dollar investment in plant and operating expenses. Similarly, allocation factors for energy related items were

developed from metered kilowatt-hour deliveries. Allocation factors were also developed on the basis of number of customers for application to items of plant; such as, certain distribution lines, meters and service drops where the customer component of cost is significant. Functional assignment and classification of plant and expenses are as follows:

Power Production. All steam production plant is classified as demand related and so allocated. Expense of boiler maintenance and fuel burned are classified as energy related. Major hydro production, Gaston and Roanoke Rapids plants, are classified as demand related since

page 195 } they are operated to supply peaking demands. At these plants, water above stream flow requirements is normally stored for peaking use. Even in dry seasons, the water supply has been adequate to meet design peaking capacity. Step-up transformers and associated equipment at generating stations which convert generated energy to transmission voltages are considered to be demand related.

Q. How about transmission plant?

A. Transmission plant has been divided into three functional classifications:

Power Supply—consisting of those lines which have the primary function of integration of major sources of generation to achieve maximum continuity and economy of power supply.

Common Transmission—consisting of those lines with the primary function of moving energy at transmission voltages directly to substations or individual customers from Power Supply.

Specific Transmission—consisting of those lines which move energy from Power Supply at transmission voltages for ultimate delivery to a single class of customer. No allocation is required.

Assignment has been based on dominant function. Power Supply lines which interconnect major power sources may incidentally supply energy directly or through

page 196 } distribution substations to customers of all classes. Conversely, a line assigned to Common Transmission may be used under certain conditions to move energy from one Power Supply source to another or to introduce minor hydro generation into the system. As previously noted, assignment was made after analysis of transmission system maps and schematic drawings and consultation with members of the VEPCO Power Supply Department. The physical location of Common Transmission Plant

within the boundaries of states of VEPCO's service area was determined from accounting records. Plant investment and associated operating expenses were then allocated to classes of service on the basis of demands occurring at the time of system maximum demand. Transmission substation plant was analyzed on the basis of function performed by major property units and such units were assigned to the same categories as lines. All transmission plant is considered to be demand related and so allocated.

Q. How about allocation of distribution plant and related expenses?

A. These facilities comprise substations, overhead and underground lines, poles and accessory fixtures, underground conduit, line transformers, service drops and meters. From accounting records of the company, the physical location of these facilities and their original cost was determined for each of the three states of VEPCO's service

page 197 } area. Allocation of plant investment and operating expenses to Virginia Jurisdictional Service was made on the basis of demand and number of customers or a combination of the two. For instance, distribution substation plant and expenses were allocated on the basis of demand; meters and service drops on the basis of number of customers. Distribution line allocation was made by assigning the minimum size line, i.e., that which would carry a mere potential to the customer, on the basis of number of customers and the balance on the basis of demand.

Q. How about the allocation of General and Common Plant, the electric portion?

A. This consists of property utilized by all other functions; such as, office buildings, service buildings, warehouses, transportation facilities, communication equipment and the like. Property units were classified in terms of broad operating functions, i.e., production, transmission, distribution and administrative and general. The detail of items in general accounts and their location provided a basis for functionalizing such plant.

Q. Will you discuss the allocation of depreciation and taxes?

A. Annual accruals for depreciation and depreciation reserve were classified by related plant accounts and allocated accordingly. Gross receipts taxes were calcu-

page 198 } lated for each class in accordance with applicable tax rate. Payroll, property and miscellaneous taxes were functionalized and then allocated in

accordance with electric plant for each function. To allocate Federal and State income taxes, taxable income for each class of service was developed. This taxable income served as the basis of distribution of these taxes. The investment tax credit and amortization are associated with specific types of electric plant items. The allocation factors applicable to these plant accounts were used to distribute this tax credit and amortization. Deferred Federal Income Tax, which is related to accelerated amortization in prior years, involves only certain portions of power production and transmission plant. Therefore, allocation factors applicable to such plant accounts were used for apportionment.

Q. Mr. Sharkey, earlier in this testimony you explained that maximum kilowatt demands and demands occurring at the time of the system peak were the basis of deriving allocation factors applicable to demand related investment in plant and operating expenses. How are these demands used for purposes of allocation?

A. A number of methods have developed for treatment of kilowatts of demand for allocation of plant and expenses among classes of customers of an electric utility. We have used two basic allocation methods, both of which page 199 } are in general use. They are Peak Responsibility or Concident Peak, as it is sometimes called.

This method assumes that demand related costs are determined by the peak load which must be carried. This peak load is the maximum one hour demand and is the sum of the individual class loads occurring at the same hour. For allocation purposes, each class shares in proportion to its load at the time of the kilowatt peak of the system. Seasonal stability in the timing of area peak is essential for consistency of results under this method. The Peak Responsibility Method is particularly appropriate for the allocation of costs which vary in accordance with peak area loads.

The Sum of Non-coincident Peaks—

Q. This is another method?

A. Yes.

This method assumes that demand costs should be shared on the basis of the sum of the demands of individual customers irrespective of when they occur. This method is most appropriate where the total costs vary in accordance with local maximum loads, the sum of which does not have to be carried simultaneously. Many analysts have applied a single method to all demand associated costs regardless of their particular operating function. More recent thinking has

page 200 } recognized that allocation of some demand costs is more appropriate under one method than another. For example, costs associated with production and transmission lines in the power supply category are necessarily determined by the maximum coincident load which the system must carry. A coincident peak method of allocation for such costs is appropriate if the system peak is seasonably stable from year to year and gives promise of remaining so. On the other hand, demand costs associated with distribution lines which service a local area are more closely related to local loads whether or not they occur at the time of area peak. Here the sum of the non-coincident peaks method is most appropriate because it bases the allocation method on the cause for variation of costs.

Q. What method was used for allocation purposes in your study, the results of which are shown on Exhibit Number TLS-1?

A. Two methods were used. The Coincident Peak Method was applied to items of plant and expense related to Power Supply, i.e., power production and transmission. The Non-coincident Peak Method was used with those major distribution substations which served more than one class of customer, using demands on the individual substation. Distribution plant, including minor distribution substations, beyond the major substations was also allocated by the Non-coincident Peak Method, using the demands measured

page 201 } at the major substations.

Q. Explain why these two methods were used.

A. Virginia Electric and Power Company builds its power supply system; that is, generation facilities and associated transmission lines, to meet the area peak demand. The VEPCO demand has been in a summer peak position since 1957 and is expected to continue so into the foreseeable future. Under this situation, the magnitude of contribution which each class load makes to the system maximum determines the investment required to meet the maximum system load. As mentioned before, investment in the remainder of the electric system, mainly comprising distribution facilities, tend to vary with the total demand imposed on individual segments of plant rather than the maximum coincident total of all customer loads.

Q. With respect to the ratio of revenues per operation, and maintenance expense, provision for depreciation and taxes shown for Virginia Jurisdictional Service, are those shown on Mr. Clement's Exhibit AMC-3?

A. That is correct.

* * * * *

page 202 } Chairman Hooker: Call your next witness.
Mr. Riely: I call Dr. Phillips.

page 203 } CHARLES F. PHILLIPS, JR., called as a witness on behalf of VEPCO, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Will you please state your name and address?

A. My name is Charles F. Phillips, Jr. My address is 414 Morningside Drive, Lexington, Virginia.

Q. Please state your present occupation and your educational background.

A. I am Professor of Economics at Washington and Lee University, where I teach courses in elementary economics, industrial organization, and regulation.

I graduated *cum laude* from the University of New Hampshire in 1956 and received my Ph. D in economics from Harvard University in 1960.

Q. Are you the author of any books and articles?

A. Yes. I am the author of two books—Competition in the Synthetic Rubber Industry, published by University of North Carolina Press, 1963, and The Economics of Regulation: Theory and Practice in the Transportation and Public Utility Industries, published by Richard D. Irwin, Inc., 1965; revised edition, published in 1969, and of over three dozen articles on antitrust and regulatory issues ap-
page 204 } pearing in such journals as The Southern Economic Journal, Journal of Political Economy, Business Horizons, The Antitrust Bulletin, Alabama Law Review, Washington and Lee Law Review, Southwestern Law Journal, Villanova Law Review, and Public Utilities Fortnightly. I have co-authored two monographs—Bank Mergers and the Regulatory Agencies, published by The Board of Governors of the Federal Reserve System in 1964, and Virginia Highway Cost Allocation Study published by the VMI Research Laboratories in 1968, and I recently contributed an article on "Public Utilities" to the Encyclopaedia Britannica.

Charles F. Phillips, Jr.

Q. Have you done any work as a consultant to business?

A. I have done consulting work for several organizations, including the American Telephone and Telegraph Company, Central Telephone and Utilities Corporation, Westinghouse Electric Corporation, and The New York Stock Exchange. Some of this consulting work has involved preparing and analyzing testimony. I have previously testified for The New York Stock Exchange before the Securities and Exchange Commission and for Lee Telephone Company before the North Carolina Utilities Commission.

Q. Are you a member of any professional associations or honorary societies?

page 205 } A. Yes, I am a member of the American Economic Association, the American Marketing Association, the Southern Economic Association, Phi Beta Kappa, Beta Gamma Sigma, and Omicron Delta Kappa. I am also a member, and serve on the National Board of Trustees, of Omicron Delta Epsilon, the honorary economics society.

Q. Dr. Phillips, what is the purpose of your testimony, in this proceeding?

A. My objective is to present testimony relative to a fair rate of return for the Virginia Electric & Power Company.

Q. I show you Exhibit No. CFP-1, consisting of 12 Schedules and 3 Charts. Was this exhibit prepared by you or under your supervision?

A. Yes, it was.

Mr. Gibson: We offer Exhibit CFP-1.

Chairman Hooker: CFP-1 in evidence.

(The document referred to was marked for identification, Exhibit CFP-1 and received in evidence.)

Q. What has been your general approach in the determination of a fair rate of return?

A. In determining a fair rate of return for VEPCO, reliance has been placed upon three basic tests or criteria stated by the United States Supreme Court in

page 206 } its 1944 Hope Natural Gas Company decision and widely used by regulatory commissions. Stated the Court in this decision:

"By that standard the return to the equity owner should be commensurate with returns on investments in other enter-

prises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."

In economic terms, then a fair rate of return has three main functions:

To maintain the financial integrity of the enterprise;

Two, to permit the enterprise to attract the capital it needs to service the public; and

Three, to provide a return to the equity owner that is commensurate with returns on investments in other enterprises having corresponding risks.

Q. Are not utilities, because of their monopoly *politions,* riskless?

A. Utilities are sometimes pictured as riskless enterprises, but such a picture is seriously misleading. To
page 207 } be sure, the grant of a monopoly franchise does eliminate some of the risks to which competitive firms are subject. Moreover, utilities supply services greatly desired by consumers, so that extreme fluctuations in demand are unlikely. But regulation cannot, and indeed does not, eliminate all risks, particularly those of a long-run nature.

The plants of utilities are fixed and specialized to furnish a given service—they can neither be moved to another geographic location nor be used to produce another service. In this sense, utilities are relatively inflexible compared to competitive enterprises, and they have value only as long as the particualr service they offer can be sold at a profit. All enterprises, regulated or unregulated, have the risk of obsolescence due to changes in technology. Finally, regulation itself introduces a risk, particularly during inflationary periods, since assets are not usually valued upward.

Q. Can you give some specific examples?

A. In recent years, interindustry competition has heightened, thereby increasing *thr* risk faced by electric utilities. Such competition is between regulated industries, electricity and gas, or between regulated and unregulated
page 208 } industries, coal and oil.

Consider the residential market. Historically, competition between electricity and the fossil fuels in this market has centered on a few household appliances, primarily dryers, ranges, refrigerators, and water heaters. The electric power industry quickly won the lighting business and, except for gas lighting for decorative purposes, has main-

tained this business to itself ever since. The recent competitive struggle has been in three areas.

First, there is competition for another appliance: air conditioning. While this area involves competition along traditional lines, it differs from the earlier situations in that gas is invading a market long held by electric power. The gas industry is becoming increasingly competitive for both large installations, that is, office buildings and shopping centers, and for the household central air conditioning business. And, from the gas industry's point of view, this area offers a major attraction—it represents an ideal load balancer for its winter peak.

Second, there is competition for the space heating business. Again, this is competition along traditional lines, with electricity invading what was previously an exclu-
page 209 } sive fuels market. For the electric power industry, this area offers an opportunity to increase consumption to new levels because of the high intensity of use.

Third, there is potential competition through the "total energy" concept, a concept now under consideration by the Virginia General Assembly.

Q. Can you update that comment, Professor? Do you know the action of the General Asembly?

A. The General Assembly, as I understand it, has now allowed the "total energy" concept to become a reality.

Q. Would you continue?

A. This type of competition is of particular importance to the electric power industry. If not successfully met, the customer is totally eliminated from the electricity market.

Gas or oil fired turbine generators, for instance, by producing on-the-spot electricity, eliminate the need for central-station generated electricity. And there are indications that the competitive battle will continue to intensify in the future. The thermoelectric generator in the furnace is being developed. The fuel cell is being hailed as the "power of the" future and millions of dollars are being expended
page 210 } on its development. Successful development would result in the total energy concept becoming a reality for the household market. Clearly, for the first time, electric utilities confront the risk that important segments of their business will be lost to them.

Q. What are the implications of this increase in competition?

A. The steady erosion in the monopoly position of many

utilities is a factor which cannot be ignored in regulatory proceedings. In determining revenue requirements, rates must now be set with due allowance for these increases in risk. In determining rate structures, utilities must be given more flexibility to meet competitive challenges. In short, utilities must be in a position to respond to their changing environment and regulation must avoid stifling innovation.

Q. Are there any other significant economic factors that you believe should be considered in this proceeding?

A. Yes, I believe that inflation is a major economic factor that must be examined. Three indexes or measures of inflation are shown in Schedule 1—the Consumer Price Index, the Wholesale Price Index, and the Gross National Product Deflator. On the basis of 1946 equaling 100, these
page 211 } indexes have increased, as of 1969, to 187.8, 171.0, and 192.1, respectively.

By Commissioner Catterall:

Q. What is a Deflator?

A. The Gross National Product Deflator is an index that has been made for the purpose of deflating the Gross National Product figures to give you the figures on constant dollars.

Commissioner Catterall: It looks bigger instead of smaller. I will look it up in the dictionary later.

Go right ahead.

By Mr. Gibson:

Q. Continue.

A. Especially important is the period 1964-1969, during which the rate of inflation accelerated. In this six-year period, the Consumer Price Index advanced 18.1%, the Wholesale Price Index increased 12.5% and the GNP Deflator rose 17.8%. It is within such an economic environment that utilities must make their financing decisions.

Q. What is the impact of inflation on public utilities?

A. First, the very prospect of inflation creates risk, because investors are more cautious about invest-
page 212 } ing in long-term bonds. The particular inflation we have been experiencing has been associated with sharp increases in the cost of debt money. Thus, it has affected debt heavy industries, such as the electric utilities, more than others.

Second, some groups have more economic power than others and are better able to protect themselves. For example, un-

regulated companies—as a group—have more freedom to adjust their prices to compensate for increases in the prices of the factors of production than do regulated companies. It is not being implied that unregulated companies can completely offset cost increases by raising the prices they charge customers. Rather, they have the option of doing so, subject to certain constraints. The important point is that regulated companies, lacking the same degree of freedom as unregulated companies in adjusting their prices to offset cost increases, must seek relief through the regu-
page 213 } latory process.

Q. How have different investor groups fared during the postwar inflationary period?

A. The relevant data are shown in Schedules 2 and 3, and Charts I through III.

Schedules 2 and 3 show how investors in utility stocks have fared with respect to growth in maket price of the stocks compared with investors in industrial stocks. In the period 1946 to 1969, as shown in Schedule 2, the market price of Moody's 24 Utilities rose 177.7%. Dow Jones 15 Utilities rose 213.8%, and Standard and Poor's 55 Utilities rose 201.7%. In the same period, as shown in Schedule 3, the market price of Moody's 125 Industrials rose 528.3%, Dow Jones 30 Industrials rose 359.5%, and Standard and Poor's 425 Industrials rose 550.1%.

These data are illustrated graphically in Chart I. Of particular significance is the period 1964 to 1969; a period in which the rate of inflation accelerated. Whereas industrial stocks showed a growth in market price—21.1% for Moody's 125 Industrials, 5.2% for Dow Jones 30 Industrials, and 24.3% for Standard and Poor's 425 Industrials—the market price of utility stocks decreased—13.1% for Moody's 24 Utilities, —15.6% for Dow Jones 15 Utilities, and—10.4% for Standard and Poor's 55 Utilities.

The relationship between inflation and industrial earnings is shown in Charts II and III. Chart II shows
page 214 } the Consumer and Wholesale Price Indexes, 1964 equaling 100 and yearly changes in those indexes for the period 1946 through 1969. Chart III shows changes in the Consumer and Wholesale Price Indexes and the rate of return earned on year-end common equity for Moody's 125 Industrials and for Standard and Poor's 425 Industrials. It can be seen from this latter Chart that industrial enterprises' earnings do fluctuate with changes in the two price indexes. The relationship is especially strong with respect

to changes in the Wholesale Price Index. That is, industrial earnings are higher during inflationary periods than during more normal periods.

Q. What do you conclude from Schedules 1-3 and Charts I-III?

A. The most obvious conclusion from these schedules and charts is that inflation has been an economic factor throughout the postwar period and that it continues to be an important factor at the present time. Moreover, it is clear that the period since 1965 has been one in which there has been a general deterioration in the market prices of all groups of utility stocks compared with the prices of industrials. If this trend continues, utilities may soon find themselves unable to raise additional equity capital on terms commensurate with those of industrial corporations.

There are two reasons for the recent slump in utility equities. First, there is the fear on the part of in-
page 215 } vestors that higher costs—due to continued inflation in operating costs and the higher cost of debt capital—cannot be recouped in revenues through action of regulatory agencies. Second, there is the fact that the cost of equity has increased. The cost of equity capital is equal to the cost of debt plus a differential for the greater risk inherent in common stocks as opposed to bonds. Thus, whenever debt costs rise, it is reasonable to assume that equity costs also rise. To make any other assumption is to assume that equity risks have become smaller. Such is not likely, since the higher fixed charges may well reduce the earnings available to common stockholders.

There is a related consideration. This Commission, along with some others, uses a net original cost rate base. Whatever the merits of such a methodological device for rate-making purposes, it must be recognized that this device does not give recognition to the changing purchasing power of money. In periods of extensive inflation, therefore, the use of such a rate base—without a proper adjustment in the rate of return—would tend to destroy the economic value of utility property.

Q. Are there other economic factors that should be examined?

A. Another factor which must be taken into account is the substantial additional expenditures for en-
page 216 } vironmental control, that is, aesthetic, air, and water pollution, as explained by Mr. McGurn. While these are largely non-revenue producing captial ex-

penditures, some are also operating expenditures, they are being required of a company increasingly concerned about environmental problems.

These costs, however, must be paid for—either directly by the consumers of electric service or indirectly by the general public through tax credits or subsidies. Absent changes in present policy, it would appear that the costs incurred for environmental control must be passed on directly to the company's customers. The economic justification for such a policy is that (a) consumer will be covering the total cost, both private and social, of providing a particular service and (b) there will be no interference with efficient resource allocation.

Given this situation, a new risk arises—as public concern for environmental protection mounts, new costs are imposed and still useful facilities are threatened with obsolescence. But the ability of the utility to secure timely compensating price increases is limited by competition, as well as by regulatory lag.

Q. How did you determine a fair rate of return for the Virginia Electric and Power Company?

A. I determined the rates applicable to debt, preferred stock, and equity capital, and then weighted each component by its proportion in the capital structure.

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Q. What is the cost of debt and preferred stock?

A. As of December 31, 1969, according to data supplied me by Mr. Clement, the embedded cost of senior capital, including short-term debt, was 5.14%. The data are shown in Schedule 4.

Q. Are you recommending the use of this embedded cost of senior capital?

A. No, I am recommending the use of somewhat higher costs for long-term debt, the convertible debentures, and preferred stock.

With respect to the convertible debentures, my judgment is that the true cost of the company's $50 million issue of May, 1966, ranges between 8% and 9%, and 8% will be used. The coupon rate is 3.625%, but it is clear that the cost of the issue to VEPCO is higher. These debentures are convertible into common stock at the rate of $1,000 bond for 26.4 shares of common. At the current price of VEPCO stock, 22, the conversion value of a bond would be $581, and at VEPCO's current dividend rate on common stock, $1.12, 26.4 shares would provide an annual dividend of $29.57, compared with the $36.25 in interest if the bond were not converted.

Charles F. Phillips, Jr.

At the time these debentures were issued, Aa-rated electric utility mortgage bonds were selling to yield 5.50%. In view of this rate, it is evident that investors were
page 218 } demanding much more than the 3.625% coupon rate to make capital available. The risks borne by the buyer of the convertible debentures are greater than those borne by the buyer of bonds, investors could only hope to earn as much as, or more than, the bondholder if the common stock dividends grew fast enough and long enough, but smaller than the risks borne by common stockholders. Therefore, their cost to the company must be intermediate between the two types of securities. Further, the company indicates that it has no plans for future issues of convertible debentures, so that these debentures will be a smaller portion of total capitalization in the coming years.

With respect to long-term debt and preferred stock, higher costs are necessary to take into account the anticipated new debt and preferred stock issues through 1972.

Q. Why do you recommend looking into the immediate future?

A. There are two major justifications for this procedure; a procedure that is founded on the accepted practice of adjusting test year data for "known changes." First, rates are for the future, not for the past. Past costs can be used where appropriate, but unless adjusted for known changes in the near future, the resulting rates are out of date as soon as they are written down. The embedded cost, in other words, shows what a company has paid for capi-
page 219 } tal in the past, but fails to indicate what future costs might be as the company seeks to finance its construction program.

Second, even though the current debt rate may recede, future long-term debt and preferred stock financing is certain to raise VEPCO's embedded cost. The data are shown in Schedules 5 through 8. Schedule 5 shows the cost of new debt for long-term public utility bond issues publicly offered since the beginning of 1966, Aaa and Aa issues of $25,000,000 or over and maturing in more than ten years. According to this schedule, public utilities have issued bonds in the 1966-1969 period at interest costs ranging from 4.85% to 9.60%. Schedule 5 also shows that the last four bond issues have cost VEPCO 5.17% in February 1967, 6.90% in December 1967, 7.12% in January 1969, and 7.83% in June 1969. Since then interest costs on Aa bonds have been increasing and currently approximate 8.5%. A timely appraisal of VEPCO it-

self will be provided by its anticipated sale of about $85 million of bonds in April 1970.

Schedule 6 shows the Bond Yield Table for Moody's Aa utility bonds for the period 1946-1969. It will be noted that the yields of these outstanding issues have risen from 2.49 percent in March 1946 to 8.23 percent in December 1969, and are currently at the highest level in twenty-three years. Yields on newly issued bonds have been at even higher rates than those on outstanding bonds.

page 220 } For comparative purposes, Schedule 7 shows the long-term bond yields for U.S. Government securities, corporate bonds, and high-grade municipal bonds for the period 1946-1969. Here again, the steady upward trend in the yields on these outstanding issues is readily apparent.

Schedule 8 shows the Preferred Stock Yield Table for Moody's High Grade public *utilites* for the period 1946-1969. The yields on these outstanding issues have risen from 3.40% in August 1946 to 7.54% in December 1969, with the latter yield—as in the case of Moody's Aa utility bonds—representing a twenty-three year high.

Q. What is the significance of the data presented in Schedules 5 through 8?

A. These studies of bond and preferred stock yields lead me to conclude that VEPCO's future long-term debt and preferred stock financing will certainly cost much more than has its past financing and that this undeniable fact should be accorded weight in this proceeding. Already, the increased cost of new senior capital over the past two years has significantly narrowed the margin between the company's overall rate of return and its embedded cost of debt and preferred stock. That margin is now inadequate, indicating that a higher over-all rate of return is required. Looking into the immediate future, the embedded cost will continue to increase as long as current cost rates are above

page 221 } the average of embedded costs—and it is very unlikely that interest rates will return to the level existing in the early 1960's in the period under consideration.

page 222 } Q. Please illustrate the effect which required financing will have on VEPCO's embedded cost of senior capital.

A. As noted earlier, the embedded cost of VEPCO's outstanding senior capital as of December 31, 1969 was 5.14,%

as shown on Schedule 4. On the assumptions that, a, a new long-term debt and preferred stock will be sold at an average cost of 8.50 per cent in 1970 and 8.0% in 1971 and 1972 and, b, the cost of short-term debt will decline to 8.0% as shown on Schedule 9, VEPCO's embedded cost of senior capital will rise to 6.30% by December 31, 1972, as shown in Schedule 10.

These assumptions of interest costs on debt and dividend requirements on preferred stock are well below the levels currently prevailing which, as indicated earlier approximate 8.5%. While it is quite likely that current restraints will in some degree be relaxed within the period covered by my testimony, the cost *figurres* I have used seem the most probable and realistic. Certainly I know of no responsible opinion that they will at any time in the foreseeable future decline to the level of VEPCO's presently embedded interest cost, which reflects in major part transactions of many years ago when conditions were completely different from those we now face.

page 223 } Since I believe that the company's embedded senior capital cost will rise at least to 6.30% and since rates must be set for the future, it is my recommendation that the allowed rate of return reflect the embedded cost that will pertain at the end of 1972. Using 8% as the true cost of the convertible debentures raises the overall cost of senior capital to 6.44.% At that time the senior capital ratio will be 64.54%, as shown in Schedule 10, and that ratio has been used to determine an overall fair rate of return. It should be noted that this projected ratio is only slightly higher than the actual ratio as of December 31, 1969.

Q. Why do you recommend the use of end of 1972 senior capital costs?

A. The date is, of necessity, a pragmatic determination. One might contend that since VEPCO's planning period appears to be seven years, as Mr. Moore has pointed out, the cost of senior capital at the mid-point in that period might be appropriate. But I have always tended to believe that rates should be devised which at least take into account the full scope of events which it is known at the time of decision are most likely to continue. By this test, it does not seem unreasonable to use senior capital costs through 1972,

page 224 } since these costs can be projected with great accuracy.

Q. Does the determination of the fair return on equity differ from the determination of the cost of senior capital?

A. Yes. Unlike senior capital, which is subject to a con-

tractual obligation, the fair return on common equity cannot be ascertained with the same precision. The common equity investor, who does not have a contractual agreement with the company for a given rate of earnings or dividends, assumes the risks of the business. In the case of a regulated firm, the common equity investor expects that the regulatory agency will give the company the opportunity to earn a fair rate of return on his investment and that his investment will grow in value. That is, the fact of regulation should neither penalize nor benefit the owners of common equity. The fair return on equity investment is provided by the comparable earnings test.

Q. Please explain more fully the comparable earnings test.

A. By the comparable earnings test is meant a return that meets the following criterion from the Supreme Court's Hope Natural Gas decision:

page 225 } "By that standard the return to the equity owner should be commensurate with returns on *investiments* in other enterprises having corresponding risks."

A very similar opinion was stated by the Supreme Court of Appeals of Virginia in a much earlier case, Petersburg Gas, 1922:

"The real test of the justice and reasonableness of any rate seems to be that it should be as low as possible, and yet sufficient to induce the investment of capital in the business and its continuance therein. This, also, is a business question, and depends on the opportunities that may be offered for more profitable investments and the risk involved."

Under the comparable earnings test, the relevant comparability is comparability of risk, not of comparable companies. Such risk comparisons are constantly being made by both amateur and professional investors, and relative prices of individual securities and industrial groups vary as investors' opinions change with respect to their comparisons. Investors are not always in agreement about the relative risk of a particular company or industrial group, yet it is a fact that such risk comparisons are being made daily.

page 226 } As noted previously, most regulated firms have one favorable characteristic that distinguishes them from non-regulated enterprises: a monopoly of a service area which protects them from compe-

tition from firms offering the same services. But this advantage is partially offset by the fact that such firms must submit to regulation and, thereby, assume certain regulatory risks which may retard their ability to adapt to changing conomic conditions. Moreover, in the short run, all business enterprises are subject to cyclical fluctuations in demand while, in the long run, all business firms are subject to obsolescence, due to new technologies and to changes in market demand or in the value of services to the consumer.

The net effect is that while utilities and unregulated companies have similar long-run risks, the service area monopoly that utilities possess tends to diminish their overall risk as compared to unregulated firms. Regulated firms thus are able to carry more debt and, consequently, generally have a lower overall cost of capital. That is, the higher debt ratio of the utilities is an offset to their overall lower business risk. This fact does not mean, however, that utilities have lower costs of equity capital, any more than it means they have lower debt costs. And, finally, the capital structures of utilities, with their high debt-equity ratios, tends to
page 227 } multiply, for the equity investor, the risks inherent in the business.

Q. You have included unregulated companies in your comparable earnings study. Is it proper to compare the earnings of such firms with the earnings of regulated utilities?

A. Yes. Such comparisons are essential for at least three reasons.

First, the alternatives open to investors include both regulated and unregulated companies. No company has a monopoly in the capital markets. "Capital," in the words of one authority, Professor A. J. G. Priest, "cannot be conscripted." Investors will seek the opportunity which provides the greatest profit, commensurate with the risks involved. Thus, since utilities must compete in the capital markets not only against other regulated firms but against unregulated enterprises as well, the earnings of unregulated companies are highly relevant.

Second, regulation is supposed to be the law's substitute for competition. It is significant, therefore, to see what unregulated companies are earning on equity capital.

Third, comparisons limited to earnings of regu-
page 228 } lated firms involve circular reasoning merely because such earnings are regulated. To break this circle, the earnings of unregulated enterprises must be considered.

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Q. What is the appropriate period of time to use in making such comparisons?

A. There are certain inherent dangers in using any period of time for purposes of comparisons. A long period may not be representative of current conditions; a short period may be one of depressed or exaggerated earnings. However, a recent period reflects current money and capital market conditions which affect long-and short-term money rates. These rates, in turn, have an effect on the cost of both debt and equity capital. Therefore, primary reliance has been placed upon the latest six-year period in order to reflect recent trends. Also, it should be noted that the period since 1964 has been one of relatively high employment, prosperity, and growth, as well as one of inflation and high interest rates.

Q. What rates are being earned on common book equity?

A. Schedule 11 shows the rate of return earned on year-end common book equity since 1946 for Moody's 125 Industrials and Standard and Poor's 425 Industrials. Common stock equity consists of toral capital minus debt
page 229 } and preferred stock; earnings include all earnings after taxes minus interest and preferred dividends. The average rates earned on year-end book equity for each of three time periods are as follows:

For the period 1946-1969, Moody's 125, 13.4%. Standard and Poor's 425, 12.5%.

For the period 1960-1969, Moody's 125, 12.4%, Standard and Poor's 425, 11.5%.

page 230 } In the period from 1964 to 1969, 13.2% for Moody's 125 and 12.3% for Standard and Poor's 425.

Q. What then do you conclude with respect to the earnings on common equity for VEPCO?

A. Using the comparable earnings test, that is, based on the average rates earned on year-end common book equity of Moody's 125 industrials and Standard and Poor's 425 industrials, with primary emphasis being placed upon the latest six-year period in order to reflect recent trends, it is my judgment that the earnings on common equity for VEPCO should be in the range of 12.5% to 13.5%.

Q. Dr. Phillips, what is your conclusion as to the over-all rate of return for VEPCO?

A. In reaching a conclusion as to the over-all rate of return, three factors should be emphasized. The first, unless the earnings of utilities measure up competitively, investors will

shy away from their securities just at a time when utilities need significant sums to meet growing consumer demands. VEPCO, for example, estimates that in the three-year period December 31, 1969 to December 31, 1972, it will be required to raise approximately $852 million in new capital. To raise this amount of capital economically, the company must have adequate earnings.

Second, because of continuous inflation in the economy, the rising cost of debt capital, and the concern for
page 231 } environmental control, it is essential that regulatory commissions look beyond the test year in determining a fair rate of return. The utilities must plan for property additions some seven years in advance. Surely it is not unreasonable for regulatory commissions to look three years into the future.

Third, the tax deferrals arising from the investment tax credit and accelerated amortization have been included in the company's capital structure and assigned a zero cost rate in determining the over-all rate of return. With respect to accelerated depreciation, VEPCO uses flow-through accounting. This method of accounting, as opposed to the normalization method increases the company's reported rate of return, as Mr. Clement has already pointed out. To the extent that the industrials use normalization accounting, their reported rates of return are lowered. On a comparable earnings basis, therefore, VEPCO's rate of return should be slightly above that of the industrials. Moreover, the assignment of a zero cost rate does not imply that no consideration should be given to an equitable sharing of the benefits resulting from the investment tax credit and accelerated amortization.

With these comments in mind, I recommend an overall rate of return in the range of 8.32% to 8.66%. As shown in Schedule 12, this range is arrived at by compositing the cost of long term debt of 6.23%, the cost of the convert-
page 232 } ible debentures of 8%, the cost of short term debt of 8%, the cost of preferred stock of 6.64%, and the cost of common stock equity of from 12.5% to 13.5%, according to their proportions in the projected capital structure at December 31, 1972.

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JOHN M. McGURN resumed the stand and having been previously first duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Mr. McGurn, yesterday you testified that you had asked your engineering and accounting staff to prepare an estimate of the additional annual revenue requirements that increased wage and costs and environmental programs will impose upon the company, which are summarized in your Exhibit JMM-8. Mr. Staples and Mr. Parker expressed an interest in seeing the back-up material and I now hand you copies of that back-up material and ask if you will comment on it.

page 233 } A. The first is entitled "Virginia Electric & Power Company, Adjustments to Proform 1969 Electric Operation and Maintenance Expenses," which annualizes for all of 1969 the increases in wages that were made effective at various times in the year and also reflects the increases in 1970 for which the company is already obligated.

The second is entitled "VEPCO Environmental Costs, Transmission, Distribution and Substations."

The third is entitled "Annual Environmental Expenses and Revenue Requirements-Power Production."

All of these were prepared by my staff at my direction and I believe they are true and correct.

Mr. Gibson: We offer this to the Commission as Exhibit JMM-9, 10, and -11, respectively.

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Q. Mr. McGurn, would you explain to the Commission whether these are possible programs and may be instituted in the future or are actual current commitments or programs that you have already authorized?

A. They are the latter, i.e., definite company policy and my

testimony makes them a commitment on the part of the company, assuming the availability of the necessary funds. The expenditures I have included in JMM-8 are certain to affect our revenue requirements as is the projected change in the surtax. The labor cost increases are already contracted for or determined; the environmental expenditures represent firm commitments or obligations to correct various problems, by one means or another. Where alternate plans are available, I have included only the least costly. These relate to

page 241 } to Mt. Storm where a more expensive alternative is considered for feasibility, and if approved may be subject to the availability of equipment. You will note that the exhibit refers only to the year 1971, which is the first year when the surtax will be wholly inoperative and the first full year when the new rates will be operative, so we are not asking the Commission to speculate as to the future but only to recognize the immediately impending situation. As Professor Phillips testified yesterday, rates are made for the future and the Commission should take a reasonable look into the future if its rates are to be realistic when they become effective.

Finally, I want to emphasize that the additional expenditures and carrying charges relating to environmental protection do not make any contribution whatever to the revenues of the company but are solely for the satisfaction of public policy in the protection and beautification of the environment. We want to be a leader in this movement, but it would be required by regulatory authority even if we had any different intention.

In short, these additional expenses and costs are an integral part of our rate presentation and essential to a full realization of the company's needs.

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page 242 } CHARLES F. PHILLIPS, resumed the stand after having been previously duly sworn, was examined and testified as follows:

Commissioner Catterall: I would like to ask Mr. Phillips to clarify his testimony.

The Witness: Mr. Chairman, if I may, I would like to answer Judge Catterall's question on the GNP Deflator.

Commissioner Catterall: This is something different, but as long as we have an expert I would like to get an extra benefit.

Charles F. Phillips, Jr.

By Commissioner Catterall:

Q. Would you look at your Schedule 12?

A. Yes, sir.

Q. Do you have paper and pencil before you?

A. Yes.

Q. I would like to begin with two assumptions. The first assumption is that if there was no electricity it would have an adverse effect on the standard of living.

You agree with that assumption?

A. Yes.

Q. There would be no drinking water except what people could get by going down to the river.

page 243 } The next assumption is that the purpose of fixing rates for a monopoly is to have the lowest rates that will enable the company to continue to perform its public service.

Do you agree with that assumption?

A. Yes.

Q. Now let us look at your Schedule 12 and let us assume that all of these items in this column, you change the percentage to $1 million, assume that they all add up to $1 million.

A. You mean the total capitalization adds up to $1 million?

Q. Yes, $1 million.

Then let us take 8% to make it easy. How many dollars of net earnings would be necessary for the company to stay in business?

Is that question ambiguous?

A. If you are saying 8% is the overall fair rate of return, then this is $80,000.

Q. I want to get these percentages into dollars. How many dollars would it take for the company to keep on furnishing electricity?

A. I am saying overall that would be $80,000, if I understood you correctly.

page 244 } Q. All right. Put down $80,000.

Now, the next assumption, let us assume that the rate base is not exactly the same as the capital structure. It often is different?

A. Yes, sir.

Q. In order to make a clear example, let us assume that the rate base is $2 million.

A. Yes.

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Q. Now, how many dollars does the company need in order to continue serving the public?

A. It will still need $80,000.

Q. Let us go on to another assumption. We have this governmental problem here which is quite a problem because so much of the current is bought by the governmental units that are not subject to our control, and it is made by private bargaining between them.

Let us assume that half the current is furnished to private people whose rates we fix and that the other half is furnished to governmental agencies where we don't have any authority to fix the price. Let us assume that the company wants good will and a good image, so it gives the governmental electricity to these governmental agencies free of charge, for nothing.

Now, how many dollars does the company need
page 245 } in order to continue to serve the public?

A. From the point of view of the overall rate of return, sir, it exactly the same figure we have used before.

Commissioner Catterall: Right. That is what I wanted to clear up.

Go ahead. I am through.

Chairman Hooker: Mr. Staples, cross-examine.

CROSS-EXAMINATION

By Mr. Staples:

Q. In that respect are you saying the rate base is immaterial?

A. I have used it from the point of view of the total capitalization of the company. I have not translated that into rate base.

Q. Is that the same theme as your testimony?

A. I am sorry?

Q. Did you follow that same theme in your testimony?

A. Yes; I have used only total capital in here.

page 246 } Q. I notice that you quote in your testimony a portion of the decision of the United States Supreme Court in its 1944 Hope Natural Gas Company case.

A. Yes, sir.

Q. You maintain that you rely on the three basic tests or criteria contained in that opinion.

The Court stated in that decision, as presented in your testimony, "By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."

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I should like to ask you what analysis you performed to determine what, if any, company earning the rate of return you propose as being fair for VEPCO are facing corresponding risks.

A. It is my opinion in several years of study concerning this particular matter that there is, in fact, no generally-accepted statistical method of measuring risk. It is my opinion that if you look at a group of industrials, recognizing that risk evaluation must be made by investors at all times, that if you look at a group of industrials, as I have attempted here, that the risk to the equity owner for the utility, particularly this utility, is approximately the same as the risk of these particular groups of industrials.

page 247 } This recognizes the fact that as I have spelled out here as to why there is risk to a utility, risk here defined is uncertainty. This recognizes what I refer to and others have as the opportunity cost of capital. These are the firms with which VEPCO must in trying to raise capital compete in the market.

page 248 } Q. Would it be fair to say it is a matter of judgment?

A. I think any rate of return is a matter of judgment, sir.

Q. When making a judgment about the speed of an automobile or judgment about how cold it is on a given day, there are certain factors which one takes into account.

Would you tell us specifically what factors you have taken into account in making your judgment that VEPCO needs a return on common equity in the range of 12.5 to 13.5% to reach comparability with other firms facing corresponding risks?

A. Yes, sir.

I considered in the first place the amount of capital which I have been told by the company it must need over the coming years, the fact that the company's total investment is increasing at an increasing rate, this year compared with last year, and probably next year compared with this year. I considered the fact that this company is in many respects not too dissimilar from those companies in the Moody's group or in the Standard and Poor's group.

Given the fact that this company must continuously go to the capital market in order to raise the capital that it needs to supply its customers, I consider that these companies are in fact comparable. It was primarily then the growth, and the fact that VEPCO must compete with these

page 249 } firms in the market.

Charles F. Phillips, Jr.

Q. Isn't it still judgment? They are not specific criteria, are they?

A. I have agreed that the rate of return is basically judgment; yes, sir.

Q. In discussing the risk faced by utilities you appear to stress heavily the fact that the clients of these utilities are fixed and specialized, furnished a given service within a geographical area. This implies that the risk that utilities face is one of having their fixed plant and equipment rendered valueless because of their inflexibility.

I wonder whether you can tell us in what year since 1950 the demand for electrical energy in the United States in general, or the demand for electric service in the VEPCO area, has fallen?

A. None.

May I amplify?

Q. Surely.

A. The amplification of your question is not what I am really trying to get at. What I am saying is that here is a plant that is fixed from the point of view of its investment and its service, but I see in the future because of changes in technology growing competition on this firm, and this has in its effect increasing risk to this company.

page 250 } This is what I am trying to get at here, again defining risk in terms of uncertainty.

Q. You do not anticipate the demand for electrical energy in VEPCO's area will fall in the future?

A. I don't have a crystal ball, and I am not trying to argue what will happen. I am saying that the risk is in the earnings and is in the risk that accrues to the common stockholders and to the total earnings of VEPCO.

Q. You heard Mr. Moore and Mr. McGurn talk about the heavy investments that they will have to make, and this anticipates this growth, does it not?

A. Growth in demand, sir. What will happen in the relationship of growth in demand and growth in earnings might be two quite different things.

Q. My question is with regard to the demand for energy.

A. Yours are in terms of demand. I am saying I know of no reason why it will decrease. There is every reason to believe that Mr. McGurn is probably correct.

Q. This means that VEPCO or any utility that supplies to a geographical area plant, transmission and distribution equipment, basically the inflexibility of plant and equipment, that does not in the foreseeable future create any particular risk.

A. No, sir; I disagree with that in the sense that the risk is not the risk from the plant. The risk is in the
page 251 } uncertainty concerning the earnings from that plant.

Q. I notice that you characterize the supply of energy for space air conditioning as being an area where electric energy faces substantial competition. Isn't one of the traditional determinants of the elasticity of derived demand for a commodity the existence of alternative commodities?

A. Yes.

Q. If you are right and in fact gas poses a significant alternative energy to electricity in space air conditioning, then would you not suspect in contrast to what Mr. McGurn has testified that the demand for electrical energy for space air conditioning may not be inelastic, but be in fact relatively elastic?

A. I have not in all honesty to you tried to work out anything with elasticity of demand with either of these.

Q. You mentioned that in your testimony.

A. What I talked about in the testimony is the fact that there seems to be growing competition in this particular area, but I have made no attempt from the point of view of working out elasticities.

Q. You have made no studies?

A. No, sir.

Q. Dr. Phillips, you state that your objective in your testimony is to present a fair rate of return for
page 252 } VEPCO. By this do you mean a fair rate of return on the portion of the capital plant and equipment used to produce Virginia Jurisdictional electrical energy sales or have you determined a fair rate of return for the total company?

A. I have determined the fair rate of return for the total company and have not made an attempt, even though I recognize this is what this Commission will have to do, to translate this into a rate of return on Virginia Jurisdictional rate bases.

Q. Dr. Phillips, what would you consider to be a fair rate of return on the Virginia Jurisdication rate bases of VEPCO?

A. I have not made that calculation, sir. What I am arguing is that VEPCO from the point of view of its total system, that this seems to me to be a fair rate of return.

Q. On the capital?

Charles F. Phillips, Jr.

A. On the capital, but I have not translated that into a Virginia Jurisdictional rate base.

Q. In light of your qualifications as an economist, you wouldn't care to opine on that question?

A. The only statement I think I can make is that I did not translate it.

Q. You wouldn't like to?

A. I could compute it if that is what you mean. However the allocation turns out and what the Jurisdic-
page 253 } tional rate base turns out, this can be applied to it. There is no such thing—

Q. You are not basically concerned with the rate of return on the rate base?

A. I am saying this rate of return can be translated into a rate of return on the rate base, but obviously there is no such thing as the demand for capital from Virginia Jurisdictional rate base. The total return is to VEPCO as a company, not into its Jurisdictional parts.

Q. You wouldn't want to express an opinion as to which is the most meaningful, the rate of return on rate base or rate of return on capital?

A. As an opinion? My opinion is rate of return on total capital, that this is what the investor looks for.

Q. How about the regulatory commission?

A. I will agree that from a regulatory point of view this will eventually have to be translated. I would hope the Commission would look at total return on capital as a starting point.

Q. Your testimony as given here in support of the case before this Commission, you are reluctant to give us a rate of return on the rate base?

A. The only reason, sir, is that I think the significant point is as I have already stated, the total return on capital. Once this is decided and once the rate base is de-
page 254 } cided it can easily be calculated.

Mr. Staples: I have no further questions.

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Q. Isn't demand the key to whether or not risk really exists?

A. No, sir.
Q. Why not?
A. Because it is perfectly possible for demand to be growing, but cost to be growing faster so that, in fact, earnings are decreasing.

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page 273 } Q. You say "The cost of equity capital is equal to the cost of debt plus a differential for the greater risk inherent in common stocks."

A. Yes.
Q. Now, by that you mean that there is more risk in common stocks because if the company doesn't make enough money there will be less left over for common stock, and if there was ever a dissolution or something, they would be the first people to be wiped out; is that correct?
A. No. What I am saying is that common equity demands a higher return than does senior capital. This is what I am saying in that sentence.
Q. And what are the reasons for that?
A. The reasons for that is—the reason basically, of course, is the fact that the common equity owner takes the risk because of the fact that he is the last one paid.

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Q. You say 12-1/2 to 13-1/2 percent is the cost of raising equity capital for—
A. No, sir, I did not say that was the cost of raising equity capital. I said that in my opinion is the fair rate of return on the basis of a comparable earnings test. I did not say it was the cost of raising equity capital.

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REDIRECT EXAMINATION

By Mr. Gibson:

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Q. As I understood the summation of your point of view it was—I would like you to say whether I am correct or not in this impression—that investors buy in anticipation of future growth as well as of current return?

A. That is correct.

Q. When the common stock of the company was
page 326 } *sodl* on March 10, 1970, you say that this application for rate increase had been pending since November 25, 1969; is that correct?

A. I believe that is the correct date.

Q. Would it be natural, therefore, to infer, or not, that the investors gave weight to the probability or the expectation of fair treatment by this Commission, which has historically characterized it?

Mr. Parker: I object to the form of the question, Your Honor.

Chairman Hooker: He is just making a speech.

There is an objection to part of the question referring to the treatment by this Commission.

Mr. Gibson: I will withdraw the "which has historically characterized it."

By Mr. Gibson:

Q. Do you suppose weight was given to an upward adjustment of rates as a result of the pending proceeding?

Commissioner Dillon: You might say knowing they are going to get fair treatment for this Commission.

Mr. Parker: We concede that everyone knows that they will get fair treatment.

page 327 } A. I think my answer is that I think any purchaser of stock in a public utility company expects that the Commission will present an opportunity to earn a fair rate of return.

Q. Would it not follow from that that cost of equity capital could not be fairly determined merely by a price earnings ratio at that moment?

A. I agree with that fully, sir.

Q. Is it not true also, or do you differ, that a purchaser of common stock cannot possibly buy an undivided interest in a particular fraction of a company's business?

A. Yes, sir.

Q. But must buy an undivided interest in the whole business of the company?

A. Yes, sir.

Q. Is there any way in which he could make a differential investment in a particular territory of the company's business?

A. No, sir, not in VEPCO's situation.

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page 334 } CHARLES H. FRAZIER, a witness introduced on behalf of VEPCO, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Will you please state your name and address?

A. My name is Charles H. Frazier, and my address is Downington, R. D. 2, Pennsylvania.

Q. What is your occupation?

A. I am a public utility consultant, with offices in Philadelphia, associated with National Economic Research Associates, Inc. since 1964.

Q. You stated that you have been associated with National Economic Research Associates, Inc. since 1964. What is that organization?

A. National Economic Research Associates, Inc., which we call NERA, provides research and consulting services in a variety of areas where the profession of economics impinges on business practices. However, a principal area of emphasis has been in public utility economics, including cost of service studies, rate of return analyses and rate design economics. The increased level of market competition and the controversies surrounding promotional rates and practices have

led clients to retain NERA to study costing techniques appropriate to the establishment of such rates, and
page 335 } the economic rationale therefor. Much of this practice has been in the regulatory area, in assisting clients with the presentation of sound positions before regulatory bodies.

Q. Please outline your educational and business background.

A. My educational background consists of the completion of a course leading to an A.B. degree at Haverford College, 1924, and such studies as were required to receive the degree of Bachelor of Science in Electrical Engineering from the Harvard Engineering School in 1926.

Upon graduation, I was employed successively by the Southwestern Public Service Company, as an engineer; the Philadelphia Electric Company in its Internal Auditing and Systems Departments; and the United Gas Improvement Company in its Department of Practices and Methods.

The greater part of my working life was spent in the employ of the Philadelphia Gas Works Division of the United Gas Improvement Company, now the UGI Corporation. I was employed by this company in 1939 and retired in 1964. The Philadelphia Gas Works is the municipally-owned facility serving gas to the people of Philadelphia. It is operated under a fixed fee management contract by the UGI Corporation. Its rates are regulated by the Philadelphia Gas Commission—a municipal body.

Q. What was the nature of your work with the
page 336 } Philadelphia Gas Works?

A. During my employment with the Gas Works, I was, in turn, Manager of its Internal Audit Department; Manager of its Management Services Department; Rate Engineer; Assistant to the President; Executive Engineer; and Director of Development. At the time of my retirement, in the last-named post, I had four principal areas of responsibility: rate policy, structure and administration; economic development, including supervision over the preparation of cost allocation studies, market analyses, and determination of policy with respect to new markets; system planning; and the procurement of natural gas and related matters, including participation with the company's counsel in various formal and informal proceedings before the Federal Power Commission.

The latter responsibility included such activities as presenting the Gas Works' natural gas requirements and par-

ticipating in pipeline and producer rate and certificate cases affecting the cost and adequacy of Philadelphia's gas supply. In this connection, where their interests coincided, I have also testified on behalf of various Eastern gas distribution companies in a number of such proceedings.

With the institution of the "area rate" methodology of producer regulation, in Docket No. AR61-1, et al., known as the Permian Basin proceeding, I was asked to be the Presiding Examiner's witness, for the purpose of
page 337 } suggesting rate procedures designed to effectuate the Commission's newly announced area rate policy.

Later, since my retirement, I testified on behalf of the Associated Gas Distributors, a group of some sixty gas distribution companies, in the Southern Louisiana, the Texas Gulf Coast, and other Southwest area rate proceedings, Docket Nos. AR61-2, et al., AR64-2, et al., and AR67-1, et al. on the subject of area rates, and for other clients, in the Pipeline Production Area Rate Proceeding, Docket No. RP66-24.

Q. Please outline some of your other assignments since you joined NERA.

A. When the Federal Communications Commission instituted its general investigation into the rates and practices of the Long Lines Department of the American Telephone and Telegraph Company, NERA was retained by that company, inter alia, to prepare testimony with respect to pricing in the gas and electric industries, to draw analogies between regulatory practices in those industries, when confronted with competitive markets, and similar recommended policies in the communications industry; which task I undertook. Particularly at issue there was the pricing of competitive services, using as the test of the compensatory nature of such prices, the full long-range incremental cost. Although I did not appear on the stand in that proceeding, I participated in many conferences and the preparation of the testimony of others.

page 338 } More recently I have appeared before the Massachusetts Department of Public Utilities on behalf of the Lowell Gas Company, in Docket No. DPU-15364, the investigation of the promotional practices of public utilities subject to its jurisdiction; and in the United States District Court for the Eastern District of Virginia, on behalf of Virginia Electric and Power Company, testifying

there as to the property of the undergrounding allowances variable with the use of electric space heating and water heating.

Q. Please describe any major public responsibilities you have had in recent years.

A. In addition to my direct professional responsibilities, I have held certain public posts, including service as Procurement Commissioner for the City of Philadelphia in 1952, service on the Philadelphia Parking Authority in 1953-1955, and service on the Urban Traffic and Transportation Board, including its Chairmanship from 1956 to 1961. In this latter connection I participated extensively in the development of the combined public and private suburban rail transportation project in Philadelphia and the surrounding counties, which involved new concepts of transportation pricing and costing. From 1961 through 1968, I served as Chairman of the Board of Trustees of Philadelphia's municipal hospital.

page 339 } Q. For what purpose are you appearing in this proceeding?

A. I have been asked by Virginia Electric and Power Company to consider the rate schedules which are being proposed, and to evaluate them in the light of appropriate regulatory criteria.

Q. Would you please list these criteria?

A. I would like to list them first and then discuss them in greater detail. However, the primary, threshhold criterion, that is, whether the rate level produces a fair rate of return, is the subject of other testimony. The criteria which I will discuss are:

1, that while the rates must not be unduly discriminatory among classes of customers, they must produce the most appropriate balance between the additional net revenue needed and the cost-revenue relationship of the various uses of electricity; and

2, that the proposed rates not be unduly disruptive of existing patterns of charges.

The general meaning of the phrase "not unduly discriminatory" is certainly clear to this Commission. It has been litigated many, many times and this concept need not be elaborated upon here. Nevertheless, it is important to be clear on one concept of "not unduly discriminatory" which has been advanced elsewhere but is in my judgment wide of the mark. The erroneous concept to which I refer is the thesis

page 340 } that this criterion is violated if the application of some generally accepted theory of allocation

of rate base and test-year costs to the various classes of service does not produce uniform rates of return for those classes.

Q. Why do you stress this point?

A. I do so because these would be the lowest rates, overall and by classes of service, only temporarily or by coincidence. This is because such a scheme would ignore the important economic factor of elasticity of demand, usually different for each class and subclass of service.

Q. Would you mind stating your understanding of this factor?

A. Elasticity of demand refers to the impact of price on quantity consumed. It is defined as the ratio of the percentage decrease in quantity demanded to the percentage increase in price, or vice versa, all other factors remaining constant. If the quantity purchased decreases by a larger percentage than the price increases, demand is price-elastic; and if the change is in the same proportion as price, demand possesses unit elasticity, an elasticity factor of one. When demand is inelastic, that is, when the elasticity factor is less than one, a decline in price will not increase purchases proportionately, and will reduce total revenue; or an increase in price will be accompanied by a smaller decrease in volume taken and, hence, will raise total revenue. The opposite is true if demand is elastic. With unit elasticity,
page 341 } the total revenue remains the same as price changes.

You will note that this definition refers only to gross revenue as a function of price. It is necessary, however, in applying this concept of elasticity of demand to rate-making to consider net revenue, since it is the change in net revenue resulting from a rate change which is the significant factor in meeting the threshold criterion above listed, an adequate rate of return.

Q. What would be the effect if VEPCO ignored the factor of price elasticity?

A. As a generality, the effect is to increase the burden on all customers, including those which are price-inelastic customers, and where, as here, additional revenue is sought, force the company to make an early return to the Commission for additional rate relief. In the specific circumstance pertaining to VEPCO, where the price-elastic services are winter-concentrated, it would increase the summer-winter imbalance, raise costs and again, require additional rate relief.

Charles H. Frazier

Q. Is the necessity of considering demand elasticity incorporated in your first criterion?

A. Yes. This criterion is not simply that rates not be unduly discriminatory. That concept is a negative one. I believe the utility has a positive responsibility, in proposing a rate change, to recognize the factor of elasticity of demand to minimize the over-all cost burden on all ser-
page 342 } vices, including the price inelastic services. I would like to demonstrate that this will be accomplished, and the maximum benefit to both the customers and the community served, if the rate changes comport with the following principle: namely, that the rate for each price-elastic market be fundamentallly based on long-run incremental costs, including return, with a margin over and above costs, however, adequate to pick up as great a dollar share as is feasible of the inevitable common overhead and sunk costs of the different services.

Q. Why do you use incremental costs as compared to embedded, average costs?

A. Because we are here, in making rates for the future, concerned with the effect of management decisions on the future revenue-cost balance. We have to look, therefore, at the changes in cost which various alternative management decisions would entail, rather than at some concept of historic cost.

Q. You have used two phrases which are subject to some misunderstanding. Would you mind defining first what you mean by long-run incremental costs?

A. Included in my definition of long-run incremental costs are not only the out-of-pocket expenses of such added service, together with any increase in overhead expenses which may result from the service expansion, and the annualized cost of any specifically-rated plant, including return and re-
lated taxes, but also the annualized cost of that
page 343 } portion of the additional common plant required by that service expansion. This concept refers to the long-run; any cost which may be added as a result of adding or expanding a service, including costs which will not immediately be incurred, are included in the long-run, or complete incremental cost of a service offering. In other words, these costs are long-run in the sense that they include the addition to total cost when the company has fully adjusted its operations and facilities to the most efficient means of meeting the increased total demand.

Included, too, in the complete incremental cost computation

should be all costs directly attributable to the related advertising and promotion. These represent costs which would not otherwise be incurred. Since such costs result in future sales, they are, in a sense, investments made to produce future sales. They should, accordingly, be taken into account when comparing the complete incremental costs and revenues of such sales.

Q. The other phrase you used was "sunk costs." Would you please give the context in which you used this phrase?

A. Here I am using the phrase "sunk costs" as the difference between the current costs used in the long-run incremental cost computation and the sometimes-higher embedded costs for the same elements used, for example, in the rate-of-return computation.

Q. Will you now describe, please, the effect of a price increase on the net revenue derived from a price-
page 344 } elastic service?

A. I have prepared an illustration of this effect in Schedule 1 of my exhibit in this proceeding.

Q. I believe that is the exhibit marked CHF-1, is it not?

A. Yes, sir.

Mr. Riely: May it please the Commission, Exhibit CHF-1 is offered.

Chairman Hooker: CHF-1 is admitted.

(The document referred to was marked Exhibit CHF-1, for identification, and admitted in evidence.)

By Mr. Riely:

Q. You were speaking first of Schedule 1. Will you turn to that and explain it, please, Mr. Frazier?

A. In this schedule I have tried to illustrate the effect of price elasticity on net revenue by taking two possible instances of rate treatment.

On the first line of this schedule I have assumed my definition of elasticity factor. This is the relationship between the change in quantity demanded and the change in price.

On the next five lines I have listed certain assumed base factors; in other words, that the enterprise that sells 1,000 units a year with elasticity of 4—

Q. A million units I believe it is, is it not?

A. A million units it is; yes, sir. That enterprise has a present long-run incremental cost of one cent per

page 345 } unit, present revenues of 1.4 cents a unit, and a growth rate of 15% per year.

Then I have calculated under case one what the next year's incremental revenue would be. I have, provided no change were made in the rate, a very simple calculation of a growth of 15% of the million units and the incremental profit of 4 mills would yield me $600.

Now let us assume, in contrast, a rate increase of 10%. If the elasticity factor is 4, the computation shows that there will be a decline in the quantity demanded to 782,000 units. It further shows that these units sold at the new, higher rates will produce $4,223 available for application to general overhead expenses. But the old rate produced $4,000 applicable for this purpose; so even with the rate increase, the year-to-year gain is only $223 in contrast to the $600 gain with no rate increase. Consequently, the rate increase, when applied to this elastic service, produces fewer funds available for general overhead expenses. A price-elastic service is, therefore, immediately and intensively affected by a price change. In this not too exaggerated case the producer fares worse because of a rate increase.

Q. What would be the effect on the loads which are not price-elastic of a failure to follow this principle in pricing price-elastic loads?

A. Since we have established as our threshold page 346 } criterion that an overall fair rate of return must be earned, and there will be a smaller contribution from the price-elastic load, it is obvious that the only place this deficiency in revenue can be made up, without a continually downward spiraling effect, is on the inelastic loads; in other words, the loads which are not materially affected by a change in price. Consequently, the latter group of customers will be worse off by the application of an across-the-board type of rate change than if the rate had been set in the first place to produce the greatest net contribution from the price-elastic services. Although the illustration in my exhibit will not prevail for all price-elastic loads, under all revenue-cost relationships, it does illustrate the kind of computation which must be made.

I should add that in VEPCO's case, since the price-elastic services happen to peak in the winter months, stimulating their growth will increase system load factor, and will result in even lower costs than would otherwise be the case.

Q. To make your recommendation more specific, would you list the services which are in your judgment price-inelastic?

Charles H. Frazier

A. As a general rule, the principal services which are price-inelastic are sales for lighting and small power applications. In the commercial field, this category covers virtually all sales except for space heating, cooking and process heating with the further possible exception in the sales category referred to as "total energy" discussed be
page 347 } low. This is so because the electric requirement in this field are determined by the scope and quality of service required if the firm is to stay competitive; and since the electric bill is typically only a small part of the total cost of operation, a commercial firm is usually more interested in the effect caused than in a minor cost variation.

In a large part of the industrial market the same circumstances prevail. For most industries the electric bill amounts to something like one per cent of the annual cost of operation; and the firm is interested in getting the job done in the most efficient way and not in this small part of the total cost of production. The most basic exception to this general rule is in the category of large electrometallurgical plants, not present in this area to any marked degree, and, to a lesser extent, electrochemical plants. Electrometallurgical plants are usually sited near very low-cost power sources, such siting being necessary in order that the plants be competitive.

I should add, however, that there is a type of elasticity present in large industrial plants which rate-makers must keep in mind. I refer to the alternative, ever present for very large users of power, of installing the company's own power plant. The reduction of industrial rates in the past has almost eliminated the installation of new isolated generating plants that were so prevalent in an earlier period. Absent special conditions such as will be discussed
page 348 } under the total energy concept, such plants are likely to "stay eliminated" provided no abrupt changes are made in industrial rates.

Q. You have referred to the total energy concept. Would you mind elaborating on this, please?

A. The concept of total energy is simply a modern example of the old isolated power plants, now sometimes referred to as on-site generation. Under certain circumstances which may occur on both commercial and industrial premises, the use of the waste heat attendant upon the production of electricity, either for process use, water and space heating, or air conditioning, can produce a very efficient and high-load-

factor operation of the essentially more costly equipment, and this may make it appear economical to install either oil or gas-fuelled equipment to produce electricity on site, in contrast to purchasing it from the power company. There is a rapidly growing number of such installations in other parts of the country, and it behooves VEPCO in its rate-making to concern itself that its rates do not invite that kind of competition, always assuming that long-run incremental costs are met by the resulting rate.

Q. Would you turn now to the residential field. Which of those particular services are price-inelastic with respect to the cost of energy?

page 349 } A. The most obvious examples in the residential field are in the category of lighting, small appliances, television and radio. Also in this category I would put those larger appliances where the electric bill is small compared to the capital investment and to the qualitative features of the appliance, such as ranges, clothes-and dish-washers. There is some question as to whether electric ranges fall in this category, but with the general acceptance of electric cooking and with the relatively small dollar-size of the cooking bill, it is the judgment of VEPCO officials, in which I would concur, that the range load is in the price-inelastic category. Thus the principal emphasis in marketing ranges is in the various cooking features, such as temperature control, speed, and cleanliness—and even appearance—and the housewife appears to be more likely to choose an appliance—particularly one costing up to $500—on the basis of expected performance rather than on a small differential in the cost of operation which might be significant, on a percentage basis, but would amount to only a few dollars a year.

Q. In which category would you put air conditioners?

A. At this time I would put air conditioning in the price-inelastic category. First, as to window air conditioners, there is no substitute for this applicance and the annual cost of operating such a unit is small compared to the comfort it provides.

page 350 } As for air conditioning the entire house, there is, of course, gas competition, but at the present time the initial cost of installing gas air conditioners is half again as much as that of installing comparable electric equipment; the dollar differential being so great that modest differences in operating costs tend to be submerged in the very substantial margin of first cost. There

is another factor here which needs to be considered. In the usual instance of whole-house air conditioning, one fuel would be used for both heating and air conditioning, with the former contributing most to the annual operating cost.

Q. Are there domestic appliances which you consider to be price-elastic?

A. Yes, I think it is generally recognized that both water heating and house heating are in this category. There are no theoretical data available as to the existing degree of price elasticity for water heating, but the various observations made above with respect to the range are clearly not applicable here. About the only qualitative advantage which can be advanced, against a potentially higher cost of service in comparison with gas, is the greater flexibility in locating the appliances and the fact that it does not require a flue. Aside from that, the kinds of talking points which can be used to promote the sale of ranges are not applicable here. The product is hot water, and the fuel used makes very little difference as long as the water reaches the page 351 } correct temperature. Moreover, the annual bill bears a much higher ratio to the cost of the appliance. Furthermore, VEPCO's experience, in terms of the changes in the base residential rate applicable to water heating, indicates a marked response to such changes. I would conclude that water heating is definitely price-elastic, at present levels of comparative prices, and that this elasticity is probably in the order of two or above, somewhat below the minimum elasticity found for space heating, to be discussed next.

With respect to electric heating, and by this I mean the heating of the entire premises, the studies which we have made indicate a high degree of price-elasticity. Here again we have an appliance where the ratio of the annual operating cost to installation cost is quite substantial, and at present levels of fuel charges, electricity operates at a material operating cost disadvantage. True, there are many qualitative comparisons which can be made to argue that the higher operating cost should be incurred, but here we are comparing intangible advantages with a very substantial dollar figure. Recently we had occasion to attempt to quantify this elasticity. A study was made of the applicable electric bills for a modest-sized home with the saturation of space heating prevalent in various companies' territories. In this study, by the use of multiple-regression technique, we attempted

page 352 } to eliminate other major variables affecting saturation. The result of the study indicates that electric space heating has an elasticity with a minimum of three, possibly being as high as five.

Q. Would you turn now to the conclusions which you would draw from the above considerations as to the course which VEPCO should follow in respect to its prospective rate filings?

A. I have already referred to the caution with which changes in industrial and large-scale commercial rates should be approached. With this as a general precept, it seems to me the company should address itself to rate changes which will, while taking into consideration the factor of price elasticity, tend to remedy the condition which has been one of the prime factors in causing VEPCO to seek rate relief at this time. I refer to the portion of Mr. McGurn's testimony which discusses the progressive worsening of the VEPCO system load factor and of the increasing cost burden, not compensated for by corresponding changes in annual sales, which this condition has imposed on it. The installation of 500,000 kilowatts of extra capacity, at a cost of at least a hundred million dollars, depending on the character of the load served, has had the effect of increasing the company's annual revenue requirements by $15 million or more. It is therefore appropriate, insofar as this is feasible, to assess much of this increase in cost against the summer-concentrated sales.

page 353 } One method by which this can be accomplished, here proposed by VEPCO, is to apply the demand charge in the large volume commercial and industrial rates to a very substantial part of the highest peak monthly demand, occurring in the summer, to each monthly bill throughout the year. The propriety of such an adjustment is obvious. It is this charge which is designed to reimburse the utility for the fixed costs incurred by the customer, and these costs, basically, are related to the kilowatts of summer demand which the summer peak utility must be prepared to meet, and which go on, month in and month out, regardless of downward fluctuations in the customer's demand.

Q. Have you attempted to quantify these costs?

A. Yes, I found it necessary to make such studies in order to appraise the propriety of the rate changes recommended VEPCO, in both the General Service and Residential categories. As I have previously testified, I considered the significant cost, in making such judgments, to be long-range in-

cremental cost. First I should note, however, that such cost computations cannot be exact, since we are here, perforce, dealing with estimates. Moreover, we still have the problem of common plant; and, in the residential area, we must make estimates of both the peak and annual consumption of the various appliances and of the effect of these additions on the overall cost of the company. However, even though precision is not possible to achieve, it is necessary to make the closest approximation if we are to apply our
page 354 } best judgment in formulating a set of rate changes which will minimize rates for all service classes.

I have made such an attempt for the VEPCO system, in the first instance by dividing both capital and operating costs currently being incurred into those costs which are variable with (a) the size of the system peak; (b) the annual quantity of energy consumed; and (c) the number of customers, or appliances, in the load being studied. With respect to generating costs, I took the most recent FPC compilation of the cost of large generating plants installed, and updated those costs to be applicable to the year 1969. Here I felt that the wider selection of up-to-date plant costs there available was preferable, as a base, to the more limited experience of VEPCO; though in end result, there was little difference. For transmission costs, after studying the capital expenditures made by VEPCO in the recent years in relation to the load added, markedly affected by the construction of the 500 KV system, I concluded to use the current booked plant cost per kilowatt of load, since much of this transmission system had been installed so recently. Finally, as to distribution investment, also much of it of recent vintage, I again used book cost as the best proxy for current costs. After studying the individual components of this investment, I concluded that only some 45% of these costs varied with the peak demand; the other 55%, with the number of customers. In this latter category I included
page 355 } not only meters and services, which, with the exception of electric heating installations, are relatively constant, but also a substantial portion of secondary distribution and some primary distribution, since the cost of these facilities is often determined by geographical considerations—a line must go down the street regardless of the number of customers and size of load—and is often governed by certain minimum construction standards. After

computing the long-run incremental capital costs, I annualized them to allow for depreciation, *ad valorem* taxes, rate of return, and in, in the instance of demand costs, for such maintenance and operating costs as vary with the peak load. Other operating costs I computed from a review of VEPCO's most recent annual report to the FPC, modified to be applicable, in the case of generation, to a modern facility.

Q. Does your exhibit show the results of this analysis?

A. Yes, Schedule 2 of my exhibit shows the derivation of the per-unit costs in all these various categories of expense which should be applied to individual customers or appliance loads. Thus, taking a cost for new generation of $158 per kilowatt of demand, I show an annualized cost per kilowatt of load for a given appliance, including losses, of $23.23 for generating facilities. Similar costs are $7.64 per kilowatt for transmission and $8.66 for distribution.

Q. Those figures I believe are all shown on page 356 } page 1 of Schedule 2 of your Exhibit CHF-1; is that correct?

A. They are all there shown.

Q. Would you now please relate these costs to the year-round demand charges proposed?

A. The cost relationship for any given class and type of customer depends upon the characteristics of service to that class, including particularly the point of service. However, for all but the very largest customers who may be served off the transmission system, the annual cost will be at least $31 a year per kilowatt for generating and transmission elements, and for some as high as $39 per kilowatt per year which is inclusive of demand-oriented distribution costs.

Q. The $31 is the sum of the $23.23 and the $7.64 previously stated?

A. That is correct.

Q. The $39 appears as the third figure from the bottom of the third page?

A. That is correct.

Q. Please continue.

A. In contrast the annual demand charges in proposed Rate Schedule 6, after discounting for the 95% ratchet provision as to which Mr. Gay is testifying—

Mr. Parker: Did you say 95 or 90?

The Witness: My original testimony was 90, sir, because at that stage that I wrote it that was the stage page 357 } of the company's proposal. Since the testimony

was filed the company changed that to 95 and I am conforming my presentation with Mr. Gay's.

Mr. Parker: Thank you. I didn't have that.

Mr. Riely: No, you are perfectly proper.

Q. Proceed, please, Mr. Frazier.

A. In contrast the annual demand charges in proposed Rate Schedule 6, after discounting for the 95% ratchet provisions as to which Mr. Gay is testifying, will range from $32 per kilowatt per year, for smaller installations, say of 100 watts, to as low as followup rate as $20. Even assuming some of the demand cost is carried in the energy charge, it is clear that this level of charges is cost-justified. I conclude therefore that the 95% ratchet provision is the most equitable way of recovering the additional costs being incurred from this class of customer.

The small general service rate, Rate Schedule 5, presents a somewhat different set of circumstances. Here the method chosen by VEPCO is to add 6 mills to the intermediate 2.4-cent block in proportion to the peak demand. This also seems to me a desirable way of assessing the higher cost burden against peak-period use.

* * * * *

page 364 } CHARLES H. FRAZIER, resumed the stand and, having been previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Mr. Frazier, as we broke for lunch you were discussing the costs shown on page 1 of Schedule 2 of Exhibit Number CHF-1 as they related to the proposed Rate Schedule Number 6 and Rate Schedule Number 5.

Would you proceed now with your analysis of the residential rate changes being proposed?

A. Yes, sir.

The next step in the analysis is to take the unit costs which I calculated on page 1 of our Schedule 2 and applied these to the various domestic appliance loads being considered.

I did this by making certain assumptions for annual usage

and peak demands, as derived from my study of the company's records, together with the what knowledge I have as to related data for other companies.

On Schedule 3 of my exhibit I have listed the consumption factors above discussed, together with the factors which enable me to account for the system's losses, in making the cost estimate.

page 365 } It will be noted that there are certain costs unique to the water heating and space heating services, such as promotional costs, but also, with respect to the latter, the cost of reinforcing local distribution facilities to accommodate 100% saturation of electric space heating, which costs company records indicate amount to some $190 per customer.

On my last schedule I have taken account of these various factors and computed an incremental cost per kilowatt-hour for the heating and water heating services. I conclude that the former has an incremental cost of slightly less than 8 mills per kilowatt-hours, and the latter an incremental unit cost of one cent. As earlier noted, these costs include appropriate rate of return allowances.

Q. What do these incremental costs indicate to you in terms of possible rate treatment of these two services?

A. First, as to space heating, it is clear that the incremental cost is substantially below the present revenue level of some 12 to 13 mills per kilowatt-hour for the heating component, whowing that this class makes a very substantial contribution, nearly $60 a year per installation, to general overhead. Because of the high elasticity found, any increase in charges for the space heating service alone should be made with great caution, and particularly with respect to the tail block, would appear contraindicated.

page 366 } To refer again to my first schedule, the data there shown closely mirrors the house heating situation and illustrates why a rate increase could have adverse results. These would not show up in the first year, of course, but the reaction would not be long delayed. Actually, since the more than 60% margin over incremental cost undoubtedly exceeds that applicable to the average new nonheating customer, both equity and considerations of sales promotion might call for a rate decrease.

Q. Now, Mr. Frazier, have there been any events that have occurred since you prepared this testimony that would cause you to elaborate on this question?

A. Yes. It will be noted that the testimony was filed early

in March and sometime toward the middle of March, this Commission issued an order in which they proscribe the certain promotional practices which heretofore the company had been using to promote the sale of various home building appliances.

Q. I believe that order was entered on April 15th, Mr. Frazier?

A. You are undoubtedly correct, sir.

Commissioner Dillon: I know it was.

A. In any event, my computations, of course, were based on recouping the costs which in their former form, at least, will not now be considered.

Now, it is impossible to state at this point how the company will react to the loss of this promotional page 367 } tool. I would consider, in considering the profitability of the house heating load and the water heating load that there will be a response. It presumably will be in the form of heightened sales effort in some other direction, either advertising, which is necessary, though I don't think it is the most efficacious use of funds to hit a particular market, or additional manpower, or possibly some consideration as to the tail block.

If I had known that the incremental costs were as low as they would appear to be, and assuming that all this promotional cost is not going to be made up in additional sales effort, my rate recommendation may have been somewhat different with respect to the tail block.

Q. All right, sir. Excuse me.

A. I just want to say that I can't tell you what the recommendation is because I don't think the company has yet formulated a response it believes to be appropriate to this order. I am sure because of the importance of the load they will be addressing themselves to this as promptly as possible.

Commissioner Catterall: Don't you think that a cut in the rate is more effective than giving somebody $40 to put in a heater?

The Witness: Well, one problem, Judge Catterall, is that if you reduce the rate by let us say 10%, to make an easy number, and this gives each existing house heating customer a 10% reduction in let's say a $200 bill, that would page 368 } be $20, and there are 50,000 existing house heat-

ing customers, you are giving—you are immediately reducing your revenue by a million dollars. Now, that particular million dollars to that particular group of customers is not going to be compensated for in getting an accelerated rate of house heating installation. It will over time—I am sure that 10% reduction over time would bring this money back but in an area when the company as such needs an additional $25 million, there is some question whether it can afford to reduce its revenue by a million dollars without any immediate response.

I am not saying that it shouldn't; I think it probably will want to consider this very seriously, but the immediate effect would be that they would be a million dollars short.

Commissioner Catterall: But they have been spending a million dollars in promotion now.

The Witness: Well, they are not going to get an increased rate of house heating installation only by reducing the rate. They are going to have to have their salesmen, their contact men with the builders go around more actively than they were before because they don't have the advantage of the promotion, and I think they are going to have to give those contact men something and it may be a rate reduction. I think in terms of the Commission rule that it

page 369 } might very will turn out to be that would be the desirable response, but again I don't want to express an opinion on it until I have studied both the Commission's order, which I have only just read, and conferred with the company officials as to what they think their response should be.

Commissioner Dillon: Don't you think they could wait until they could generate enough electricity to supply the present users before they spend any money to try to get additional customers?

The Witness: Well, sir, this load that we are talking about, the house heating load, comes in the wintertime and, fortunately or unfortunately, depending on which way you look at it, they have plenty of capacity in the wintertime. They could take on another 50,000 house heating customers and not increase their generating and transmission capacity and probably only have to make a minor increase in their distribution capacity.

Commissioner Dillon: I though we were short on electricity even in this past winter.

The Witness: I don't—

Commissioner Catterall: We had a slight brown-out, as we call it.

The Witness: There have been difficulties with coal piles, I recognize that, all over the country. There was a rather severe rundown of the utilities' coal piles. I don't page 370 } consider that that's going to be a permanent thing. I would not think so, I am not an expert on coal, but that did not have anything to do with the capacity of the company to serve—

Commissioner Catterall: Perhaps we ought to urge people not to have air conditioning. I don't believe they have advertised for air conditioning for several years.

The Witness: Well, sir, it probably goes against the grain for a public utility company to urge people not to use their product, but certainly there is some merit in going very slow on any kind of a promotional effort for the air conditioning business until the rate is sufficient to justify promoting it, and even with the summer block that they have recommended, I think that it is still pretty much of a touch-and-go situation.

Q. Mr. Frazier, would you please turn now to the implications as to water heating?

A. Because the price of water heating consumption in the customer's usage schedule is not as clearly defined, it is not possible to state with precision the exact revenue per kilowatt-hour now received for water heating. The lowest effective rate generally available for this service is 1.2 cents per kilowatt-hour, although under Rate Schedule 2, some is sold at 1.35 cents and some at 1.4 cents. Let us assume an average revenue per kilowatt-hour of at least page 371 } 1.3 cents. We find, thus, a smaller margin between this revenue and incremental cost than is the case with house heating. Consequently, it is clear that no rate reduction is appropriate, under the circumstances. Indeed, if the objective is simply to increase net, and not to maximize a profitable load, the common increase, 10%, applied to the other services as a whole, might well be appropriate. This is because a more than 40% increase in the margin over long-range incremental cost would more than offset any eventual decrease in gross demand.

Q. What is your recommendation then with respect to the water heating service?

A. Here we have to keep in mind the second criterion above

mentioned; namely, the need for a relative degree of stability in rate-making, that is, not too abrupt a degree of change from current levels. Currently, a substantial amount of electricity is still being sold at a one-cent rate under Rate Schedules 16 and 17 which VEPCO is proposing to terminate. Moreover, it appears likely that the recent strong demand in water heating installations was founded on the premise of the feature of Residential Rate Schedule 2 which charges only one cent for one-half of the monthly use in excess of 100 kilowatt-hours. True, the effective rate is higher, but the one-cent feature still has visibility. Consequently, keeping in mind that the present effective rate is profitable, when judged against long-range incremental cost, VEPCO's
page 372 } choice of a 0.4 cent discount to be applicable to the average consumption for water-heating seems entirely appropriate, as resulting in only a small increase over present average charges.

Q. If you have concluded your discussion of the price-elastic loads would you next turn to the implication of your analysis on the summer-oriented residential loads?

A. Certainly. We have a different set of conditions. I would conclude that incremental summer-oriented load is presently being added at a price considerably below long-run incremental cost, in contrast to the two services above discussed. It is difficult to determine with any degree of precision the incremental cost for an air conditioning installation, for example, since there is no way to measure with any exactitude the average annual consumption for this type of appliance, particularly as it applies to the bulk of air conditioning consumption derived from room air conditioners. Nevertheless, on Schedule 4 of my exhibit, I have shown an approximate incremental air conditioning cost of 2.5 cents—say, down to perhaps 2 cents for all summer-oriented load. In contrast to this cost, it is quite clear that the rate being paid for such kilowatt-hours, particularly when one considers that this is an incremental load being added in substantial volume, is well below even the lowest of these costs. Thus the block applicable to such sales for Rate Schedule 1 customers ranges from 1.8 cents to
page 373 } 1.4 cents; and for Rate Schedule 2 customers from 1.4 cents to 1.2 cents. It is obvious, therefore, that the substantial addition of such load at current step rates will materially worsen the company's financial picture. Indeed, as I have shown, the load factor reduction caused by the addition of substantial volumes of air con-

ditioning and other summer-related load is a major factor in VEPCO's need to file for rate relief.

Q. What in your judgment is an appropriate remedy for this circumstance?

A. The obvious answer might be to establish a separate rate, but this is hardly an appropriate *regularory* response. The general trend in rate regulation, particularly with respect to residential rates, is toward the elimination of special rates and of separate treatment for specific appliances. Furthermore, because of wiring problems and policing problems, it would be almost impossible to meter this consumption separately. Moreover, the typical block rate applicable to residential use here works in the wrong direction. This form of rate, in general, is highly appropriate to the residential service, because it matches unit revenue reduction with unit cost reduction, but the form works against the utility with respect to air conditioning. Thus, for most loads which peak in the winter and have reasonably comparable load factors, the greater the consumption per customer, the lower the cost.

page 374 } With a summer-oriented load, however, the opposite is the case, as the block-rate form makes the low, follow-up rates applicable to this high cost load.

The only remedy which seems feasible is the one which VEPCO has adopted, of using the seasonal differential concept, with a tail block in the summer substantially higher than that applicable during the rest of the year.

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Commissioner Catterall: A what?

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Q. Continue, please, Mr. Frazier.

A. Theoretically, to protect against loss from incremental air conditioning, one might even consider increasing this tail block to 2 cents in the summer months, or even higher. However, this would be a very substantial increase from the present level, 67% higher than the tail block on Rate Schedule

Number 2, and would thus go counter to the rate-making criterion of stability which I have postulated.

page 377 } Furthermore, it would be applicable to many loads, including some water heating, and some heating in the spring and fall months, which are price-elastic.

I conclude, therefore, that the summer period tail block of 1.8 cents per kilowatt-hour and is not an inappropriate modification and should be tested before any more drastic approach is attempted.

By Commissioner Catterall:

Q. Now, at that point what would the block before that tail block be in a sense?

A. Mr. Gay's testimony is before me.

Mr. Staples: 2.5?

Mr. Gibson: Yes, 2.5 cents.

A. (Continued) 2.5 cents is the third block.

Commissioner Catterall: So this would be lower?

Mr. Riely: Yes. It is lower in the tail block of the rates the company has proposed, even the summer.

The Witness: It is just you don't get as much lower in the summertime as you do in the wintertime.

Chairman Hooker: I suppose there is an in-

page 378 } crease in the minimum charge?

Mr. Riely: Yes, sir. That is my next question, Judge.

Commissioner Catterall: This 1.8 is higher than 1.2.

Mr. Riely: Yes, sir.

Mr. Gibson: At different seasons.

Commissioner Catterall: That is 50%.

By Mr. Riely:

Q. Mr. Frazier, for Judge Catterall's benefit, you will have noted that VEPCO proposes to increase the monthly minimum bill from the present $1.50 to $3.

Do you have any comment on this?

A. In the light of the per-customer costs which have been isolated, this seems to be a highly justified step. It is, of course, a substantial percentage increase for customers presently using hardly any electricity at all, but in terms of dollars per year it represents a relatively small increase, entirely justified by costs believed to be in the order of ap-

proximately $60 per residential customer per year. Moreover, VEPCO advises me that many of the minimum bills are incurred only once or twice a year, so that the annual increase in cost is substantially diluted. Those page 379 } who habitually have very small bills, the so-called convenience customers, have not been paying their proportionate share of costs for some time, and it is only fair to the other customers that they should begin to pay a more adequate portion of the cost to serve them.

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By Mr. Parker:

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Q. Do you know of any other jurisdictions which have permitted such a theory of rate allocation?

A. I think that most jurisdictions have in this sense: Perhaps elasticity hasn't been used as much in the testimony, but you certainly have seen in a great many cases discussions of offering a lower rate because that rate was necessary to meet competitive efforts by other companies.

There is a gas case in Milwaukee, I think, where this was discussed with respect to heating rate some years ago, and commissions have many times considered the competitive situation in fixing rates.

Well, when you said competitive situation, you are talking about elasticity.

Q. In summertime air conditioning your testimony is that it is almost totally inelastic, at least for residential air conditioning?

A. I said it was priced inelastic, which means it is less than unity. Whether it is .5, .3, .7 I don't know and don't purport to say.

Q. I guess your end result is that what you suggest be

page 386 } tried out for a while in order to determine whether your theories on elasticity are correct or not; isn't that right?

A. No, sir; I didn't mean it that way when I spoke about stopping at 1.8. I wasn't trying to test out my theories. I was trying to meet and come as close to meeting costs as possible without too much of a disruption to the present rate schedule.

Q. It is still less than cost at 1.8, isn't it?

Mr. Riely: I think the witness is trying to finish his answer, if the Commission please.

Mr. Parker: Pardon me.

A. (Continued) I would hope that a study by the company after a year or so of having this rate in effect would produce some measurements as to whether they had in effect covered the cost of taking on additional summertime load during this period.

I am afraid that the chances are greater that the company would have to come back and ask for further increase over the 1.8 than that they would come back and say, "No, we had asked too much; we are going down to 1.6."

Q. Do you know of any other jurisdiction which has resorted to this tail block increase in order to discourage summertime air conditioning?

page 387 } A. Well, I would like to put it a little bit differently, sir. I will try to answer that. I don't have a list, and it could be supplied you, but there are a number of jurisdictions which have a differential rate between summer and winter.

I don't think that this rate which VEPCO is proposing is being proposed to discourage use. I think it is being proposed to cover the cost of the use. If that is discouraging, it is unfortunate, but they can't keep on selling something below cost.

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page 396 } Q. On Schedule 2, Page 1 of 2, in your exhibit, the bottom lines relating to promotional cost, should they be ignored as the result of the recent Commission decision, or omitted from this exhibit?

A. Well, I tried to cover that in the remarks which I added, and note that you caught. There will be no house-

heating allowances as such, as I understand it. Whether the company concludes to put on a force of 100 additional salesmen, or whether they conclude to double their advertising allowance, I don't know at this point. I assume they are going to do something, because if they had a certain rate of gain and they were suddenly deprived of this promotional tool, they are going to have to respond, but I don't know what it is.

Q. Whatever they might do as far as you are concerned at the moment, it is speculative, is it not?

A. It is speculative, sir, but in making a rate of this kind you can't ignore the fact that they are going to have to do something. Again, I am not accounting for anything.

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page 400 } CARL H. SELIGSON, called as a witness on behalf of VEPCO, after having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Will you please give your name, occupation and address?

A. My name is Carl H. Seligson. I am a Vice-President-Research and Senior Utility Analyst of Kuhn, Loeb & Co., 40 Wall Street, New York, New York.

Q. Will you please outline the nature of the business conducted by Kuhn, Loeb & Co. and the nature of your duties?

A. Kuhn, Loeb & Co. is engaged in the fields of investment banking and securities brokerage and maintains an investment advisory service. My duties are related to the analysis of public utility securities in order to make recommendations to our clients for the purchase and sale of these securities.

Q. Are your firm's clients primarily individual or institutional investors?

A. Our clients are primarily institutional investors, such as banks, mutual funds, *insurange* companies, pension funds, charitable institutions and the like. Our Invest-
page 401 } ment Advisory Department performs overall portfolio management for those of our clients wishing constant supervision of their accounts, and many of these are individuals. The largest part of our business is with institutional investors whose funds are administered by professional investment managers.

Carl H. Seligson

Q. Would you please tell us of your educational and professional background?

A. I was graduated from Brown University with an A.B. degree in Economics and have done graduate work at New York University Graduate School of Business Administration. I have been employed in the investment field since 1961 and have devoted the largest portion of my time to the analysis of public utility securities since 1964.

Q. Have you ever had any of your writings published?

A. Yes. In addition to numerous research reports published by Kuhn, Loeb & Co., I also wrote an article entitled "Higher Rates of Return are Inevitable" published in Public Utilities Fortnightly in June, 1969. I also prepared a paper delivered before the National Association of Regulatory Utility Commissioners at their Annual Convention in October, 1969 on the subject of rate of return in an inflated economy.

Q. Have you ever appeared as an expert wit-
page 402 } ness before a regulatory commission?

A. Yes, I presented testimony before the Florida Public Service Commission on behalf of Southern Bell Telephone and Telegraph Company in Docket No. 69357-TP.

Q. What is the general subject of your testimony in the present proceeding?

A. The subject of my testimony is the adequacy of the proposed rates of Virginia Electric and Power Company in order for VEPCO to be able to attract the capital required to provide the necessary service to its customers.

Q. Have you analyzed the recent financial statements and projections of VEPCO with regard to their ability to maintain and support their financial integrity and credit and to raise funds necessary to provide adequate service?

A. Yes, I have.

Q. What criteria did you consider in this analysis?

A. In order to preserve their financial integrity, maintain their credit and raise the required capital, VEPCO must be permitted to have the capacity to earn a sufficient amount to provide a satisfactory coverage of interest charges and preferred dividend requirements while maintain-
page 403 } ing a reasonable balance in their capital structure. Earnings on common equity must be sufficient to permit competition with other corporations seeking to attract equity funds. Due to their extremely heavy construction and financing programs, it is of paramount importance

to their customers that VEPCO have this earnings capability.

Q. Are you generally familiar with the direct testimony presented by the VEPCO witnesses, including their projections of construction expenditures and financing requirements?

A. Yes, I am.

Q. From this direct testimony and their financial reports, would you summarize both the recent growth and the future construction program of VEPCO?

A. Net electric utility plant has increased by 68.8% in the five years from December 31, 1964 to December 31, 1969, from $838,975,000 to $1,416,593,000. The budgeted construction program indicates an increase of 115% in the next five years to $3,045,437,000 at December 31, 1974.

page 404 } Q. What do you think is responsible for this experienced and projected growth in the plant account?

A. These large construction programs are, I believe, a result of the rapid load growth in the service area combined with the impact of inflation on construction costs, the increased investment required due to the longer lead times needed to complete construction projects, the greater necessity for adequate reserve margins in the light of the increased size and complexity of new facilities, the added emphasis placed on reliability of service, and the substantial sums required for capital items relating to environmental protection.

Q. Does the size of the construction program have a direct bearing on the external financing requirements of VEPCO?

A. Of course. The growth in plant requires a corresponding increase in new outside capital since internally generated funds can provide only a relatively small part of the total funds required. It is interesting to note that of the total funded debt of $762 million at December 31, 1969, some $367 million or 48% has been raised on the last five years, while the balance was issued to help pay for capital additions over the entire prior history of the company.

Q. What has been the trend of interest rates on the debt securities issued by VEPCO?

A. VEPCO has issued debt securities in four

page 405 } of the last five years, with coupon rates ranging from 3⅝ to 7¾.

It should also be noted that the cost of the bank loans in

this period has increased from 4½% to 8½%, at the time of this writing, and now 8%, but that the present effect of interest cost for bank loans is in excess of 10% since the banks generally require minimum compensating balance of 20% on amounts borrowed.

Q. Can you update that statement by reference to bonds that were sold on April 21, 1970?

A. The bond sales on April 21 was at a coupon rate of 9% or cost to the company of approximately 9.09%.

Q. Would you please describe the calculation of the ratio of debt coverage and its significance?

A. Yes. The ratio of debt coverage is determined by dividing interest charges into gross income after taxes, except income taxes. The bond rating agencies rely heavily upon interest coverage ratios in appraising the degree of protection or amount of risk present in a bond. The coverage ratio is used as a measure of the relative quality and investment standing of a bond, and the rating assigned to the bond will greatly influence its cost and marketability. Further, the indenture agreement specifies a minimum coverage level which must be maintained in order to sell additional debt securities.

Q. What rating has been given to the VEPCO page 406 } debt?

A. Double A.

Q. Have companies lost such a rating in recent weeks or months?

A. Well, it is my understanding that just recently the Appalachian Power Company had been downgraded from AA to A, although I have not seen that in print; but in addition to that—that happens to be a company in this jurisdiction—in addition to that, there have been other companies which have lost AA rating. One that comes to mind is Consolidated Edison Company in New York.

Q. In your opinion, speaking as of today rather than as of the day when this initial testimony was evolved, what would the cost to VEPCO be if they were to sell debt today?

A. Oh, I would think the cost to VEPCO would probably be in the area of 9.30, 9.35.

Q. Have you examined the interest coverage ratio of VEPCO?

A. Yes, I have. In my Exhibit CHS-1, I have detailed the ratio of debt coverage for VEPCO for the ten years 1965 through 1974. Projections of coverage in future years on the basis of information supplied to me by Mr. Clement and assume different rates of interest for future debt sales.

Q. Was Exhibit CHS-1 one prepared by you or under your direction and supervision?
A. Yes, it was.

page 407 } Mr. Gibson: We offer this in evidence, if Your Honor please, Exhibit CHS-1.
Chairman Hooker: The exhibit will be received.

(Vepco ration of debt coverage, 1965 through 1974, was marked for identification Exhibit CHS-1 and received in evidence.)

Q. What does Exhibit CHS-1 show as to the past and future trends of interest coverage?
A. The interest coverage ratio has declined from 5.15 times in 1965 to 3.36 times in 1969. Under the assumptions that future debt will be sold at 8½% in 1970 and at 6%, 7% or 8% in the years 1971-1974, and in the absence of rate relief, the coverage will decline to 1.90 times, 1.77 times or 1.65 times respectively by 1974.
Q. Have you compared the VEPCO coverage ratio with that of the electric utility industry on average?
A. Yes. In my Exhibit CHS-2, I show the coverage ratios for VEPCO and the FPC Class A and B electric utilities. The FPC data is not available with interest annualized, which would lower the coverage somewhat. Thus, while VEPCO had better coverage than the industry average through most of the period, the differential probably disappeared in 1969. As the future financing program described by VEPCO is carried out, the coverage ratio will fall substantially below the industry average since the
page 408 } percentage of outside financing for VEPCO will be considerably higher than that for the industry on average.
Q. Was Exhibit CHS-2 prepared by you or under your direction and supervision?
A. Yes, it was.

Mr. Gibson: We offer that into evidence, if Your Honor please, Exhibit CHS-2.
Chairman Hooker: The exhibit is received.

(Coverage ratios for VEPCO and for Class A and B Electric Utilities was marked for identification CHS Exhibit 2 and received in evidence.)

Carl H. Seligson

Q. Why do you state that the coverage ratio for VEPCO will fall below that for the industry average in the future?

A. Earlier in my testimony I stated that current construction budgets for VEPCO indicate an increase of some 115% in net electric utility plant between December 31, 1969 and December 31, 1974. I calculate that the increase for the electric utility industry on average will amount to some 50%, about in line with the past when plant has roughly doubled every ten years for the industry. The lower rate of growth of plant for the industry will require a lower relative amount of external financing, thus not impairing the ratio of debt coverage for the industry to the same extent that it will be impaired for VEPCO. Long-term debt of VEPCO will increase some 143% between year-end 1968 and
page 409 } year-end 1973, while I calculate that the increase for the industry in this period will be less than half as great. Some months ago, when I made this calculation, it amounted to an increase of some 53% for the industry.

Q. What conclusions do you draw from your comparisons of interest coverage ratios of VEPCO and the FPC Class A and B electric utilities?

A. Due to the necessary sale of long-term debt at prevailing rates, the imbedded interest cost for VEPCO has risen from 3.66% in 1964 to 4.85% in 1969. Earnings growth has been insufficient to maintain the interest coverage ratio. The rapid growth of demand has required rapid growth of facilities, with a corresponding need for additional capital. This capital has been raised at prevailing rates, which have been considerably in excess of the embedded cost of capital. This process is continuing.

In recent years, operating costs have increased at a rate exceeding any offsetting economies. In 1967, VEPCO's electric operation and maintenance expenses per kwh sold amounted to 5.60 mills while in 1968 these costs rose to 5.80 mills and in 1969 they amounted to 6.12 mills. Once again, an adverse trend is continuing.

In the face of these trends, VEPCO has not raised its rates in 15 years, but has indeed reduced them and their average revenue per kwh has declined.
page 410 } I conclude that the interest coverage ratio must be increased in order to maintain the financial integrity and credit of VEPCO. I believe that the factors outlined by Mr. McGurn clearly illustrate that there are no remaining economies available to VEPCO that have not already been utilized to improve net income without re-

course to higher rates. Therefore, without a sizeable reduction in prevailing interest rates and other costs, interest coverage can be improved only by increased rates.

Q. Are you familiar with VEPCO's capitalization ratios?

A. Yes, I am.

Q. What are these ratios, and how do they compare with the industry average?

A. At December 31, 1969 VEPCO had 53.7% long-term debt, 3.8% short-term debt pending permanent financing, 8.9% preferred stock and 33.6% common equity. The common equity portion is slightly lower than the industry average of 35.4% at December 31, 1968 while the long-term debt portion is slightly higher than the 52.2% for the industry. Short-term debt is slightly higher and preferred stock slightly lower than the ratios for the industry.

Q. Do you consider these capitalization ratios as reasonable?

A. Yes, I do.

page 411 } Q. In your opinion, would it be in the interest of consumers that, as a matter of policy, VEPCO increase the common equity ratio beyond the level of December 31, 1969?

A. No, I do not think it would be. In the long run, increasing the common equity ratio increases the cost of capital because subsequently rates must be paid to provide a fair return on the additional common equity. I would prefer to see a current rate of return that would allow VEPCO to maintain a sound capital structure and finance its needs on a basis consistent with industry practices, since in the long run this will best serve the needs of the customers.

Q. Since you cannot change the level of interest rates, and would not change the capitalization ratios, what would you do in order to improve the coverage ratio?

A. Raise rates.

Q. What do you consider an appropriate level for interest coverage?

A. I believe this ratio should be in the area of 3.0 to 3.5 times on an annualized basis of interest costs.

Q. Why do you feel this range is appropriate?

A. I feel that an electric utility that is expanding rapidly should have a ratio of debt coverage at least equal to the ratio of the average electric utility. As I explained earlier, the more rapidly growing company will be selling proportionately more debt at interest rates above the prior embedded

page 412 } costs, thereby increasing its embedded cost more quickly and eroding its coverage ratio more rapidly. VEPCO will have a greater need to sell debt at a time not of its own choosing due to its need for the funds to provide adequate service and must have earnings sufficient to attract capital on an acceptable basis even in periods of monetary stringency and high interest rates.

Q. What ratio of interest coverage would be produced by the rates proposed by VEPCO?

A. I have examined this matter in my Exhibit CHS-3. If we assume that the proposed rates are in effect as of January 1, 1970 and produce the revenues they are designed to produce, and that VEPCO does in fact sell $170 million of debt during 1970 at a cost of 8½%, then the coverage ratio would be 3.14 times.

As can be seen in Exhibit CHS-3, assuming that the rates continue to provide the revenues they are designed to produce, interest coverage would decline from these levels in future years even if future debt is sold at but 6%.

Q. Was Exhibit CHS-3 prepared by you or under your direction and supervision?

A. Yes, it was.

Mr. Gibson: We offer it in evidence as Exhibit CHS-3, if your Honor please.

Chairman Hooker: Exhibit 3 is received.

page 413 } ("Interest Coverage Would Decline if Future Debt is Sold at But 6%" was marked for identification Exhibit CHS-3 and received in evidence.)

Q. In your judgment, then, are the proposed rates fair and reasonable based on the ratio of debt coverage that they will provide?

A. Yes, they are just barely adequate at the current point in time. That is to say, assuming an 8½% cost of debt in 1970, which I believe is an understatement, the interest coverage ratio with the new rates will be just above the minimum point that I consider acceptable. Investors are quite cognizant of the fact that higher rates of interest will prevail relative to embedded debt costs, and that the interest coverage will necessarily be eroded in future years. Personally, I would rather see higher coverage at this point in order to allow for the erosion that will take place, but I will say that the proposed rates are certainly fully justifiable

based on the interest coverage test. As can be seen in Exhibit CHS-3, the proposed rates will not prevent a continuation of the decline in coverage, even assuming future debt at a 6% cost.

Q. Since you believe that the interest coverage ratio provided by the new rates is adequate to attract future debt capital, what about the attraction of equity capital?

A. It is the return on equity capital that provides, in large part, for the coverage of interest. An increase
page 414 } in the return on equity capital is, in my belief, an absolute necessity to provide greater interest coverage and also to maintain the integrity of the common stock investment.

An investor buys a common stock with the anticipation of earnings growth in the future. He is willing to accept the additional risk of ownership due to his expectation that the combined return of dividends and price appreciation concurrent with higher earnings will exceed the returns available in investments with less risk. When both operating costs and capital costs take an increasingly larger portion of revenues, as they have for VEPCO, then the return on common equity declines and the common stock investor no longer participates in the growth of the business, and the risk factor is increased.

Q. What do you mean by the risk?

A. Since growth in earnings is the primary objective of an investor in common equities, it seems quite obvious to me that the investor of today is taking more of a chance on the future growth than his counterpart of some years ago. The rapid increase in the cost of senior capital and in operating costs results in a squeeze on the earnings available for common, demonstrating clearly that there is greater risk in equity investments in electric utilities than was previously the case. The decline in price: earnings ratios for the utility group, and for VEPCO, is illustrative of the
page 415 } greater risk in predictable earnings increases. When an investor is able to receive a return of 9% on the bonded debt of a company, he must expect considerably higher return on the common stock to compensate for the added risk that he assumes. In 1965, VEPCO sold $60 million of debt with a 4½% coupon and earned 13.4% on common equity while the last debt issue offered a 7¾% coupon and the return on common in 1969 was but 12.1%. It would appear that the reward for risk has decreased while

Carl H. Seligson

the actual risk has increased. Investors do not, in general, segregate their fund for commitment to debt or equity securities, but rather compare anticipated rewards with anticipated risks.

Q. What would help to attract investors to future common equity offerings?

A. The belief that a company's management is dedicated to providing increased earnings through taking every possible step to achieve a return on common equity that is adequate in light of present day conditions and that the regulatory body having jurisdiction is realistic in its recognition of this need.

utility industry, do you have an opinion as to a reasonable

Q. As an adviser to potential investors in the electric utility industry, do you have an opinion as to a reasonable return on common equity for VEPCO?

A. Yes, I do. In my opinion a reasonable return on common equity for VEPCO would be in the area of 13.5-

page 416 } 14.5%.

Q. How does this suggested return on common equity for VEPCO compare with that earned by the electric utility industry on average?

A. It is higher, but I don't think that this is a valid comparison. VEPCO also has a greater load growth, a greater need for facilities and a greater requirement for external financing than the industy on average. VEPCO must be able to attract capital in proportionately greater amounts than the industry on average and at more frequent intervals. In order to compete for the investors' dollars, VEPCO must be allowed to do better than the average.

In addition, the return will be eroded more quickly for VEPCO than for the industry due to the fact that proportionately VEPCO will sell more debt at a higher interest cost. I also believe that the return on common equity for the industry on average is woefully low in the light of present day conditions. The industry must provide adequate service and cannot conscript the capital required to provide this service. The trend of interest coverage for the industry is bad and will worsen with future financings at historically higher costs than have been experienced. Many utility managers have already recognized this problem and have sought a higher return through increased rates and, fortunately, most regulatory bodies are equally cognizant of the magni-

tude of the problem and are permitting higher

page 417 } returns on equity.

Carl H. Seligson

Q. What return on common equity would be produced by the rates proposed by VEPCO?

A. Under the assumption that these rates were in effect as of January 1, 1970 and produced the revenues they are designed to produce, and an 8½% cost of new senior capital in 1970 and 8% in 1971, the return on common equity capital would be 13.6% in 1970 and 12.4% in 1971.

Q. In your judgment, are the proposed rates fair and reasonable based on the return on common equity that they provide?

A. Again, as in the case of the interest coverage ratio, they are barely adequate and nothing more at this point in time. The cost of senior money in the future will cause erosion in the return on common equity as it has in the immediate past. I would personally prefer to see an equity return level set in the 13.5-14.5% range on average for several years in the future since I believe that it is inevitable that whatever level is set currently will be eroded almost immediately. Setting the return on equity in this area would also provide a greater ratio of debt coverage than is now indicated.

Q. Are you prepared at this time to offer an overall rate of return level that you consider appropriate?

A. No, I am not concerned with the matter of overall rate of return since I consider this very much a matter of mathematics that is not financially relevant. The concern of potential investors is with adequate compensation for their capital, and the industry in general and VEPCO in particular must be assured of the availability of this capital in order to assure the completion of facilities required to provide service. Rate of return is necessarily tied to cost of money, and the only major variable in determining the cost of money is the return of common equity. I would suggest that since rates that are set by this proceeding are to be collected in the future, the revenues and costs reasonably expected for the future should be examined and considered in determining the end result.

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Q. Would you please summarize the principal matters you have covered in your testimony?

A. Yes. It is my belief that VEPCO's rate of load growth, and consequently the growth in required plant and capital, is such that the ratio of interest coverage should be at least equal to that of the industry average. I feel that the present and projected ratio of interest coverage is too low and constitutes a threat to the maintenance of the financial integrity

of VEPCO. I conclude that the ultimate results in this proceeding should be to provide interest coverage in the range of 3.0-3.5 times.

Further, it is my judgment that the return in common equity for VEPCO should be sufficient to provide
page 419 } the adequate coverage ratio and should be set with current alternate investment returns considered. To this end I would recommend that a return on common equity of 13.5-14.5% would be an appropriate level at this point in time.

Q. In your judgment, are the proposed rates of VEPCO fair and reasonable in relation to your criteria for interest coverage and return on common equity?

A. They are barely adequate so far as the results that they will produce in 1970. However, I believe that no allowance is made for what I consider to be the certainty of erosion in both interest coverage and return on common equity. As I have stated earlier, I consider the minimum coverage level to be 3.0 times and the minimum return on common equity to be 13.5%, and the proposed rates barely produce these results in 1970. Even under the assumption that new senior capital can be raised at a cost of 6% in 1971, the interest coverage ratio would decline to 2.79 times and the return on common equity to 12.6%, levels which I consider below the minimum acceptable. The implication in the mind of the investor would be that VEPCO must continually seek rate relief. Such an assumption would, I believe, produce a lack of *conficence* which would in turn lead to still higher costs of capital for VEPCO and require still higher and more unstable rates for the consumers to bear, and additional time and expense for both VEPCO and the Commission by virtue of the need for a series of rate
page 420 } increase applications.

It follows that if increased rates were to be considered the only source of increased earnings of the company, I do not believe the increase requested by the application is sufficient. But I understand from company management that the redesign of its rate structure, particularly the summer-winter differential, and the related effort to build up winter load, has substantial promise of adding to net earnings. If this sales and operating judgment of the company is realized in such degree as to satisfy the conditions I have stated, I believe the application is reasonable and proper, though I must maintain my own personal reservations that the application is for a minimum increase and that in all

probability events will force the company to return at an early date for additional relief.

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page 425 } CARL H. SELIGSON, was recalled as a witness, and having been previously first duly sworn, was examined and testified further as follows:

CROSS-EXAMINATION

By Mr. Staples:

Q. Mr. Seligson, have you determined the cost of equity for the entire company or for the Virginia Jurisdiction?

A. When you say determined the cost of equity, you are referring to my reference to what it was in 1969?

Q. Well, your recommendations.

A. Oh, my recommendation? That's for the capitalization which would be the entire—

Q. The entire company?

Is there a difference in the cost of equity to VEPCO for the purchase of equipment to serve Virginia Jurisdictional customers than to serve non-Jurisdictional customers?

A. Well, being associated with the stock market, basically we are interested in the stock or the equity that's available to purchase or which is all the equity that exists and which serves everybody that VEPCO serves, so it is really—

Q. Your answer is no?

A. The answer is no.

Q. If the cost of capital is the same shouldn't the rate of return for both be the same?

page 426 } A. Well, I don't get into the subject of rate of return in my testimony at all.

Q. On rate base.

A. I beg your pardon?

Q. On rate base.

A. I make a return on capitalization. The return on capitalization is whatever that capitalization is used for. If you want to make a differential, that's the Commission's job, not mine.

Q. You feel the cost of equity to capital to VEPCO is in the range of 13½ to 14½%, is that correct, as indicated by your testimony?

A. That's what I recommend as a return on equity capital, yes.

Carl H. Seligson

Q. This would then be for the cost of capital for all segments of VEPCO's business?

A. It would be the cost of all equity capital.

Q. Regardless of where that equipment is involved and what customers that equipment serves?

A. It would be the cost of all equity capital.

Q. What in fact does an investment earning much less than the cost of capital, about 25% of the capital of a business, have on the investor acceptability of the stock?

A. Assuming that they—if I gather what you are saying, in case the capital would not show a return of
page 427 } 13½% on equity capital, they would have earned 13½% on part of it and something less on the other part, so that as to all classes it would show a return less than 13½% which, as I say, would be undesirable.

Q. Then you state the way to improve VEPCO's earnings picture is to raise rates?

A. Yes.

Q. And that the whole rates, Jurisdictional and non-Jurisdictional—we are just considering Jurisdictional rates here—

A. Well, I have no reference to what is Jurisdictional and what is not Jurisdictional. My reference is simply to the return of the dollars which the investors have contributed to this business and which return they must have to continue to contribute dollars to VEPCO.

Q. Then, in short, your testimony is you have not determined a rate of return on a rate base at all?

A. No, I have not.

Mr. Staples: All right, Mr. Parker.

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page 449 } By Mr. Parker:

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Q. If in theory the stock had been sold exactly at book value, does that mean that a person was willing to invest at a reasonable return of 12.1%?

page 454 } A. No. The return on common equity as repre-

sented by my recommendation of 13.5 to 14.5 percent is not the return that the investor receives when he makes an investment in common stock. The return that he receives or that he expects to receive is based on the increased earnings that the company can provide and which will be translated to an increase in price in the stock and the payout of earnings that the company makes to him in the form of dividends.

The source of increased earning power in the future is threefold, three and only three sources:

The sale of additional common equity at above book value is one source;

The earnings on the retained portion, what is earned during the course of a year, the return on common, on the retained portion in the following year; and,

An increase in the return on common equity.

There is no other way that earnings can go up. These are sources which must be made available so that the suggestion that the return on book value is what the investor is looking for is to my way of thinking just a

page 455 } lack of knowledge of what is going on in the market.

Q. What applicability, then, does your term of return on common equity have if it is not a consideration of the investor who is putting the money up?

A. The applicability is that this return must be made available to the company, giving them the opportunity to earn it, so that the earnings per share growth will be able to increase in the future, because this is what the investor winds up making his decision about the common stock in looking at, that the earnings per share and the dividends will be increased in the future.

Q. You referred to the fact that you are an adviser to potential investors. What primarily are you looking toward when you give your advice? What is the criterion that you place your primary weight on?

A. Growth in earnings per share.

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page 460 } JAMES C. WHEAT, JR., called on behalf of the Applicant, being first duly sworn, was examined and testified as follows:

James Wheat, Jr.

DIRECT EXAMINATION

By Mr. Gibson:

Q. Would you tell the Commission your name?

A. Mr. Gibson, if it is permissible, after the response to this question I would like to have my testimony read.

Q. Certainly, we would be delighted to do that.

A. My name is James C. Wheat, Jr. I am the Chairman and Chief Executive Officer of Wheat & Company, investment bankers, incorporated.

Q. We will have the testimony read by Mr. Riely. You have prepared your own testimony and that has been filed with the Commission, is that correct?

A. That's correct, sir.

Q. We will read it just as you have prepared it.

Please describe briefly the business of Wheat & Company, Inc.

(Answers read by Mr. Riely:)

A. Wheat & Company, Inc., operates 13 offices in Virginia, North Carolina and West Virginia. Eight of these offices are located in Virginia, more than any other
page 461 } investment banking and brokerage firm. From these Virginia offices approximately 100 registered representatives deal with some 25,000 active individual investors. In addition to these individual investors, our firm is currently doing business with several hundred institutional investors throughout the United States and overseas. This relationship with institutional investors is due in large measure to their reliance our our extensive and specialized knowledge of Virginia companies and their management.

Q. What is the purpose of your testimony in this case?

A. My comments are those of a Virginia businessman concerned with the future economic well-being of my State.

Q. How will the outcome of this case affect the future economic well-being of Virginia?

A. At the risk of appearing perhaps to over-simplify a very complex subject, may I say that there are two basic and inextricably interrelated questions before this Commission. First, will VEPCO be able to compete in the capital markets for the funds necessary to provide the service required, and, second, will the Commonwealth have a reliable and adequate supply of the electrical energy com-
page 462 } pletely essential for continued economic growth?

If the answer to the first question is "No," then the answer to the second is likewise "No." The result will be economic stagnation instead of the economic vitality we currently enjoy.

Q. Please explain.

A. VEPCO is only one of a hundred forty-nine investor-owned utilities whose securities are listed on the New York Stock Exchange and only one of approximately 50,000 companies whose securities are traded in the listed and unlisted markets. The appeal of VEPCO bonds and stocks to investors, both private and institutional, will be based on absolute earning power and earning power relative to other comparable companies. In addition to this truism of competition, there is the truism that all investors, individual or institutional, are investing for the future. Investors purchase securities only if the indications of the future assure them of adequate earnings coverage for debt and adequate growth in per share earnings on common stock. The rapid and unprecedented increase in construction costs, combined with the unprecedented rise in interest rates over the past few years have made this future highly questionable for the electric utility industry, including VEPCO. To the bond investor, the increase in embedded interest cost
page 463 } has reduced the interest coverage, thus lowering the quality of the bond, which in turn tends to further increase the cost of future borrowings and thus the embedded interest costs. At the same time, the same forces reduce the rate of return on equity, which increases the risk and inevitably tends to reduce its investment appeal and market value. In these circumstances a much greater return on equity is needed than has been allowed or thought of for many years.

Q. What would be the effect of current economic circumstances on an electric utility such as VEPCO?

A. In the extreme, if Vepco continues without an adequate rate increase, embedded interest cost will rise; debt coverage will decline; bond ratings will be reduced to A or below; dividends on equity will be cut; and no one can say with assurance that equity capital could be raised. We Virginians are a proud and loyal breed, but pride and loyalty will not provide Vepco with the $1,900,000,000 necessary to provide adequate electric service by 1975. VEPCO must have an adequate increase in earnings if it is to attract the necessary capital from either Virginia investors or investors outside the Commonwealth.

James Wheat, Jr.

page 464 } Q. How of VEPCO's ability to raise capital related to other sectors of Virginia's economy?

A. My firm has the privilege of serving as investment banker for some 100 Virginia corporations. In the last several years we have managed accounts and/or placed privately securities aggregating $100 million for some of our Virginia clients. These included commercial banks, insurance companies, furniture manufacturers, computer hardware and software companies and gas utilities, to mention but a few. Obviously, this is but a small portion of the total spectrum of capital formation in the Commonwealth, but it is indicative of the great vitality of our economy at present. The corollary of this great economic vitality is an increasing demand for electric energy. In my opinion we cannot expect continued growth in the economy of our State without a reliable and adequate supply of electric energy.

Q. Mr. Wheat, what must be done to assure such a reliable and adequate supply of electric energy?

A. VEPCO must have earnings that will attract investors to its securities. Those earnings must be improved from recent levels if VEPCO is to raise sufficient capital to carry out its more than two billion dollar construction program that the company believes necessary during the next seven years to provide reliable and adequate service. Professor Phillips, Dr. Keyserling and Mr. Seligson have

page 465 } presented to the Commission their expert and detailed testimony regarding proper rate of return for VEPCO. I believe that a rate of return in the range they have indicated will be adequate for the immediate future. It is of critical importance to the Commonwealth that the Commission permit VEPCO to earn at the level necessary to enable VEPCO to raise the capital required to provide adequate and reliable service for all sectors of Virginia's economy.

Q. Mr. Wheat, you have heard the testimony of Professor Phillips and Professor Seligson; is that correct, sir?

A. That is correct, sir.

Q. There has been read to you the filed testimony of Dr. Keyserling who will follow you; is that correct?

A. That is correct, sir.

Q. Has your own testimony been faithfully read to you?

A. Yes, sir.

Q. Have you anything else to add?

A. Well, I would first like to address a comment to the thrust of Mr. Parker's cross-examination of Mr. Seligson

yesterday afternoon, in which Mr. Parker sought to imply that Kuhn, Loeb and Company and any other underwriter was by participating in the sale of VEPCO common stock on March 10th in essence endorsing the present pattern of rates.

I don't think this is the case at all. Our firm participated in this underwriting. I did not participate in
page 466 } the sale or distribution of the shares, but the firm took a position, and the position in this underwriting was predicated on a basic belief in the record of this Commission in responding to responsible requests for rate increases over the years, where appropriate.

Absent this climate VEPCO would not have been able to sell the securities, and I doubt that we or any other underwriter would have seen fit in the hectic capital markets of today to have participated.

Put another way, absent the continued responsive attitude of the Commission to responsible requests, I think you will see a liquidation of VEPCO shares with an attendant further reduction in the prices, and with the attendant further difficulty in raising the necessary capital.

I also direct Mr. Parker's attention to the fact that the investor has a mobility that the consumer that he is supposed to be protecting does not have. The investor can sell and move elsewhere. The consumer unless he wants to leave the VEPCO trade area has no such option.

Finally, I think that the question of adequacy of return is pointed up today more than anytime in the 25 years that I have been in the securities industry. The markets I think speak for themselves, both the debt market and the equity markets. I honestly do not recall any period in the 25 years that I have been in this business in which the
page 467 } markets have been as unsettled across the board, both debt and equity.

Therefore, in my judgment it behooves this Commission in the public interest to see that this company gets the rates necessary to compete in the capital markets to provide the facilities that are so essential to continued growth in this state.

The irony of it is that absent these rate improvements the consumer that Mr. Parker is representing is going to be hurt the most, because as the press covered this morning, you see that dimouts are expected; he is going to lose service. Further, if you do not get the facilities built to provide

efficient power, you will in my judgment ultimately end up with higher costs to the consumer.

I am a consumer and I am in favor of the rate increases.

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page 469 } LEON H. KEYSERLING, called as a witness on behalf of the Applicant, after having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Will you please state your name, occupation, and business address?

A. Leon H. Keyserling, 1001 Connecticut Avenue, Washington, D. C.

Q. Your occupation?

A. I am a consulting economist and attorney, and also President and Director of the Conference on Economic Progress, a nonprofit foundation engaged in economic research and education at the same address.

Q. What has been your experience in economic and financial matters?

A. My experience in such matters has extended over almost four decades. After teaching economics at Columbia University, I held positions in the Federal Government from 1933 to 1953. Throughout these 25 years, my work concentrated upon economic and financial matters, first as Legislative Assistant to one of the most active Senators on Capitol Hill and as the Chief of Staff of the Senate Committee on Banking and Currency, of which he was Chair-
page 470 } man; second, in various housing and home-finance agencies; and third, for seven years as Vice Chairman and then Chairman of the Council of Economic Advisers to President Truman. Since 1953, my work has covered a very wide range of economic and financial studies for individuals and for very large business, labor, and farm organizations, and also consulting for some governments overseas. My work in connection with the Conference on Economic Progress has involved preparation of close to 30 book-length studies of a wide range of problems within the U. S. economy, all clustered around the theme of adequate economic growth and the relationships among the components thereof. I have also served, since 1953, as consultant to some Senate Committees and Senators.

Leon H. Keyserling

Q. Has your work drawn you into the utility field?

A. Very extensively. I have, over the years, made comprehensive studies of the natural gas pipeline industry, the electric utility industry, and the railroad industry. I have represented various combinations of utilities and individual utility companies before regulatory commissions, both Federal and State, and also offered Congressional testimony on their behalf.

Q. What has been the major theme or focus of your work in the utility field?

page 471 } A. In line with my main interest and focus in all of my economic work during the past four decades, I have sought to ascertain and quantify the needed facilities and services on the part of the utilities, and, as part of this, their needed dollar receipts, in order that they may make the investments and conduct the other business activities essential to their important role in facilitating optimum economic growth in the U. S. economy at large. Thus, my principal interest in the progress of the utilities has related to their capacity and incentives to furnish optimum services to the consumer, both industrial and household, at the price which best serves the customer in the long run, in a U. S. economy expanding at an optimum rate.

Q. What do you mean by this?

A. The price which best serves the consumer in the long run is not the lowest possible price at any given time. It is the price which results in an optimum allocation of resources between investment in the means of expanding production, including technological progress and research directed toward reducing real costs, on the one hand, and expansion of consumption, on the other hand.

Q. Can you capsule the significance of what you have just said, in its applicability to the problems of utility regulation?

page 472 } A. In capsule form, the prime problem is to achieve and maintain that substainable balance between investment and consumption which will optimize service to the consumer on the long run. This, in my view, is the central challenge to the whole regulatory process.

Q. How do you feel that the investment-consumption balance can be reasonably achieved in the public utility field?

A. The generally laudable desire to achieve, through the rate-making process, the lowest possible price to the con-

sumer in the short run must be balanced against the need to maintain the investment programs of the public utilities at levels compatible with optimum service to the consumer in the long run. In view of the most recent trends, I feel that this will present a serious problem during the years immediately ahead, if remedial stops are not taken.

Q. How do you intend to develop and quantify this thesis in your testimony here today?

A. My strongly-held view is that the problems and performance requirements of any particular business entity in the public utility field must be viewed in the larger perspective of that regulated industry as a whole; that such industry as a whole must be examined in the still

page 473 } larger perspective of the regulated utilities in general; and that the regulated utilities in general must be viewed in the still larger perspective of the problems, needs and potentials of the U. S. economy as a whole. We must take care lest insufficient attention be paid to these broader perspectives. This does not mean that each regulated business entity does not require treatment in terms of the highly specialized conditions pertinent to it. But unless the regulatory process is to become excessively *ad hoc* and excessively complex, and if it is to achieve the full public-service results intended, it is my view that there must be increased attention to these larger perspectives. For after all, what each regulated business entity does enters into the stream of our general economic activities and progress, affects that stream, and is also affected by it.

The outline which I shall therefore follow in my testimony here today is first, to examine the pertinent problems of the U. S. economy at large; second, to examine the pertinent problems of the regulated utilities in general; and third, to move more pointedly into analysis of Virginia Electric, and the regulatory treatment to be applied to this company.

Throughout the various stages of my analysis,

page 474 } I shall stress the problem of the investment-consumption balance which seems to me to be the core problem, and perhaps one requiring unusually careful and prompt attention in the case of the regulated public utilities generally, and Virginia Electric in particular.

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Leon H. Keyserling

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In any event, as I shall demonstrate fully as my testimony proceeds, the observation that business investment in general may now be advancing too rapidly has no applicability whatsoever to the regulated utilities in general, nor to Virginia Electric. Entirely to the contrary, as I shall show, recent and current trends in revenues and income, unless promptly corrected, indicate that investment in future threatens to lag dangerously in the perspective of appropriate correlations between actual and desirable trends in the regulated utility field and those in the general economy, and also in the perspective of utility-service needs.

Q. Can you now proceed in detail with your examination of the investment problem among the regulated public utilities?

A. We must always remember that, in our kind of mixed economy, combining responsible free Government and responsible free enterprise, the core problem of economic growth needs to be dealt with by use of both aggregate and selective approaches. Just as the progress of particular
page 484 } industries, including the regulated utilities, depends upon the overall economic environment, so the overall economic environment and performance are, in a large degree, a composite of what happens to individual industries, as affected by the policies bearing upon their performance. We must build from the ground up as well as from the top down.

As I have already stated, the understandable desire of the regulators and utility management to achieve the lowest possible price to the consumer in the short run must not be permitted to impair the ability to obtain adequate funds for investment. The appropriate equilibrium between the investment factor and the consumption factor must be maintained. This equilibrium, at least theoretically, is the purpose of the classical "free market" for which utility regulation has been substituted.

The practical consequence of regulation must be to place the regulated utilities in a position of desirable equality with the nonregulated sectors. They must not be placed at a competitive disadvantage in the attainment of investment funds and the expansion of investment programs. This would run

counter to the very purposes for which regulation was intended. In its zeal to do for the consumer in the short run what classic competition was intended to do, the regulatory process must not become inimical to the consumer
page 485 } interest in the long run, by creating a disequilibrium in the form of deficient investment. And this would be doubly damaging because, in order to provide optimum service to the consumer and to the U. S. economy at large, the regulated utilities will need to expand capacity considerably more rapidly than the U. S. economy at large in the years ahead.

Q. What is the relative importance of investment in the regulated utility field?

A. Of course, the economy at large is more important than any one sector. But subject to this truism, any inadequacy in the volume and rate of expansion of investment in the utility field would in some respects be more urgent and acute than the overall investment problem, or at least more urgent and acute than in some other important sectors.

Q. Why is this the case?

A. The first reason for this is the great extent to which the services rendered by facilities in the utility field underpin and influence other lines of economic development, and enter into consumer standards of living. We could do for a while, if we had to, with an inadequately expanding supply of many types of goods and services, and in some instances we would be better off if the supply were reduced. But we cannot grow and prosper as we should, without an adequately expanding supply of electricity, gas, communica-
page 486 } tion facilities, et cetera. In fact, the investment process among the utilities is not only a quantitative item in total private investment, it is also a powerful conditioning factor in determining the magnitudes of many other investment items in total private investment.

Second, and more directly, utility investment in plant and equipment is a very substantial component in total nationwide investment in plant and equipment, coming to 18.0 percent of the total in 1968.

Third, for a wide variety of technological reasons and reasons relating to changing patterns of industrial development and consumer demands, plus the factor of rapid population shifts, it is well recognized that investment in the public utilities needs to grow more rapidly than the economy at large, or private investment at large, in the foreseeable years ahead. This is needed not only to provide directly

the services which the utilities offer, but also to help assure adequate growth in total nationwide private investment, and also adequate growth in the economy at large.

Fourth, while some erratic ups and downs in the process of investment in some sectors of the economy may be endured—although vigorous efforts should be made to reduce these—the situation among the regulated utilities is entirely different. Ironing out the business cycle with
page 487 } respect to utility investment is not merely desirable, it is imperative, because the whole economy is so dependent upon such growth. Further, in some sectors, investment can be permitted to respond to demand, but in the utility sectors, investment to a considerable degree needs to run ahead of demand, and to anticipate it. Substantial reserve capacity is also more needed in the utility sectors than in most others.

Recent developments involving Consolidated Edison in New York, the New England telephone system, and the Denver power system, afford examples of imperative need for considerable reserve capacity in the utility field, in part to maintain full service despite unexpected breakdowns or interruptions, and in part for reasons stated above.

Q. Would you now turn to your quantitative examinations of the problems confronting the public utilities in general?

A. I will begin with a discussion of trends in revenues and income, and first of all must explain my reason for starting at this point. As one who tries to bear the public interest in mind, I have no independent interest in revenues and income *per se*. To illustrate this explicitly, if revenues and income should be reduced to zero, and business concerns nonetheless maintain optimum extension of plant and service to the consumer, no one could object in terms of the
page 488 } public interest. But this extreme example illustrates the point, really the same as the point earlier made with respect to the relationship between the optimum price to the consumer and the optimum level of business investment, that the very purpose of revenues and income is to optimize plant growth and the ability to translate that plant and technology into the service of the consumer. Thus, my grave concern about revenue and income trends, looking forward and not backward, is this: I see also, in the growth impact of adverse revenue trends upon plant and sales, enough to convince me that optimum plant development and sales will be impossible to support in future

if these adverse revenue and income trends continue. My portrayal of the trends in plant and sales on Charts 5 and 6 is not designed to question what has happened, but rather to indicate the basis of my strong conviction that improved revenue income trends are essential even to maintain the rates of plant and sales expansion which have thus far taken place, and certainly essential to move forward to the even improved performance in future which we all desire in common.

Although it is only recently that the revenue and income problems of the utilities have become dramatically clear, the adverse financial trends which have been developing can be seen to have originated some years ago. My Chart 7 shows rather vividly what has been happening. In the

page 489 } case of the public utilities generally, comparing 1953-1960 with 1960-1968, the average annual rate of advance in per unit revenues worsened from 2.3 percent to 0.3 percent; in the case of the electrical utilities, worsened from minus 0.2 percent to minus 1.2 percent; in the case of the pipelines, declined from 5.2 percent to minus 0.6 percent, and for all gas utilities, declined from 4.7 percent to 0.2 percent. To the extent that these declines in per unit revenue represented a response to gains in efficiency and reductions of real costs, they were a desirable phenomenon. But it has become increasinly clear of late—although the timing of this impact has varied among the different utilities—that continued declines in per unit revenues have already produced a serious squeeze upon revenues and income in the case of many companies, and will soon do so in the case of many others.

Q. You indicated that the adverse financial trends which have recently become abundantly apparent have been developing for several years. Could you elaborate?

A. As shown also on Chart 7, during 1960-1968, compared with 1953-1960, the average annual rate of advance in income before taxes declined tremendously in the case of gas pipelines and the gas distributors, greatly in the case of the utilities at large, and quite substantially in the case of the electric utilities. Income after taxes showed very adverse trends in the rate of growth in all four cases.

page 490 } Q. How do these trends compare with those in other key sectors of the economy?

A. My Chart 8 makes comparisons with respect to profits after taxes, and also with respect to prices. During 1960-1968, while the average annual increase in profits was 6.4

percent for the gas pipelines, 6.7 percent for the electric utilities, and 5.4 percent for the public utilities generally, it was 8.1 percent for all U. S. Industry and 9.8 percent for total manufacturing, despite the fact that these two categories included laggard and depressed industries. The rate of advance in profits after taxes was 8.5 percent for motor vehicles and equipment, 11.2 percent for nonferrous metals, and 14.4 percent for non-electrical machinery.

The relationship of the price factor of these relative profit trends is shown on the same chart. During 1960-1968, while prices received by the electrics and the gas pipelines moved downward, and while prices received by the public utilities at large moved upward very slightly, the average annual increase in prices was 1.0 percent for all U. S. industries, 0.9 percent for total manufacturing, and substantial in all of the key sectors shown on the chart.

Q. What is the value of these comparisons, in view of the fact that it is often argued that utilities need and should have much less than other key sectors by way of profit incentives, in that they are regulated and thus protected against loss and assured an established rate of return?

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A. Whether or not these arguments ever had validity, they certainly have no bearing or validity in the current proceeding. The real function of profits is to entice on reasonable competitive terms the debt and equity capital required for investment. Functionally and in the public interest, the appropriate test of profit requirements for utilities should be investment requirements. As all studies of desirable relationships among components indicate that the use of the products delivered by the utilities should advance very much more rapidly than the general economy during the years shortly ahead, it follows that the demands upon investors for funds in support of utility investment will be enormous. Investors will not be willing to make such funds adequately available, if the utilities are required to accept less profit progress than others, on the mistaken assertion that they are riskless. In terms of reality rather than theory, it is hard to find any indication that the utilities are less risky than the great motor companies and some others. Quite to the contrary, these industrial giants have the power within themselves to adjust their own prices to rising general price levels, and to acquire through their own decisions the plentitude of investment funds which they need, to a degree which

page 492 } the utilities have been and will remain unable to match, without appropriate change in regulatory policies.

Q. What additional type of evidence do you have that the utilities are suffering from a recent and current profit squeeze which, if continued, will in your judgment prevent them from carrying forward the levels of expanding investment which are essential to adequate business progress?

A. One good example, as shown by my Chart 9, is the appraisal placed in recent years upon the problems and performance of the utilities by prudent investors, as indicated by the trends in common stock prices. From 1960 to 1968, while the average annual increase in common stock prices was only 4.2 percent for 31 electric utilities, 5.6 percent for 6 natural gas pipelines, and 4.4 percent for 55 public utilities, the average annual rate of advance was 7.4 percent for 130 capital goods stocks and 500 combined stocks, and 7.8 percent for 181 consumers' goods stocks.

Q. What other factors have combined to work adversely against the regulated utilities?

A. The almost fantastic and almost steady rise in the cost of money has been of tremendous significance. As shown on my Chart 10, the ratio of long-term debt to capitalization in 1968 was 53.8 percent for the electric utilities, companies, and 48.1 percent for gas distribution companies, and the

page 493 } ratio of long-term debt to total assets was 47.1 percent and 31.3 percent, respectively. The comparative ratios in all manufacturing were 25.5 percent and 19.5 percent. In motor vehicles and equipment, they were 15.6 percent and 11.2 percent. The same chart shows the situation in various other key industries. This means very simply that, with the probable exception of the housing industry, the utilities have been hit far more severely by the upward spiral of interest rates than almost any other key sector. By way of example, with respect to the electric utilities, my Chart 11 shows the upward movement of the calculated interest rate on debt capital and the average interest rate on new bonds through 1968, imposing an aggregate additional interest cost, during 1953-1968 estimated at more than 1.73 billion dollars.

Q. How does the increasing cost of debt capital impact upon the availability of equity capital?

A. In many ways. In the first place, the tremendously increasing cost of debt capital pulls down the time-earned ratio, which is the ratio of earnings to fixed debt costs. This in-

creases the riskiness of the business, and makes it harder to acquire equity capital on favorable terms. Second, the increasing cost of debt capital, at any given volume of total dollars received by the utilities, leaves less over for investment purposes. And third, these adverse factors mean that the relationships between what the utilities have to pay for equity capital and what others have to pay is
page 494 } worsened. The trends in this direction are shown on my Chart 12. In 1953, looking at 125 industrials, the average dividend yield was higher than that of the electric utilities, gas distribution companies, or gas pipeline companies. But by 1968, the dividend yield for these 125 industrials was from about half to about two-thirds as great as that for the three categories of utilities indicated. Comparisons of the utilities with two hundred composite stocks, shown on the same chart, tell essentially the same story.

Q. But is not a high ratio of debt capital to total capital deemed to be desirable?

A. Traditionally, it has been deemed desirable. But that as it may, whether debt capital is relatively more desirable than equity capital does not affect the very important point that a tremendous upward spiral in the cost of debt capital must be damaging and has been damaging.

Q. Can you develop any one factor which appears to you to get to the core reasons why the utilities are encountering these increasing difficulties?

A. We live in a price economy. Prices, as I have already indicated, determine the allocation between the investment function and the consumer function. The downward procession of utility prices received, together with the upward-moving general price level, have conspired to impose the price-investment squeeze upon the utilities which
page 495 } I deem most significant in terms of their own progress and their ability to serve the consuming public. My Chart 13 depicts these contrasting trends from 1960 forward, but let us look particularly at the five-year period 1963-1968. During this period, the average annual rate of advance was 2.6 percent for consumer prices, 1.6 percent for wholesale prices, and 1.6 percent for industrial prices, while electric utility prices received declined at an average annual rate of 1.7 percent, gas pipeline prices received declined at an average annual rate of 1.5 percent, and prices received in the public utilities category generally increased at an average annual rate of only 0.3
page 496 } percent.

Leon H. Keyserling

Q. Will you now turn from your analysis of the trends among the utilities in general, and discuss the trends within Virginia Electric?

A. I shall be glad to do so. But first of all, let me stress again that the foregoing discussion of trends and problems among the regulated utilities throughout the nation has high pertinence to the trends and problems in the case of Virginia Electric. It is true that each utility company subject to regulation must be viewed in terms of its own characteristics, some of which are likely to be unique. Nonetheless, I do not believe that the nationwide trends and problems should be ignored in dealing with a particular company. It is desirable, to the degree feasible, that regulatory treament move toward some degree of uniformity. This, by putting various companies in a more similar situation in some respects, increases the opportunity to gain distinction by superiority in management and efficiency. Moreover, despite apparent differences, most utilities are similar in that they are fed by sources of capital funds which are nationwide in character. Most important of all, the adverse trends confronting practically all utilities make it urgently desirable that these be taken into consideration in the process of regulating any utility, in that the extension of the page 497 } corrective process to the utilities in general will be achieved by the specific treatment of individual companies case by case.

With respect to Virginia Electric, officials within the company are in a better position than I to depict and evaluate some of these trends, and to offer explanation as to why they have occurred. But I think it highly desirable that I apply to Virginia Electric, to the extent that I can, the same lines of analysis which I have already offered with respect to the regulated utilities in general.

Q. In your earlier discussion of the public utilities in general, you referred to the central problem of maintaining in future adequate rates of growth in plant and sales, as affected by trends in revenues and income. Do you have any comment on these plant and sales trends in the case of Virginia Electric?

A. Looking to the past, I have no reason to question the plant and sales trends during 1960-1969, as depicted on my Chart 14. In fact, a word of congratulations may be due both to the company performance and to the regulatory process, in that these trends appear to have been more favorable than generally throughout the nation, and reasonably

consistent with the unusual growth of the area served. But the past is only a prelude to the problems ahead.
page 498 } And looking ahead, I see no fair prospect for continuation of these favorable trends in service capacity and sales, if there is continuance of the adverse trends in revenues and income which fundamentally support plant investment and sales capabilities.

Looking to the future, Virginia Electric's growth rates in plant and sales cannot be sustained without improved revenues and income. And Virginia Electric's growth in both plant and sales would give future impetus to general economic growth in the areas served because, as I have already indicated, growth in utility plant and service is so important an underpinning for general economic growth.

Q. What are your views concerning recent trends in revenues and income?

A. I would characterize them as highly adverse, and flashing a warning signal for the years immediately ahead. As shown on Chart 15, measured in constant dollars, and comparing 1953-1960 with 1960-1969, the average annual rate of increase for total electric operating revenues declined from 6.7% to 5.9%; for net electric operating revenues, declined from 8.8% to 6.8%; for net income before taxes, declined from 10.8% to 4.2%; and for net income after taxes, declined from 10.2% to 6.1%. The trends in net
page 499 } income before taxes are more significant than the after-tax trends, because the after-tax trends were greatly affected by immense changes in national tax policies which are unlikely to be recurrent in comparable magnitudes in the foreseeable future.

For the period 1960-1969, the same Chart 15 compares the annual average increase in Virginia Electric profits after taxes of 8.7% (in current dollars; of 6.1% in constant dollars) with an average annual increase of 7.8% for all U. S. industries; 6.3% for public utilities, transportation and communication; 9.5% for total manufacturing; and 13.9% for nonelectrical machinery. The considerable lag in the rate of advance of Virginia Electric after-tax profits behind the rate of advance in total manufacturing is especially significant. This is not only because the average for total manufacturing includes many laggard and retarded industries, but also because, for reasons already stated, the rate of advance in capacity should be considerably higher among the utilities than in the economy at large. Significant again

in this connection is the fact that the economy served by Virginia Electric appears to have been growing much more rapidly than the U. S. economy at large during this period.

page 500 } Q. What has been the impact of the increasing debt burden, as affected by rising interest rates?

A. My Chart 16 shows that, in 1968, Virginia Electric had a ratio of long-term debt to capitalization of 52.5%, which was somewhat lower than the 53.8% for all electric utilities on a nationwide basis. But the ratio was only 25.5% in all manufacturing, or rather close to that in most key industries, and it was only 15.6% in motor vehicles and equipment.

Mr. Staples: Excuse me. Is that an amendment of the testimony, industry sectors?

Mr. Gibson: I don't think so.

The Witness: I didn't intend to amend the testimony. Let me reread it.

My Chart 16 shows that, in 1968, Virginia Electric had a ratio of long-term debt to capitalization for 52.5%, which was somewhat lower than the 53.8% for all electric utilities on a nationwide basis; but the ratio was only 25.5% in all manufacturing, or rather close to that in most key sectors, and it was only 15.6% in motor vehicles and equipment. And as Chart 17 shows, with debt capital rising rapidly, and with the embedded interest cost of long-term debt rising from 3.02% in 1955 to 4.85% in 1969, and estimated to rise further to 6.13% by 1972, it is estimated that the cost of rising interest rates during the period 1955-1972 will impose an additional interest cost of 138.3 million dollars upon Virginia Electric.

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Q. Do you see any prospects of alleviation of the burden of rising interest rates in the foreseeable future?

A. So far as Virginia Electric and other companies comparably situated are concerned, the burden of rising interest rates is certain to increase greatly in the foreseeable future. The interest rate of new bonds rose from 3.25% in 1955 to 7.52% in 1969, and is estimated conservatively to rise to 8.00 by 1972, contrasted with the calculated rate of 4.85% in 1969. This indicates vividly that, even if interest rates should go down somewhat in the near future, the calculated interest rate borne by Virginia Electric will continue to rise, until the interest rate of new borrowings is lower than the calculated rate at the time such new borrowings are made.

Nothing like this appears to be possible in the foreseeable future.

Q. How has the rising debt burden, and the other adverse factors which you have described, impacted upon the cost and availability of equity capital?

A. It has impacted for the same reasons as in the case of the utilities more generally, a situation which page 502 } I have already reviewed. The rising debt costs increase the riskiness of the business, and reduce the times-earned ratio, that being the ratio of earnings to debt-service costs. This, combined with the other adverse factors, makes it more difficult for Virginia Electric and similarly situated companies to obtain adequate equity capital, and forces them to pay much more for the equity they do obtain, placing such companies at a serious disadvantage in the nationwide markets for equity capital. Virginia Electric does not obtain equity capital from a limited market, dealing only with those similarly situated. As shown on my Chart 18, the ratio of the average dividend yield paid by 125 industrials to the dividend yield paid by Virginia Electric rose from 100.7 in 1953 to 126.5 in 1960, but declined to 73.5 in 1969. The ratio of the average dividend yield paid on 200 composite stocks to the dividend yield paid by Virginia Electric rose from 100.4 in 1953 to 130.9 in 1960, but decline to 80.1 in 1969.

Q. Will you now turn to a discussion of price trends and their significance?

A. Prices received, at any given rate of return, determine how many dollars a utility company receives. As the entire purport of my analysis thus far is that Virginia Electric is not receiving enough dollars under conditions page 503 } of rising costs, and expecially rising debt costs, to meet the challenge of the years ahead, it follows that prices received have become too low.

Whether or not prices received by Virginia Electric would have been adequate in the environment of a generally stable price level is a moot question, and entirely irrelevant. The relevant point is that prices received have moved persistently downward, which imports also that the dollars which prices received have brought to Virginia Electric have not been adjusted to the declining purchasing power of the dollars. This is what I mean by the increased disparity between prices received and costs, which is by now bearing down so heavily upon Virginia Electric and many other utilities.

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As my Chart1 9 shows, electric prices received by Virginia Electric declined at an average annual rate of 2.5% during 1960-1969. Meanwhile, industrial prices rose at an average annual rate of 1.1%, wholesale prices at an average annual rate of 1.2%, and consumer prices at an average annual rate of 2.4%.

By Commissioner Catterall:

Q. Excuse me. Do those consumer prices include the prices of electricity or exclude them?

page 504 } A. Yes, sir; they include all prices.

Q. So the increase in the electric prices makes the consumer price increase less than it otherwise would be.

A. That is correct; and stated in another way, if you exclude the electric prices, the consumer price showing would have gone up even more.

Further, the disparate trends have become even more serious most recently. Electric prices received by Virginia Electric declined 0.8% from 1968 to 1969, while industrial prices rose 3.3%, wholesale prices rose 4.0%, and consumer prices rose 5.4%.

Inter-industry comparisons tell substantially the same story, as shown on Chart 20. During 1960-1969, when, as already indicated, the average annual decline in Virginia Electric prices received—electric—was 2.5%, the average annual increase in prices was 0.4% in electrical machinery, 0.5% in petroleum and coal products, 0.6% in motor vehicles and equipment, 1.1% in iron and steel, 2.3% in nonelectrical machinery, and 3.2% in nonferrous metals. As already shown in Chart 19, it was 1.1% in total manufacturing, or all industry.

Q. What is the outlook for the future?

page 505 } A. It is estimated, as shown on Chart 21, that, if current prospects become actuality, the electric prices received by Virginia Electric during 1969-1972 will decline at an average annual rate of 1.6 percent. In contrast, most economists now would be more willing to settle for an average annual increase of about 4.0 percent in the general price level during these years ahead as measured by the Consumer Price Index.

Q. What about the argument that relative trends in prices are inconclusive in themselves, in that relative changes in efficiency and other factors may justify various types of price movements?

A. This observation is valid in general, but it has no

applicability to Virginia Electric. The function of prices is to yield adequate revenues and income. And it has already been demonstrated, as I see it, that Virginia Electric is threatened with a situation in which it will fall far short of needed revenues and income in terms of the functional purposes of dollars received, namely, to optimize investment and sales. Efficiencies have been registered throughout the U. S. economy. But there is no possible basis for any implication that efficiency is now rising so much more rapidly among the utilities than elsewhere as to overcome the effects of inflation; and thus to rationalize the tre-
page 506 } mendous disparities in price trends which have developed and are still augmenting.

Q. Do you believe that recent and current regulatory practices have been adjusted adequately to the problems imposed upon the regulated utilities, such as Virginia Electric, by the generally rising price level and the declining purchasing power of the dollar?

A. Looking ahead, certainly not. Prices and dollars received by regulated utilities such as Virginia Electric, and their rates of return, have been essentially connected with the concept that rates of return should be related to an investment rate base at original cost less depreciation. This entire historic concept, as enunciated, for example, by Justice Brandeis several decades ago, was based upon the assumption of a fairly stable general price level and a fairly stable dollar. All experience has increasingly invalidated that assumption, see Chart 30. Continued support of this theory of rate-making has, in my view, been based increasingly upon semantics and stereotypes which have ignored emerging realities. This has become increasingly ironical, because the courts have also declared the principle that the rate-making process shall serve to place the utilities in a position of reasonable competitive equality with non-regulated business. It follows that original cost jurisdictions should allow for the inflation I have just described, in determining the appropriate rates of return.

page 507 } Q. In passing over the reference to Chart 30, did you mean to omit the comment shown in the footnote on that page, page 26?

A. I should not have omitted it. The footnote merely corroborates the reasons for the expectancy many years ago that there would be a stable price level.

Q. What does it say?

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A. "By coincident, as shown on Chart 22, a stable value of gold did in fact persist for two centuries before the Brandeis opinion, but it is now evident that this was an exceptional period and that, before and since that time, the price of gold has risen persistently."

Q. Can you, in any single way, depict the effect of the disparate trends which you have been describing upon a company like Virginia Electric?

A. My Chart 23 attempts this. From 1953 to 1960, the rate of return on capitalization of Virginia Electric increased 20.3 percent, and the rate of return to common equity increased 22.7 percent, while the embedded cost of long-term debt increased 14.1 percent, and the rate on new bonds 32.3 percent. From 1960 to 1969, the rate of return on capitalization increased only 4.6 percent, and the rate of return to common equity increased 1.7 percent, while the embedded cost of long-term debt increased 43.1 percent, and the rate on new bonds 61.0 percent. Estimates made by Virginia
page 508 } Electric indicate that, from 1969 to 1972, under current prospects, the rate of return on capitalization will decrease 2.5 percent and the rate of return to common equity will decrease 29.8 percent, while the embedded cost of long term debt will increase 26.4 percent, and the rate on new bonds 6.4 percent.

The significance of the trends under review is revealed even more clearly by Chart 24. This indicates that the coverage ratio (a) net income before taxes plus interest to (b) total interest charges, rose from 5.29 in 1953 to 6.65 in 1960, but then declined to 3.75 in 1969, and would decline further to 2.28 by 1972 if current prospects were actualized. In contrast, consistently with needed rates of return subsequently to be discussed, I estimate that the needed ratio in 1972 would be 3.54.

Q. Drawing upon all of the analysis which you have thus far made, can you now turn to appraisal of the rates of return needed by Virginia Electric in order that it may furnish what you designate as optimum service to the public?

A. Before answering this question in detail, I should state the general approach which I apply to the entire problem of rate of return, whether upon capitalization or upon common equity. In my view, there is no such thing as an appropriate rate of return, any more than there is any such thing as an appropriate wage or price or profit, except in the perspective of the larger economic adjustments which I have
page 509 } earlier discussed. The rate of return determines

the number of dollars received by the regulated utility, and also determines the immediate price treatment of the consumer, and thus determines in large measure the all-important balance between investment and consumption. The number of dollars received by the regulated utilities should be adequate to promote an optimum level of investment, to meet normal and even unexpected business costs, to service debt, and to yield a return to equity which performs the function of assuring optimum equity investment. If dollars received are not adequate to these multiple purposes the regulated utility may get by for a while by robbing Peter to pay Paul, but in the long run it will pay the Piper, to the detriment of the consumer whose service is the ultimate purpose of the entire operation.

Thus, my approach is to bring the tools of economic analysis, which include empirical observation of the past and projections of sensible goals for the future, to bear upon the needed number of dollars received. Once these aspects are dealt with workably, the needed rates of return and the needed price levels to maintain these rates of return follow ineluctably.

Q. In this connection, what is the significance of your Chart 25?

page 510 } A. My Chart 25 commences to apply to Virginia Electric the approach which I have just described. My analysis here is for the system-wide electric operations of Virginia Electric and Power, not only those under the jurisdiction of this Commission. By my findings as to rate of return are, in my view, applicable to that part of Virginia Electric's operations which are before this Commission. Upon taking into account all relevant factors, it appears to me that the period 1953-1960 can serve as an effective initial model, covering a period when Virginia Electric net operating revenue, per KWH was set at levels which yielded a reasonably appropriate number of dollars, in terms of their functional purposes as I have defined them. During this initial model period, net electric operating income per KWH grew at an average annual rate of 0.9 percent. During this period, the embedded cost of long-term debt was growing at the somewhat faster average annual rate of 2.0 percent, with respect to both net electric operating revenues per KWH and embedded cost of debt, I have used three averages centered on 1953 and 1960, instead of the single years. However, the embedded cost of debt during the most recent years

has risen far faster than during the initial model period, and this discrepancy will continue to increase. This makes my initial projection of needed electric operating revenues per KWH, based upon 1953-1960 trends, a serious underestimate. I have therefore adjusted my 1953-
page 511 } 1960 initial model by adding an allowance for actual trends in debt costs above those contained in the intial model. Using this adjusted model, I find that needed net electric operating revenues per KWH come to 0.542 cents in 1972, and rise to 0.573 cents by 1972, contrasted with the actual 0.384 in 1969, and an estimated 0.403 in 1970, and 0.428 in 1972, as projected *y* Virginia Electric in accord with actualization of current prospects.
page 512 } Mr. Counsel, may I interrupt for a second off the record to ask a question of the Commission.

Q. Yes.

The Witness: In my derivations here I showed averages for '70 to '72. However, I understand that the Commission is basically interested in the test year 1969.

Chairman Hooker: Yes.

The Witness: I have the figures for the test year 1969 and would like if permitted—

Chairman Hooker: You can go ahead.

The Witness:—when I come to the matter of rate of return to give—

Chairman Hooker: The record will show our ruling on it. Go ahead.

A. Applying the needed net electric operating revenues per KWH to actual physical sales as estimated, I find needed net electric operating revenues of $127.6 in 1970, rising further to 167.2 million by 1972, contrasted with the actual 80.8 million in 1969, and an estimated 94.9 million in 1970, and 124.8 million by 1972, when projected in accord with current prospects.

Q. What about total electric operating revenues?

A. I find it to be a workable rule of thumb
page 513 } that total electric operating revenues should exceed the actual in the amount by which needed net electric operating revenues exceed the actual, multiplied by 2.2 to allow for taxes and other deductions. On this basis, needed total electric operating revenues come to 407.9 million dollars in 1970, and 497.4 million by 1972, contrasted with 305.8 million actual in 1969, and an estimated 336.0 million in

1970 and 404.1 million by 1972, when projected in accord with current prospects.

Q. What does this analysis import for levels of prices received, or imputed prices?

A. The imputed prices per unit are derived by dividing total operating revenues by unit sales. The results, shown on Chart 26, are as follows: the imputed electric prices needed per KWH are estimated at 1.73 cents in 1970, and 1.70 cents in 1972, compared with 1.45 actual in 1969, and an estimated 1.43 in 1970 and 1.38 in 1972, when projected in accord with current prospects.

Q. Can you translate the data shown on Chart 25 into growth rates?

A. My chart 27 does this. It shows that the needed average annual growth rate in net electric operating revenues per KWH during 1960-1972 comes to 2.1%, compared with 0.9% during the initial model period 1953-1960. The
page 514 } needed average annual growth rate in net electric operating revenues during 1960-1972 comes to 13.7%, compared with 11.3% during 1953-1960. The needed average annual growth rate in total electric operating revenues comes to 10.7%, during 1960-1972, compared with 9.2% during 1953-1960. I submit that these comparisons indicate the conservative nature of my findings, especially taking into account the more rapid price inflation in recent years, and the rising cost of debt service. The conservative nature of my findings is further indicated by the fact that, for the purpose of determining needed revenues, the average annual growth rate in electric sales is projected at 11.3% during 1960-1972, which is very slightly above the 11.2% average annual rate during 1960-1969, see again Chart 14. Although, for the purpose of determining needed revenues, I have projected sales in accord with the estimates made by Virginia Electric, I have some feeling that sales in future might need to grow more rapidly than this to reach the optimum.

Q. What are your findings as to the needed rates of return on capitalization and on common equity?

A. This is developed on my Chart 28. Here, I start with net operating income, the concept pertinent to return to capitalization, which exceeds net electric operating reve-
page 515 } nues by net gas operating revenues, plus interest charged to construction, less charitable donations. Averaging the years 1970 through 1972, I find a

needed rate of return on capitalization for these years of 8.45%, contrasted with the actual return of 6.61% in 1969. In somewhat less precise terms—the precision resulting from the rigor of the exercise—the years 1970-1972 appear to call for a return to capitalization averaging within a band of 8.30-8.60 percent.

Now I would like at this point, if I may—

Q. If you please.

A. —to make a one-sentence amendment to my testimony, that is to the fact that since all of my projections based upon my model period are at a uniform average rate of change, the figure for 1969 as to the net rate of return and the needed prices and the needed income is implicit in my exercise, I will merely have to subtract one year from the projection from 1960 to 1969. So the whole thing is in there implicitly. Explicitly I find for 1969, with a capitalization as of year end of 1,465.6 million and a needed net operating income of $124 million, I find a needed rate of return for 1969 of 8.75% which would come within a band of 8.45 to about 9, as stated. So that that is entirely consistent with my projection to '70 to '72.

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Q. What are your findings as to the needed return on common equity?

A. My findings are not directed essentially toward needed returns to specific types of capital, but rather toward prices and incomes needed to optimize investment and service. Once these are determined, the needed rate of return to capitalization follows automatically. However, using Professor Phillips' determination of the cost of senior capital, end of 1972, it appears that the 8.45% return to capitalization yields a balance of 4.30% available for common equity after these senior costs are subtracted. Dividing this by the 33.38% common equity capital ratio used by Professor Phillips, the result is a needed return of 12.9% for common equity. In terms of a band of 8.30-8.60 percent for return to capitalization, the band for return to equity comes to 12.4-13.3 percent.

Again, by way of amendment, for 1969 that would be about 13.5 consistent with the estimates for '70 forward.

Q. How do these suggested rates of return compare with those received elsewhere?

A. I think I have made it very clear that my approach to the problem is not founded primarily upon such comparisons, but rather upon the dollars needed by this particular company to enable it to render optimum service in the years ahead. This depends

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upon ability to meet all costs including rising debt costs, to maintain a competitive rate of payouts on equity investment, and to expand plant and other business undertakings enough to exploit fully all potential sales opportunities. Nonetheless, some comparisons may be of value, especially because investors pay so much attention to these comparisons.

Among more than 200 electric utilities reporting to the F. P. C., it appears that the average rate of return on equity has tended during the most recent years to be rather close to that received by Virginia Electric, while the average overall rate of return has tended to be considerably higher than that received by Virginia Electric. But I do not deem it useful to go into detail with respect to these comparisons, because my studies of the electrics in general indicate that their rates of return have become far short of adequate. Indeed, the majority of them are now confronted by problems very similar to those confronting Virginia Electric.

Q. Can you give some other comparisons?

page 518 } A. Yes. In 1967, according to the First National City Bank, the rate of return on equity, average for the year, was 12.2% in total manufacturing, 15.0% in total mining, 12.4% in total trade, and 14.7% in total services. In 1967, average for the year, the rate of return on equity for Virginia Electric was 13.6%.

Q. Do you believe that an electric utility should receive rates of return on equity and on capitalization as high as those received in the nonregulated sectors you have mentioned?

A. There is no appreciable difference, in my view, between the outmoded or nonfunctional notion that utilities *per se* need lower levels of and lower growth rates in profits than other regulated industries of comparable size and profits, and the outmoded and nonfunctional notion that they need lower rates of return. The needs for each industry, and where pertinent for each company, should be determined on the basis of the needed dollars required to optimize total performance, the meaning of this functional concept being made clear by my testimony as a whole. Further, as I have earlier pointed out, as utility investment and services should grow considerably faster than the economy at large, higher rates of return than in other key industries are

page 519 } in order, and certainly higher than "averages" including retarded industries. And as I have already indicated, the investment programs of the utilities

were being severely retarded by 1967, the year used for the foregoing comparisons.

page 520 } By Mr. Gibson:

Q. Dr. Keyserling, do you have ways of supporting the reasonableness of your estimates, beyond the analysis you have thus far presented?

A. Chart 24, which I have already discussed in another connection, sheds considerable light upon the reasonableness of my estimate. It shows that the goals which I set would, as of 1972, result in a 3.54 ratio, income before taxes, plus interest charges, to total interest charges. This would be much higher than the 2.28 ratio which would result if current prospects materialize. But it is well below the 3.75 ratio in 1969, and immensely below the 6.65 ratio in 1960 or the 5.29 ratio in 1953.

To put this another way, as an alternative to the method which I have actually used for determining needed rates of return, I could have used the method of projecting needed rates of return on the basis of restoring the ratios shown on Chart 24 to the levels pertaining in 1960 or 1953. If I had done so, I would have arrived at needed rates of return much higher than those which result from the methods I use.

Q. Are there still other ways of indicating the conservative nature of your findings?

A. My Chart 29, in my view, fortifies my findings. During the period 1953-1960, which I use as my model
page 521 } period, the average annual decline in Virginia Electric imputed prices was 0.9 percent, while the average annual increase in the Consumer Price Index was 5.1 percent. Thus, on a simple additive basis which avoids technicalities that would not add substantially to the analysis, the disparity between the two price trends cited comes to 2.4 percent. During 1960-1972, the average annual increase in the Consumer Price Index is estimated at 3.8 percent, and the average annual decrease in needed imputed prices at 0.5 percent, with the disparity on an additive basis coming to 4.3 percent, or almost twice as great as during the model period I use. With the Consumer Price Index being the best measurement of the declining purchase of a dollar, this exercise indicates strongly that the results I have obtained as to needed increases in prices and rates of return are conservative vy this test alone, and in addition do not factor in as fully as they well might the accelerated rate of increase in money costs.

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Q. Are there alternative methods, other than increases in the rate of return on capitalization, which would accomplish the fundamental results which you advocate toward optimizing performance by yielding adequate revenues and incomes?

A. Of course there are. I do not care about the permutations involved in the formula of adjustment, so long as the eye is kept on the ball of needed dollars of net operating revenues to induce optimum performance. These

page 522 } needed dollars may be achieved in a variety of ways. But in a State committed to an original cost-rate base method, rate of return is the vehicle which must be used.

Q. Are there still other reasons why you regard your results as conservative?

A. I have already intimated these other reasons, but I will now state them more explicitly. My proposals would lead only to rate increases in future, based upon an adjusted 1953-1960 model used, first of all, to determine how prices received and incomes should have trended from 1960 to 1969. But while this would result in appropriate rates of return and prices received after 1969, it would not compensate at all for the deprivation Virginia Electric has suffered to date because of departure from appropriate trends in prices received, and correspondingly in rate of return.

Q. Are there other qualifications, as to your conclusions?

A. Obviously, the analysis which I have undertaken does not pretend to the certainty of results shown on a pure mathematical table, as judgmental factors are involved at all stages in the process. Nonetheless, I believe that my analysis leads, at least, to an indication of the reasonable bands within which appropriate adjustments should be made through regulatory decisions.

In addition, and very importantly, it should

page 523 } be noted that the estimates of needed rates of return are based upon projections of sales and of the investment rate base which may have been conditioned by developments as they should be. Be this as it may, it seems clear to me that the application of the rates of return and imputed prices which I propose should make it feasible for Virginia Electric to achieve the enormous growth rates in physical sales and in the investment rate base which are clearly needed. Efficiency should also proceed at an accelerated pace, through this process, and efficiency gains tend *pro tanto* to mitigate the need for rate increases.

Q. How do your conclusions as to needed rates of return compare with those of others in the current case?

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A. I have arrived at my results objectively, and not in concert with others. But my understanding is that my conclusions as to the needed rates of return are very close to those suggested by others. Such variations as appear may be due predominantly to a different methodology, which does not change appreciably the fundamental impact and implications of the conclusions reached.

Q. What about the argument that the inflationary problem is now so severe that any price increases anywhere should be avoided at all costs, and that the regulatory agencies have the responsibility, in effect, to help fight inflation by preventing any price increase among those sub-
page 524 } ject to their jurisdiction?

A. I can understand the resort to the argument, but I find it to be entirely without merit. While every effort should be made to curb inflation, and while the rate of inflation since 1966 has been unbearably high, no one industry can be *taxes* with a task of bearing an entirely disproportionate share of the responsibility to stop inflation, regardless of what is happening to that industry. To illustrate, let us suppose that the average annual rate of general price inflation and decline in the purchasing power of the dollar, which was 6.1 percent from December 1968 to December 1969, were to continue at that rate or even increase—heaven forbid—at an average annual rate of 8 percent to 10 percent, or what have you. In that event, it is manifest that industries such as the utilities in general, or such companies as Virginia Electric, would be utterly destroyed in due course if they were held within the confines of a price policy utterly irresponsive to what was happening in the economy at large, in which they borrow money, invest dollars, pay dividends, et cetera.

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Q. Would you please summarize your testimony?

A. Virginia Electric, and indeed many of the regulated utilities, have been confronted of late by seriously adverse trends which threaten their ability to meet their future service requirements.

The basic reason for these unsatisfactory trends, which portend even worse in future if steps are not taken to correct them promptly, is that prices received have not been sufficient to generate the number of dollars needed to optimize business performance.

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The deficiencies in prices and dollars received, accompanied by rapidly rising debt costs, have sharply reduced traditional coverage ratios. If these coverage
page 532 } ratios are not improved, this in itself will make adequate financing at even tolerable costs progressively more difficult. That, in turn, might be accompanied by reduced ratings for Virginia Electric and Power *secutiries,* and this, by a circular process, might augment the adverse trends to which it responds.

The ultimate victim, under these circumstances, would not be Virginia Electric and Power. The ultimate danger would be that the thriving and growing Virginia economy would find its further progress seriously impaired by inadequate energy supplies.

The number of dollars received, and the prices determining the number of dollars received, are connected basically with the rate of return. Thus, the rate of return needs to be set at a level which will yield the number of dollars needed to promote optimum company performance, in the interest of the area economy and in the interests of present and future consumers served by Virginia Electric.

My most important finding is that Virginia Electric Power, during the years 1970-1972 on the average, needs a rate of return of 8.45% on capitalization, and 12.9% on common equity. Converting these precision findings
page 533 } into reasonable bands, I find need for a rate of return on capitalization within a band of 8.30-8.60 percent, and on common equity within a band of 12.4-13.3 percent.

Let me stress once again that I regard these findings as quite conservative. Although the initial model which I use for my projections from 1960 has been adjusted to take account of the swiftness and steepness of rising interest rates and debt costs, these allowances do not fully reflect what has already happened. Much less do they fully reflect the progressively severe impact upon embedded debt costs, as refinancing continues. Nor do they reflect that inflation in general, which affects a utility in other ways besides debt costs, for example, costs of building plant, and value of dollars received by investors, has proceeded since 1966 at a much faster rate than during the initial model period 1953-1960. The conservatism of my findings is reinforced by the showing on Chart 24 that, even if my findings were to be adopted, coverage ratios would not return even close to those

in effect during the period 1953-1960 which I use as an initial model.

Mr. Gibson: The witness is available for cross-examination.

page 534 } CROSS-EXAMINATION

By Mr. Staples:

Q. Dr. Keyserling, I notice on Page 32 of your testimony you did not determine the cost of capital for the Virginia Electric & Power Company, but rather you determine based on your model of the period 1953 through 1960 what you call "the needed rate of return on capitalization."

Do you consider then that this needed rate of return on capitalization of 8.45% is in fact the cost of capital to the Virginia Electric & Power Company?

A. No, I do not because I do not believe, at least I respectfully submit, that cost of capital is the most desirable way of determining how many dollars a utility company needs.

My whole method is based upon what I call the functional method, which very simply is what a business group asks when they sit around a table and say, "How many dollars do we need to do our job?"

Cost of capital is one of the components in the dollars needed to do the job, but it is not the only one.

I can make a model of a company that has
page 535 } adequate dollars to cover its costs of capital
and does cover its costs of capital, but does not have enough left over to make the level of investment needed for the growth needs of the area.

So I use the number of dollars of operating income received and test that against how the company is doing with respect to cost of capital, cost of equity, adequacy of funds, trends in investment, trends in sales, and trends in profits, which is the ultimate test of where a business is going.

So neither for the test period nor for any other period do I use cost of capital. I use dollars needed to cover capital and to cover everything else, and measure empirically the adequacy of those dollars against the investment, sales, and profit performance of the company.

Q. Just so that I can understand a little bit better in my frame of reference, if, in fact, as it seems apparent you do believe that the cost of capital for Virginia Electric & Power Company is 8.45% average for the years 1970-1972, could

you indicate what you think the cost of capital, the price VEPCO has to pay to get the dollars to buy its physcial equipment for the test year, actually was?

A. First of all let me answer your question

page 536 } by elaborating on an amendment that I made to my testimony. I regret very much, Mr. Chairman and members of the Commission, that either through error or some other reason I set forth my needed findings as an average for the years '70 to '72.

Now, since this is so closely related to the question and so important, let me first indicate why I did that, and then I will bring it back to 1969.

I did that because I find in the very nature of utility investment, which results in very erratic fluctuations in investment from year to year, that when you determine to find the needed rate of return year by year by bringing net operating income to the investment base you get erratic fluctuations, I think for a variety of reasons, and at least I, therefore, submitted this to the Commission that looking at a three-year average gives you a better picture. That is why I took a three-year average.

page 537 } The Witness: However, this does not preclude the application of the most simple mathematical process to get for 1969 every one of the findings that I made of the average for '70 to '72, because under my method I am projecting prices per KWH in accord with my model at a uniform rate from '60 to '72 so as to get the figure on that for '69 you would just take nine-twelfths of the progression from '60 to '72 and would thereby get the needed return per KWH for '69. Multiplying that by sales in '69 you would get my finding as to needed operating income in '69. Applying that to the rate base in '69 you would get my finding as to the needed rate of return for '69.

So implicit in my findings are the findings for '69 but categorically, as I read into the record a few minutes ago, these result in findings for '69, taking the capitalization of 1,465.6 million, and my finding as to a needed rate of net operating income of $124 million, a rate of return of 8.75 which would be within a band of 8.45-9.05, and this is very close to my findings for the three-years ahead, but illustrate a year in the erratic nature of year-to-year diferences because of the very high rate of investment contemplated for the year immediately ahead reduces somewhat the ratio of operating income to investment as against '69.

Leon H. Keyserling

Now, coming again to the matter of cost of
page 538 } capital—

Q. You just said 8.75 is the cost for '69?
A. No, I said 8.75 is my figure for the needed rate of return as of—
Q. Applied against the rate base?
A. Against the rate base as of the end of '69.

Mr. Staples: No further questions.
Chairman Hooker: Mr. Parker.

CROSS-EXAMINATION

By Mr. Parker:

* * * * *

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* * * * *

Q. Do you feel that the electrical industry is subject to the risk of a slackening of demand as a result of technological improvements in other areas, such as the advent of the total energy concept and fuel cells, and that sort of thing?
A. It is perfectly right to say that the electrical industry has smaller fluctuations than many other industries. But let me at that very point—I know that technically I may be going a little beyond your question, but I am trying to be helpful by putting it in its relationship—to jump to the conclusion that because an industry fluctuates less in its sales, or even in its earnings, or even in its rates of return that it is in a more favorable position, a stronger competitive position, a more favorable position with the investor, to make that jump is like jumping from the earth not to the moon but to Mercury, because I may have a stable income and stable sales at a bankruptcy level, and another
page 563 } company may fluctuate as General Motors does, but it is fluctuating in heaven and the investor knows that.
So it is utterly fallacious.
Sure the utilities have smaller fluctuations than many other industries. That does not mean that they are more strongly positioned or less risky.

Many of the fluctuations among the others are caused by their ability to adjust.

Now, the real thing is not the fluctuations in the short run, but the relative real growth rates in the long run, and this is why so relevant and so pertinent are my comparisons throughout this study of the relative real growth rates in plant and investment and in sales and in profits, which is what business is about; and here the utilities have lagged in the recent years, lagged seriously, although you wouldn't find a single economy student of needs, which is what it is all about, who would not say the utilities in a healthy economy ought to grow faster than the rest of the economy.

So that is what really counts, not that we fluctuated more or less from year to year.

* * * * *

page 569 } ROBERT S. GAY, called as a witness on behalf of the Applicant after having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Please state your name and position.

A. My names is Robert S. Gay and I am Manager of Rates and Contracts for Virginia Electric and Power Company.

Q. Mr. Gay, would you briefly describe your background?

A. After graduating from Virginia Polytechnic Institute with a B.S. Degree in Agricultural Engineering in 1951, I was employed by VEPCO in its Sales Department in Richmond in April 1952 and held various positions in that department until April 1962. During this period from April 1952 to April 1962, I was at various times; Rate Research Coordinator, Supervisor of Rate Research and Director of Resale Contracts. In April 1962, I was made Assistant to Manager of Engineering and Construction in VEPCO's System Engineering Department in Richmond. I was assigned as Manager of Virginia Beach in April 1964 and was made District Manager of the Norfolk District in March 1967. I was appointed Manager of Rates and Contracts on February 1, 1968.

page 670 } I am a member of the Load Research Committee of the Association of Edison Illuminating Companies.

Robert S. Gay

Q. What are the responsibilities of your position?

A. As Manager of Rates and Contracts, I am responsible for the following:

A, correct and uniform application of rates, service requirements, and terms and conditions of furnishing service.

B, long-term planning of simplification and improvement in the company's rate structure compatible with forecasted economic changes in the service territory and trends in cost of rendering service.

C, periodic preparation of long-and-short-range forecasts of sales and revenues as part of the company's operating budgets.

D, design and development of rate schedules as required and estimates of resulting changes in revenues.

E, preparation of analyses of cost of rendering service for guidance in planning of the rate structure and in response to regulatory action.

F, planning of programs of customer load testing to determine the characteristics of use of utility service.

page 571 }

G, negotiations of special contracts for service where special considerations are required and preparation of such contracts subject to legal review.

H, keeping company management informed on utility rate making developments and developments in regulatory matters.

Q. As Manager of Rates and Contracts, what are your specific responsibilities in this proceeding?

A. My major responsibility in preparing for this proceeding was to develop rate schedules which would produce the revenue objective set by Company Management. This included the preparation of load and rate design studies as an aid in meeting the revenue requirement objective.

* * * * *

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Q. What were the major objectives in the development of the proposed rate schedules?

A. There were three major objectives:

1. To design rates that would result in a reasonable distribution of the additional annual gross revenues among Virginia jurisdictional service classifications.

2. To develop rates that would promote the use of electric service in a manner which will tend to improve system load factor. This will achieve improved utilization of the Company's production, transmission and distribution facilities, thereby tending to lower the unit cost of furnishing service to all customers.

3. To simplify our rate structure so that the application of the schedules may be better understood by cus-
page 580 } tomers and improve the administration of the schedules by the company.

Q. How is this revenue increase distributed among the various classes of customers?

A. I have an exhibit that shows this distribution.

Q. I believe that, Mr. Gay, is Exhibit RSG-5, is that correct?

A. That is correct.

Q. Would you please explain this Exhibit RSG-5?

A. In this exhibit the 1969 annual revenue is broken down by schedules within each class of customers. The first column lists the annual revenue based on present rates, the second column lists the estimated proposed annual revenue, and the third column lists the amount of the proposed estimated annual increase each schedule and class would receive.

The residential class would receive an estimated increase of $13,357,718 or 10.64 percent.

Q. That is shown opposite subtotal residential on the fifth line of figures on the exhibit; is that correct?

A. That is correct.

Q. Continue, please, sir.

A. The small general service an estimated increase of $4,191,175 or 9.35 percent; the large general service an estimated increase of $6,145,342 or 8.77 percent; and the mis-
cellaneous service an estimated increase of
page 581 } $83,115 or 3.05 percent. In addition, the overall revenue increase includes an estimated $1,297,438 to be derived from the 30-day billing provision and an estimated $748,469 as the result of the late payment charge.

Q. That is shown at the bottom of the exhibit, the third and fourth lines from the bottom of the page; is that not correct?

A. That is correct.

Q. All right, sir, what is the overall estimated increase?

A. The overall estimated increase is $25,823,257, or 10.62 percent.

Robert S. Gay

Q. That is shown on the bottom line of the exhibit, is that correct?

A. That is correct.

page 582 } Q. How did you arrive at this distribution of increases among the five classes of customers?

A. Other witnesses have previously testified that a primary cause for this request for rate relief is the continuing deterioration of system load factor resulting from the ever widening gap between winter and summer system load trends. In the process of making an equitable distribution of the revenue increase, we have attempted to place the burden of the increasing cost of furnishing service on customer groups mainly responsible for this system load factor deterioration. This deterioration has resulted from the increase in demand caused by summer air conditioning and other summer oriented loads. Our load testing studies indicate that residential, small general service, and large general service classifications all have their peak demands in the summer months. The summer maximum demand of residential service was 33% higher than the winter maximum demand. For small general service, the summer maximum demand exceeded that of the winter by 38%. Compared to these high differentials, the summer maximum demand of large general service was only 17.5% higher than the winter maximum demand.

From these data, we thought it equitable to allocate to the residential and small general service classes

page 583 } a higher proportion of the revenue increases.

Q. What other consideration did you take into account in the distribution of these increases?

A. We considered it important that the present relationship of the level of rates among classes of customers not be too greatly disturbed. A difference between the residential and the small general service classes has been historically maintained and it should not be widened but, if possible, should be narrowed to the extent practical. In other respects, historical rate relationships required to meet competition should be retained. We recognize the desirable annual characteristics of the relatively high load factors of our largest customers by assigning relatively low increases to this customer class.

Q. You referred to load tests. Have you prepared an exhibit which shows the results of the load tests?

A. Yes. We made a load study based on summer 1968 and winter 1968-1969, and I have an exhibit showing the results of these studies for the residential, small general service,

and large general service customer classes. This data is shown both in graphic and tabular form.

Q. That I believe is Exhibit No. RSG-6, is it page 584 } not?

A. That is correct.

Q. Would you please now explain these load study graphs and tabulations?

A. These show the graphic comparison of a summer and winter load patterns plotted from average demand per customer values shown on each tabulation.

Q. The graphs precede the tables in each case, is that correct?

A. That is correct.

The first graph shows the summer and winter load patterns for the residential class. The maximum coincident demand for the residential customer in the summer occurred at 6:00 p.m. and amounts to 1.68 KW at the point of service to the customer. The corresponding demand for the winter occurred at 7:00 p.m. and amounts to 1.26 KW. The residential class demand is 33% higher in the summer than in the winter.

Q. And the table on the second page Exhibit RSG-6 provides the information that is plotted on the graph on the first page, does it not?

A. That is correct.

Q. Would you go to the second graph, please?

A. The second graph, entitled "Small General page 585 } Service Load Study," shows the coincident peak demand per customer to be 5.67 KW at 3:30 p.m. in the summer. The winter peak demand is shown to be 4.11 KW at 5:30 p.m. The small general service summer peak demand is thus 38% higher than the winter peak.

Q. Again the fourth page provides the material that is put on the graph on the third page, is that correct?

A. Yes, sir.

Q. Will you proceed to the third graph?

A. The third graph, entitled "Large General Service Load for the summer occurs at 2:30 p.m. and amounts to 326.65 KW, and the winter peak demands occurs at 10:30 a.m. and amounts to 277.98 KW per customer. The large general service customer thus has a summer peak that is 17.5% higher than the winter peak demand.

Q. Again the material appearing on Page 6 is that which has been graphed on Page 5, is that correct?

A. That is correct.

Q. Mr. Gay, you mentioned before that the proposed rate schedules are designed to increase the use of electric service in a manner which would improve system load factor. Please explain this.

page 586 } A. Obviously, the best way to do this is to increase the electric heating load and other winter loads. To avoid discouraging the use of electric heating, we have essentially retained the existing terminal rate levels applicable to residential and small general service during winter months. It is important to promote the growth in the winter load in order to increase annual load factor. This will tend to reduce overall unit costs and benefits all customers because additional winter load can be served without additional investment in costly power supply fa-

page 587 } cilities.

Q. Why did you propose a higher summer rate?

A. It is reasonable to charge the summer loads some portion of the additional cost experienced by the company as the result of the summer demand contribution to the summer peak. For this reason, in the proposed schedule for residential service, the terminal rate applicable to summer months is 1.8 cent per kilowatt-hour compared to the terminal rate of 1.2 cents for the other months. In other words, a seasonal rate is proposed. Similar reasoning has been applied to small general service pricing.

Q. Mr. Gay, how do you arrive at the 1.2 cent bottom step in the residential rate for the non-summer months?

A. After a review of the history of the additions of electric space heating on several different terminal rates, it was decided that in order to attract space heating loads in the amounts which will improve the company's system load factor, a rate not higher than 1.2 cents per kilowatt-hour is required. In addition, the adequacy of 1.2 cents per kilowatt-hour was demonstrated by an analysis of cost of rendering this service. This analysis will be shown by Mr. Charles H. Frazier in his direct testimony.

Q. Do you have an exhibit that shows the in-

page 588 } crease in residential electric space heating installations by years applicable at terminal rates?

A. Yes, I have an exhibit entitled "Residential Electric Heating—Customer and Saturation Data."

Q. And that, I believe, is Exhibit No. RSG-7, is it not?

A. That is correct.

Robert S. Gay

Q. Please describe the significance of this exhibit.

A. This exhibit consists of two graphs: one entitled "Number of Residential Electric Heating Customers and the other entitled "Percent Saturation of Electric Heating Customers to Total Residential Customers." It can be seen that there was little increase in the total number of residential space heating customers from 1957 through the middle of 1960. On June 1, 1960, the terminal rate was reduced from 1.8 cents to 1.5 cents per kilowatt-hour; and while there was a slight increase in the number of space heating customers added, the increase was relatively small. However, on December 1, 1962, after the Company went to a terminal rate of 1.25 cents per kilowatt-hour, the space heating increased significantly. After the rate was reduced to 1.2 cents per kilowatt-hour on February 1, 1965, there was a significant change in the rate of increase in additions of space heating

page 589 } customers. It will be noted from this graph that the company added approximately 3,000 installations from 1957 through 1962 when the terminal step of the residential rate was 1.8 cents and 1.5 cents per kilowatt-hour. In contrast, since 1962, the company has added some 47,000 installation of residential electric space heating. In 1968 and 1969, the additional annual installations have amounted to around 9,500 installations per year.

Q. Mr. Gay, it is apparent from Page 1 of Exhibit RSG-7 but it also confuses me. The dates at the bottom of the page are at December 31 of the year, is that correct?

A. That is correct.

Q. They are not supposed to indicate the middle of the year?

A. No, sir.

Q. Would you now turn to Page 2 of this exhibit and explain that to the Commission?

A. Page 2 of this exhibit shows graphically the percent saturation of space heating installations related to total residential customers. This graph shows that lowering the rate level was accompanied by similar increases in percent saturation of space heating.

In view of these analyses, we believe that a

page 590 } 1.2 cent rate is required by the company to obtain enough of this business to improve its system load factor and, thereby, tending to reduce the necessity for higher rate levels to all customers in future years.

Q. Can you illustrate how this seasonal rate operates?

Robert S. Gay

A. I have an exhibit that shows a comparison of present and proposed billing presently billed on Schedule No. 2 under three variations of monthly use with constant annual usage.

Q. And that, I believe, is Exhibit No. RSG-8, is it not?

A. That is correct.

Q. Please explain this exhibit.

A. In Table 1, the monthly use is assumed to be 700 kilowatt-hours for each month. This results in an annual increase of 9.62%. Table 2 is a similar tabulation in which the summer usage is higher by 300 kilowatt-hours for each of the four summer billing months, July through October. This results in an annual increase of 12.96%. Table 3 shows the effect of 150 kilowatt-hours higher usage in each of the eight billing months, November through June, designated "base period" months. This results in an annual increase of 8.20%.

page 591 } These tabulations show that the customer with a higher base period use will receive a lesser increase than a customer with higher summer use.

Q. Why did you select the billing months of July through October for the summer seasonal rate differential?

A. These months were selected for the residential and small general service classes because these billing periods cover most of the kilowatt-hours used in the summer. October is included because the monthly and bimonthly meter readings made during October are comprised principally of the August and/or September kilowatt-hour usages.

In the case of the large general service class of customers, the peak summer demand is the primary basis for obtaining the major part of the increase in revenue from this class of customer. Since this demand determines the amount of power supply investment that must be made to serve this customer, it was found, based on analyses of the 1968 customer demands, that these customers' maximum demands were more likely to occur in June than in October. Also, the meters for these customers are read on a monthly basis and there is less of a carry-over effect into October than would occur where bimonthly meter reading is in effect. As a result,

page 592 } the billing months of June through September were selected as the summer months.

Q. For those rates?

A. That is correct.

Q. Why do you propose only one residential rate when you presently have two?

A. The difference between present Schedules Nos. 1 and 2

is that the latter is applied to customers with electric storage water heaters. We have proposed a water heating rate provision within the proposed residential rate. On the proposed Schedule No. 1, any customer who uses a qualifying water heater will receive up to 390 kilowatt-hours of those in excess of 210 kilowatt-hours per month at a reduction of 0.4 cents per kilowatt-hour. This proposed Schedule No. 1 replaces not only present Schedules Nos. 1 and 2 but also replaces separately metered water heating Schedules Nos. 16 and 17 for residential customers.

page 593 } Q. Why do you propose a lower rate for water heating?

A. A lower rate for water heating is proposed since the annual load factor for this business, based on its demand at the time of system peak, is 76 percent. This compares with a corresponding load factor of 50.3 percent for the total use of customers without electric water heating. The addition of the water heating loads will improve the system load factor. Electric water heating is highly competitive with other sources of fuel for this purpose. This is exemplified by the large number of electric utilities in the United States who recognize that the water heating business is highly competitive and to obtain this load, it is necessary to offer a lower rate of charge.

The annual kilowatt-hours per customer used for water heating is equal to approximately 92 percent of the average annual kilowatt-hours used by customers without electric water heating. From this it is obvious that the average annual use per residential customer would be materially increased by the addition of water heating.

Q. How do the rates you propose affect the billing of residential customers?

A. I have an exhibit that shows a comparison of the proposed schedules with present Residential Schedule No. 1 and present Residential Schedule No. 2 for both summer and winter.

Q. And that, I believe, Mr. Gay, is Exhibit

page 594 } No. RSG-9, is it not?

A. That is correct.

Q. Please discuss Exhibit No. RSG-9.

A. Page 1 of Exhibit No. RSG-9 summarizes the effect of the proposed Residential Schedule No. 1 on present Schedules Nos. 1 and 2 customers. At the top of the page, the tabulation shows that the customers now on Schedule No. 1 will

receive a 10.34 percent increase on the average. The increase over present Schedule No. 2 is 10.86 percent. The four-month summer increase for all customers on these two schedules will be 17.03 percent and the base period increase will be 6.93 percent. Overall, the increase will be 10.55 percent as shown at the bottom of the page.

The succeeding pages show a comparison of the application of the proposed Schedule No. 1 to Schedules Nos. 1 and 2 for the summer and base periods over a wide range of kilowatt-hour usages.

Page 2 shows the effect of the proposed summer rate on present Schedule No. 1 customers without electric water heating. Except for the minimum bill, to which I shall refer in a moment, the increase is shown to range from 70 cents a month for usages of 80 kilowatt-hours to a 20 percent increase for the largest customer usage shown. But in the base period, as page 3 shows—

Q. That is the next page?

page 595 } A. That is correct.

But in the base period, as page 3 shows, the largest present schedule No. 1 customers receive a 5.8 percent reduction.

Q. That is the last figure in the column on the right on Sheet 3 of Exhibit RSG-9, is that correct?

A. That is correct.

Q. Please continue, sir.

A. The reduction, of course, applies to eight months, while the increase applies only to four months. For all customers on present Schedule No. 1, the summer increase averages 13.77 percent, and the base period increase averages 8.22 percent. The average annual increase for customers on present Schedule No. 1 is 10.34 percent as shown on page 1.

Similar details are shown on pages 4 and 5 for customers on present Schedule No. 2. The summer months increase for present Schedule No. 2 customers averages 22.39 percent. . . .

Q. That is the third figure from the bottom of the page on page 4 of RSG-9, is it not?

A. That is correct.

Q. All right, how about the base period?

A. The base period increase averages 5.24 percent for an annual average increase of 10.86 percent.

Q. The minimum bill is increased from $1.50 to

page 596 } $3.00. Why did you increase the minimum charge to this extent?

A. Both present Schedules Nos. 1 and 2 for residential ser-

vice have a $1.50 monthly minimum charge which includes the use of 33.33 kilowatt-hours. The proposed residential schedule has a $3 minimum bill which includes 60 kilowatt-hours. The present $1.50 minimum is inadequate to cover the cost assigned as customer related costs. The minimum charge is designed to cover the investment costs related to transformer capacity, meters and service equipment, and the operating and maintenance expenses directly related to providing electricity to each customer. These costs amount to about $38 per year per customer and these costs are incurred regardless of whether the customer uses any electricity or not. This is the minimum annual cost that should be recovered in the minimum charge. In my opinion, the $25 additional customer-related costs of the common distribution system also should be included in this minimum charge. However, we have not proposed a minimum greater than $3 per month.

Q. Do you have an exhibit showing the effect of the proposed general service rates on present Schedules Nos. 4, 5 and 6 customers?

A. Yes, I have an exhibit entitled "Billing Comparison-Present Schedules Nos. 4, 5 and 6 with Proposed Schedules Nos. 5 and 6."

Q. And that, I believe, is Exhibit No. RSG-10, page 597 } is it not?

A. That is correct.

Q. Mr. Gay, would you please discuss the first page of Exhibit RSG-10?

A. The first page of this exhibit presents an overall summary of the estimated effect of the proposed rates on present Schedules Nos. 4, 5 and 6.

Present Schedule No. 4 customers will receive an increase of 10.44 percent, Schedule No. 5 customers an increase of 5.98 percent, and Schedule No. 6 customers an increase of 7.02 percent. The total increase for customers presently billed on all three present schedules is $4,191,175 or 9.35 percent.

Q. And those were the figures shown on the last two lines of page 1 of Exhibit RSG-10, is that correct?

A. That is correct.

Q. What is the significance of page 2 and 3 of this exhibit?

A. The second page shows a billing comparison over a wide range of usage between present Schedule No.4 and Proposed Schedule No. 5 for the four summer months. The average increase for these months, as shown near the bottom of the page, is 20.12 percent. A similar comparison for the

eight-month base period is shown on page 3. An average increase for these eight months is shown near page 598 } the lower right-hand corner to be 4.56 percent. The overall increase for present Schedule No. 4 customers was shown on page 1 to be 10.44 percent. There is no summer rate differential for usages of zero to 510 kilowatt-hours monthly because customers in this range normally do not have significant seasonal variation of usage. The summer rate differential appears in the third block of the proposed Schedule No. 5 and affects all bills for usages above 510 kilowatt-hours per month. The extent of this effect at various levels of usage can be seen by comparing the increases at comparable usage levels shown in the two right-hand columns on page 2 and page 3.

The minimum charge has been increased from $1.50 to $3, as in the case of residential service, and the same cost principle applies to proposed Schedule No. 5.

Q. Under the proposed rates, how are customers billed for direct current service?

A. Virtually all our customers take alternating current, AC, service. However, there are 27 customers under the jurisdiction of this Commission who receive direct current, DC, service. These are small customers using an average of 3,000 kilowatt-hours annually. They are located in Norfolk and Richmond and the service is used in most instances for the operation of elevators.

The direct current service is now supplied un- page 599 } der present Schedule No. 4, and we propose to supply this service in accordance with proposed Schedule No. 5. This proposed schedule includes a 10-percent surcharge to cover the much higher investment required to supply DC service. We will continue the practice of encouraging these customers to convert the DC service to AC service by financial assistance in accordance with the provision outlined in a letter from the Company to this Commission dated January 8, 1957.

Q. What is the increase in charges for present Schedule No. 5—General Service customers?

A. As shown on page 1 of Exhibit No. RSG-10, these customers would receive an annual increase of $297,755 or 5.98 percent on the proposed Schedule No. 5.

Q. What is the increase in charges for the present Schedule No. 6 customers?

A. As shown on page 1 of Exhibit No. RSG-10, the annual increase would be $551,052 or 7.02 percent.

Robert S. Gay

Q. In the small general service customer classes, you had a seasonal differential rate of charge based on kilowatt-hour use ranges for the proposed schedules. How do you provide for a seasonal differential in large general service?

A. Present Large General Service Schedules Nos. 10 and 15 would be replaced by the proposed Schedule No. 6—Large General Service. This large general service rate

page 600 } contains both demand and energy charges, usually termed a two-part rate. Since the major share of the investment made to serve customers is demand related, a seasonal differential in this proposed rate is accomplished through the demand determination.

In the proposed Schedule No. 6, the monthly demand charge is based on 95 percent of the demand created by large general service customers in the months of June, July, August and September. For example, if a customer created a 2000-kilowatt demand in July and a 1000-kilowatt demand in December, the billing demand charge for December would be based on 95 percent of the 2000-kilowatt demand created in July or 1900 kilowatts.

Commissioner Catterall: Is that the demand for the whole month or the highest half hour?

The Witness: The highest half hour.

We would also use the 1900 kilowatts in the energy charge portion of the rate to determine the kilowatt-hours to be used for billing purposes in the second block of the energy charge. This was designed to more closely align the cost of providing the service with the charges for the service.

By Mr. Riely:

Q. You appear to be penalizing the customer in the winter by charging in December on the basis of the

page 601 } summer demand. How does this tend to promote winter loads?

A. Let me take the example of the customer with a 2000-kilowatt demand in the summer and a 1000-kilowatt demand in December. This customer could add 900 kilowatts of space heating or other winter-oriented load without increasing the December demand charge.

Q. What is the effect of the proposed rates on present Schedule No. 10 customers?

A. Most present Schedule No. 10 customers would receive service under proposed Schedule No. 6. The present Schedule

No. 10 has a 50-percent demand ratchet based on the highest demand occurring in the previous eleven months. The proposed Schedule No. 6—Large General Service has a 95-percent demand ratchet, as previously described, based on the highest demand in the summer months. In addition, the demand charges would be increased and certain of the blocks would be reduced. As shown on Exhibit No. RSG-5, the annual increase for these customers amounts to $4,435,134 or 11.58 percent.

A. What is the effect of the proposed rates on Schedule No. 15 customers?

A. All present Schedule No. 15 customers would receive service under proposed Schedule No. 6. As shown on Exhibit No. RSG-5, the annual increase for these customers would be $1,710,208 or 5.38 percent. The proposed Schedule No. 6 has a lower demand charge and a higher

page 602 } energy charge than does present Schedule No. 15.

Q. Do you have an exhibit showing the effect of proposed Schedules Nos. 5 and 6 on customers now billed on general service schedules?

A. Yes, I have an exhibit entitled "Comparative Monthly Billing Under Present and Proposed General Service Schedules for Various Hours Use and Demands Assuming 85% Power Factor and Assuming Equal Monthly Demands Throughout the Year." Also, it is assumed that the billing is for 30 days.

page 603 } Q. That is Exhibit RSG-11, is that correct?

A. Yes, that is correct.

Q. All right. Suppose you describe Exhibit RSG-11 for the Commission.

A. This exhibit shows the billing on the present schedule compared with the proposed for 100, 200, 400 and 600 hours use per month for demands ranging from 5 KW to 20,000 KW of monthly demand. In all cases, the rate schedule most advantageous to the customer is applied. Where customers are billed on proposed Schedule No. 6, the effect of the 95% ratchet, based on the summer demand, is not practical to show on a 30-day billing tabulation; therefore, it is not a part of this exhibit. It is, however, taken into account in the overall increase of 11.58% for present Schedule No. 10 customers and the increase of 5.38% for present Schedule No. 15 customers.

This exhibit shows a comparison of the percentage increases for customers with low monthly load factors of 13.9% or 100 hours use to customers with high load factors of 83.3% or 600 hours use for a range of demands of 5 KW to 20,000 KW.

Robert S. Gay

Q. Have you prepared graphs showing the range of use for the present general service rates and the proposed new rates and the relative level of charges?

A. Yes, I have two graphs—one comparing the
page 604 } present and proposed general service rates at
250 hours use of demand per month and the second showing the same comparison at 500 hours use of demand per month. These graphs are plotted on the basis of cents per kilowatt-hour against kilowatts of demand on semi-log graph paper. The chart is based on 30-day bills.

Q. These two charts, I believe, are Exhibit RSG-12, are they not?

A. That is correct.

Q. What range of use is shown by this exhibit for your present rates?

A. As shown on Page 1 of this exhibit, at 250 hours monthly use of demand or 34.7% monthly load factor, present Schedule No. 4 serves generally loads of from 0 to 9 KW; present Schedule No. 5 serves loads from 9 to 22 KW; present Schedule No. 6 serves loads from 22 to 56 KW; present Schedule No. 10 serves loads up to 950 KW; and present Schedule No. 15 serves loads above 950 K.W. At 500 hours use, as shown on Page 2, present Schedule No. 4 serves loads from 0 to 5 KW; present Schedule No 5 serves loads from 5 to 22 KW; present Schedule No. 6 serves loads from 22 to 50 KW; present Schedule No. 10 serves loads from 50 to 750 KW; and present Schedule No. 15 serves loads over 750 KW. Particular customers with different load factors
or monthly hours use many change the ranges
page 605 } of demand stated above.

Q. What does this exhibit show as your proposed rates?

A. As shown on Page 1 of this exhibit, customers with 250 hours use of demand with loads up to 40 KW in the summer and slightly more than 100 KW in the base period months would be served on proposed Schedule No. 5 and higher loads would be served on proposed Schedule No. 6. On Page 2 of this exhibit, at 500 hours use of demand, proposed Schedule No. 5 covers demands up to 30 KW in the summer months and up to 50 KW in the base months. Proposed Schedule No. 6 covers demands above these limits.

Q. What are some of the areas in the present schedules that you have improved on in the new rates?

A. Exhibit No. RSG-12 shows that the proposed two gen-

eral service schedules achieve a more uniform relationship of average price per kilowatt-hour to size of load than the present five general service schedules. It is apparent from this exhibit that the proposed schedules recognize a more uniform reduction in average price per kilowatt-hour with increased demands.

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page 675 } JAMES C. WHEAT, having been previously duly sworn, was recalled and testified as follows:

CROSS-EXAMINATION

By Mr. Parker:

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page 680 }

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Q. Would your firm sell securities which they do not believe to be sound and of good value?

A. Not to the best of my knowledge, but I hasten to add that in buying securities you are buying futures, not past and present, and in the case of VEPCO when the security was sold on March 10, the common stock was sold, this case was pending. As I stated in my testimony yesterday, in my judgment if your point of view prevails in this case, VEPCO securities will be sold and VEPCO will lose the favorable investor climate which it presently commands because of the responsive attitude of this Commission over the years to responsible requests for rate revision.

Q. Sir, you haven't heard me express my point
page 681 } of view, have you?

A. I believe I have, sir.

Q. There wasn't any rate case pending in 1968 when your firm participated in the underwriting of what at that time was the largest sale of common stock in the history of American utilities, was it?

A. Is this your statement, sir?

Q. I am asking you if there was a rate case pending at the time?

A. I do not know, sir. I don't believe so.

James C. Wheat

Q. Did you at any time ever recommend against participation in the underwriting syndicate for either the common stock or the bonds and the subsequent distribution of the stock and bonds?

A. Did we ever recommend against distribution?

Q. Against participation in the syndicate.

A. In March 10 of this year?

Q. Yes, sir, or the April 21 period.

A. No.

Q. Or in 1968?

A. No. Again we, recognizing the risk of the situation, felt and still believe that the Commission will take a resonsive position with respect to responsible requests, and we reserve the right to recommend to our customers

page 682 } to liquidate their position; and, as I indicated yesterday, this is a mobility that the consumer does not have. The investor can sell his securities just as readily as buy them.

page 683 } Q. Your firm also participated in the sale of $75 million of Virginia Electric and Power Company bonds Series X around June 3, 1969, did they not?

A. I believe so, sir; yes.

Q. At any time did you ever recommend against your firm's participation in either of the two sales this year or the sales last year of bonds and stocks?

A. No, sir. Again, we reserve the right to recommend against the investment in the light of conditions as they develop, and a key condition is the outcome of this rate case.

Q. There was no rate case pending on June 3, 1969, when the $75 million of bonds was sold, was there?

A. Neither was there a 9.09 effective rate which raised the embedded interest cost of 4.85 percent as of December 31, 1969 to 5.28 percent as of the effective date of the offering.

Q. Have you ever seen the company's five-year projections which were available at that time relative to embedded cost?

A. What schedule are you referring to, sir?

Q. I am not referring to any schedule. I am referring to the material which the company furnished Mr. Seligson in preparation for his testimony.

A. Right, yes.

Q. Did they give you the same thing?

A. Yes.

James C. Wheat

page 684 } Q. How long ago, prior to March 10?
A. Yes.

Q. Those figures that they gave you do not include any material related to this rate case, do they? They have projections in there based on existing rates?

A. This is correct, sir, unless projections are so compelling as to the need for rate increase that it is inconceivable to the investing public that this Commission, which has a record of responsible reaction, will not grant rate relief.

If this does not occur, as I have stated before, if rate relief does not occur, in my judgment you will see liquidation of Virginia Electric Securities, which will put further pressure on the markets, which will make raising capital more difficulty and, furthermore, you will see a further deterioration in the coverage figures. Mr. Seligson has testified, as Dr. Keyserling has testified. You will see thereby further deterioration in the growth pattern of the earnings of the company, the company equity, and in my judgment you inevitably reach the point where the company will not be able to provide the facilities that the consumer needs. So the consumer is the loser.

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page 687 }

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By Mr. Durland:

Q. I would ask you if that includes Mr. Wheat also?

A. Certainly. But again I remind you that the investor has recourse to mobility, and in my judgment as a professional I say to you in all dead seriousness that this Commission has a posture in the investment community of responding to responsible requests for rate revision. Destroy that in this case and VEPCO is going to be damaged in its efforts to raise capital. It is just this simple.

Commissioner Dillon: You don't think we are in VEPCO's pocket like we have been accused?

The Witness: No, sir; I don't think anybody could accuse the Commission of being in anybody's pocket.

I do think this Commission responds promptly and fairly to responsible requests, and I emphasize "responsible." In my judgment when you see embedded interest costs with one

issue, one debt issue of $85 million, when we are looking down the gun barrel of another billion behind it, one issue of $85 million increased the embedded interest costs from 4.85% as of December 31, 1969 to 5.28% on the long-term debt less than four months later, I say that this Commission,

page 688 } this company, the Commonwealth of Virginia, and its entire consumer population has got a problem that we better all face together in a responsible manner, and I have perfect confidence in the reponsible attitude and reception of the Commis-

page 689 } sion.

Mr. Durland: Your Honor, I haven't asked the question yet. I presume that the answer has already been given.

By Mr. Durland:

Q. My question would have been—and if your answer remains the same, Mr. Wheat, the record will so show—do you have any reason to dispute the bright out-look for utilities and particularly for VEPCO that Merrill Lynch reports in its spring 1970 outlook?

A. Yes, I have reason to dispute it. I think the position that you and Mr. Parker are taking is good reason to dispute the outlook. I think the position that you take leads inevitably to higher interest rates, lower debt coverage, higher costs of interest, lower market for the equity security and inevitably—and I don't mean today or tomorrow—but inevitably over the foreseeable future if this circular reaction continues you will come to a point where VEPCO will not be able to finance the $2 billion plus over the next seven years.

If this is what the object is—I don't believe this is what you gentlemen want—but if this is the objective, we are on the right road to accomplish it.

Q. You don't mean to say that the stock market crash on Tuesday was a direct result of what we were

page 690 } doing down here on Monday, do you?

A. I didn't suggest that, sir.

Q. Moving from Merrill Lynch to Moody's, Moody's in their most recent Handbook of Common Stocks seems to agree with Merrill Lynch, which you apparently do not. They say, speaking about VEPCO, "This company has been one of the leading growth companies in the utilities industry. Population gains and steady expansion of industries, com-

mercial establishments and shopping centers have all contributed. Further development seems likely and we expect the company's above-average earnings growth trend to extend well into the future." Would you like to see that, Mr. Riely?

Mr. Riely: Yes, sir, please.
The Witness: Is there a question on the floor?

By Mr. Durland:
Q. I am waiting until they look at it.
Now we have Moody's joined with Merrill Lynch against you, Mr. Wheat, and I wonder whether you might want to reconsider your original answer in the light of what these reputable people have to say?
A. What is the date of that?
Q. This is their latest, and it is 1970.
page 691 } A. That covers a rather wide span. What date in 1970?

Mr. Riely: You have the original books.
Mr. Durland: It is Page 972. I do not have the original book, but I would be happy to bring it in.
Mr. Riely: Do you know the title of the book?
Mr. Durland: Yes, Moody's Handbook of Common Stock.

By Mr. Durland:
Q. I believe you have it in your office, Mr. Wheat?
A. A response to something as vague as this would be grossly misleading either way. I will stand on what I have said previously:
A, that the fact that at any given time any investment service or broker recommends a stock does not automatically assure the soundness of the investment. It is an honest expression of opinion, but that is the best it can be.
B, the circumstances that are unfolding before us at a rapid rate in the money markets as they affect
page 692 } this company can clearly invalidate anybody's opinion two weeks ago, four weeks ago, eight weeks ago, or any time in 1970.
I submit to you that if VEPCO can raise the $85 million in September at today's cost, which is better than 9%, the embedded cost will jump again to 5.62%.
The truth of the matter is that we do not have the luxury of time to make the adjustments necessary to preserve the

dynamics of this company and its contribution to the economic well-being of the Commonwealth. We can argue back and forth as to the question of what Moody's or Merrill Lynch have said in the past, but the question before us is very simple: Is this company going to be given rate revisions sufficient to compete in the capital markets and is the Commonwealth of Virginia going to have, thereby, an adequate supply of electrical energy.

My answer to the first question is no and the answer to the second question is no.

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page 696 }

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A. I don't believe they are any better, sir. As a matter of fact, I think that the circumstances since February 13 clearly indicate that the situation is deteriorating rapidly. That is not to say that there is any death rattle or anything else.

I am just saying that the situation as far as
page 697 } a rate of return sufficient to attract the necessary capital of $1,900,000,000 is a lot of money.
I think, Mr. Dillon, you made the inference the other day that there were a number of shareholders and stock owners in Massachusetts and New York.

Q. I didn't ask that question today.

A. Virginia will never be able to supply $1,900,000,000, so we have got to compete in the market place with every other electric utility, with every other of the 50,000 different securities in the market place. The only way we are going to do it is to have a rapid response.

Now, February 13 was prior to the issuance of 9.09 interest cost bonds to VEPCO, which as I have indicated—that one item, one $85 million offering, increased the embedded interest cost from 4.85% to 5.28%.

A comparable sale in September of $85 million—and today it could not be sold on a comparable basis—but a comparable sale in September would immediately raise that to 5.62%.

Q. Yes, Mr. Wheat. Now, after all this—and you have said it a number of times—is it not true that when this testimony was filed—and I believe it appears in one of the wit-

ness—that VEPCO common stock was at 22 and today after all the market has been going through this week the stock is at 21? Do you think that really shows that VEPCO is in real trouble here and if this rate increase of 10%

page 698 } isn't granted somehow or other electricity will disappear in Virginia by the end of the year?

A. I did not make the statement it would disappear by the end of the year. I say according to the papers yesterday there is a good possibility in the foreseeable future you will have dim-outs, which I don't believe the consumer wants.

As to the price of the stocks as of today, I will give you my professional judgment. If your point of view prevails in this rate case, VEPCO will not be selling at $21 a share or $22 a share, and VEPCO will not finance, at 9%, again in September.

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page 760 } THADDEUS L. SHARKEY, called as a witness on behalf of the Applicant, having been previously duly sworn, was examined and testified as follows:

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CROSS-EXAMINATION

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page 765 }

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By Mr. Staples:

Q. I intend to explore a few of the reasons for the differences between your allocations and Mr. VanScoyoc's as to Virginia Jurisdictional Service net operating income and rate base. For this purpose I have prepared certain comparisons of the results obtained by you and those obtained by Mr. VanScoyoc, or more accurately that Mr. VanScoyoc has prepared, for the purpose of localizing some differences and shortening the cross-exaimination.

A. Yes, sir.

Q. You have been supplied with copies of those and I would like these marked for identification, and in this series of exhibits to be introduced by Mr. VanScoyoc he will take responsibility for these calculations.

I think these would be MVS-2, 3, and 4.

Mr. Brasfield: May I see them?
Mr. Staples: Yes.
Mr. Brasfield: We have no objection subject to Mr. VanScoyoc properly establishing them.
page 766 } Mr. Staples: He will stand for cross-examination on them.
Chairman Hooker: These exhibits are admitted.

(The documents referred to were marked for identification, Exhibits MVS-2, 3, and 4 and received in evidence.)

By Mr. Staples:
Q. On Exhibit MVS-2, which reflects a comparison of the Virginia Jurisdictional rate base as developed by you and as developed by Mr. VanScoyoc, broken down by functional categories, it appears in this exhibit, does it not, that the rate base amounts allocated by Mr. VanScoyoc to Virginia Jurisdictional pertaining to the power supply production and transmission facilities are approximately $4,400,000 in excess of the amounts which have been allocated by you to Virginia Jurisdictional; is that correct?
A. Yes, sir.

Mr. Brasfield: Where is that figure?

Q. You add the top two?
A. That is the $2,485,000 and the $1,923,000 added together.
Q. Is that correct?
A. I assumed that was what you meant.
page 767 } Q. It is a little difference that appears between you and Mr. VanScoyoc in the common and specific transmission categories; is that correct?
A. Yes, that is minor. I believe you said little.
Q. You accept that for minor?
A. Yes, sir.
Q. Does it also appear from this exhibit that the classification of rate base amounts for distribution and customer categories by Mr. VanScoyoc and yourself are substantially different, and that the net effect of such difference on the Virginia Jurisdictional rate base is that your rate base amount exceeds that developed by Mr. VanScoyoc by approximately $40 million?

A. As shown on this exhibit, yes, sir.
Q. As shown on MVS-2?
A. Yes.
Q. It is in respect to the distribution and customer components that I desire to explore the allocation methods which you have been employing.
First do I correctly understand that both the distribution and customer plant categories are carried on the company's books under functional group distribution plant?
A. Under what?
Q. Under the "Functional Group-Distribution Plant"?
A. Oh, yes.
page 768 } Q. Is it also correct that "Distribution Plant" was classified by location, that is all distribution plants located in Virginia are assigned to Virginia Service classification in your cost allocation?
A. That is correct.
Q. Would you please examine your working paper headed "Split of distribution plant between customer and demand components, 1969"?
A. This is the one that was attached to what we furnished.
Q. You would accept this being introduced as TLS-2 and 3?
A. Yes, sir. I have typed copies of that, if you wish.
Q. This is readable, I believe, isn't it?
A. Oh, yes, sure. I anticipated that, Mr. Staples.

Mr. Staples: Would counsel prefer for finished copies to be put in?
Chairman Hooker: They would be better, I think, if you have those copies.
Mr. Gibson: They are certainly more legible.

page 769 } By Mr. Staples:
Q. Is that on two sheets?
A. Two sheets.

Mr. Staples: I will ask those be marked TLS-2 and 3. The one that runs vertical will be TLS-2.
Mr. Riely: "Split of distribution plant between customer and demand components"—
Mr. Staples: That is correct.
Mr. Riely:—but they both say that.
Mr. Staples: That is the problem. I identified one as going vertically.

Mr. Riely: The one vertically is TLS-2 and the one going horizontally is TLS-3.

Mr. Staples: That is right.

Mr. Parker: Mr. Chairman, could I ask the witness to identify what these documents are for the record and what the circumstances of their preparation are? One of them is listed as Page 6 of 8. I would like to know where the other 7 pages are. This is the first time we have ever seen these documents. Apparently the Commission Staff has had them.

page 770 } Mr. Staples: That is correct. We were accommodated by the company and got the working papers behind Mr. Sharkey's allocation figures. The results of our examination is the review of all of these papers, Mr. Parker, together with Mr. VanScoyoc's testimony.

At the break I think we would be happy to accommodate you.

The Witness: That is right. Mr. VanScoyoc has them all.

Mr. Staples: We will accommodate you by letting you look at Mr. VanScoyoc's working papers, or if you want copies of them, we can work that out.

By Mr. Parker:

Q. Do I understand, Mr. Sharkey, these were prepared by you in preparation of the testimony you presented in your case?

A. I would say these are part of the working papers; they are reproductions of the working papers that we used in the study. We did not anticipate at the time that these would be considered an exhibit.

By Mr. Staples:

Q. That is why you retyped them?

A. Yes, sir, because you had Xerox's that came from the data we furnished Mr. VanScoyoc.

page 771 } Chairman Hooker: Are the exhibits straight?

Mr. Staples: I offer TLS-2 and TLS-3.

Chairman Hooker: The exhibits will be received.

(The documents referred to were marked for identification, Exhibits TLS-2 and 3 and received in evidence.)

Thaddeus L. Sharkey

page 772 } By Mr. Staples:

Q. Mr. Sharkey, would you please examine your working papers headed Split of Distribution Plant Between the Customer Demand Components, 1969?

A. Yes.

Q. Does the work paper indicate that 46.2448% of the distribution plant was assigned to what you have termed the customer components?

A. That is correct.

Q. Was the balance of 53.7552% assigned to the demand component?

A. That is correct.

Q. Do the amounts in the first amount column on this working paper reflect the original cost of total system distribution plant in service at December 31, 1969?

A. It does.

Q. The second column shows the basis of assigning and allocating the amounts in the first column to the customer component, is that correct?

A. Yes.

Q. Is reference made in that column to page 2 of your work paper in regard to Accounts 364, 365, 366, 367 and 368?

A. That is correct.

Q. Please turn to page 2 of what is now marked TLS-3.

In your testimony on page 8 you refer to as-
page 773 } signing the mimimum size line that would carry a mere potential to the customer. When you refer to potential, I assume you mean voltage, is that correct?

A. Yes. Well, actually what I meant there is the presence of electricity. The presence of electricity not sufficient to carry any load.

Q. You assume zero consumption of electrical energy?

A. That is correct.

Q. Does TLS-3 reflect the VEPCO distribution system as designed to carry a mere potential to each of its 985,822 customers?

A. No, if I understand your question, Mr. Staples.

Q. The distribution system depicted here does not portray carrying a mere potential to each of the 985,822 customers?

A. No, sir.

Q. What does it show?

A. Are you referring to the figures on TLS-3, the system amount total or are you referring to the one eighty six double 0 nine seven eight four?

Q. That is correct.

Mr. Brasfield: Which?

Mr. Staples: The one eighty six double 0 nine seven eight four, second.

The Witness: Now may I ask you to repeat
page 774 } the question, now that we have identified the figure?

By Mr. Staples:

Q. I asked, does the exhibit reflect the VEPCO distribution system as designed to carry a mere potential to each of its 985,822 customers?

A. This represents the dollar amount—

Q. Can you give me a yes or no and then explain your answer?

A. That is what I am trying to do, sir.

Q. I didn't hear the yes or no.

A. I didn't say either one.

Q. May I have a yes or no and then explain?

A. I can't answer that yes or no, directly. I think if you would let me explain it—

Chairman Hooker: My understanding of that is that it is neither yes nor no?

The Witness: That is correct. It is a qualified yes, sir.

Mr. Brasfield: And you now want his qualifications?

Mr. Staples: Yes, I just wanted to get a yes or no.

Mr. Riely: Explain it.

The Witness: That is what I want to do now.
page 775 } Mr. Riely: Go ahead.

The Witness: These figures represent the original cost value which we consider to be the minimal amount representing the minimum type of facility of wires, poles, distribution transformers, secondary wires, to bring service to the customer. That is all. It is not to furnish any load but to bring service to the customer.

By Mr. Staples:

Q. That is a theoretical distribution system?

A. Yes. Now, may I dwell on that a moment?

Q. Did you design this?

A. Did I design this method?

Q. No, this system, this characterization of the system, to deliver a mere potential.

A. I selected the minimum priced equipment that would be

required to bring this minimum amount of presence of electricity to the customer.

Q. Is all of the design data reflected on the sheets?

A. Yes.

Q. Did you want to add something?

A. Yes, I did. You asked me if this was theory, did you not, sir?

Q. No, I characterized it as a theoretical system.

A. All right, if it is a theoretical system. I merely wanted to explain what we meant by the customer com-
page 776 } ponent.

Beginning at the top of the system, that is, the generation and transmission of power supply, that is there to carry kilowatts entirely and produce kilowatt-hours according to the usage of the total number of customers. The transmission system delivers that to a distribution system. There the kilowatts of demand imposed by the customers on the system are responsible for the plant investment costs of those facilities.

When we get further down into the system where we are most closely approaching the customer and furnishing him his service, the customer component becomes effective there because this company, like any other electrical utility, builds its lines to serve its customers.

That is a customer component there because the length of line, the placement of the distribution transformer, is dependent upon the number of customers.

Q. Do you know of any—are you through?

A. Yes.

Q. Do you know of any utility distribution system which was constructed to carry a mere potential to its customers?

A. Oh, no. This is not intended to portray that.

Q. So this is still a theoretical system?

A. Yes, but I would like to add that it is theoretical to some extent but—
page 777 } Q. Then you would agree—

Chairman Hooker: Let him finish.

The Witness: I wish to say that this is a standard method of approaching the determination of customer component of an electric utility distribution system. They have been using this for years. Most utility analysts use this approach as the most appropriate and the most realistic way of determining the value of the customer component of the distribution system.

By Mr. Staples:

Q. Of course you realize Mr. VanScoyoc is in some disagreement?

A. Very well, sir.

Q. You would agree, would you not, that no utility would ever build a distribution system of this type?

A. Of course.

Q. Why did you select No. 2 aluminum wire for use as overhead primary and secondary conductors for voltages ranging from 34,500 volts down to 240 volts?

A. I selected the No. 2 wire because it was the least expensive that the company carries in stock for which we could get a price comparable with the original cost value of the distribution system in place.

Q. Smaller conductors would do the job, would they not, to carry a mere potential?

Q. VEPCO has used smaller ones?

page 778 } A. I imagine they would, yes.

A. No.

Q. In its distribution system?

A. No. That was the minimum—

Q. They have never used—

A. I beg your—

Q. —smaller than No. 2 wire, or is it just the smallest one on which they had a price?

A. Well, that is a historical fact I couldn't answer. At the time we were making this study the No. 2, which happened to be the cheapest we could find which amounted to about 11 cents a foot in place, was No. 2 aluminum.

page 779 } Q. Why did you select 1-0 aluminum wire for all underground connectors?

A. For the same reason. That is a different type of cable, of course. That is a lead-covered cable.

Q. Why did you select 10 kva transformers to provide a mere potential to the customer?

A. That is the smallest capacity transformer that the company would ever install. In fact, I have been informed that they are not installing anything of that load capacity now.

Q. But you wouldn't need that for a mere potential?

A. Not for a mere potential. Perhaps the use of the word "potential" is incorrect here or misused in the technical sense.

I realize that you were associating voltage with potential, which is completely correct, but this is merely a presence of electricity. It is what it would cost the company if they were

to build the minimum system with the type of facilities that they would use just to bring service to a customer.

Q. How do you expect a potential would be provided to the customer without any distribution substation equipment being included as a component of this hypothetical distribution system?

page 780 } A. The distribution *substantion* is not included in this.

Q. That is what the question is. How do you expect the potential would be provided to the customer without any distribution substation equipment being included as a component of a distribution system?

A. There would be required a substation, yes. I don't quite understand the point of that. I thought we were talking about the customer component.

Q. Did you finish your answer?

A. Yes.

Q. I think you have agreed that it is necessary that there be a substation component to provide potential?

A. Of course.

Q. And you didn't include it?

A. In the customer component?

Q. In this theoretical distribution system.

A. Let me make this clear, Mr. Staples. The distribution substation facilities, that is, the land, the building, the power transformers, the switchgear and wiring, are all considered demand-related. They have nothing to do with what you have termed the theoretical approach of the determination of the customer component.

Q. Did you not include as a customer component a portion of the substation land and structures?

page 781 } A. No.

Q. I refer to to TLS-2, Account 360.

A. Station equipment is zero.

Q. Account 360.

A. Land and land rights. That is not station equipment. That does not refer to station equipment. That is rights-of-way for distribution.

Q. No substation land in there?

A. No, sir.

Q. How about 361, structures and improvements?

A. No.

Q. No substation land in there?

A. No, sir.

Commissioner Catterall: Why are those two figures identical, Mr. Sharkey?

The Witness: The 51.3168?

Commissioner Catterall: Where did that come from?

The Witness: That is the ratio we used to assign those dollars to the customer component. It would be the same in either case.

Commissioner Catterall: Is that explained on these exhibits or elsewhere?

The Witness: Yes, sir.

Mr. Riely: May we have the last question?

page 782 } (The pending question was read by the Reporter.)

By Mr. Staples:

Q. What is included in structures and improvement?

A. I would have to check on that to give you an exact answer.

Q. We are coming to lunch.

Did you include as a customer component all of the service and meter investments?

A. Yes. That is a hundred percent customer.

Q. Is it a fact, Mr. Sharkey, that services and meter installations are sized to take care of the different amplitudes of customer demand?

A. Oh, yes.

Q. If the customer costs were to be determined on the basis of the hypothesis of providing only a potential to the customer's premises, could not smaller-sized meters be used for that purpose?

A. Of course.

Q. In fact, you might not need any at all?

A. We didn't regard that as such in the customer component. We assigned all of that to the customer component. There was no theoretical split there.

page 783 } Q. But you might not need any at all, any meters?

A. I couldn't answer that.

Q. For mere potential.

I note from Page TSL-3 that you estimate 301,058 kva transformers would be required. How was this number determined? If you need to look that up—

A. No, that is quite all right. I just want to be sure to identify the figure. The 301,058?

Thaddeus L. Sharkey

Q. That is correct, sir.

A. That was determined from the actual count of distribution transformers. We had the exact figure in 1968 and those figures were not available for the year 1969 when we made this study. That is the reason it has est. after it. It was upgraded to that extent.

Q. I note from the company's Annual Report to the Commission, Page 447, Line 14, Column C, that at the end of 1969 only 258,593 line transformers were in active use. Why does your design require more line transformers to carry potential to the customers than are needed to meet the load requirement of VEPCO's customers, the total capacity which is half of the capacity of all line transformers in service at the end of the year?

A. I will have to check that for you, Mr. Staples. This is for the State of Virginia, is it not?

page 784 } Q. Total system.

A. Is this for the total system? I will have to have that explained to me.

* * * * *

page 805 } The Witness: I am informed that a statement I made is not completely correct, that the $18 million, more or less, of street lighting investment I have assumed was directly assignable to the State, county and municipal class of business—I am informed that that was all lumped together as part of distribution and distributed among the classes as we did the other portions of the distribution system. This was due because—

By Mr. Staples:

Q. Let me establish the answer to my question and then you can explain it. So the answer to my question is that investment in the street lighting is in the demand component?

A. It is in both the customer and demand as a matter of distribution. Both were taken into account.

Q. Go ahead and explain. You had an explanation you wanted to make.

A. That is all I had to say.

Q. They were taken together by weighting, is that correct?

A. Well, it was weighted according to the customer component, demand component ratio.

Q. Does not the classification of such street lighting investment as demand related result in the assignment of 87.

3488% of the net investment in such facilities to the retail classification?

page 806 } A. Under that basis I would say that was about right.

Q. Are you aware that the company's net investment in street lighting and signal system facilities in the State of Virginia is in excess of 14½ million, or would you accept it subject to check?

A. Yes, I would accept that subject to check. It must be in that neighborhood.

Q. Would you agree that if 14½ million dollars is correct, that 87.3488% of the street lighting net investment, or approximately $12,665,000 was assigned to Virginia Jurisdiction?

A. Subject to check, yes.

May I make a comment here? I wanted to explain, so everybody would understand, that the reason it was done this way and was tested for reasonableness with previous studies is that the street lighting investment, as such, the total for the company and that attributable to Virginia, was such a small portion of the total distribution that it did not make any great difference in the results of our study, which was the basis of assigning property and expenses and taxes to Virginia Jurisdictional business.

Q. That $12 million, or over $12½ million, was not material?

A. I don't think it would materially affect the end result, that much of plant investment.

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page 810 }

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Q. Mr. Sharkey, I understand that in allocating the distribution net investment that you used what is know as a noncoincident demand method, is that correct?

A. That is correct.

Q. Does this method utilize the ratios of noncoincident maximum demands of each class to the total maximum noncoincident demands?

A. That is about correct, sir.

Q. Does this method give recognition to the extent of use

by customers of their energy-consuming appliances or applications?

A. None whatsoever. There is nothing in the
page 811 } building, operating and maintaining of a distribution system that has anything to do with the customer usage measured in kilowatt-hours. They don't set transformers, build lines, poles or anything on the basis of kilowatt-hours. It is based on the local demands of the customers that are served from the distribution system.

Q. Actually the method results in each kilowatt of maximum class load being given equal weight, regardless of the time, and such maximum load is imposed on the system over its duration during the test period, is that correct?

A. Not exactly. It is in the ratio of the sum of the individual class demands imposed on the system, not necessarily the total load of the system. The total load of the system would be something else.

page 812 } Q. When you say not exactly, is it more right than wrong?

A. Well, there are two different figures, if I understood you correct. The company system load is the—

Q. Do you want me to repeat the question? Maximum class load may make a difference.

The method results in each kilowatt of maximum class load being given equal weight, regardless of the time?

A. That is correct, yes, sir.

Q. Are you familiar with the average and excess method used by Mr. VanScoyoc for allocation of demand component of distribution system plant and related annual cost?

A. Yes, sir, I am familiar with it.

Q. Does this method give recognition to the amount of use made by customers of their appliances and applications?

A. Yes, it does, and it also gives recognition to system load factor. In fact, that is one of the ratios that are required, is the system load factor expressed as a percentage. That is multiplied by a derivative of kilowatt-hours divided by the number of hours of the year, which is termed average demand.

page 813 } Q. Have you ever used the average and excess method in electrical utility cost allocations?

A. Yes. May I explain that?

Q. Well, can you give me an example of when you have used it? Did you use it in 1954?

A. We used a modification of it.

Q. For whom did you make that study?

A. For this Commission.

Q. Did you want to expand on that?

A. Yes, I wanted to expand on the average and excess. You were asking me if we had ever used it.

We have used it. I and my associates use it frequently in our cost analyses for utility companies, electric utility companies.

Q. But you didn't use it for this case?

A. No. I had a good reason for that. The average and excess method is an acceptable one among utility analysts and regulatory authorities, but the average in excess method was developed primarily for allocation of capacity costs of the power supply system, not the distrubution system.

Now, some analysts do apply it to the power supply systems of a company and for a matter of convenience they carry it through to the distribution. We don't do that. page 814 } We don't consider it appropriate.

I wish to repeat that the average in excess method of allocation of costs is well accepted in the utility field but its major application is to power supply facilities.

Q. But you didn't consider it appropriate at this time?

A. No, definitely not.

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page 826 } T. JUSTIN MOORE, JR., called as a witness on behalf of the Applicant, having been previously duly sworn, was examined and testified as follows:

Chairman Hooker: All right, Mr. Staples.

Mr. Staples: I have no questions of Mr. Moore.

Chairman Hooker: Mr. Parker, do you have any questions?

Mr. Parker: I have a few, Mr. Chairman.

CROSS-EXAMINATION

By Mr. Parker:

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T. Justin Moore, Jr.

page 829 }

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Q. As Chief Financial Officer at the time of the two recent underwritings did you achieve any difficulty in selling the stock or the bonds?

A. I think we were very fortunate to sell the common stock at the price we did. There is no doubt in my mind that the most material factor in the success of that sale was the pending rate case and the feeling on the part of the investing community that this Commission would grant appropriate rate relief.

* * * * *

page 842 } The Witness: I am going to explain exactly what I mean by that. The basic point I have in mind here and the way I referred to dilution is the key is the large construction program of some 1.9 billion dollars in the next five years. The next step of that is 1.4 billion of that 1.9 come from outside financing.

We have traditionally kept about 35% of our capitalization in common stock. When you take 35% of 1.4 billion you get about $490 million in common stock that we are going to have to be issuing in the next five years. That is an awful lot of common stock. In the past when we have issued common stock we have always been able to end up a year with still an increase in earnings per share.

What I am saying here is, without substantial rate relief I don't believe we are going to continue to find ourselves in that situation. I think we are going to find earnings per share growth leveling out or possible, even worse, going down.

When that happens you are going to find investors turning away from investing in our stock and looking to other situations where the dilution factor does not occur, is not so likely.

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page 856 }

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Q. My clients seemed to feel that the net income as percent of gross revenue is a significant figure in determining whether you should be granted a proposed rate increase. I wonder whether your advisers did in fact advise you as to the net income as percent of gross revenues for VEPCO?

A. Do you have any particular figures there in mind?

page 857 } Q. I had a figure that has been reported to the Fourth Annual Industry Report of the Top One Hundred Electrical Utility Companies, July 1969, of 19.43 for 1968 and I did my own figuring, which I wouldn't rely on, from your '69 Annual Report, which indicates for '69 it is approximately within a tenth of a percent or two of the same thing, 19½ cents per dollar.

My question is, did your advisers advise you that this is a significant figure or one significant figure in a number that you would take into consideration in determining the amount of rate increase that you would recommend at this hearing?

A. You mean the net income as a percent of the gross dollar?

Q. Right.

A. How much of the operating revenue we take down to net income, which you say is 19, approximately?

Q. Yes.

A. Yes, we prepared an exhibit on that which I will be delighted to furnish to you and introduce for the record. We think that net income as a percent of operating revenues is really not relevant. We think the relevant determination is your rate of return on net utility plant.

Mr. Gibson: May we offer that while we are discussing it as TJM-1, if you please?

Chairman Hooker: TJM-1 will be received.

page 858 } (The document referred to was marked for identification TJM-1 and was admitted in evidence.

The Witness: If I may point out, Mr. Durland, on this exhibit, you see there under VEPCO we show the 19.4 per-

cent of operating revenues carried down to net compared, as you point out, to 15.4 for the total U. S.

But when you get down to the rate of return on net utility plant, VEPCO's return on utility plant is 6.78 percent, which is less than the total in the U. S., which is 6.95.

In the last five years in this fast-growing territory of ours we have increased our utility plant by almost 57 percent and that is the reason for that, whereas the average utility in the country has only increased by 39.4 percent. We have increased rapidly in times of inflation.

Mr. Parker: Mr. Chairman, I object to the exhibit in that I believe under Virginia law, as I read it,

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page 891 } A. M. CLEMENT, called as a witness on behalf of the Applicant, having been previously duly sworn, resumed the stand and testified further as follows:

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page 949 }

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REDIRECT EXAMINATION

By Mr. Riely:

Q. Mr. Clement, a couple of brief questions. Mr. Parker, I believe, questioned you on the ratio of earnings to fixed charges as shown on page 5 of the prospectus dated April 21, 1970. In the next to the last line on that page it shows a *pro forma* ratio of earnings to fixed charges of 2.93%. Do you have a statement showing how that percentage is computed?

A. Yes, sir.

Mr. Parker: Mr. Moore indicated he was going to give us some extra copies of this prospectus. Are they available to somebody?

Mr. Moore: I did give them to someone. I have some extras and I will give them to you.

Mr. Parker: Do you just want to put this document in?

Mr. Riely: Yes, sir, I would like to.

Mr. Parker: Is this the only copy you have of this?

Mr. Riely: Yes. I will have some copies made if
page 950 } the Commission will permit me.
Mr. Parker: It is perfectly all right with us. If we have any questions on it we would like to have the right to question him on it.

By Mr. Riely:
Q. Is this the statement to which you have referred?
A. Yes, sir.

Mr. Riely: If it please the Commission, I offer this as Exhibit AMC-5.
Chairman Hooker: It will be received.

(The document referred to was marked Exhibit AMC-5 for identification and was received in evidence.)

By Mr. Riely:
Q. Mr. Clement, is coverage as computed on Exhibit AMC-5 the same thing as coverage computed under the mortgage indenture under which the Commission issued the bonds?
A. No, sir.
Q. And the mortgage requires two times coverage to permit the issuance of bonds, does it not?
A. Yes, sir.
Q. Do you have a statement showing coverage after each of the last five bond issues?
A. I do, sir.

page 951 } Mr. Parker: I think that is already in the record, isn't it?
Mr. Riely: Is this that statement?
A. Yes, sir.
Mr. Riely: If it please the Commission, I offer this as Exhibit AMC-6.
Chairman Hooker: Received.

(The document referred to was marked for identification, Exhibit AMC-6, and received in evidence.)

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page 953 }

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CROSS-EXAMINATION

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page 960 }

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By Mr. Rogers:

Q. Let me rephrase it. Do you believe your company will be able to maintain its present rate of growth if the 1.2-cent terminal rate is maintained under the residential rate schedule?

A. We are hoping so with additional efforts, as well as having to make our sales program, advertising, and with additional sales and other efforts in this way.

page 961 } We are hoping so. We don't know.

Q. Do you believe that you would be able to attract additional customers if the 1.2-cent terminal rate was lowered to a lower rate?

A. Yes, sir; I do.

Q. Could this be done without penalizing the existing customers of the company?

A. Oh, yes, sir. Mr. Frazier testified that we could go down below 1.2 cents, down to one cent or lower possibly, without hurting the other customers in any way.

By Commissioner Catterall:

Q. Why don't you do it?

A. Sir?

Q. With all that idle equipment why don't you give them free electricity?

A. Our objective here, Your Honor, was to obtain an amount of revenue, and we felt if we could hold onto this while we had to increase some other areas in order to raise additional revenues that we needed—we would have liked very much to reduce it.

By Chairman Hooker:

Q. You would have to increase somebody else, is that it?

A. Yes, sir, that is correct.

By Commissioner Catterall:

Q. You are going to reduce it as soon as pos-
page 962 } sible?

A. Yes, sir; that is what we hope we will be able to do.

By Mr. Rogers:

Q. Mr. Gay, you stated that it is necessary to offer a lower rate of charge to obtain water-heating load because of its competitive nature. Is that true?

A. Yes, sir.

Q. Do you believe a utility should be able to charge lower rates for services that are offered in a competitive market?

A. Yes, sir.

Q. I take it you believe that it is proper to charge higher rates for services that are non-competitive?

A. I think that has substantial support, yes.

Q. So your answer is yes?

A. Yes.

Q. Then if you look on page 32—

A. May I continue? The purpose of that, of course, is in the long run to minimize the charges to all customers.

Q. How do you reconcile your position on this matter with the answer given to Question 76 on page 32?

A. Question 76?

Q. Yes, sir.

Mr. Riely: Would you point out the conflict, Mr. Rogers, so we can direct ourselves to what you have in mind?

Mr. Rogers: We will be happy to after I read
page 963 } the statement.

Q. (Continuing) You state that the pricing arrangement of the new rates is more equitable than the former rates because they recognize the character of the service rather than the functional or end use of the service.

Mr. Riely has asked for you to give an explanation.

A. We recognize not only—you have to recognize the elasticity of demand of your products, of what you are selling from your equipment. However, one of the main reasons, however, that the water heating and space heating earns a lower rate is because first of all space heating imposes no load on your summer peak, and as a result a very substantial

part of the investment required to serve some peak load is just not present when you are serving electric space heating.

In the case of water heating, of course, the load characteristics of water heating are very significantly different in the wintertime as compared to the summertime, and the annual load factor of the water heating is very high.

So these are the reasons primarily that if you are referring to these two particular items the reason they earn a lower rate.

Q. But in the case of water heating you are pricing on the basis of the end use of the service, which is the
page 964 } water heater?

A. Basically on the load characteristics of the waterheating service. You must remember that the water heater itself uses almost as much as the total use of customers without water heating.

Q. Your rate Schedule No. 7 provides that when electric water heaters are in use that one-half the kilowatt-hours used during the summer months will be billed at 1.5 cents per kilowatt-hour.

Why was the rate lowered to customers who have electric storage water heaters?

A. Because we found that approximately 42% of the total average use of the Schedule No. 7 customer in the summer months was water heating, and they are now paying 1.2 to 1.5 for the water-heating service.

Q. The residential rate schedules placed a limit of 390 kilowatt-hours which were eligible for the lower water-heating rate.

A. That is correct.

Q. Why was no limit placed on Schedule No. 7 customers?

A. Because the characteristics of use of the residential water heater can pretty well define, and they are pretty consistent.

However, water-heating use of commercial customers varies very significantly, and the average use is not very representative of any individual group of cus-
page 965 } tomers.

Q. Is there a relationship between the size of the water heater element and the consumption of energy of water heaters?

A. It could be and probably is, but that would not necessarily be true in all cases. Normally the reason a person installs a larger water heater would be because he uses more hot water, but that is not necessarily true.

Q. There is a limit to the number of kilowatt-hours which could be consumed by a water heater of a given element size during a month?

A. Correct.

Q. That would be the size of the element in kilowatts times the number of hours in the months.

A. 730 hours, right.

Q. But your Schedule No. 7 does not place any limit on the number of kilowatt-hours which would be eligible for the 1.5 cent rate during the summer months?

A. That is correct.

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page 990 }

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By Mr. Troy:

Q. Mr. Gay, I believe you stated to Chairman Hooker that if the 1.2-cent winter rate were decreased that you would have to increase somebody else's rate?

A. That is correct, to raise your revenues, to raise the amount of revenues you would need. If you take some out of this bucket you have got to get additional revenues from somewhere else to replace those revenues.

Q. That is in view of all the testimony here about the elasticity of the demand of the winter rate?

A. Yes, sir. The elasticity of the demand over the relatively short run, maybe two or three years, would bring in some additional—would bring in additional revenue, but as Mr. Frazier pointed out the other day, when you page 991 } lower it from, say, 1.2 to one cent you immediately lose $1 million in revenues that you are now getting and it will take several years, probably to recover that million dollars.

Q. Then it would be built back up?

A. Yes, sir, we think it would be over the long run, but the revenues are needed now.

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James H. Brown

page 1004 } JAMES H. BROWN was called as a witness and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Staples:

Q. Please state your name and place of residence.

A. James H. Brown, Richmond, Virginia.

Q. What is your occupation, Mr. Brown?

A. I am Chief Accountant of the State Corporation Commission.

Q. Has the staff of the Accounting Division, under your direction and supervision, made an examination of the books and records of Virginia Electric and Power Company in connection with this rate case?

A. Yes, the staff began its examination on December 10, 1969, most of the detail work being done at the company's general offices in Richmond. Six commission accountants participated in the audit which was completed on February 27, 1970. Additional staff personnel participated in the completion of the field study and in the *prepration* of the exhibits during the last several weeks.

Q. Will you outline the general scope of the studies made by your staff and by you?

A. Our examination covered total electric operations for the calendar year 1969—the test year in this case. Analyses, to the extent deemed necessary, were made of

page 1005 } revenues, expenses, depreciation and taxes. Summaries were made of payroll, pensions, and other employee benefits for the year and amounts charged to electric operations were reviewed.

In addition to these detail studies, determinations were made of the total electric system rate base, net earnings and the rate of return.

Q. Mr. Brown, have you prepared exhibits which you will submit in the course of your testimony?

A. Yes.

Q. Before these exhibits are presented, I believe it would be helpful if you will, at this point, state what your specific responsibilities are in this rate case and what your exhibits and testimony are intended to cover.

A. My major responsibility in this case was to develop a rate base for the total electric system consistent with the method used by this Commission over a long period of time; and to prepare a rate of return for the total electric system

based on the relationship of net earnings, after certain recommended adjustments, to the period-end rate base.

Mr. M. W. Van Scoyoc will present exhibits showing amounts determined by him to be allocable to "Virginia Jurisdictional Service" with respect to both the rate base and the rate of return.

Q. Turning now to your exhibits, you say you have prepared a statement showing the rate of return for the company's total electric operations for 1969, is that

page 1006 } correct?

A. Yes, I have.

Q. Is this an exhibit with several schedules?

A. I have marked this Exhibit No. 1 and it consists of the top statement one and five attached schedules, all as Exhibit No. 1.

Mr. Riely: May it please the Commission, may the record show that I reserve the right to object to this exhibit at a later time?

Chairman Hooker: The record will so reflect.

Commissioner Catterall: You understand that under the rules of procedure you don't have to make any objection. You can appeal from any mistake we have made, or even if you agree with it.

Chairman Hooker: You can even appeal if we don't make a mistake.

Mr. Riely: The Commission has a distinguished record of proving that that has been the course of action of most appellants.

Commissioner Dillon: How is the record going to show that he didn't agree to it?

Commissioner Catterall: The law says he doesn't have to be here to take exception to it.

Chairman Hooker: Let Mr. Brown go ahead.

Mr. Riely: I don't think that this is a proper discussion.

Mr. Staples: I thought you raised the point.

page 1007 } The Witness: Let me clarify my answer. These exhibits were not numbered, as you will recall. What I just said is not entirely correct.

Exhibit No. 1 is marked Statement 1. I would like to have that marked Exhibit JHB-1 consisting of one page.

Chairman Hooker: Exhibit JHB-1 is received.

(The document referred to was marked Exhibit JHB-1 for identification and was received in evidence.)

By Mr. Staples:

Q. What does this exhibit show?

A. This statement shows the rate of return from the company's operations for the year 1969. Shown in the several columns are operating revenues, operation and maintenance expenses, depreciation, taxes, and net operating income. Following that is shown the net original cost rate base, and on the bottom line is shown the rate of return.

Q. Please discuss Column 1.

A. Column 1 shows figures for the company's total operations, including electric operations in Virginia, West Virginia, and North Carolina and gas operations in Virginia. Column 2 shows total electric operations, representing approximately 97 percent of the company's total
page 1008 } investment and net operating income, the gas operations representing only a small part of the total.

Q. Please discuss Column 2.

A. Column 2, line 1 shows that the company's total system electric operating revenue amounted to $305,770,229 during the year 1969. Under this revenue figure are shown deductions for operating expenses, depreciation and taxes. In regard to Federal income taxes I show the current tax for the test period before reduction for the current year investment tax credit, which is shown separately as a credit amount of $4,044,000. To reflect the accounting that is being given by the company, which is to defer the current year tax credit and amortize it, along with investment tax credits deferred in prior years, overt he lives of the property which gave rise to the credits, it is necessary to make two adjustments. First, the current year tax credit in the amount of $4,044,000 is added back as tax expense. Second, tax expense is credited with $505,104 which represents an amortization of the accumulated tax credits over the service lives of the property which gave rise to the tax credits. I will comment on this matter further in connection with certain other recommended adjustments.

The next item in this column is a reduction in tax expense in the amount of $1,547,340 and represents the amortization of prior years tax reductions derived from ac-
page 1009 } celerated amortization allowed for tax purposes in lieu of straight line depreciation on certain

properties. The total tax reductions resulting from amortizing, for tax purposes, the cost of certain property additions essential to the national defense over a five-year period, amounted to $40,687,709 in total accumulations at the time this benefit ceased under the tax law. Of this amount, $13,631,333 has been amortized or credited back to tax expense during the years 1957-1969, leaving a balance at December 31, 1969 of $27,056,376 which is being amortized over future years in annual amounts of $1,547,340. This treatment, which was approved by Commission order, normalizes the taxes over the life of the property, and I agree with it, both as to accounting and rate-making.

Total deductions, as shown, amounted to $225,007,776 resulting in net operating income for the year in the amount of $80,762,453. To this, is added interest during construction in the amount of $13,595,434 and a deduction is made for charitable and educational donations in the amount of $183,437, resulting in an adjusted net operating income of $94,174,450. The rate base, which I shall discuss later, is shown in Column 2 in the amount of $1,444,677,617.

page 1010 } Q. Mr. Brown, what was the electric system rate of return?

A. 6.52%, as shown on the bottom line of Column 2.

Q. Column 3 of this exhibit is headed "SCC Staff Adjustments." Will you discuss this Column?

A. This Column summarizes a number of adjustments, set forth in detail on Schedule A to this Statement, which I suggest should be made for purposes of this rate proceeding. I have reduced operation and maintenance expenses by $4,385,677, representing nine separate adjustments. Federal income taxes have been adjusted to eliminate the 10% surtax and also to reflect the tax effect of adjustments made to operating expenses and other accounts.

* * * * *

page 1024 } By Mr. Staples:

Q. Go ahead.

A. I have adjusted the normalization of investment tax credits by increasing such credits by $1,406,696 so as to write off the balance of $19,118,400 of accumulated credits over a 10-year period. The effect of these adjustments is to reduce expenses and taxes in the amount of $7,862,209 and to increase net operating income by the same amount. Cash

working capital allowance is reduced by $487,297 which is necessary since the allowance for cash working capital, as suggested by the staff, is based on a fraction of operating expenses, which have been adjusted downward as I have indicated.

Q. Do you have any further comment on any of the adjustments you have made to operation and maintenance expenses, which you said total $4,385,677?

A. Yes. I believe the next Schedule fully explains each of the several adjustments, but I would like to make further comment with respect to the adjustment eliminating a portion of expenses recorded on the books during 1969 in connection with this rate proceeding.

$255,104 of such expenses were recorded during 1969 and I have allowed one-fifth of these costs but eliminated four-fifths on the assumption that rate case expenses

page 1025 } should be amortized over a reasonable period which is customarily five years. It is my understanding that additional costs will be incurred and booked during the first few months of 1970. I do not now know what these costs will be but I recommend that in determining the amount of additional revenue that may be needed in this case, the Commission give consideration to allowing one-fifth of such additional costs as may be proper.

Q. What is the rate of return for total electric system, after your adjustments?

A. As shown in Column 4 of the rate of return, after staff adjustments, would be 7.07%.

Q. What does Column 5 show?

A. This Column shows the additional earnings the company would have derived from the proposed rates had such rates been in effect during the year 1969.

According to Mr. Clement's Exhibit 4, the company's total electric system operating revenues would have increased by $27,449,000. This additional revenue would have increased gross receipts taxes and Federal income taxes, in the amounts shown. The net operating income would have increased by $13,614,902. The *pro forma* rate of return, as shown in the last Column, would have been 8.01%.

Q. Is your increase in net earnings of $13,-

page 1026 } 614,902 in agreement with the company's exhibit?

A. No, the company's exhibit shows only $12,358,000 or $1,256,902 less.

Q. What is this difference?

A. The difference is due to the fact that the company's computation of Federal income taxes included the 10% surtax. I made no allowance for this because the 10% surtax expires in June, under existing tax laws.

Q. What is the rate of return, after your adjustments and after reflecting the effect of the proposed rates, and how does this compare with the return shown on the company's exhibit?

A. As I have stated, my exhibit shows a return of 8.01% as compared with the company's exhibit which shows 7.37%. The difference is due to the fact that I have not included the 10% surtax and have also made certain adjustments shown in Column 3. The company made no adjustments to actual book figures and made no adjustments to eliminate the 10% surtax.

Q. Your exhibit shows total electric system figures, I believe. Have you prepared a similar exhibit showing the company's Virginia jurisdictional business?

A. No. Mr. Van Scoyoc will present an exhibit showing that.

Q. Turning again to the adjustments you show in Column 3, have you prepared an exhibit showing the
page 1027 } detail of these adjustments?

A. Yes, I have prepared an exhibit, consisting of five pages, showing the detail of my adjustments, which I have referred to as Schedule A to Statement I.

Mr. Riely: I hope the record will show that my objection goes to exhibits as well as the testimony.

Commissioner Dillon: We understand it goes to everything.

By Mr. Staples:

Q. That would be Exhibit JHB-2?

A. Yes.

Q. Consisting of five sheets?

A. Consisting of five sheets.

Mr. Gibson: Would it not be in order to strike the words "to statement I"? That would reconcile with the new number.

Mr. Staples: That is correct.

Chairman Hooker: Received.

(The document referred to was marked for identification, Exhibit JBH-2 and received in evidence.)

James H. Brown

By Mr. Staples:

Q. Please discuss this exhibit.

A. This exhibit consists of several adjustments that I recommend should be considered by the Com-
page 1028 } mission in this proceeding.

I believe that all the adjustments are generally self-explanatory; however, I would like to discuss a few of the more significant ones at this time.

Q. All right.

A. On Page 2—skimming over, if you will, the first page—I show an elimination of $2,464,915 representing promotional allowances made by the Company in 1969. These allowances were made in accordance with tariffs filed with the Commission and were costs properly chargeable to expenses during that time.

However, in view of the March 15 ruling—

Q. You are amending the testimony at this point, Mr. Brown?

A. Slightly. I had prepared this testimony before the Commission's order was issued, and I am therefore amending the language slightly. Let me read that sentence again, if I may, the amended sentence.

However, in view of the April 15 ruling by the Commission the practice of making allowance for promotional purposes by utility companies must be discontinued.

As a test period in this case, costs incurred
page 1029 } in 1969 should therefore be adjusted to reflect this possible change in policy. I consider the costs for "trade-ally" advertising in the amount of $320,769 to be in the same category and these costs have also been eliminated.

Another significant adjustment appears on Page 4 of this exhibit. I have eliminated $3,022,998 representing the 10% surcharge on Federal income taxes. While this tax was a proper item to include in 1969 costs, for purposes of determining "test year" costs I have not allowed the 10% surtax because under present tax laws, this surtax will expire on June 30, 1969 and should not be included as a cost for purposes of fixing future rates.

Another significant adjustment appears on Page 5 of this exhibit. I am recommending here that the reductions in Federal income taxes the company has received by reason of the Government's allowing a credit to be taken against the current year tax, which reductions have been deferred in a

reserve account, should be normalized over a period of 10 years.

Since 1962, when the Revenue Act added a new section 38 to the Revenue Code, allowing a credit against the tax due for the current year equal to a percentage page 1030 } of new investment in certain property, the company has received tax benefits aggregating $21,083,000 applicable to electric operations. As of December 31, 1969 $1,964,600 has been credited back to tax expenses through annual amortization credits, leaving a balance of $19,118,400 at December 31, 1969. The tax credit actually received in 1969 was $4,044,000; the amount of investment tax credits "normalized" in 1969 was $505,104. This practice of normalizing these tax savings over the service lives of the property was approved by Commission Order.

However, Congress has now eliminated the Investment Tax Credit and it appears appropriate to dispose of the accumulated credits over a shorter period of time than the Commission Order prescribed in 1963. At the present rate of amortization these tax savings which the company has received will not flow to the benefit of the consumer until the year 2000.

The 3% investment tax credit is not, like the five-year Amortization Deduction which I discussed earlier, a deferral of taxes which the company will have to repay during the years of useful life following the five-year amortization period. The investment tax credit merely reduces the tax the page 1031 } company otherwise would have to pay. Because the tax credit received in any given year could not, in any practical way be used in setting rates on a year-to-year basis, the Commission authorized the spreading of these savings over the lives of the property which gave rise to the credits.

However, in this proceeding when rates are being fixed for the future, the Commission can now spread these savings in a direct meaningful manner that will benefit both the consumers and the company. In my opinion a reasonable period of time to do this should not exceed 10 years. It is my recommendation that the net accumulated tax savings amounting to $19,118,400 be credited back to tax *espenses* over a 10-year period in equal annual amounts of $1,911,840 thus lowering the rates consumers otherwise would have to pay by reason of reducing revenue requirements during this period of time.

Q. Have you prepared a statement showing

page 1032 } how you arrived at the rate base for the total electric system which you used in determining the rate of return?

A. Yes.

Q. That will be JHB-3?

A. JHB-3, yes, sir.

Chairman Hooker: It will be received.

(The document referred to was marked JHB-3 for identification and was received in evidence.)

Mr. Staples: We would strike Statement 2 from that, to clarify it, because we didn't know what the exhibit number would be.

By Mr. Staples:

Q. Please explain the first column headed "System."

A. This column shows the components of a rate base for the entire company's operations, including the investment in both electric and gas properties. The second column excludes gas properties and represents the total system electric rate base, based on period-end figures.

Q. Please discuss this column.

A. The original cost of total electric utility plant, including nuclear fuel is shown by various book accounts which add up to $1,699,147,552. From this is deducted accumulated provisions for depreciation and contributions in aid of construction. Net utility plant amounts to $1,406,022,866.

page 1033 } To this is added the electric portion of common utility plant, less depreciation, to arrive at the total net original cost of electric utility plant in the amount of $1,411,978,423, as shown. To this I have added working capital requirements of $32,699,194 consisting of $9,871,299 for fuel stock; $9,541,328 for materials and supplies; and $13,286,567 for cash working capital. The total rate base amounts to $1,444,677,617.

Q. Mr. Brown, how did you calculate the allowance for cash working capital?

A. Consistent with the practice followed by this Commission, I have made an allowance of an amount equal to approximately 40 days' operation and maintenance expenses, with an adjustment however for coal cost. I allowed, as usual, 40 days of operation and maintenance costs, including coal costs at the Mt. Storm station. I allowed only 20 days of the

costs of coal used at the other production plants. The staff's lag study of coal invoices shows that there is an average of 27 days between the date that coal is received and the date that remittance is made in payment of the coal at stations other than Mt. Storm. As to Mt. Storm, it appears that on the average coal suppliers are paid within 10 days of delivery date. This delay in payment is comparable to the delay in payment for other operation and maintenance costs and I allowed the usual 40 days.

Q. What is the adjustment you show on this
page 1034 } exhibit reducing cash working capital shown in the first column by $487,297?

A. Since my allowance for cash working capital is computed on operation and maintenance costs, the adjustments I made in expenses makes it necessary to make a corresponding adjustment in the allowance for working capital. The adjusted allowance for cash working capital, as shown in the last column is $12,799,270. This compares with the allowance determined by Mr. Clement in his Exhibit of $13,100,000. This difference of about $300,000 accounts for the difference in total system electric rate base shown in his exhibit amounting to $1,444,491,000. The total system electric rate base as shown in my exhibit amounts to $1,444,190,320.

Q. Have you prepared a statement showing what "Construction Work in Progress" amounting to $220,122,017 consists of?

A. Yes, I have marked this statement as Schedule A to Statement II.

Mr. Staples: We will mark this JHB Exhibit No. 4.
Chairman Hooker: It is received.

(The document referred to was marked JHB Exhibit JHB-4 and was received in evidence.)

Mr. Staples: Strike Schedule A to Statement 2 on that.

page 1035 } By Mr. Staples:

Q. Please explain what this exhibit shows.

A. This is a summary of Improvement Requisitions or Construction Work Orders in process of construction at December 31, 1969.

Q. Why do you include construction work in progress in the rate base?

A. This was done in the last rate case and in fact this is the policy generally followed in all rate cases. By adding to the operating income, interest charged to construction during the year, which I did on my Exhibit No. 1, carrying charges on the construction costs are largely met, so that current earnings provide a part of the carrying charges and future earnings provide a part.

Q. Have you prepared other exhibits relating to your major exhibits on rate of return and rate base?

A. Yes, I have and I would like to submit them at this time. These exhibits, I might add, are informative but will not require any detailed explanation.

Q. All right, what is your next exhibit?

A. The next exhibit is titled "Electric Department—Schedule of Operating Revenues—Year 1969."

Mr. Staples: That would be JHB-5.

Chairman Hooker: It will be received.

(The document referred to was marked JHB-5 for identification and was received in evidence.)

page 1036 } The Witness: Strike Statement 3.

By Mr. Staples:

Q. What does this exhibit show?

A. It shows total electric revenues from sales of electricity to residential, commercial, industrial, and others for 1969 and 1968 and the increase over 1968.

Q. What is your next exhibit?

A. The next exhibit is titled "Electric Department—Schedule showing number of customers and sales by MWHR-1969." The exhibit compares the number of customers by class of service for 1969 with 1968. It also compares the megawatts sold by class of customer during 1969 with 1968.

Q. Is this JHB-6?

A. JHB-6.

Chairman Hooker: I will be received.

(The document referred to was marked JHB-6 for identification, and was received in evidence.)

By Mr. Staples:

Q. What is your next exhibit?

A. My next exhibit is titled "Electric Department—Schedule of Operation and Maintenance Expenses—Year 1969." This exhibit consists of 4 pages, and compares 1969 expenses with 1968 by functional groups and individual accounts.

Q. Is that JHB-7?

A. That is right.

page 1037 } Chairman Hooker: It will be received.

(The document referred to was marked JHB-7 for identification and was received in evidence.)

Mr. Staples: Please strike Statement 5 from that.

By Mr. Staples:

Q. What is your next exhibit?

A. My next exhibit is entitled "Statement of Net Additions to Electric Plant in Service—From July 1, 1967 to December 31, 1969," and consists of two pages.

Q. Is that JHB-8?

A. That is JHB-8. Strike the Statement.

Chairman Hooker: It will be received.

(The document referred to was marked JHB-8 for identification and was received in evidence.)

By Mr. Staples:

Q. Mr. Brown, what does this exhibit show?

A. It shows in the first column, the balance of electric plant in service by individual plant accounts at July 1, 1967. Additions, retirements, and reclassifications during the period from July 1, 1967 to December 31, 1969, by accounts are shown in Columns 2, 3 and 4. The last column, showing balances, by accounts, at December 31, 1969. The total, as shown on page 2 amounts to $1,467,327,370.

page 1038 } Q. Is there any significance to the period covered by this exhibit, that is, July 1, 1967 to December 31, 1969?

A. No. The only reason for using these dates is that in previous audits the staff had reviewed plant additions up to July 1, 1967 and this statement merely updates previous staff audits.

James H. Brown

Q. Have you prepared a balance sheet showing the company's financial condition at December 31, 1969?
A. Yes.
Q. Is that JHB-9?
page 1039 } A. JHB-9, and strike Statement 7.

Chairman Hooker: It will be received.

(The document referred to was marked for identification, Exhibit JHB-9 and received in evidence.)

By Mr. Staples:
Q. Please discuss this exhibit.
A. The left side of this balance sheet statement includes all the assets of the company, including electric property investments in Virginia, North Carolina and West Virginia and investment in gas properties in Virginia. The right side of this statement shows the company's capital structure and liabilities as at December 31, 1969.
Q. Will you comment on any of these figures you consider significant?
A. The capital structure of the company is made up of common equity of $476,666,490; preferred stock of $126,447,200; bonds and debentures of $762,000,000; and notes payable of $53,900,000. Adding these figures shows a total capitalization of $1,419,013,000.
Deferred tax credits from accelerated amortization shows a balance of $27,056,376 at December 31, 1969. Deferred tax credits from investment tax credits shows a bal-
page 1040 } ance of $19,532,706. Of this amount $19,118,400 is applicable to total electric operations and $414,306 to gas operations. My next two exhibits will show when these credits were recorded on the books, and the amounts that are being amortized by credits to tax expense.
Q. Are those JHB-10 and 11?
A. Those would be JHB-10 and 11.

Chairman Hooker: They will be received.

(The documents referred to were marked for identification, Exhibits JHB-10 and 11 and received in evidence.)

By Mr. Staples:
Q. What will we strike on the top of that one?
A. Strike Statement 7.

Q. Have you prepared an exhibit showing the income and earnings of the total company operations for 1969?
A. Yes, I have. That would be JHB No. 12.

Chairman Hooker: It will be received.

(The document referred to was marked for identification, Exhibit JHB-12 and received in evidence.)

By Mr. Staples:
Q. Do we strike Statement 8?
A. Strike Statement 8.
Q. What does this exhibit show?
A. This exhibit is an income statement, per page 1041 } books, for the year 1969. It covers both electric and gas operations with respect to operating revenues, operating expenses, and operating income. The last Column shows total figures for these items, and also shows other income, income deductions, interest charges, and interest credits representing interest charged to construction. Net income available for preferred dividends and common stock amounted to $63,251,272 for the year, as shown on the bottom line in the last Column.
All of the figures shown in the first Column also appear in my rate of return statement, Column 2 of Exhibit 1, covering total electric operations.

* * * * *

page 1042 } ERNEST M. JORDAN, JR., called as a witness, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Rogers:
Q. Please state your name and address.
A. My name is Ernest M. Jordan, Jr. My address is 2405 Raymond Avenue, Richmond, Virginia.
Q. By whom are you employed?
A. I am employed by this Commission As Chief Engineer, Electric Utilities.
Q. Would you briefly summarize your qualifications.

Ernest M. Jordan, Jr.

A. I was graduated from Duke University in 1950 with the degree of Bachelor of Science in Electrical Engineering.

For the past 20 years, my employment and business experience has been in, or associated with, the electric utility industry.

I have been employed by this Commission for 11½ years.

I am a professional registered engineer and a senior member of the Institute of Electrical and Electronics Engineers.

Q. What are the duties of the Engineering
page 1043 } Division of the Commission?

A. The Engineering Division is primarily concerned with the rates and service of public utilities.

The tariffs of all utilities under the jurisdiction of the Commission are filed with the Engineering Division. It is the responsibility of the Engineering Division to see that the rates, rules, and regulations of the utilities are uniformly and correctly applied.

The Engineering Division also makes such investigations and tests as are necessary to see that service provided by utilities is adequate and reliable.

The Division also investigates complaints received from customers of utility companies. The Engineering Division is responsible for reviewing the rates and rules submitted by the utilities and keeping the Commission informed on matters pertaining to rates and service of utility companies.

Q. Would you please be more explicit concerning your review of the rates. For what factors or attributes do you examine the rates?

A. One of the principal purposes of the examination is to
page 1044 } be sure the schedule is not unjustly discriminatory. The rate should be simple in form. It should be understandable and easily administered.

Changes in the rates should not be drastic or make a radical departure from the rates presently in use. In reviewing the schedules, we try to head off problems which might arise in application or interpretation of the rate schedules.

Q. Have you reviewed the rate schedules submitted by the applicant in this proceeding?

A. I have reviewed the schedules and have prepared two exhibits to illustrate the effect of the new rates on customers' bills.

Q. These will be EMJ-1 and EMJ-2?

A. Yes.

Chairman Hooker: They will be received.

(The documents referred to were marked for identification, Exhibits EMJ-1 and 2 and received in evidence.)

The Witness: The first of these exhibits consists of two bar charts showing the effect of the new rate on residential customers.

Across the bottom of these charts, monthly use in kilowatt-hours is shown for several specific consumptions of electric energy. The amount of the customer's bill under the present rates, the November through June rates, the July

page 1045 } through October rates, and the percentage increase for each of the new rates is shown at the top of each bar.

Page 1 of this exhibit illustrates the effect of the new rate on VEPCO residential customers who do not have water heaters. Examination of this chart shows that the high-use residential customer actually receives a reduction in rates in the winter months, while in the summer months, all customers receive an increase. The differential in rates for the summer months is not effective until a monthly consumption in excess of 600 kilowatt-hours is reached.

The percentage increase accelerates from this point and is greater for high-use customers than for low-use customers. It should be noted that not many electrically heated homes would be served under this rate, since most electrically heated homes have an electric water heater.

Page 2 of this exhibit shows the effect of the proposed rates on residential customers with electric water heaters. This chart illustrates the company's objective to develop rates that will promote the use of electric energy during the winter months. During the winter months, customers using 1100 kilowatt-hours per month, and over will

page 1046 } receive a maximum increase of 46 cents per month; while during the summer months, customers using 2000 kilowatt-hours and over receive an increase in excessof 30%.

page 1047 } By Mr. Rogers:

Q. Have you prepared an exhibit to show the effect on customers billed on the general service rates?

A. Yes, I have.

Q. That is the one already distributed?

A. Yes.

Because of the nature of the general service rates, it is difficult to demonstrate the effect of the proposed rates on any customer, or any specific type of customer, without an analysis of actual bills. The only accurate way to determine the effect of the new rate on a customer's bill is to make a comparison of the account for an entire year. In order to show the effect of the new rates on a sampling of customers, I selected 72 customers which are billed on VEPCO's general service rates.

The customers are divided into groups according to types; that is, large industry, shopping centers, department stores, service stations, theaters, et cetera. These customers were selected solely for the purpose of illustrating the effect of the new rates on specific customers billed. The sample is not presented to represent an average or typical cross-section of customers billed on the general service schedules. Emphasis was given in the selection to customers in the so-called urban corridor, beginning in the Washington metropolitan area and extending through Fredericksburg and Richmond and down to the Hampton Roads area. More than 70 percent of VEPCO's nearly 100,000 general service customers are in this urban corridor.

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It has been the policy of the Engineering Division of the Commission not to disclose any customer's bill to anyone other than the customer or someone representing him. Therefore, in the preparation of this exhibit, the names of the customers have been withheld, and in the first two groups the location of the customer has not been shown. In other groups, the customer's location by town is shown in order to demonstrate that the sample was taken from several areas within the company's territory.

Q. Do you have any comments concerning the structure of the new rates?

A. Yes. Mr. Moore stated that VEPCO has always recognized the undesirability of large and abrupt changes in rate levels.

Mr. Frazier said that proposed rates should not be unduly disruptive of existing patterns of charges.

There is some question in my mind whether some of the increases to residential customers during the summer months meet the criteria I have previously set forth in this testimony and the comments by Mr. Moore and Mr. Frazier. Consider, for example, customers with electric water heaters using over 1500 kilowatt-hours. Dur-

page 1049

ing the four summer months, VEPCO renders more than 182,000 bills for individual consumption in excess of 1500 kilowatt-hours per month. Each customer receiving one of these bills next summer will receive an increase of more than 25% in his charges over last year for the same amount of electricity. Customers with electric water heaters are now charged 1.2 cents per kilowatt-hour for all energy used in excess of 1100 kilowatt-hours. During the summer months under the proposed rate, these kilowatt-hours will be charged at the rate of 1.8 cents. This represents a 50% increase in the unit charge for consumptions in excess of 1100 kilowatt-hours.

Q. Does this mean that you are opposed to a higher level of rates in the summer months than in the winter months?

A. No, not per se. The only question I raise is whether the increase does not impose too great a burden on the high-use customers in the summer months.

The testimony concerning the economic factor of elasticity of demand and pricing based on incremental cost, as presented by Mr. Frazier and also discussed by Professor Schotta, is a relatively recent development in electric utility rate-making. There have been numerous articles written on this subject, and I have no reason to believe that the theory presented by the economists is incorrect.

page 1050 } I have reviewed the company's winter capability, as compared to their summer capability, the decreasing load factor, and discussed this question with a member of the Federal Power Commission staff. Summer-winter differential rates are in use by numerous other utilities throughout the country, and I do not believe that their use by the Virginia Electric and Power Company will adversely affect the public.

Q. You have reviewed Professor Schotta's prepared testimony?

A. I have considered Professor Schotta's testimony, also Mr. Frazier's and Mr. Gay's testimony, on the subject of the 1.2 cent bottom step of the residential rate. I do not believe that the 1.2 cent rate will improve the system load factor as Mr. Gay testified on page 14 of his prepared testimony. I have prepared an exhibit to illustrate this.

Q. Will that be EMJ-3?

A. Yes.

Chairman Hooker: It will be received.

(The document referred to was marked EMJ-3 for identification and was received in evidence.)

The Witness: Mr. Gay presented an exhibit showing the percent saturation of electric heating customers to total residential customers. Also on this chart were the bottom steps of the residential rate. Mr. Gay stated that page 1051 } his exhibit shows that lowering the rate level was accompanied by similar increases in percent saturation of space heating. I have taken this same chart, as prepared by Mr. Gay, and overplotted the system load factor for the years 1957 through 1969.

The black dots indicate the load factor for the year in question and the broken line indicates the trend which the load factor has taken over these years. I believe this shows the 1.2 cent rate has not *beeen* effective in improving the system load factor. This is not to say that the 1.2 cent rate has been the cause of the decreasing load factor. Without this low terminal step, the load factor would, no doubt, have had an even greater decline.

Q. Do you accept the theory of elasticity of demand for customers using electric energy for heating as stated by Mr. Frazier and discussed further by Professor Schotta?

A. Yes, up to a point. Perhaps it would be more correct to say if the change in rate is great enough. Based on my knowledge and experience of the service area of the Virginia Electric and Power Company, I believe that there is a certain amount of inertia in the elasticity of demand for electric heating customers.

Q. By "inertia in elasticity," do you mean that a major change in rate is necessary to effect the installation of additional units of electric heat?

A. Yes, it is my opinion that the demand is page 1052 } elastic only with a major change of the rate structure. I do not believe that a small change in the bottom step of the rates will make a significant difference in the demand for electric heat by customers.

Q. Why do you believe this to be so?

A. Mainly because in the VEPCO system, 70 percent of the new dwelling units constructed using electric heat are built for speculative purposes. The decision to install electric heat is not made by the ratepayer, but is made by the builder or developer. I believe that his decision is influenced by factors other than the bottom step of the rate schedule. To be sure,

if the bottom step were raised a substantial amount, to say 2 cents per kilowatt-hour, for example; the builder or developer would meet buyer resistance to the purchase of a home with electric heat because of the high operating cost.

On the other hand, if the trailing rate were reduced to, say, 0.8 cent or less, he would meet buyer demand to have homes with electric heat.

I do not believe that a small change in the bottom step of the rate will have any significant effect on the saleability of homes with electric heat. Elasticity for a large change in the bottom step for the residential rate can be demonstrated by observing a system, such as the one in Chattanooga, Tennessee.

page 1053 } This city is served by the Tennessee Valley Authority. The bottom step which would be applicable for the electric heating customers is 7.5 mills or three-fourths cents. The saturation rate of electric heating customers in Chattanooga is approximately 60 percent. This brings us face to face with the two problems which confront VEPCO at this time: (1) The increasing costs which the company has experienced; and (2) A need to have rates which will attract increased business during the winter months which will, in turn, improve the system load factor.

In my opinion, the present bottom step of 1.2 cents per kilowatt-hour offers little assistance to either of these problems. This exhibit which was introduced showing the load factor demonstrates that the 1.2 cents rate has not been able to reverse the downward trend of the system load factor. Certainly, by not increasing the 1.2 cent bottom rate, those customers who receive this rate do not contribute to the increased expenses which the company has realized.

I see two possible steps which could be taken to move away from this dilemma. One is to increase this bottom step of 1.2 cents to some higher amount, so that the high use winter customers will pay their share of the greater expenses which the company has experienced.

page 1054 } As an alternative, the company could take a bold step forward and reduce the 1.2 cent rate in order to attract even more electric heat customers and thereby improve the system load factor and increase the company's revenue.

In my opinion, any reduction in this bottom step should be to a rate of not more than 1.0 cent per kilowatt-hour.

Professor Schotta has testified that this would increase the company's revenue by at least $1 million per year. He further testified that this would not be an economic burden to the existing customers of the company.

page 1055 } Q. What other aspects of these schedules would you like the Commission to consider?

A. There are a number of other things I think should be pointed out for the Commission's consideration. The first of these is the applicability clause in Schedule No. 1. The second paragraph of this schedule, which is the residential service schedule, states:

"This schedule is not applicable to, a, individual motors rated over 15 h. p., b, commercial use as in hotels, public inns, motels, auto courts, tourist courts, tourist camps, or trailer camps, or, c, separately metered service to accessory buildings or equipment on residential property that are not themselves intended or suitable for residence."

The last portion following the letter c is not in the present rate schedules. This change is inconsistent with the informal decision of the Commission of September 25, 1969. On that date consideration was given to a complaint filed by a VEPCO customer in Alexandria.

The customer objected to being charged under a general service schedule for service to a swimming pool

page 1056 } in his back yard. The service was separately metered from that of his house. His position was that if he could supply service to the swimming pool from his house meter, then he should be able to buy service directly from the company through a separate meter under the residential rate schedule.

The Commission upheld the contention of the customer and directed the company to provide service to the customer's swimming pool under a residential rate schedule. While there are relatively few customers with swimming pools which would require separate metering, the same principle would apply to a separate service to a garage or workshop in a back yard.

I believe that a customer should be allowed to purchase separately metered service under the residential rate, so long as the second service is a part of the customer's residential occupancy of a premises and not used for production of income.

Ernest M. Jordan, Jr.

Q. Are there other features of the rate schedules which you would like to discuss?

A. Yes. The next feature of the proposed rates, which I think will create a great number of problems in customer relations, is the 30-day rate. A 30-day rate is applicable to all rates submitted by the company in its application, with the exception of Schedule No. 26, Outdoor
page 1057 } Lighting Service. This feature is particularly objectionable in residential service and in the case of small general service customers.

There is no question that, technically, it can be supported; and, with computer billing in use by the company, there is no problem of calculating the bills. There is no doubt that the bills will be accurate, as rendered. However, it is difficult for the small user to understand why his bills would vary from month to month for the same amount of electricity used.

The present rate schedules of the company are monthly rates and, in the case of residential and small general service customers, bills for periods of 26 through 35 days are calculated on the rate as stated in the schedule. Under the new schedules proposed by the company, the only bills which will be rendered in accordance with the rate as stated in the schedule will be when the period between meter readings is exactly 30 days. Other billing periods will be pro rated.

To show the effect of this proration, I have calculated the bills of a customer who uses 500 kilowatt-hours of electric energy and has an electric water heater.
page 1058 } Under the present rate his bill will be $10.30, regardless of whether the meter reading was 26 days or 35 days since the last reading. Under the proposed rate, the same customer using 500 kilowatt-hours of electric energy will lay $11.56 if his meter readings are 30 days apart. However, if the company reads the meter only 26 days after the last meter reading, the charge would be $10.95; or, if they waited, because of bad weather or some other reason, and read the meter 35 days after the previous reading, it would be $12.32. The customer, in comparing bills, would see that the charge will vary from $10.95 to $11.56 to $12.32 for the same amount of electricity.

We receive letters from customers now saying that the utilities charge whatever they want. I am certain that, after being billed on schedules such as these, many people will be convinced that there is no control over the rates of utilities.

Ernest M. Jordan, Jr.

Q. Do you have a recommendation which you would like to make in this connection?

A. Yes, I would like to propose that the Commission eliminate the 30-day rate on Schedules No. 1, Residential Service; Schedule No. 5, Small General Service; Schedule No. 7, Electric Heating; and Schedule No. 25, Underground Decorative Lighting Service. Schedule 25 is a particularly inappropriate schedule in which to use a 30-day rate, since the service rendered is not metered but is a flat rate.

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The company can determine what annual revenue it proposes to obtain from a customer on this schedule and divide by 12 to make a monthly rate, since no meter readings are involved in this type service.

Q. Do you have any comment on the late payment charge proposed by the company?

A. Yes.

This is another item which deserves careful examination. It is interesting to note that the company proposes to pro rate bills if the billing period varies from 30 days by only one day. When it comes to a late payment charge, there will be no proration, and a one-month late payment charge will apply if the payment is only one day late.

Some of VEPCO's customers have monthly bills which exceed $100,000. For these customers, the penalty for being one day late in paying the electric bill is $1500. This certainly seems to be a case of the punishment not fitting the crime.

Q. Do you anticipate that there will be problems with customer relations if the late payment penalties are approved?

page 1060

A. Yes.

Since the charge will not apply on an interim bill; but, apparently will apply on other bills, even though they may be estimated, I foresee a great deal of confusion. The company's administrative cost and cost in customer good will may well exceed the revenue produced. For this reason, I recommend that the late payment charge not be approved.

Q. Are there other aspects of the rate schedules which deserve special attention?

A. Yes.

The next feature which I would like to discuss is interim billing. This is included in three of the proposed rate schedules. The interim billing provision gives the company the option of reading meters monthly or bimonthly. It also provides that when a meter is read at other than monthly inter-

vals, the company may render an interim monthly bill. This type of tariff provision is so vague that it gives the consumer no idea of what he is entitled to, or can
page 1061 } expect.

I believe the tariff should be written so clearly that a customer can examine the tariff and know exactly to what he is entitled. The tariff should be specific as to the procedure to be followed.

* * * * *

Chairman Hooker: Proceed, Mr. Rogers.

By Mr. Rogers:

Q. Before the Commission recessed you were discussing the interim bill as being an estimated bill. Do you have any objection to estimated bills, Mr. Jordan?

A. Estimated bills have been used by utilities
page 1062 } for many years. Several years ago we received a considerable number of complaints about estimated bills. Because of these complaints, certain guidelines concerning estimated electric bills were adopted by the Engineering Division of the Commission. These guidelines are:

1. Estimates should not be made of initial or final meter readings.
2. Readings may be estimated when necessary, but not more than two consecutive bills may be based on estimated readings.
3. Bills based on estimated readings should be so marked.
4. Whenever a customer questions a bill based on an estimated meter reading, the utility should make an adjustment satisfactory to the customer, or make a special meter reading and render a revised bill based on actual use.
5. Whenever a customer receives an unusually high bill as a result of a previously incorrect estimate, the utility should allow the customer to make a partial payment and extend the date for final payment a reasonable time, if necessary, to prevent a hardship on the customer.

Since adoption of these guidelines, the number
page 1063 } of complaints on estimated bills has decreased considerably. I have previously not objected to estimated bills as long as they were within these guidelines. It should be pointed out that the estimate is made of the meter meter reading and not the dollar amount of the bill. The bill

is calculated from the estimated meter reading. If an error is made in the estimate, it will be compensated when the next bill, based on an actual reading, is made.

The proposed VEPCO tariff presents two new problems which have not been previously considered. The first of these is the change in rates which the company proposes to make each July and November.

I recommend that bills based on meter readings taken in June and October be based on actual meter readings rather than an estimate. If estimated readings are used in either of these months and the estimates are in error, it will result in the customer being overcharged or undercharged, depending on the *cirection* of the error and the month in question. This type of error is not self-compensating and could result in a non-recoverable penalty to the customer.

The second problem presented by the interim bill proposals is in Schedules Nos. 5 and 7. Charges under both of these schedules are dependent upon demand. The com-
page 1064 } pany proposes to render estimated bills under these tariffs. This would require using an estimated demand. An error made in an estimated demand reading would not be self-compensating as in a kilowatt-hour estimate. I am opposed to using any type of estimated demand.

Within these guidelines and exceptions, I have no objection to estimated bills or interim billing.

Q. What other portions of the rate schedules would you like to call to the Commission's attention?

A. The next facet to which I would like to see the Commission give special attention is the rate for water heating. Special rates for customers who have electric water heaters have been in existence for many years. However, there has been a trend in recent years for simplification of rate schedules.

I believe the time has come to give consideration to eliminating rates for customers using certain appliances or making a specific end-use of the service. The Virginia Electric and Power Company has had rates for the water heaters on file with the Commission since 1932. The original rates were for off-peak use and were available only during certain hours. Effective December 1, 1962, the company filed a rate with the Commission to offer water heating service to be billed on a single meter rate.

Since December 1, 1962, in addition to time-
page 1065 } control rates and separately metered rates for

electric water heating, VEPCO has had two rate schedules available for residential customers; one with, and one without, electric water heating. Since that time, we have had numerous problems in application of the rates; that is, customers being billed on the improper rate schedule. This problem was brought dramatically into focus last year.

In the spring of 1969 it was brought to the attention of the Public Utilities Commission of Fairfax County that some customers were being billed on Schedule No. 1 who were eligible for service under Schedule No. 2, which is the lower rate for customers using electric water heaters. The Fairfax Utilities Commission contacted VEPCO and also informed us of the problems they were having.

I recommended that the company print across the face of the bill of those customers billed on Schedule No. 1 the statement: "If you have an electric storage water heater, you may qualify for a lower rate. Please contact our local office."

During the period July through October, 1969, the bills of all customers on Schedule No. 1 carried this statement. As a result of this notice being put on the face of the bills, VEPCO changed 9,145 customers to Schedule
page 1066 } No. 2. Certainly this many customers being billed on the wrong rate schedule demonstrates the difficulties in applying two residential rates.

The original philosophy in having a separate rate for water heating customers was that the electric water heater was an untried, unproved method of water heating. In order to encourage use by customers of something that was relatively new, the utility companies were allowed to offer a lower rate for water heating.

The situation is no longer true today. More than one-third of VEPCO's customers have electric water heaters, and it has been shown and demonstrated to be a fully satisfactory way of heating water. I see no reason for two customers with equal consumption being charged different rates, solely because one customer owns a water heater.

Water heating loads are desirable to electric utilities and can be promoted by the design of the rate schedules to include a block of energy at a reduced rate where their consumption will normally come. VEPCO has done this in their new Schedule No. 1. I do not believe this block of energy should be restricted to customers with water heaters. The company apparently recognizes that the character of use of the service rather than function or end-use is more equitable.

Ernest M. Jordan, Jr.

Reference was made to this by Mr. Gay on page
page 1067 } 32 of his prepared testimony.

Q. What would be the effect on the company's revenue if the water heating rate were made available to all customers?

A. Based on information supplied to me by the company, it would decrease the company's annual revenue by approximately $4,370,000.

Q. Would your comments concerning special rates for water heating customers apply to special rates for electric heating customers or other special uses by certain appliances?

page 1068 } A. Yes.

VEPCO's rate Schedule No. 7 is a rate which is designed for general service customers for water heating, clothes drying and space heating. Air-conditioning equipment may be served on this schedule where electricity is used for space heating and only in the same space which is heated electrically.

On bills rendered, based on meter readings taken during the months July through October under this schedule, the rate is 3 cents per kilowatt-hour, except for those customers who have an electric water heater. For those customers, one half of the energy used during the billing period ending in the months July through October will be billed at 1.5 cents per kilowatt-hour and the remainder at 3 cents per kilowatt-hour.

The obvious intent of this is to give a special rate during those months to the water heating customer, but there is no limit on the number of kilowatt-hours billed at the lower rate. A customer with a small water heater and a large air-conditioning load, obviously, will receive the benefit of the water heating rate for his air conditioning.

The Commission may want to consider wheth-
page 1069 } er such specialized uses of service; such as space heating, clothes drying, air conditioning, and water heating, have such unique characteristics that they constitute a reasonable basis for a separate classification of service and justify a preferential rate. Certainly the restriction which limits use of air-conditioning equipment under this schedule, to that which serves the same space which is heated by electric energy, deserves close scrutiny as to whether or not such a restriction is consistent with the law, which requires utility companies to charge uniformly for service rendered under like conditions.

Melwood W. Van Scoyoc

Q. Mr. Jordan, have you reviewed Mr. McGurn's testimony concerning environmental control measures?

A. I have.

Q. Do you have any comment concerning this?

A. It is difficult to make a specific comment in view of the lack of any definite information in the testimony which was filed with the Commission.

However, I would like to point out that VEPCO has been spending money for environmental control for many years. This is not new to electric utilities. There is no question that in the future electric utilities, as well as all other industries and private citizens, will have to pay more for environmental control. I do not believe that a utility should receive any advance amount for money to be spent in the future.

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The present capital investments and operating expenses associated with environmental control are included in the rate base and the operating expenses of the company. This Commission used an end-of-period rate base. This provides for revenue which is directly related to plant investment made and being made in a period of abnormal expansion and rising costs. It is my opinion that additional adjustments for future expenses should be made in the future.

* * * * *

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Chairman Hooker: I wanted to read a statement into the record before the cross-examination starts.

This being a purely legislative proceeding, we will permit the record to contain all material offered. Counsel are requested not to make motions to exclude material. When we reach our decision we will consider all relevant matters. The bailiff will cross out the notation "Refused" that he has written on some of the exhibits.

Cross examine, Mr. Riely.

* * * * *

page 1139

MELWOOD W. VAN SCOYOC, called as a witness, after having been first duly sworn, was examined and testified as follows:

Melwood W. Van Scoyoc

DIRECT EXAMINATION

By Mr. Rogers:

Q. Please state your name.

A. Melwood W. Van Scoyoc.

Q. Where do you reside?

A. Washington, D.C.

Q. What is your business?

A. I am Chairman of the Board of Directors of Van Scoyoc & Wiskup, Inc., Public Utility Consultants, with offices at 1735 K Street, N.W., Washington, D.C. 20006.

Q. Please outline your educational background.

A. I was graduated from Oregon State College in 1927 with the degree of Bachelor of Science in Electrical Engineering. Subsequently I took course in accounting from the Oregon Institute of Technology and the Walton School of Commerce.

Q. What has been the general scope of your experience in the field of public utility regulation?

A. I have been engaged continuously in public utility engineering, accounting, ratemaking and other regulatory matters since my graduation from college, with the

page 1140 } exception of 39 months in World War II, during which period I served as a Captain in the United States Army.

My first employment was by the then-named Public Service Commission of Oregon as Assistant Engineer. I held this position from June 20, 1927, until January 1, 1930.

From January 1, 1930, until April 1, 1931, I was in the employ of the Portland Electric Power Company as Assistant Valuation Engineer.

I returned to the Oregon Commission Staff on April 1, 1931, in the capacity of Statistical Engineer, which position I held until April 1, 1935. Upon reorganization of the Commission Staff I was appointed Utility Auditor and head of the Department of Finance and Accounts. On July 1, 1936 I was given the title of Chief Accountant.

In these several positions with the Oregon Commission my duties embraced the inventorying and pricing of public utility property; audits of property records and other books of account; analyses of rates and tariffs; making rate and other investigations of utilities; auditing of annual reports of railroads and utilities; preparation of rules and regulations, uniform accounting systems, annual re-

page 1141 } port forms, and statistical publications; and

the making of analyses and recommendations to the Commissioner concerning depreciation rates, issuance of securities, mergers, purchases and sales of utility property, transactions between affiliates, rates of return, annual utility budgets, and other matters. I also acted as Trial Examiner in a number of cases. During the major period of my employment by the Oregon Commission my duties involved the supervision of other staff members.

On November 14, 1938, I entered the employ of the Federal Power Commission as Assistant Chief of the Division of Original Cost. Thereafter I was appointed acting Chief of that Division, and on July 1, 1939, became its Chief. I continued in that capacity until entering upon active military duty in June, 1942.

The Division of Original Cost was charged with the responsibility of verifying the original cost and reclassification studies submitted by approximately 300 public utilities and natural gas companies in compliance with the Commission's Uniform System of Accounts with recorded book costs in excess of $10 billion.

Following my return from military service
page 1142 } in September 1945, I was appointed Assistant
Chief of the Commission's Bureau of Accounts, Finance and Rates, which position I held until my resignation on July 23, 1954. In that position I exercised general supervisory duties with respect to all of the functions of that Bureau, including matters dealing with natural gas and electric rates, certificates of public convenience and necessity, accounting and depreciation practices, security issues, rates of return and FPC statistics. The staff of the four operating divisions of the Bureau was comprised of approximately 250 accountants, engineers, rate analysts, statisticians, and clerical and stenographic personnel.

In addition to these supervisory duties I actively participated in a number of the more important proceedings involving rates, certificates of public convenience and necessity, and accounting matters which were before the Commission during this period of approximately nine years.

Q. After you resigned from the Federal Power Commission Staff what has been the nature of your consulting work?

A. Since July 24, 1954, I have been continuously engaged in consulting work in the public utility field, chiefly in connection with rate and other proceedings, before the State
commissions and the Federal Power Commission

page 1143 } The clients of our firm have included governmental agencies, State regulatory commissions, municipalities, public utilities, REA cooperatives, industrials and other customers of utilities and trade organizations. We have been employed as consultants on rate and other matters by the Maine, New Hampshire, Georgia, Louisiana, Mississippi, Missouri, Wisconsin, California, Oregon Washington, Maryland, Tennessee, South Carolina, North Dakota, Iowa, Virgin Islands, Virginia and Utah Commissions.

Q. By what departments of the Federal Government have you been employed in a *consultaing* capacity?

A. The United States Department of Justice, the Comptroller General, the Internal Revenue Service, and the Atomic Energy Commission.

Q. Mr. Van Scoyoc, did you testify before the Oregon Commission and the Federal Power Commission as a staff member?

A. Yes, I testified on numerous occasions before the Public Utilities Commission of Oregon in matters dealing with utility rates, security issues, mergers, accounting practices, depreciation rates, affiliated company transactions, and other matters. While a member of the Federal Power Commission Staff, I testified in a number of proceedings be-
page 1144 } fore the Commission dealing with pipeline company rates, original cost and reclassification matters, mergers, and accounting practices.

I also testified before the Securities and Exchange Commission in a Section 77(b) proceeding when I was a member of the Oregon Commission Staff.

Q. Since the establishment of your consulting practice, to what extent, if at all, have you testified in proceedings before State and Federal commissions, other agencies, and the courts?

A. I have testified before the Arkansas, California, Colorado, New York, Georgia, Iowa, Louisiana, Maine, Maryland, Michigan, Mississippi, Missouri, North Carolina, North Dakota, Oregon, Rhode Island, South Carolina, Tennessee, Utah, Washington, Virgin Islands and West Virginia Commissions in 52 rate and other proceedings.

I have also testified before the Federal Power Commission in 39 proceedings involving natural gas and electric rates, applications for certificates of public convenience and necessity, and other matters.

I have also testified before the Federal Communications Commission, the Washington Metropolitan Area

page 1145 } Transit Commission, the Canadian Royal Commission on Energy, the Board of Transport for Canada, the Province of Alberta Public Utility Board, the Province of Quebec Electricity and Gas Board, one Arbitration Board, three Federal District Courts, the Court of Claims, and one State Superior Court, five Congressional Committees, a State and a Provincial Legislative Committee, and one City Council.

page 1146 } Q. Have you published any articles or delivered any papers concerning public utility regulatory matters?

A. I have delivered a number of papers before utility organizations and other groups, some of which have been published. For the past two years I have served as a faculty member for the N.A.R.U.C. Short Coure concerning the subject matter of Rate Base Components and Measurements.

Q. Have your professional qualifications been recognized by any state?

A. Yes, I am a Registered Professional Engineer in the State of Oregon and of the District of Columbia.

Q. Are you a member of any technical or professional societies or organizations?

A. Yes, I am a member of the District of Columbia Society and the National Society of Professional Engineers, and also of the American Accounting Association, the National Association of Accountants and the Federal Government Accountants Association.

Q. What is your assignment in this procedure?

A. I was requested to prepare and present in this proceeding a cost of service study of Virginia Electric and Power Company for the year 1969 which would reflect, in my opinion, the costs properly applicable to the jurisdictional and non-jurisdictional electric service classifications of the company, such cost study to be based on the

page 1147 } electric system Rate Base, Operating Revenues, and Operating Expenses as determined by Mr. James H. Brown.

Q. Do you take responsibility for the development of the figures reflected on Exhibit No. JHB-1 sponsored by Mr. Brown for Rate Base, Operating Revenues, Operating Expenses and Operating Income?

A. No. My responsibility is limited to the assignment and allocation of the figures developed by Mr. Brown to service classifications.

Melwood W. Van Scoyoc

Q. Please state the scope of your studies and indicate what they involved.

A. My studies involved:

1, a review and analysis of the company work papers supporting the cost allocation submitted by Mr. Thaddeus L. Sharkey, Exhibit No. TLS-1, and an examination of his testimony;

2, the examination of the exhibits prepared by Mr. Brown and underlying details of certain adjustments made by him;

3, review of the annual reports to this Commission and the Federal Power Commission; review of the monthly financial reports of the company for the years 1968 and 1969;

5, review of certain data furnished by the company at the request of the Staff;

page 1148 } 6, a review of the testimony and exhibits of other company witnesses.

In addition I performed such research work as I deemed necessary and appropriate to carry out my assignment.

Q. You have referred to jurisdictional and non-jurisdictional service classifications. What do you mean by such terms?

A. The cost allocation study made by the company classified all sales within the State of Virginia under the terms of rate schedules filed with this Commission as jurisdictional service. Sales made outside of the State; sales to state, county and municipal governments; sales under Schedule M, military service; sales to NASA, and sales for resale are classified as non-jurisdictional. For the purpose of this allocation I have accepted these service classifications and have not passed up their legal status.

Q. Did you prepare an exhibit which sets forth the 1969 cost of service of VEPCO for jurisdictional and non-jurisdictional electric service classifications?

A. Yes, I did.

Q. Would it be convenient at this time to introduce your MVS-1 as well as your other exhibits?

A. Yes.

Q. You have prepared an errata sheet to

page 1149 } show changes in your testimony?

A. And exhibits, yes.

Mr. Rogers: Sir, we would like to offer MVS-1 and MVS-5, MVS-2, 3, and 4 were offered during the cross-examination of Mr. Sharkey.

Chairman Hooker: Received.

(The documents referred to were marked MVS-1 and MVS-5 for identification and were received in evidence.)

Mr. Staples: MVS-1 is being passed out now and has been previously passed out to counsel and reflects the changes in the Schedules 1 and 3.

Mr. Riely: Does it reflect the errata here?

By Mr. Staples:

Q. It does not reflect the errata shown on the sheet?

A. So far as individual changes within the exhibit. Others are on the revised schedule.

Q. Exhibits 2, 3 and 4, which intervene between MVS-1 and MVS-5, were introduced through Mr. Sharkey's cross-examination; is that correct?

A. They were identified during his cross-examination.

By Mr. Rogers:

Q. Does Exhibit No. MVS-1 reflect the results of cost of service study of VEPCO which was prepared by you or under your supervision?

A. Yes, it does.

page 1150 } Q. Is it true and correct to the best of your knowledge and belief?

A. Yes, it is.

Q. Before you commence your explanation of the exhibit, will you state briefly the experience you have had in making cost allocation studies of electric utilities?

A. As a member of the Oregon Commission staff, I made a number of separation and cost allocation studies with respect to electric utilities which operated in Oregon and other states and were engaged in more than one kind of utility business.

Since the establishment of my consulting practice, I have made cost allocation studies and testified in respect thereto of Alabama Power Company, Narragansett Electric Company, Natahala Power and Light Company, and Southwestern Public Service Company.

In addition, I have made a number of other cost allocation studies for clients which were not presented in rate proceedings.

Q. Have you been involved in making cost allocation studies with respect to gas utilities?

A. Yes, when I was a member of the Federal Power Commission staff I supervised the making of cost allocation

studies in a number of pipeline rate cases. In my consulting practice I have made cost allocation studies
page 1151 } with respect to a considerable number of natural gas pipeline companies and gas distribution companies, and have testified with respect to these studies in rate proceedings.

Q. Are the guiding principles of cost allocation applicable to electric utilities comparable with those applicable to natural gas companies?

A. Yes, the basic principles are equally applicable to both kinds of utilities. However, the techniques and methods used reflect differences in physical characteristics, operations and economics of the two types of utilities.

Q. Will you please outline the general approach which you followed with respect to the cost of service study of Virginia Electric and Power Company?

A. The general approach I have used may be divided into three steps. The starting place is the overall cost of service of VEPCO for the year 1969 which Mr. Brown determined and presented in Exhibit No. JHB-1.

Preliminarily, it should be noted that because of the methods utilized by the company in its cost allocation the data which it accumulated to be used in its study was geared to such methods. This had the effect of channeling certain of the cost allocation procedures I followed along certain paths. In several particulars the study which I made and that which was made under Mr. Sharkey's supervision parallel each other. In some instances I accepted
page 1152 } his procedures because I believe them to be correct. In other instances I would have followed another method but time did not permit my doing so.

However, certain principles and procedures which I followed differ from those used in the Company's allocation study, the net result being that different cost amounts were arrived at for the jurisdictional and non-jurisdictional services because of these differences. These differences are unrelated to the adjustments made by Mr. Brown in regard to his operating expense and rate base determina-
page 1153 } tions.

Q. Before you describe the three steps, will you indicate the results of your study?

A. The ultimate results of the study are reflected on Schedule 1 of the exhibit. This schedule shows the Operating Income and Rate Base for the year 1969 for each of the Jurisdictional and Non-Jurisdictional service classifications. The

earned rate of return for the Virginia Retail Business is 8.099%. The total System rate of return is 7.065%, and coincides with that shown on Mr. Brown's Exhibit No. JHB-1.

Q. You intended that to be an amendment to 8.086 that you had?

A. Yes, sir.

By Commissioner Dillon:

Q. What was that figure again?

A. 8.099.

By Mr. Rogers:

Q. Would you please now explain the first step in your allocation approach?

A. The first step is to classify or separate the production, transmission, and distribution facilities of the company between those used specifically to furnish service to a particular customer or class of customers, and those which are used jointly by all customers or by groups of customers.

The initial classifications I have used are as
page 1154 } follows:

Power Supply Facilities. Under that Generation and Transmission.

Common Transmission Facilities. Under that Virginia and North Carolina.

Specific Transmission Facilities. Under that Virginia and North Carolina.

Distribution Facilities. Under that Virginia, North Carolina, and West Virginia.

Customer Facilities. Under that Virginia, North Carolina, and West Virginia.

Q. How was this done?

A. Since the company had made a functional classification of its plant a detailed review was made of its workpapers. The electric and common plant amounts used by the company were verified to source data and reconciled in total with the figures set forth in Mr. Brown's Exhibit No. JHB-1. All Production plant was included in the Power Supply category. Transmission plant was separated into three categories, i.e. Power Supply, Common, and Specific. Each transmission line and sub-station was analyzed by the company

tions was made accordingly.

page 1155 } The VEPCO power supply system is com-
as to its particular use and its assignment to these clasifica-

pletely integrated and interconnected. Power Supply transmission lines are those which serve to interconnect the various sources of power. Common transmission lines are those which are used to transmit power and energy from the Power Supply system to sub-stations or individual customers. They are jointly used by more than one customer class or by individual *customess*. Specific transmission lines are those lines whose function is to transmit power and energy from the Power Supply system or Common transmissions lines to individual customers or a single customer class, and are used solely for such purpose.

The results of this functionalization of the electric plant in accordance with the categories I have previously mentioned is shown on Schedule 4 of Exhibit No. MVS-1.

Q. Revised?

A. No, not revised.

I should continue with that sentence: By components of the system rate base as they were determined by Mr. Brown. Common transmission, Specific transmission, Distribution and Customer plant was classified within a particular state according to physical location.

page 1156 } Q. What electric plant items are included under the heading Customer Plant?

A. Services, meters and street lighting, and signal systems. The facilities in these plant accounts are for the use of single customers and they are allocated on a customer basis.

Q. How was General plant treated in the functionalization process?

A. General plant, which includes the electric utility portion of Common plant of the company, was allocated on the basis of all other utility plant.

Q. Was a similar functional classification made of Operating and Maintenance Expenses?

A. Yes. All production expenses were assigned to the Power Supply category. Transmission Operating and Maintenance Expense was allocated between Power Supply Transmission, Common Transmission, and Specific Transmission based on plant investment. Distribution Operation and Maintenance Expense was classified either to the distribution or customer categories as appeared appropriate.

Customer Accounts Expense was classified as a customer cost, as was Sales Expense.

page 1157 } Administrative and General Expense was allocated to functions based on all other operat-

ing expense excluding fuel, water for power, and purchased power.

These classifications are not shown directly on any of the schedules of this exhibit; however, details of such classifications are set forth on the schedules which reflect the third step of the allocation procedure.

Another facet of the functional classification procedure was the classification of generation and purchased power costs to the fixed and variable categories. Not all of the cost items are 100% fixed or 100% variable. Some cost items have both attributes. Because of this fact, classification of such cost items is usually made on a predominant basis, or portions thereof are assigned to each category based on judgment or cost behavior studies. I intend to classify all power supply costs either as 100% fixed or as 100% variable.

Q. Please describe the third step in your general approach.

A. This step consists of the assignment or allocation on various bases of Net Utility Plant, Operating and Maintenance Expenses, Depreciation, Taxes, and other cost of service items to the several service classifications.

page 1158 } I will start with the Rate Base and in this connection I will refer to Schedule 3 of the exhibit. Column 1 of the schedule shows the functional classifications described previously. Column 2 shows total system amounts for each classification. The sources of these amounts is Schedule 4, previously referred to.

Power supply generation on line 3 was allocated to service classifications based upon the responsibilities of such classifications for the incurrence of generating plant investment. These responsibilities were determined by reference, 1, to the demands imposed upon the VEPCO power system at the time of its 1969 system peak which occurred on July 18, at the 2:00 to 3 o'clock hour; and, 2, to the use of energy by each of the service classifications.

Q. I note in column 13, Allocation Factors or Basis, number 4 appears on line 3. Does this refer to the allocation factor which you used?

A. Yes it does. This factor is shown on Schedule 12, Sheet 1, at Line 7.

Q. Will you turn to that schedule and explain the development of Allocation factor 4?

A. Allocation factor 4 represents a 50-50 page 1159 } weighting of the coincident peak kilowatt

Melwood W. Van Scoyoc

demands, and annual kilowatt-hour energy amounts. The peak demand values on line 1 were developed by the company at the production level as shown on Schedule 13 of MVS-1. I have accepted these demand values based on a limited examination of the underlying data for the Retail and State, County and Municipal classifications. Available time did not permit me to do otherwise. The demand values used for the other service classifications have been verified.

Later I will refer to additional research work, which I propose to do with respect to this item as well as in respect to several other items prior to the hearing date.

I might interpolate here that that research work has been done, and I have some supplemental testimony which deals with that.

page 1160 } If such research work discloses the need for significant adjustments to the cost of service allocations submitted herewith, I will propose they be made a part of the record.

I found that the annual energy figures developed by the company required an adjustment because of the omission of a sale of 47,804 megawatt hours to member companies of the CARVA pool, and the figures shown on line 2 reflect such adjustment.

Q. Why did you weigh the coincident peak demands and annual energy on a 50-50 basis to develop the Power Supply allocation factors on line 7?

A. The Power Supply system of the company operates as a unit and supplies both capacity and energy to customers. Since the costs attributable to Power Supply are joint costs it is impossible to assign specific parts to any customer or class of customers. Therefore, it is necessary to allocate these joint costs to the customers and classes of customers based on their relative use of the capacity and energy supplied by the Power Supply system.

Although a large share of the cost of producing, transmitting and distributing electric energy results from investment in production, transmission, and distribution facilities having capacity and capability magnitudes of

page 1161 } certain sizes, such facilities are used to deliver energy throughout the year as well as during peak periods. Virginia Electric and Power Company is not in business for the purpose of selling kilowatt-hours only during peak periods. Costs are incurred to sell kilowatt-hours the 8,760 hours of the year. Since both the peak use

of the facilities as well as their annual use is equally important to the financial welfare of the company, and there is no mathematical means of establishing the relative importance or weight to be given to the capacity or annual use factors, it is my judgment that it would be appropriate and equitable to give equal weight to the factors of capacity and energy in the allocation of the production and transmission facilities net utility plant and the fixed costs related to such facilities.

The method that I propose to use is a modification of the peak responsibility method. The peak responsibility method allocates fixed costs among customer groups in proportion of their respective kilowatts of demands at the time of the system peak, in this case a one-hour period. The method assumes that inasmuch as the fixed costs are related, in the main, to the investment in facilities, the allocation of such costs among the customer groups should be in proportion to the participation of each class to the system peak.

This method has the basic *weakeness* that
page 1162 } off-peak customers or seasonal customers who peak at a time of year other than when the annual system peak occurs, are assigned none or little of the demand related costs. For this reason the peak responsibility method has been variously modified to provide a more equitable distribution of demand cost between classes.

Q. Is the method your propose to use for allocating demand or capacity costs a recognized method?

A. Yes, it is. The Federal Power Commission has used this method for many years for gas pipeline cost allocations. It has also been used in electric utility cost allocations by the Commission Staff. I have used this method in a number of electric utility cost allocations.

Q. Did you use the same allocation factors to allocate Power Supply transmission plant mong the several service classifications?

A. No. VEPCO delivers power to certain REA cooperatives who are resale customers of both VEPCO and Southeastern Power Administration, SEPA. A portion of such power is supplied to VEPCO by SEPA. Because of this fact, and also because of transmission line losses, different allocation factors are necessary. These *facotrs* were developed from data on Schedules 13 and 14, and the resulting allocations are shown on line 12 of sheet 1 of Schedule 12, Factor No. 7.

Melwood W. Van Scoyoc

Q. Would you explain the basis for the allo-
page 1163 } cation of Common transmission plant?

A. The allocation factors for Common transmission plant are shown on line 17, sheet 1, of Schedule 12, Factor No. 10. Demand and energy data used to develop such factors are shown on Schedules 13 and 14.

Q. How was the Specific transmission plant classified to states assigned to service classifications?

A. The company's investment in transmission lines and substation facilities classified as Specific was assigned to the appropriate service classification utilizing such facilities.

Q. What basis did you use to allocate Distribution net plant?

A. I used an allocation procedure known as the Average and Excess Method. This method was developed by Mr. W. J. Greene in the mid-20's. It has since been widely accepted by utility cost analysts as a superior method of allocating capacity costs particularly when you are dealing with distribution systems where considerable diversity in use exists, and also where non-coincident demands are available.

Where such data are available as in this case, I much prefer to use this method for the allocation of distribution plant and costs as I think it produces the most equitable results.

page 1164 } Q. Will you explain the application of this method?

A. Under this method that part of the fixed costs incurred to serve the average loads are allocated on the basis of kilowatt-hours, while the remainder of the system demand, that is the demand in excess of the average, is allocated among customer classes on the basis of their respective excess demands; that is, maximum non-coincident demand minus average demand. This method is generally recognized as being more in harmony with sound costing principles than the peak responsibility method and other methods *wuch* as the non-coincident demand method.

Q. Is the development of the allocation factors based on the Average and Excess method shown on Schedule 12, sheet 1?

A. Yes it is, starting at line 18. The allocation factors are shown on line 23. The average demands on line 21 are computed based on dividing the megawatt hours on line 20 by the number of hours in the year. These average demands are deducted from the non-coincident demands shown on line 19 to establish the demand values in excess of the average.

The ratio of the sum of these excess demands to the total coincident demand as shown on line 18, is de-
page 1165 } termined. Such ratio is applied to the excess demands of each service classification to obtain the adjusted excess demand. To the adjusted excess demand is added the average demand to obtain the Average and Excess demand values shown on line 22.

Q. Will you describe the method you used to allocate Customer Net Utility plant of $81,178,416 shown on line 23 in column 2 of Schedule 3?

A. Customer Net Utility Plant pertains to services, meters, street lighting, and signal system facilities. The plant cost of customer services assigned to a state was allocated to service classifications on a customer basis. The development of the allocation factors is shown on lines 1 to 4 of sheet 2 of Schedule 12.

It would have been more appropriate to use weighted customers as a basis so as to give effect to the more costly services used for serving the larger customers. However, it was not feasible to develop such data within the amount of time available. The use of customers only has resulted in a slight overstatement of the Virginia Retail Net Utility Plant.

Meter plant investment for each state was allocated on the basis of the weighted number of meters. The
page 1166 } development of the weighted number of meters was based on data furnished by the company. The development of the allocation factors, Factor 16, is shown on sheet 2 of Schedule 12 at lines 5 to 8.

Street lighting and signal system plant in Virginia was assigned directly to the State, County, and the Municipal service classification. For North Carolina and West Virginia such plant was included in the Retail category.

Q. What basis did you use to allocate the Materials and Supplies shown on line 26 of the respective service classifications?

A. Material and supplies of $19,412,627 consists of fuel and other material and supplies used throughout the system. Schedule 4 at lines 33 to 36 lists the items making up this sum. Fuel was assigned to Power Supply and was allocated on the basis of Allocation Factor 3; that is, megawatt hours at the production level. The portions of the Materials and Supplies assigned to Power Supply transmission and Common transmission were allocated on the basis of the previously described Allocation factors 7 and 10.

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The amount assigned to Specific transmission was allocated on the basis of plant.

page 1167 } The Materials and Supplies assigned to Distribution were allocated on the basis of Allocation factor 11.

The Materials and Supplies assigned to the Customer function were allocated to service classifications on the basis of previously allocated Net Utility Plant.

Q. What basis was used to allocate Cash Working Capital to service classifications?

A. Cash Working Capital was allocated by use of the same allocation factors mentioned in respect to Materials and Supplies, except the amounts assigned to Specific transmission and to the Customer function were allocated on the basis of operation and maintenance expenses applicable to such categories.

Q. Please turn to Schedule 2 of the exhibit and explain what is shown thereon?

A. This schedule reflects the allocation and assignment of Operating Revenues and Operating Expenses to service classifications, and a determination of the adjusted Operating Income amounts for each service classification.

Line 1 shows the Operating Revenue by service classifications. These amounts are detailed on Sched-

page 1168 } ule 5. By reference to that schedule, it will be noted that Sales of Electricity are listed by revenue classifications. Other Operating Revenues have been allocated to service classifications using the allocation factors or bases indicated in Column 13 of that

page 1169 } schedule.

Power production expenses shown on lines 4 and 5 of Schedule 2 have been allocated to service classifications using Allocation factor 4 for those expenses classified, and Allocation factor 3 for those expenses classified as variable.

Transmission Operation and Maintenance Expenses were allocated using the particular bases identified on Schedule 6 of the exhibit.

Distribution Operation and Maintenance Expenses shown on line 8 consist of a combination of expenses previously functionalized as Distribution Expense, and Customer Expense. Schedule 6 of the exhibit shows the allocation of each of these functional costs to service classifications. Allocation factor 11 was used to allocate the Distribution expense portion. Details of the allocation of the Customer portion

of Distribution Operation and Maintenance expense is shown on Schedule 6.

Customer accounts expense, shown on line 9 of Schedule 2 was allocated in accordance with Allocation factor 20. Allocation factor 20 reflects a combination of Meter Reading and Surveys and Customer Records and Collection expenses. The allocation factor for meter reading and surveys is shown on line 11 of sheet 2 of Schedule 12 and was developed on a weighted customer basis. The allocation for

page 1170 } Customer Records and Collections is shown on line 14, and was also developed on a weighted customer basis. The weightings used to determine the number of weighted customers were those developed by the company. I have accepted such weightings for the purpose of this cost allocation.

Sales expense on line 10 of Schedule 2 was allocated based on Allocation factor 19. This factor was developed from a company segregation of Sales Expense between Residential, Commercial, Industrial, and other revenue classifications which I have accepted for the purpose of this cost allocation.

Administration and General Expense on line 11 was allocated in accordance with the allocation factors shown on Schedule 7. Basically, this expense was allocated on the basis of all other operation and maintenance expense excluding fuel and water used for power production and purchased power cost.

The allocation of Depreciation Expense on line 13 to service classifications is detailed on Schedule 8 where the allocation factors are shown for each of the functional plant groups. Basically, the allocation of Depreciation Expense is predicated upon gross plant cost at December 31, 1969 for each of the four electric plant functions. The company accounts for Depreciation Expense on a functional plant group basis.

page 1171 } The allocation factors used to allocate Taxes Other than Income on line 14 of Schedule 2 are shown on Schedule 9. I suggest that reference be made to that schedule. The first tax item pertains to labor costs included in operating expenses. The company is required to submit to the Commission, in its Annual Report. a distribution of labor costs charged to operating and maintenance expenses for each of the functions of production, transmission, distribution, customer accounts, sales and administrative and general expenses. Since this information for the

year 1969 was not available, I therefore used the actual distribution of labor costs for the year 1968 on the assumption that there would be a little variance in the relative relationship of labor expense charged to each function for the year 1969 as compared with 1968.

Property taxes were allocated on the basis of Net Utility Plant assigned and allocated to service classifications. Gross receipt taxes are a function of revenues and were allocated on that basis. Specific assignments to states were made of certain miscellaneous taxes. Allocations to service classifications within such states were made on appropriate bases.

State income taxes shown on line 15 of Schedule 2 were assigned specifically to the states of North Carolina and West Virginia.

* * * * *

page 1173 } AFTERNOON SESSION

MELWOOD W. VAN SCOYOC, having been previously duly sworn, resumed the stand and testified as follows:

DIRECT EXAMINATION (Continued)

By Mr. Rogers:

Q. Mr. Van Scoyoc, I believe your concluding sentence at the close of the morning session was "State Income Taxes shown on line 15 of Schedule 2 were assigned specifically to the States of North Carolina and West Virginia." Is that correct?

A. Yes, sir.

Q. Would you explain your allocation?

A. The development of the Federal income tax by service classification is shown on Schedule 10. I believe this schedule is self-explanatory except that reference need be made to line 10 "Other Deductions—Net." These deductions aggregating $51,370,884 consist, in the main of interest, and the excess of tax depreciation, over book depreciation. Interest was allocated to service classifications based on previously assigned and allocated Net Utility Plant. The excess of tax depreciation over book depreciation was allocated to service classifications on the same basis as book depreciation, which is shown on Schedule 8.

Line 16 reads Restatement to Tax Basis.
page 1174 } This restatement is necessary because the ser-

vice classifications of State, County, and Municipal Military Service and Resale, reflect negative taxable incomes. The resulting negative income tax amounts need to be reduced to a zero basis as shown on line 17 by a redistribution of the income tax between service classifications without changing the total income tax liability. On lines 18 and 19 is shown the Investment Credit Generated and Deferred. Since these are offsetting items, it is not necessary to allocate them to service classifications.

On line 18 of Schedule 2 is shown the allocation of the Investment Tax Credit—Amortization. The allocation of the total amount of $1,911,800 is detailed on Schedule 11 which shows the allocation factors used for each functional plant group to which the investment tax credit was applicable.

The deferred Income Tax Amortization amount of $1,547,340 on line 19 is also allocated on Schedule 11 based on the allocation factors shown in Column 13. The Deferred Income Tax Amortization amounts pertain to plant classifications which gave rise to the creation of the

page 1175 } deferred tax reserve.

On line 22 is shown the Donations which have been added to operating Income in the total amount of $183,437. Donations were classified by states and the allocation to service classifications within each state was based upon the Administrative and General Expenses previously allocated to service classifications within each state.

Interest During Construction on line 23 was allocated to service classifications in accordance with the allocation factors shown on Schedule 8. The amount of Interest During Construction was assigned to plant groups by the company, and these amounts were then allocated in accordance with the Allocation Factor or Basis shown in column 13 of Schedule 8.

The resulting Net Operating Income—Adjusted for total system and for each service classification is shown on line 24. These amounts are carried forward to Schedule 1 of the exhibit.

Q. Does that complete your explanation of Exhibit No. MVS-1?

A. Yes it does.

Q. Mr. Van Scoyoc, as I understand it, Exhibit No. MVS-1 does not reflect the effect upon revenue and earned rate of return of the company's proposed increase in

page 1176 } rates to the Virginia Retail classification of customers, is that correct?

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A. That is correct. The revenue amounts I used in the exhibit reflect actual revenues for the year 1969.

Q. Have you prepared an exhibit which shows, based on your allocation of the cost of service, what the rate of return would be for the Virginia Retail classification if the company's proposed rates became effective?

A. No, however, I have made the calculation and can furnish the result.

Q. Will you do so?

A. Exhibit No. JHB-1 sponsored by Mr. Brown shows the effect of the proposed rate increase on operating revenue to be $27,449,000. The Virginia Jurisdictional share of this sum is $25,823,257. The effect on Net Operating Income—Adjusted is $12,903,418 based on 48% Federal income tax rate. If the latter amount is added to the sum of $86,100,383 shown at line 2 on Schedule 1 of Exhibit No. MVS-1, the total Operating Income for the test period becomes $99,003,719. Dividing this sum by the Rate Base amount of $1,063,127,010 produces a rate of return of 9.313%.

Q. I believe you previously testified in regard to certain additional research work you intended to do

page 1177 } concerning certain demand data and other items. Can you be more specific as to these items, and indicate the reasons why you feel such work is necessary?

A. Yes. Demand data for the Retail and State, County, and Municipal service classifications was derived by applying load factor ratios developed for the year 1968 to 1969 megawatt hours. The 1968 demand values for these two service classifications was determined from a load study made by the company. This study involved a sampling of the demands of a number of customers in Residential and Small General Service Classifications by the use of DSLD load research meters. Customer demand meters were used mainly for determining the demands for the Large General Service customers. From these data the load characteristics of each class was determined.

Another area of investigation involves the classification of transmission line and sub-stations into the Power Supply, Common Transmission, Specific transmission categories. The company classification was based on the transmission plant as it existed at December 31, 1968. All additions to transmission plant in service for the year 1969 and the additions included in Construction Work in Progress

page 1178 } were classified by the company as Power Supply transmission facilities. The 1969 plant addi-

tions of approximately $70,000,000 had not been utilized at the time the company's 1969 allocation study was made, and it was judged that no significant shift between the three categories of transmission plant had occurred.

A further area for intended research is the use of the unweighted number of customers to allocate the investment and other costs related to overhead and underground services which I previously mentioned.

In addition, the demand values used by the company for the service classifications supplied from Common transmission plant were based on the application of ratios to 1968 demand data and this procedure should be given additional study.

I have accepted the results of the company's work in these areas with reservations because I did not deem the review which I was able to make in the time available to be adequate for the expression of an unqualified opinion as to the validity of such results.

page 1179 } Q. Referring to your supplemental testimony, Mr. Van Scoyoc, in your testimony commencing at page 24 you refer to certain additional research that you intended to do subsequent to the submission of your direct testimony. The first item pertained to demand data for the retail and state, county, and municipal service classifications which were based on 1968 load studies.

What was the result of your research work?

A. An examination was made of the procedures used by the company in conducting the load studies in 1968 from which the demand values for these two service classifications were developed. This included a review of the sampling method used and the data derived from the DSLD load survey meters. The customer demands were recorded on magnetic tape which was decoded, verified, and placed on punch cards for computer analysis. The computer programming computations were reviewed and the results checked to the company's worksheets. Based on our futher examination, we concluded that the company's coincident and non-coincident demand determinations were acceptable.

Q. You also refer in your testimony to an investigation of the functional classification of the 1969 net additions to transmission plant, lines and substations, and the transmission plant included in Construction Work in

page 1180 } Progress at December 31, 1969. What was the result of this investigation?

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A. Our review of the company's functional classification of transmission lines and substation facilities at December 31, 1968 revealed no significant misclassifications. With the assistance of the company, almost all of the 1969 transmission plant additions and the amounts carried in construction work in progress at December 31, 1969 were assigned to specific lines and substations and functionally classified to Power Supply, Common and Specific. This classification process resulted in a shift of approximately $4,200,000 of transmission plant from the Power Supply function to the Common transmission plant and Specific transmission categories. The allocation of the reclassified amounts resulted in a reduction of the Virginia Jurisdictional Rate Base of approximately $618,000. It also resulted in a reduction in operation and maintenance expense, depreciation expense and other taxes, applicable to Virginia Jurisdictional of approximately $29,600.

Q. Another area in which you expressed a desire to make further studies dealt with the use of un-weighted customers to allocate the cost of customer services to service classifications. I believe you expressed a preference for the use of weighted customers as the basis for such allocation. What was the result of your further study?

page 1181 } A. Since data were not available as to the number of overhead and underground customer services in the residential, small general service, large general service and other classifications at December 31, 1969, use was made of data which had been compiled for the year 1968. As investment costs for typical services applicable to each classification were not available, it was necessary to resort to estimates of service costs. For this purpose I used those shown in the 1954 cost allocation study. Consequently, the results of the weighted customer study reflects only a rough approximation. The Virginia Jurisdictional rate base would be reduced by approximately $1,836,000. The reduction in operation and maintenance expenses, depreciation, and other taxes would amount to approximately $120,000.

Q. The final item related to the demand values used by the company for service classifications supplied by Common transmission plant. What did your further investigation reveal?

A. We examined supporting data pertinent to the 1968 demand values used by the company, including substation load data. The various ratios, load factors, and loss factors used

by the company were checked and applied in an appropriate manner to obtain Common transmission demand values. No discrepancies were apparent.

Q. Do you propose to amend Exhibit MVS-1 to reflect the differences you mentioned resulting from a reclassification of the 1969 transmission plant net additions and the transmission Construction Work in Progress at the end of 1969?

page 1182

A. No, I do not. The effect of the two items—that is the reclassification of transmission lines and the end weighted services—on the rate of return for the Virginia Jurisdictional classification being less than 3/100 of one percent is not of sufficient significance to warrant a revision of the exhibit.

Q. Mr. Van Scoyoc, did you make certain comparisons of the results of your allocation study with the company's study?

A. Yes, I did.

Three of these comparisons have been identified in the record as Exhibits MVS-2, MVS-3, and MVS-4, and were referred to during the cross-examination of Mr. Sharkey.

Exhibit MVS-5 pertains to the State of Virginia operations and is a companion exhibit to MVS-3.

Mr. Rogers: MVS-5 has been offered and accepted.

Q. Are these exhibits true and correct to the best of your knowledge and belief?

page 1183

A. Yes they are.

Q. Is there any explanation you deem appropriate to make concerning these four exhibits?

A. I believe a brief explanation would be helpful. I will refer first to Exhibit MVS-3. This exhibit pertains to the State of Virginia rate base and shows the Staff rate base by functional components in Column 2, and the Company rate base by functional components in Column 3. The total company rate base exceeds the Staff by $2,456,011.

The next exhibit I will refer to is the one just identified as MVS-5 which shows Net Operating Income for the State of Virginia. As shown in Column 4 on line 23 there is a difference of $7,694,275 between the Staff and the company. In Column 5 are shown the differences amounting to $7,649,697 which arise from the adjustments proposed by Mr. Brown. In Column 5 is shown the differences relating to

the classification and allocation of revenues and operating expenses. The effect on Net Operating Income is $44,578, the Staff Net Operating Income being greater by that amount than the company's.

page 1184 } The next exhibit to which I will refer is MVS-2. This exhibit pertains to Virginia Jurisdictional service. The net of the differences between the Staff and company rate bases amount to $37,528,765. The reasons for the company rate base exceeding the Staff rate base were touched upon during the cross-examination of Mr. Sharkey. A portion of the difference relates to the different treatment of street lighting plant. Another portion relates to the classification of distribution plant between the demand related and the customer related components which affect the amount to be allocated on the basis of demand and the third is the use by me of the Average in Excess method to allocate demand costs and the use of the Non-coincidental Demand by Mr. Sharkey. The Virginia Jurisdictional Average and Excess allocation factor is 85.4152% compared with the non-coincident demand ratio of 87.3489%.

I will now refer to the companion exhibit showing Net Operating Income comparisons which is MVS-4. Net Operating Income per the Staff exceeds that of the company by $10,571,227. Of this amount $7,072, 728 results from the adjustments proposed by Mr. Brown. The total classification and allocation difference is $3,560,215.

page 1185 } Q. Referring to their difference of $3,560,215, to what items do you attribute this difference?

A. I have not attempted to account for all of the difference; however, it appears that about half of the difference relates to distribution and customer component operation and maintenance expenses. Since these expenses, as well as depreciation, and property taxes were allocated on the basis of plant and a substantial difference exists in the amount of distribution and customer plant allocated to the Virginia Jurisdictional base rate, these differences in operating expenses naturally follow. Also as administrative and general expenses are allocated on the basis of other expenses, the difference in this item is likewise related to the allocation of distribution and customer plant.

Another difference of significance is in production operating expenses. The difference of $721,455 in production expense relates principally to the sale of energy to the CARVA pool and the sale of "firming energy" to SEPA. I considered the company's treatment of these sales to be erroneous. They

resulted in Power Supply costs being allocated to Virginia Jurisdictional which should have been allocated to the Resale classification.

Q. Mr. Sharkey testified at Page 715 of the trial transcription that the metering equipment cost for
page 1186 } NASA was assigned to that customer. Do you find that to be the case?

A. No. Since NASA was supplied at transmission voltage, I believe Mr. Sharkey was unaware that NASA was not included as one of the 914,864 customers to which customer component investment cost including meter investment was allocated. However, had NASA been included as a customer it would have been assigned only $288.21 as the customer cost net investment.

Q. Mr. Sharkey testified at Page 809 of the transcript that the Average and Excess method was developed primarily for the allocation of capacity costs of the power supply system, not the distribution system. Do you agree?

A. No, I do not agree nor can I find any reference in textbooks or other literature on the subject which would support such statement. The Average in Excess Method is, in my opinion, particularly adapted to allocation of distribution system capacity costs because of the large degree of load diversity in the distribution system and the varying customer load factors.

Q. What do you mean by diversity?

A. It is the ratio between the total of the maximum demands of the individual customers and the co-
page 1187 } incident maximum demand of such customer class. It recognizes the fact that the maximum demands of all customers do not occur at the same time.

Q. Mr. Sharkey testified at Page 770 and 771 of the transcript that the use of a theoretical distribution system is a standard method of approaching the determination of the customer component of an electric utility distribution system. Do you agree?

A. I would agree that the method has been presented in rate cases by some utilities, however, I was able to find only one case where it was accepted, and in that case, it was not accepted on its merits. I would not consider it to be a standard method because it has not been generally accepted by regulatory commissions or authorities on public utility regulation as an appropriate method. In my opinion, the method is illogical and unsound. The customer investment cost com-

ponent should be limited to the inclusion of services, meters, installations on customers' premises and street lighting and signal system equipment. The cost of these items of plant was incurred solely to serve individual customers who should be charged with the annual costs related thereto. All other elements of the distribution system are jointly used by groups of customers and are appropriately allocated on the basis of their use of the distribution system capacity.

page 1188 } Mr. Rogers: That concludes the direct testimony of Mr. Van Scoyoc.

He is now prepared for cross-examination.

Chairman Hooker: Do you have any questions?

page 1189 } CROSS EXAMINATION

By Mr. Riely:

Q. Mr. Van Scoyoc, am I correct in my understanding that your point of departure in this case is with Mr. Brown's JHB-1?

A. That is correct.

Q. That if there were any alteration to be made in Exhibit JHB-1, there would have to be conforming changes in your exhibit?

A. Yes, sir; that is correct; it would have to be followed through.

Q. I am confused in your supplemental testimony by your statement that investment costs for typical services applicable to each classification were not available.

You mean the company doesn't have those investment costs?

A. At least so far as for 1969 data were available.

Q. Did you inquire?

A. Yes, sir; we did.

Q. Did you inquire as to '68?

A. Yes, sir.

Q. They didn't have it for '68?

A. That is right.

Q. They didn't have any so far as you know?

A. So far as I knew I was not able to come

page 1190 } up with any.

Q. That is why you went back and used 1954?

A. Yes, sir.

Q. You couldn't find anything later than 1954?

A. I couldn't find anything; no, sir.

Melwood W. Van Scoyoc

Q. Would you please turn to Schedule 10 of your Exhibit MVS-1?

A. Yes.

Q. In your prepared testimony you stated that the service classification of state, county, and municipal, military service, and resale reflected negative taxable income; is that correct?

A. Yes, sir.

Q. You stated in your prepared testimony that these negative tax amounts need to be reduced to zero; is that correct?

A. Yes, sir.

Q. You then redistributed these negative taxes among three classifications, the Virginia retail, NASA, and the North Carolina retail; is that correct?

A. Yes, sir.

Q. The result of this redistribution was to reduce the amount of Federal income tax assignable to Virginia retail from that which you compted on line 15 for Virginia retail; is that correct?

A. That is correct.

page 1191 } Q. Mr. Van Scoyoc, if there had been no negative tax figures for any classification, $31,726,775, as shown in Column 4 on line 15, would have been assignable to Virginia retail rather than $30,129,215; isn't that correct?

A. That is correct.

Q. The difference of about $1,600,000?

A. Approximately; yes, sir.

Q. Let me ask you this: If the rates for sales to state, county, and municipal customers, or to military service customers, or to resale customers were increased and the negative taxes for those classifications were thereby reduced, though in fact eliminated, all other things remaining the same, would not the amount of taxes assignable to Virginia retail be increased?

A. Yes, sir, if the rates were increased sufficiently to eliminate the negative taxable income, that result would follow.

Q. If you increase the amount of taxes assignable to Virginia retail, you would reduce the net operating revenue assignable to Virginia retail, would you not?

A. I am sorry. May I have that question again?

Q. If you increase the amounts of Federal income taxes assignable to Virginia retail, you would reduce the net operating revenue assignable to Virginia retail, would you not?

A. The non-operating revenue for Virginia

page 1192 } retail would *would* be reduced; yes, sir.

Melwood W. Van Scoyoc

Q. The net operating revenue would be reduced?

A. Yes, sir.

Q. If you reduce the net operating revenue assignable to the Virginia retail, you would reduce the rate of return on the Virginia retail, would you not?

A. If you reduce the net operating income, yes, sir; it would have the effect of reducing the earned rate of return on Virginia retail classification.

Q. So the peak of this, Mr. Van Scoyoc, is that your method of assigning taxes means that if Virginia Electric were to go to the Federal Power Commission and get a rate increase, the result would be that your indicated rate of return earned by Virginia retail classification would be reduced; is that correct?

A. As of that time, yes, sir. I don't know what the rate of return would be on Virginia retail at that time.

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page 1196 }

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Now let me go to Page 12 of your prepared testimony. I believe you state there, about three-quarters of the way down the page, and I quote, "I intend to classify all power supply costs either as 100% fixed or as 100% variable." That is your statement.

page 1197 } In the statement are you including power supply investment cost as well as operating expenses?

A. Yes, I think that is correct. Of course, as far as the investment is concerned, those are all classified as 100% fixed.

Q. What do you mean, a fixed cost? What makes a fixed cost fixed as compared with variable costs?

A. The cost does not vary with the productive output.

Q. So the cost—

A. That is, in general terms.

Q. So the cost doesn't vary with the number of kilowatt-hours that are produced?

A. That is right.

Q. So in other words a fixed cost is fixed regardless of the quantity of production, is that correct?

A. Within limits, yes.

Melwood W. Van Scoyoc

Q. And a variable cost normally varies with the amount of energy produced?

A. Yes, sir.

Q. You have classified, as you stated on Page 12, Power Production Expense as fixed and variable, and you classified $14,220,772 as fixed Power Production Expense on Schedule 2, Column 1, Line 4. Is that correct?

page 1198 } A. Yes, sir.

Q. And you allocated this on your 50-50 method, isn't that correct?

A. No, sir.

Q. You did not?

A. Well, yes, you are right. It was allocated on Factor 4.

Q. And that is 50-50, is it not?

A. Yes, sir.

Q. And under the 50-50 method 50% of this expense is allocated on the basis of the energy, the kilowatt-hours produced, isn't that correct?

A. Yes, sir, and I have explained my reasons for so doing.

Q. Aren't you really classifying $7 millon out of this $14 million as a variable expenses on the basis of energy produced and not as a fixed expense?

A. No, sir.

Q. Would you explain to me why that is not true, Mr. Van Scoyoc?

A. I feel that in making a fair and equitable division of these power production fixed costs between customers or classes of customers, that consideration of the use of those facilities should be accorded.

Q. And you say that you did not allocate

page 1199 } half of that expense on the basis of kilowatt-hours?

A. No, I didn't say that, Mr. Riely.

Q. I am sorry, sir. I misunderstood your answer.

A. I do not classify them as variable costs.

Q. You don't classify them as variable costs, but you allocate them on the basis of kilowatt-hours of production, is that correct?

A. I allocated 50% on the basis of kilowatt-hours.

Q. And we have just defined a variable cost as a cost that varies with the amount of energy, of kilowatt-hours, produced?

A. That is right, but it is not allocated because it was a variable cost.

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Q. But it is allocated as if it were a variable cost?

A. Yes. The result is treatment of half of the operating expenses of production as a variable cost.

Q. On Page 14 of your prepared testimony you do not state, so far as I can find, that the investment in the power supply system is either fixed or variable. Your opinion is, is it not, that this investment is a fixed cost?

A. Yes, it was all allocated on the basis of demand and energy relationship.

page 1200 } Q. And again this was allocated on the 50-50 basis?

A. Yes, sir.

Q. And the 50-50 basis allocates half of the investment on the basis of kilowatt-hours of energy served, does it not?

A. Yes, sir.

Q. And that is equally true of depreciation?

A. Yes, sir. The depreciation was allocated—the portion of the depreciation applicable to production would be allocated on that basis. The other depreciation is allocated on other bases.

Q. Excuse me. I intended to give that implication.

A. That would apply to—well, I think property tax is allocated on a plant basis.

Q. And which would be allocated on the basis of plant?

A. Yes, sir.

Q. Now, Mr. Van Scoyoc, on Page 15 of your prepared testimony, in discussing the allocation of power supply plant, you state that there is no mathematical means of establishing the relative importance or weight to be given to the capacity or annual use factors, isn't that correct?

A. Yes, sir.

page 1201 } Q. You state that on the basis of your judgment it is appropriate to give them equal weight, is that correct?

A. That is correct.

Q. It is true that instead of giving them equal weight another person might weight them 60-40 or 70-30, isn't that correct?

A. Somebody else might do it differently than I did and I have to do what I think is right.

Q. So your allocation of one half of the fixed power supply cost on the basis of energy is a pure matter of judgment, is it not?

A. It is a matter of judgment, buttressed by my experience in this particular field.

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Q. Further down on that page you state that the basic weakness of the peak responsibility method used by Mr. Sharkey is that customers who peak at a time other than when the annual system peak occurs are assigned none or little of the demand-related costs, is that correct?

A. That is correct.

Q. They would be assigned some of the demand-related cost if they were taking any service at all at the time of this system peak, wouldn't they?

page 1202 } A. Yes, and just to illustrate that point, taking the street lighting service, under the peak responsibility method no part of the investment in generation or transmission would be allocated to street lighting service.

Q. Can you think of another class of customers to whom that same ruling might apply?

A. There could be other off-peak customers.

Q. Can you think of another class of customers to whom it might apply?

A. Well, you were referring to any of our normal service classifications like residential, commercial and industrial?

Q. Yes.

A. No, I don't think it would apply.

Q. How many interruptible customers are there on the VEPCO system?

A. I think there is only one that I know of. There may be others. That would be NASA.

Q. They are the only interruptible customer?

A. Yes.

Q. It was on during what we are talking about here?

A. Yes.

Q. So all the other customers' classifications would make some contribution to the system peak?

page 1203 } A. Yes, sir.

Q. You have heard testimony by company witnesses as to the declining load factor of the company, have you not, Mr. Van Scoyoc?

A. Yes, I have.

Q. And you have heard testimony by company witnesses as to the desirability of building up winter loads such as space heating, so as to balance the company's load and improve utilization of the company's facilities?

A. Yes, sir.

Q. Do you consider this to be a desirable objective on the part of the company?

Melwood W. Van Scoyoc

A. I think it is a desirable objective of this company as well as any other utility company to balance their load.

page 1204 } Q. But isn't it true, Mr. Van Scoyoc, that under your 50-50 allocation method, if the company were successful in building up its winter retail load in a very substantial way, a good deal more of the power supply cost would be allocated to the retail class because of the 50% that you allocate on the basis of energy or KWH usage?

A. They would at least share in one-half of the demand cost.

Q. Which they wouldn't do under the peak responsibility method?

A. Which they would not do under the peak responsibility method, assuming you have a summer peak. I think that is appropriate. I don't think they should get a free ride.

Q. Doesn't this mean that when a company achieves its objective of building up winter usage the result would be the assignment to customers who have helped the company by increased winter usage of a greater portion of the power supply cost?

A. I don't think that would occur anywhere nearly as radically as it would if you used the peak responsibility method, because the minute you shift to a winter peak everything is changed.

Q. Do you remember what the difference was between the summer peak and the winter peak of Virginia Electric and Power Company?

page 1205 } A. I think it is several hundred thousand kilowatts.

Q. It would take right many winter customers to put us back on a winter peak, would it not?

A. Yes, it would.

Q. So unless we did get back onto a winter peak, your system would penalize the winter customer, would it not?

A. It doesn't penalize the winter customers. You are not making rates on a cost basis.

Q. Let me take another assumption. Let's assume that the company has a great many customers who add summer air conditioning and nothing else. Under your method the assignment of power supply cost to the Virginia retail classification would be reduced below the amount assigned on the peak responsibility method. Isn't that correct?

A. I am sorry. Would you mind repeating that question?

Q. If you got a lot of new air conditioning customers and nothing else, with high demand, under your method the

assignment of power supply cost to the Virginia retail classification would be reduced below the amount assigned on the peak responsibility method, isn't that correct?

A. That is true, but it just so happens, Mr. Riely, that my method assigns more power supply cost to Virginia retail than Mr. Sharkey's peak responsibility method.

Q. That is true. We well know that, sir.

page 1206 } Now, Mr. Van Scoyoc, on page 15 you state that the Federal Power Commission has used the 50-50 method for many years in gas pipeline allocations. In fact, this method is known as the Atlantic Seaboard method, isn't it, by the Federal Power Commission?

A. That is a name which has been applied to it because of the first case in which it was used being the Atlantic Seaboard Corporation rate case.

Q. Now I get confused, Mr. Van Scoyoc, and I hope that you will help me out of my confusion. In your prepared testimony it is stated—and that is the reference to this 50-50 method—"It has also been used in electric cost allocations by the Commission" but I thought I heard you insert the word "staff."

A. I did, sir.

Q. Is this method generally accepted by the Federal Power Commission in utility cost allocations, in electric utility cost allocations?

A. No, the staff in most of the cases—and I might explain that there were very few electric rate cases before the Federal Power Commission up until the last three or four years.

The staff has used several methods in the last three or four or five years in electric resale rate cases. They have used a peak responsibility method. However, instead

age 1207 } of using the maximum system peak they have used the average of the monthly peaks which substantially reduces the impact.

Also I noticed in the cost allocation to which I referred earlier that they are now averaging the coincident and noncoincident demands. So they are not using what you might call the pure peak responsibility method.

Q. They are not using the 50-50, are they?

A. They are not using the 50-50 method, either.

Q. As a matter of fact, that hasn't been accepted by the Commission itself in any recent electric utility case, has it?

A. No, that is right, but there are very few electric utility

rate cases where the Commission has made the determination as to a method of allocation of demand costs.

Q. Didn't your firm recently testify before the Maine Commission?

A. Yes, somebody from my firm. I was not familiar with that case.

Q. Are you familiar with that at all?

A. I have not read the testimony.

Q. You don't know what method was presented by your firm in that case?

A. No, sir.

page 1208 } Q. Turning to page 18 of your testimony, as I understand it, services, meters, street lighting and signal system facilities were assigned by you to the customer classification direct. Is that correct?

A. Yes, sir.

Q. Now, if a residential customer installs electric heat and as a result requires larger customer service wires, this added investment would be assigned direct to the customer, would it not?

A. If I had had the information available it would have been assigned directly to the customer.

Q. Poles, distribution lines and line transformers are assigned by your average and excess method, is that correct?

A. Yes, sir.

Q. Mr. Van Scoyoc, I am certain that you heard Mr. Gay's testimony or have read it, that the peak of residential customers is 33% higher in the summer than in the winter period. If we assume that in a residential area customers did install additional winter load but did not install enough to require the company to beef up its distribution wires and poles, would not the result, under your average in excess method, be that additional cost would be assigned to the retail classification as the result of this additional

page 1209 } winter use?

A. You mean if the customer—if you had an existing customer and he put in some electric heating which increased his demand in the wintertime—

Q. And no additional in-plant investment was necessary.

A. And no additional plant investment was required of the company. Of course, that situation that you described would prevail, but I don't think you can take an individual customer and draw a conclusion from that, that the average and excess method would not be appropriate for distribution system allocations. We have to work on average and consider the

whole situation as it existed at the time of the system peak in 1969 and investment as it was at the end of the year.

Q. But stay with my individual customer with me for a moment, please, Mr. Van Scoyoc. Additional costs would not be assigned, under the state of facts that I have outlined to you, on the basis of the peak responsibility method because of this additional winter use, would it?

A. No, no additional cost would be incurred and that customer would get the free ride, if you want to put it in terms of an individual customer, and would not, for that additional use of electricity, bear any of the cost of generation and transmission.

Q. So this demonstrates a basic difference between your study and the Ebasco study, does it not?

page 1210 } A. That is one of the basic differences between Mr. Sharkey and myself, yes.

Q. Now, Mr. Van Scoyoc, the distribution plant, among other things, includes primary lines and secondary lines and line transformers, doesn't it?

A. Yes, sir.

Q. And you applied your average in excess method to all of these in making your allocation, did you not?

A. All of the distribution plant which was considered to be demand-related.

Q. Now, will you please turn to Schedule 3, Column 8, line 15. That exhibit shows that $12,084,099 of net distribution plant was allocated to the Virginia resale customers, does it not?

A. Yes, sir.

Q. And similarly in Column 11 on line 16, you have allocated $10,266,500 of net distribution plant to the North Carolina resale customers, is that not true?

A. Yes, sir.

page 1211 } Q. And on Line 15 in Column 6 you have allocated $15,700,738 to the military service customers of net distribution plant?

A. Yes, sir.

Q. Would you accept, Mr. Van Scoyoc, subject to check, that the total of these figures is $38,051,337 of net distribution plant allocated to these three classifications of customers?

A. Yes, sir.

Q. And this allocation of distribution plant was made on the basis of your average and excess method, wasn't it?

A. It was.

Q. Now let's turn to Schedule 12, Sheet 1. The demand and kilowatt-hours shown on Schedule 12, Sheet 1, on Lines 18, 19 and 20 are the demands and kilowatt-hours that you used to determine your average in excess allocation factor for the distribution system, are they not?

A. Yes, sir.

Q. Does your allocation for distribution plant to military service and resale customers include a portion of secondary lines and line transformers?

A. Yes, sir.

Q. On Schedule 15, if we may turn to that page 1212 } for a moment, you show on Line 7 9,019,635 kilowatts as the sum of the non-coincident demands at the substation level for the system, do you not?

A. Yes, sir.

Q. Would you accept, subject to check, that 649,928 kilowatts of this non-coincident demand is applicable to military service and resale customers? That is the total of the 254,891 on Line 7, the 204,735 and the 190,302—649,928.

Is it not a fact, Mr. Van Scoyoc, that only 3,980 kilowatts of this 649,928 kilowatts, or less than 1%, is imposed at the secondary level capable of using line transformers and secondary lines for military and resale customers?

A. Yes, sir, I think that is my—I will accept that subject to check.

Q. On your Schedule 15, the system non-coincident demands shown clearly indicated 6,034,418 kilowatts at secondary level, an additional 2,570,873 kilowatts that do not use line transformers on secondary, is that not correct?

A. Yes, sir.

Q. And you have made no effort to recognize this different use of about $409 million of primary lines, secondary lines and line transformers shown on Line 18 of page 1213 } Schedule 3, have you?

A. I did not, in distributing the investment, the demand-related investment, make that distinction.

Q. You were furnished, as a working paper, a 1968 analysis of electric operations by the company, weren't you?

A. I received a copy, yes. I received that copy.

Q. Do you have a copy of it there?

A. Yes, I think I do.

* * * * *

page 1214 }

* * * * *

By Mr. Riely:

* * * * *

Q. Would you accept, subject to check, that for 1968 there is $457,421,609 in plant which you have labeled distribution other than for customers' services, needed for street lighting and signal systems?

A. I don't know that I can accept that 457 million figure without referring to my exhibit. This particular document was only used in very limited fashion. I was working from the company's working papers of their 1969 study and not from this study.

I reviewed the study and got a little information from it in a very limited area, but it did not provide the basis for my study.

The amount of plant which I allocated as shown on Schedule 3 of Exhibit MVS-1—this part that was allocated on a demand-related basis is shown on Schedule 3, Line 18.

Q. Do you see the 87,993,000?

page 1215 } A. What document are you referring to?

Mr. Staples: Are you referring to the 1968 study?

Mr. Riely: Yes.

Mr. Staples: The 1968 study.

The Witness: Yes, the substation demand, is that it?

By Mr. Riely:

Q. Yes.

A. 87 million-and-some-odd.

page 1216 } Q. The subtotal of the contribution of $240 million?

A. Yes, sir.

Q. And the subtotal under line transformers of $128 million?

A. Yes, sir.

Q. And the sum of those, which you accept subject to check, is $457,421,609?

A. Yes; I accept that figure subject to check.

Q. Would you accept, subject to check, the $209,217,480 of that plant is shown for overhead secondary and line transformer?

Mr. Parker: Sir, what do you mean by "is shown"?
Mr. Riely: On this statement.

A. Well, as a matter of adding up figures, I will accept it.
Q. But you, Mr. Van Scoyoc, have allocated the secondary plant, including line transformers, to resale and military customers by use of the same factor that you used to allocate the primary distribution facilities, haven't you?
A. Yes; it was all rolled in together the same as Mr. Sharkey's was all rolled in together.
Q. You allocated this $209 million of secondary on the same basis as you allocated all the rest, didn't you?
A. Yes, sir.
page 1217 } Q. Does this mean that you allocated about $17½ million of secondary plant to resale and military customers who have their own secondary distribution systems?
A. I don't know the figure, but the effect would be of my method of allocating demand related distribution plant to assign a prorata portion of all distribution plant to customer groups and classifications based on their demand factors.
Q. It is true that these military and resale customers have their own secondary distribution systems generally?
A. Most of them do, but they still have primary distribution systems.
Q. But you allocated the secondary the same way you allocated the primary?
A. Yes, sir.
Q. On the same factors?
A. Exactly the same as Mr. Sharkey's.
Q. On exactly the same factors?
A. Yes, sir.

* * * * *

page 1224 } CHARLES SCHOTTA, called as a witness, after having been duly sworn was examined and testified as follows:

Charles Schotta

DIRECT EXAMINATION

By Mr. Staples:

Q. Please state your name and address.

A. My name is Charles Schotta and I live in Blacksburg, Virginia.

Q. What is your present occupation?

A. I am Associate Professor of Economics at Virginia Polytechnic Institute at Blacksburg, Virginia. I teach graduate and undergraduate courses in Monetary Economics and am Director of the Western Regional Office of the Virginia Consortium on Law Enforcement and Crime Prevention.

In addition to my duties at V.P.I., I am also President of Technical Associates of Virgnia, Inc., a firm of economic consultants.

Q. Would you outline your background of training and expertise in Economics?

A. After graduating *cum laude* from Texas Christian University in 1957, I received an M.A. degree in Economics in 1959 from Brown University and taught Economics for several years at the University of Texas at

page 1225 } El Paso.

After spending three additional years of graduate study at Brown University, I became Assistant Professor of Economics at the University of California at Davis, leaving there in 1967 to come to my present position at Virginia Polytechnic Institute.

Q. Would you comment for us on your research activity in Economics?

A. I have authored or co-authored eight articles in major Economics journals such as The American Economic Review, The Journal of Finance, the Southern Economic Journal, Economic Development and Cultural Change, Kyklos, and The Review of Regional Studies.

In addition to that, I have published ten articles in proceedings of major professional associations such as the American Statistical Association, the Operations Research Society of America and others. In addition to that, I have read over 15 other research papers at major professional academic meetings such as the Econometric Society, the Southern Economic Association, and the Operations Research Society of America.

Q. In addition to your teaching and research activities, have you been a consultant to business organizations?

Charles Schotta

A. I have been a consultant to numerous busi-
page 1226 } ness organizations, among them wholesale gro-
cery chains, gasoline refiners and distributors, motels, banks, electronics manufacturers, and public officials.

Q. Have you testified in public utility rate cases?

A. Yes, I have testified in several rate cases before this Commission.

Q. What professional associations in your field are you a member of?

A. I am a member of the American Economic Association, the American Statistical Association, the American Finance Association, the Southern Economic Association, the Western Economic Association, and I have been elected a full member of the Operations Research Society of America.

Q. Will you tell us what matters your testimony today will deal with?

A. My testimony will consist of three distinct but closely related parts. In the first part of my testimony I shall present a detailed analysis of rates of return being earned on equity and on measures of capital by important segments of our economy which are not under regulations, but which
are subject to the competitive forces of the mar-
page 1227 } ket. In addition to this, I shall present a de-
tailed analysis of rates of return to certain semi-regulated and regulated industries, including electric utilities, in the United States over the past decade.

In the second part of my testimony, I shall present evidence on the cost of money to electric utilities in general and to the Virginia Electric and Power Company, VEPCO, in particular. Building upon this base, I shall present my testimony relative to a fair rate of return.

The last part of my testimony will deal with the important economic issues raised by Mr. Frazier in connection with the proposal for a summer-winter differential electric energy rate.

At this time, I should like to introduce the first of my six exhibits.

Q. That would be CS-1?

A. CS-1.

Chairman Hooker: It will be received.

(The document referred to was marked for identification, Exhibit CS-1 and received in evidence.)

Charles Schotta

Q. Were these exhibits prepared by you or under your supervision?

A. Yes.

Q. What does this exhibit deal with?

page 1228 } A. Generally, we are all interested in setting a rate of return for VEPCO which will permit it to secure, in a competitive money market, the capital funds it needs to purchase the instruments for producing electrical energy necessary to adequately and efficiently serve its customers. In order to do this it is necessary to provide rewards to the investor in VEPCO which will cause him to purchase the equities in this electric utility rather than the equities of other companies. This means we must give him a rate of return, at the very least, equal to the return he can get from using his dollars to make an alternative investment of approximately the same risk as an investment in VEPCO. Additionally, the fair and reasonable rate of return which we are interested in will not be one which will unduly burden consumers nor must it afford the opportunity for unusual or speculative profits. If these standards are met then the rate of return which we determine should not impair the utility's ability to maintain its credit standing.

I should make it clear, however, that I believe that the comparable earning standards for determination of a fair rate of return is the most meaningful.

page 1229 } The first exhibit of mine, CS-1,Schedule 1.1, presents selected end of the year financial data from VEPCO's annual report and its December, 1969 Condensed Financial Statement. Of special interest to this portion of my testimony are the last two columns headed "Return on Equity" and "Return on Common Equity."

Q. What do these columns tell us, Professor Schotta?

A. The first column, "Return on Equity," lists for us, year by year, the return on the owners' equity of the Virginia Electric and Power Company. As we can see in all years except one, this return is above 10% and the 11-year average is 10.91%.

Q. Why do you look separately at the return on equity and the return on common equity?

A. As we all know, preferred stock has, in general, a fixed rate of return which is "guaranteed" as a dividend. It is entirely proper to separate the fixed ownership return from the variable ownership return available to satisfy the holders of common stock. When we look at the return on

common equity during the period 1959 through 1969 which VEPCO secured, we see that it has consistently been above 11% and for the most part has ranged about
page 1230 } 12% with the average return on common equity for the 11-year period being 12.69%.

This is indeed an impressive performance record. It is even more impressive when one considers that the only period of business contraction during the entire period 1958-1969, occurred during May, 1960 through February, 1961. During the period of movement from the peak to the trough of the business cycle in February, 1961, VEPCO's earnings on common equity increased by nearly one full percent. Surely, this is impressive evidence of the vigor and profitability of this large electric generating utility.

I should now like to introduce the second of my exhibits, CS-2.

* * * * *

page 1232 }

* * * * *

Chairman Hooker: The exhibit will be received.

(The document referred to was marked for identification, Exhibit CS-2 and received in evidence.)

By Mr. Staples:

Q. Would you explain to us what is contained in this exhibit and how it relates to the determination of a fair rate of return for VEPCO?

A. This exhibit consists of 16 schedules, Schedule 2.1 through 2.16 and 20 charts, Chart 2.1 through 2.20. In general, this exhibit contains the basic data which we can use to assess the rate of return being earned in important segments of our economy on owners equity and the measure of riskiness associated with these rates of return. The charts contain a graphic display of the data in the preceding schedule. The dotted lines enclose the range of one
page 1233 } standard deviation to establish visually the "risk band." For convenience the VEPCO return on equity is plotted in red on each chart.

The first schedule, Schedule 2.1, contains rates of return on owners' equity for 65 largest class A electric utilities

for the decade 1959 through 1968. It can be seen from a perusal of the column entitled "Average Rate of Return on Equity" that these returns have been rising generally since 1959 although the average rate of return on equity did fall slightly for the year 1968. The column entitled "Measure of Riskiness" or "Standard Deviation" expresses for us a standard statistical measure of the range of rates of return on equity exhibited by these electric utilities. In general, the lower the standard deviation, the smaller the scatter of rates of return on equity around the average. Economists generally use this standard deviation of the cross-sectional rates of return as a measure of the risk faced by an investor in acquiring one from among the group of stocks for which this cross-sectional variance was calculated. If the standard deviation is zero, then there is no divergence from the mean and there is no risk that the investor will secure a rate of return different from the mean, no matter what company he buys.

page 1234 } Risk for me is characterized as the uninsurable possibility of loss.

One notable thing about the measures of the standard deviation or measure of risk for these 65 electric utilities is that they are, in general terms, quite small with the standard deviations being on the order of 15% of the mean.

Chart 2.1, of course, is the visual display of the schedule.

Schedule 2.2 presents the rate of return on owners' equity and the measure of riskiness associated with that rate of return for the 50 largest banks in the United States for the decade 1959 through 1968. These rates of return range from approximately 9.8% in 1962, during recovery from the slight recession in 1960, to a high for 1968 of 12.7%. In general, the standard deviations or measures of riskiness are larger than for the 65 utilities.

Again, Chart 2.2 is a visual display of Schedule 2.2.

Schedule 2.3 presents the rate of return on owners' equity for the 200 largest manufactring corporations in the United States, ranked each year according to total assets for the decade 1959 through 1968. The rates of return

page 1235 } here in general are quite comparable in magnitude to those exhibited by banks and are slightly higher than those exhibited by the 65 electric utilities. One striking thing about the pattern over the years of the average rate of return on equity of these manufacturing corporations is their apparent sensitivity to business

conditions. The recession of 1960-1961 began in May of 1960 and reached its trough in February of 1961. It was during that time that we saw the return on equity of these manufacturing corporations slide from 9.9% to 9.25%; recovery in 1961-62 brought the rate of return back up to its 1960 or pre-recession level.

page 1236 } When we turn to the measure of riskiness or standard deviation, we see that these 200 largest manufacturing corporations are exceedingly risky, compared to the banks we looked at and the electric utilities which we looked at in our previous exhibits.

Q. Chart 2.3 merely graphically shows that which you have outlined in Schedule 2.3?

A. That is right.

Schedule 2.4 presents the rate of return on owners' equity of the 65 largest class A electric utilities segregated into three asset size classes during each year of the decade. I separated the utilities into those with assets under 500 million in each one of the years, those between 500 million and one billion, and those over one billion.

Q. Did you intend to amend your testimony to "assets"?

A. Right. I found a sentence in there that shouldn't have been there.

Mr. Brasfield: So it is by total assets?

The Witness: Total assets.

By Mr. Staples:

Q. Under 500 million dollars other than rate base?

A. Right.

As we would expect, the measure of risk, in general, is lower for the very largest utilities than it is for the intermediates or for the smalls. The rate of return

page 1237 } on equity, however, does not follow any definite pattern, although it does appear that the large utilities, being less risky, have been successful in maintaining themselves with a slightly lower rate of return on the average than that exhibited by either the intermediate utilities or the smallest utilities.

Chart 2.4, Chart 2.5 and Chart 2.6 represent the three columns in Schedule 2.4 and present those visually.

Schedule 2.5 presents the rate of return on owners' equity of the 50 largest banks by asset size class during the decade. I divided these banks into two groups by total assets; those with assets between 500 million and one billion, and those

over one billion. Here it appears that over time the larger banks are becoming riskier than the smaller banks, and commensurate with this higher risk, the rate of return to the larger banks is somewhat higher than that for the smaller banks.

Chart 2.7 contains a visual display of the first column and Chart 2.8 a visual display of the second column.

Schedule 2.6 presents the rate of return on owners' equity of the 200 largest manufacturing corporations by the three asset size classifications used for the utilities. Here, we have a pattern much like that in utilities with the
page 1238 } smaller companies under 500 million being both riskier and having a higher rate of return on equity than those over one billion. As might be expected. the intermediate sized companies are less risky than the smalls, with the largest companies showing the lowest returns, and risks, so that rates of return on equity and risk appear to decline with size.

Chart 2.9, 2.10 and 2.11 are visual displays of the information in the three columns of Schedule 2.6.

In Schedule 2.7, I present the rate of return on owners' equity for the 65 largest electric generating utilities—

Commissioner Catterall: That includes preferred stock, too?

A. The Witness: Yes.

—by Moody's Bond rating for each of the years of this decade. Oddly enough, it does not appear, for the recent years of that decade, that there is any significant difference between either the rate of return averaged by these utilities among the bond ratings, or the measure of risk averaged the same way. While the Aaa and Aa bonds appear to be yielding somewhat more than the A bonds, the measure of risk or dispersion does not appear to differ significantly among the bond rating, leading me to speculate that the rating formula used in perhaps too mechanistic
page 1239 } and does not fully take into account some major financial factors relating to risk. Further evidence of this, of course, comes when one considers the relationship between yields to maturity of bonds by bond rating. There is not an extremely high rank correlation between bond rating and rate of return.

Chart 2.12, 2.13 and 2.14 present the data in visual form contained in the three major columns of Schedule 2.7.

Charles Schotta

Schedule 2.8 presents the rate of return on owners' equity of the 200 largest manufacturing firms by bond rating. Here again, the differences in risk or standard deviation, do not appear to be particularly significant except for the fact that Aa rated companies are apparently riskier than either Aaa companies or A rated companies, since the standard deviations appear to be larger in general. The rates or return of the Aaa companies are, of the course, higher than the rates of return of either Aa or A companies.

Charts 2.15, 2.16 and 2.17 contain the visual representation of the information in the three major columns of Schedule 2.8.

Schedule 2.9 presents a comparison of the rate of return on owners' equity of ten electric generating utilities from among the 65 which are comparable to VEPCO

page 1240 } in bond rating and approximate size of rate base in each of the years of the decade. In each one of the ten years, VEPCO earned as much or more on owners' equity as the average of the ten comparable companies. Again, a very strong record of financial performance.

Chart 2.18 is the visual display of the information in Schedule 2.9.

Q. I wonder, Professor Schotta, if you could summarize for us now, the import of these calculations of average rates of return and measures of riskiness for these three classes of industry, regulated, semi-regulated and unregulated, and tell us how this bears on establishment of a set of risks and returns which are comparable to VEPCO's position.

A. In Schedule 2.10, I present the rate of return on owners' equity of the 50 largest banks, as a percent of the rate of return of the 65 largest electric generating utilities for the decade. When we survey the relationships between the two sets of mean rates of return for each of the years we find that over the decade, the rate of return on equity of banks has, in general, only been 4 percent greater than that of utilities. The recent experience and recent trend suggest that utilities, while the average measure of risk has been one percent greater than that of electric utilities. The recent experience and recent trend suggest that these two ratios will reach equality in 1969 and 1970. Therefore, this is strong evidence that in seeking a comparable unregulated or semi-regulated industry for developing comparable

page 1241 } risks and comparable rates of return to electric utilities, banks must be a leading candidate.

Charles Schotta

Schedule 2.11 performs the same comparison for the 200 largest manufacturing firms for the decade. Here we observe that the rate of return to owners' equity of these firms over the decade has been approximately 6 percent larger than the rate of return on equity of the utilities, while these 200 largest manufacturing firms are over 1½ times riskier than the electric utilities.

Before we could uncritically decide that Virginia Electric and Power Company needs the same rate of return on equity as large manufacturing firms in order to compete for capital, we must make an adjustment to equalize the risk. Certainly the fact that these firms appear to be over 1½ times as risky as electric generating utilities in general over the decade calls for a major downward revision of the rate of return on equity necessary for the much less risky utility industry to compete for capital with manufacturing.

Schedule 2.12 presents the same comparison we have detailed in these exhibits, broken into the asset size groups. Here we can clearly see the reason for the close relationship between the all-bank averages and the utility average for it is the small banks in this group that have rates of return approximately equal to that of the electric utilities but for a higher risk, while the large banks in the over one billion dollar asset size class have rates of return 12% higher than the rate of return on equity of the utilities but with a risk that is 40% higher.

page 1242

Schedule 2.13 presents the rate of return and risk comparisons between utilities and the manufacturing firms broken into asset size classifications. Of greater interest to us, of course, is the relationship between rates of return on electric utilities over one billion dollars in rate base and rates of return to the 200 largest manufacturing firms in the over one billion dollar asset size class. We see that over the decade the relationship between the mean rates of return on owners' equity of the two has been such that manufacturing firms have had equity returns 15 percent larger than those for utilities. However, risks for this large group of manufacturing firms are almost 2½ times greater than for the comparably-sized electric generating utilities. Again, I consider this most impressive evidence for the argument that electric utilities present a much less risky picture to investors than do large manufacturing industries.

Schedule 2.14 presents the comparison between mean rates of return and risk measures for the 200 largest manufactur-

ing firms and the 65 largest utilities by bond
page 1243 } rating. In general, we find that equally rated
manufacturing firms are earning, on the average over the decade, more than utilities with higher risks ranging from 90 percent riskier to approximately 1½ times riskier. In fact, in the Aa bond rating category, VEPCO's rating, except for one year of the decade, the return on equity of the manufacturing firms was only 8 percent greater than that of the comparably rated utilities by the risk factor was 2.51.

In Schedule 2.15 I present a final summary comparison of the comparable rates or return on owners' equity for the 200 largest manufacturing firms, the 65 largest electric generating utilities, the 50 largest banks, and VEPCO selecting the manufacturing firms and the public utilities such that they have VEPCO's bond rating in each year. Banks, of course, are unrated.

I think that we can conclude that adjusting for comparable risks, VEPCO has an impressive earnings record when compared in each year with the banks and manufacturing firms both facing substantially different risks.

Schedule 2.16 presents the average rate of return on owners' equity and measures of associated risk over the entire decade for the 200 largest manufacturing firms, the 50 largest banks, the 65 largest electric utilities, the ten comparable electric utilities from among that group and for
VEPCO. We can see that VEPCO's return on
page 1244 } equity on the average over the decade was only
slightly lower than the 200 largest manufacturing firms for a risk factor which is slightly less than half as large as that of the manufacturing firms. It has exhibited a return on equity larger than the 50 largest banks over the decade, again for a risk factor which is only about 60% the size of the risk factor of these banks.

VEPCO's 10.95% mean rate of return on equity over the decade is almost half a percent larger than that earned by the 65 largest electric utilities, yet VEPCO's variance or measure of inter-year risk is lower than that of the 65 largest electric utilities.

By Commissioner Catterall:

Q. By "mean" do you understand the average of highest and lowest?

A. Mean? The arithmetic mean.

Charles Schotta

Q. By "mean" do you understand the average between the highest and the lowest figure?

A. No, it is the sum of all the figures divided by the number of figures.

Q. You mean the average.

A. The arithmetic mean.

Q. You mean the average in ordinary English, the average of each time. You add ten together and divide by ten.

A. Right.

page 1245 } Commissioner Catterall: Go ahead.

A. (Continued) Yet VEPCO's time standard deviation on measure of inter-year risk is lower than that of the 65 largest electric utilities, again impressive evidence of the strong and consistent profit performance of this dynamic electric utility over the last decade.

Q. What is your judgment, Professor Schotta, with respect to the risk climate which should be used to compare VEPCO's earnings against?

A. Clearly, the weight of evidence is impressively in favor of the view that electric utilities, from an investor's standpoint, are not and have not on a cross-section or time-series basis, for the last ten years been as risky as unregulated manufacturing enterprise. Nor have they been as risky as semi-regulated banks. However, the rates of return on equity that the utilities and VEPCO in particular have earned, have not been significantly lower when compared on an asset size basis or bond rating basis with those earned by banks and these manufacturing firms.

It is my judgment that a significant adjustment for lower risk must be made before comparing rates of return earned by manufacturing enterprise and banks with those earned by public utilities. Only in this way, then, can we secure the rate of return on equity which is necessary for these low risk utilities to compete effectively for the in-
page 1246 } vestor's dollar with the high risk manufacturing enterprise.

Q. Professor Schotta, it is frequently asserted that electric generating utilities are subject to the same kinds of risks from the business cycle that manufacturing industries and other industries are subject to. Do you have an opinion on this topic?

A. Yes. If you refer back to some of my earlier tables, I

think I have pointed out that VEPCO's earnings actually rose during the slight recession of 1960-61, while manufacturing rates of return on equity appeared to be seriously adversely affected by that slight recession. Further, it is clearly established in economic literature that as consumer incomes fluctuate in response to the level of business activity, sales of manufacturing firms and other segments of industry follow suit. Thus, for example, in a recession we would expect to see total revenues of automobile manufacturing firms fall as consumer demand for automobile falls.

On the other hands, the best available evidence that we have on the relationship between the business cycle and revenues of public utilities strongly indicates this is not true for either electric utilities, gas utilities, or the consolidated Bell Telephone System.

Q. Would you amplify for us the basis on page 1247 } which you make these statements?

A. Recently, in LAND ECONOMICS, Professors Wallace F. Lovejoy and David A. Bowers presented, in their words, "the result of a statistical analysis designed to evaluate the extend to which changes in the level of revenue or sales of electric, telephone and gas utilities have coincided with changes in the level of general business activity during the post-war years."

In general, they found "that there is no apparent similarity of movement between public utilities' activities and short-run changes in the general level of business activity and it appears that virtually all of the changes in the level of activity of these utilities can be explained in terms of secular growth and seasonal fluctuation." They further found that electric utilities appear among these total utilities to be the least sensitive to the business cycle indicator which was used. It is, I think, important to understand that the data that they were using were total revenues of all electric generating utilities in the United States for the years 1947 through 1959. The measure of the business cycle which they used was the Federal Reserve Index of Industrial Production. There can be no question but that the statiscal methods that they used were applied in a technically correct fashion and produced inferences which were properly drawn.

page 1248 } Professors Lovejoy and Bowers conclude their study with this statement which I quote in its entirety. "It might be asked whether the conclusions about the sensitivity of the utility business to the cycle, as

measured by gross revenues, could also be made if net revenue data were available. It seems to us that gross revenue would be more, rather than less, sensitive than net revenue, given the results of this study. To argue that net revenue would have a statistically significant relationship with industrial production, at the same time that gross revenue has no statistically significant relationship, requires that it also be argued that costs in an absolute sense rise as business activity falls, and that costs fall as business activity rises. This seems to us to be highly unlikely, and, in fact, contrary to what probably occurs.

"The conclusions of this study cannot be applied to a particular utility firm with any assured accuracy. They can be used for projecting future behavior of the industries concerned only to the extent that it is assumed that conditions in the future will be the same as in the past. Finally, it is important to note than no conclusions are drawn about the total risk faced by utility industries or about the risks by one utility industry compared to another utility industry, or compared to non-utility industries. Such con-
page 1249 } clusions go far beyond the scope of this study which was limited to an analysis of the vulnerability of utilities to cyclical fluctuations during the post-war period."

page 1250 } Q. Professor Schotta, what do the findings of this important study tell us about the degree of business cycle risk faced by, in particular, electric utilities?

A. I believe that this sound study tells us that electric utilities' revenues are unaffected by the state of the business cycle and are affected over time only by the basic growth rate of the economy and by such seasonal demand factors as are known to us and exist in the electric utility business. The rate of return on owners' equity for VEPCO during the slight recession of 1960-61 reinforces a particularization of the general Lovejoy-Bowers findings to this instant case.

Q. Professor Schotta, could you sum up this portion of your testimony for us, giving us your appraisal of the standard against which the return on equity of the Virginia Electric and Power Company should be measured after having considered the risk climate for regulated, semi-regulated, and unregulated industry.

A. Assessment of risk which investors in common equities of companies, unregulated, semi-regulated, or regulated, face

is a matter of judgment. Judgment, however, can and must be aided by recourse to the best statistical evidence which can be accumulated. I believe that the data pre-
page 1251 } sented in my Schedule 2.1 through 2.16 and the accompanying charts establish rather conclusively that investors in electric generating utilities face much lower risks, as economists generally measure such, than do those in the 200 largest manufacturing corporations or the 50 largest banks.

On the average, over the decade 1959 through 1968, after considering rates of return by asset size and rates of return by comparable bond rating, banks and manufacturing companies' rates of return on owners' equity were approximately 11% higher than the rates of return on equity enjoyed by comparably sized and bond-rated utilities. This comparison can be seen graphically on the bar chart, Chart 2.19, where the return on owners' equity of VEPCO is higher over the period than all except manufacturing and higher than for the 65 electric utilities as well.

Applying this 11% adjustment factor to the time-series average rate of return on equity of the 200 largest manufacturing firms of 11.6%, from Schedule 2.16, we arrive at an adjusted comparable rate of return on owners' equity of 10%. I consider this to be a risk-adjusted comparable rate of return since the comparably sized banks, the comparably sized manufacturing firms and the comparably
page 1252 } bond-rated manufacturing firms are, on the average, 1.44 times riskier than the group of 65 utilities.

To adjust the relationship between the average risk of banks and manufacturing companies and the 65 utilities to the VEPCO experience over the years 1959 through 1968, I secure a comparison of VEPCO's time-series risk as a percent of the utility time-series risk for that decade. These risk comparisons, on a time-series basis, are depicted graphically in Chart 2.20.

By Commissioner Catterall:

Q. Tell me what percentage that the left-hand bar is. What is it a percentage of?

Mr. Staples: Which chart, Judge Catterall?

Commissioner Catterall: 2.20.

A. This is a percentage of the corresponding figure on Chart 2.19.

Q. A percent of what?

A. Percent of the rate of return on equity of manufacturing.

What I have depicted here is the standard deviation, which is the variance in terms of the rate of return on equity.

Q. Give me a concrete example of what the
page 1253 } 1.2% is of?

A. It is 1.2% of the 11.16% average rate of return on equity of the 200 largest manufacturing firms. If you subtract this 1.2 roughly from 11.16, that gives you a figure of a little bit less than 10%, and if you added it to 11.16 it would give you something like 12.4.

Q. In other words, the 1.2% is the percentage of the return on equity?

A. It is not a percentage. It is a percent itself which when added to or subtracted from—

Q. It is a percentage point.

A. Yes, put it that way.

Q. All right.

A. If these profits are distributed as we expect, we would find that 68 of the firms well within the one standard deviation or 1.26 on each side of this 11%.

Q. The spread between the success and the unsuccessful is the greater risk?

A. That is what I am arguing.

By Mr. Parker:

Q. Why do you use 68?

A. I assume that profits are distributed according to a normal distribution, and one deviation on each side of it either means you have 68% of the sample popu-
page 1254 } lation, 34% on each side—34% will be higher than the mean—with 2 point standard deviation you have 85%, 3 point standard you have 99%, and so on until you get to six standard deviations where you catch practically everything.

By Mr. Staples:

Q. Go ahead.

A. I now have a change here. Applying this factor of .91 to the factor which indicates the relative risk faced by the 65 utilities as compared to manufacturing and banks, we can suggest that the comparably sized banks and manufacturing companies, and comparably bond-rated manufacturing companies were approximately 160% riskier than VEPCO.

Q. That is a change?

A. This is a change.

If a 10% rate of return on equity is accepted as the comparable cost of total equity capital which VEPCO faces, then the risk adjustment factor of approximately 160% greater risk is measured against rate of return only 10% higher.

Based on my analysis of the riskiness of both cross-section and time-series rates of return on equity in these groups of industries, it is my judgment that a rate of return on total equity for this growing utility of approximately page 1255 } 9.5 to 10.5 percent represents a straight comparable cost of equity.

Q. Does this mean, Professor Schotta, that you think that a 9.5 to 10.5 percent rate of return on equity is the cost of capital for VEPCO?

A. No, we must first survey the money market and establish future trends so that the cost of debt capital can be secured.

I should like to introduce my third exhibit consisting originally of nine schedules, Schedules 3.1 through 3.9. I now have 3.10 and 3.11 in there.

Commissioner Catterall: Are there any changes in this?

Mr. Staples: He has added two charts to this, Your Honor.

We will put them all together and mark it as Exhibit CS-3.

I offer that exhibit.

Chairman Hooker: Received.

(Document referred to was marked for identification, Exhibit CS-3 and received in evidence.)

By Mr. Staples:

Q. What does this exhibit contain?

A. The first seven schedules of this exhibit are in support of an analysis of trends in the money and capi- page 1256 } tal markets.

The last four schedules present calculation of the cost of capital and rate of return to VEPCO.

Q. That is an amendment there in changing the 2 to a 4?

A. That is right.

Q. Would you tell us what each schedule in this exhibit contains and how it assists us in assessing trends in the money and capital market?

Charles Schotta

A. Schedule 3.1 presents selected interest rates on several important financial assets. Taken together, the interest rates on these financial assets give us a picture since 1965 of the course of interest costs. I present data here on trends in interest costs by month for 1969 for long term U.S. bonds, AAA corporate bonds, industrial corporate bonds, public utility corporate bonds in general, preferred stock dividend price ratios, common stock dividend price ratios and charges for conventional first mortgage contracts. My data go through January of 1970 and uniformly present a picture of rising interest rates.

By Commissioner Catterall:

Q. What do you mean by price ratios? I thought that was the yield times the price. What does that 3.00 page 1257 } mean at the top of the common stock?

A. I am sorry. I didn't hear you.

Q. On Schedule 3.1 I want an interpretation as to what you mean by common stock price ratio.

A. The dividend price ratio.

Q. Give me a fraction so I understand it.

A. Dividend divided by price.

Q. Where do you get the 3%?

A. No, price divided by dividends.

Q. Give me the price and dividend that comes out to 3. What is the price?

A. This is from the Federal Reserve Bulletin averaged across common stocks.

By Mr. Staples:

Q. Assume a stock price and a dividend that would resolve in 3.

A. $10 and $3.33.

Mr. Riely: No; $3 and $100.

A. (Continued) Okay; that is right.

By Commissioner Catterall:

Q. You mean you buy it for $100 and it yields three?

A. Yes.

Q. You are talking about yields and not earnings?

A. Not earnings. It is a yield.

page 1258 } Commissioner Catterall: All right. Just like a 3% bond?

Charles Schotta

The Witness: Yes, the expectation from a 3% bond. And charges for conventional first mortgage contracts.

By Mr. Staples:

Q. Proceed.

A. There is no doubt but that we have had tremendous price inflation in 1969, accompanied by the sharp rise in interest rates on fixed price assets necessary to maintain the "real rate of interest."

Schedule 3.2 presents selected U.S. Treasury bill yields for five dates, November 10, 1969, December 11, 1969, January 12, 1970, February 11, 1970, and March 12, 1970, to present us a picture of the term structure of Treasury bill yields at five equally spaced points in time.

I have selected issues maturing in one week, one month, up through 11 months. When we examine the yield curve as of November, 1969, we see that it rises generally from the short maturities out to the longer, indicating the holding of expectations on the part of bill owners that interest rates in the near term will tend to rise. Even as early as November 10, 1969, however, the yield curve was not
page 1259 } a uniformly rising one. Nine month bills, ten month bills and eleven month bills show yields less than eight month bills and declined progressively out to eleven months, thus indicating that investors held expectations that the interest rate rise would not continue at its present rate past eight months.

The yields on these maturities of Treasury bills increased during the interim period November 10 through December 11, 1969, with the average change being approximately one half of 1%. Again, however, when we survey the yield curve as of December 11, 1969, we see that it intially rises to the eight month level and then declines out to eleven months, again evidence of a set of interest rate expectations similar to those prevailing in November.

During the interim period December 11 through January 12, yields on these maturities fell almost uniformly, with the average fall being about 1/10 of 1%. Interestingly enough the yield curve with respect to maturity still has its apex at the five month maturity but the differenital between the five month maturity and the eleven month maturity is now more pronounced than was the case in December.

During the interim period January 12 through February 11, 1970, there was, of course, quite a consider-
page 1260 } able fall in these yields generally. In the two,

three, four, five and six month maturities, the fall was a substantial ½%. The average fall over all maturities during the month was about 3/10 of 1%. When we look at the yield curve, we observe some spottiness but with a definite tendency toward a declining term structure of interest rates.

In the interim period February 11 through March 12, 1970, there was, of course, a pronounced fall in the yields on all maturities with very large falls, in excess of 1%, for the very short maturities. Some of the longer maturities fell by almost 1%, with the average change over all maturities being about 8/10 of 1%.

Strikingly, even the March yield to maturity curve from the three month maturities on is a declining yield curve, indicating the holding of expectations concerning an interest rate fall in future months.

Q. Would you summarize for us what the examination of these yield curves on Treasury bills indicates for us?

A. The predominantly declining term structure of interest rates exhibited here, in addition to the pronounced fall in interest rates in these yields over the last three months, is strongly indicative of the holding of expec-
page 1261 } tations concerning further interest rate falls.

I should not be surprised to see falls in these Treasury bill yields over the next several months equal to the declines that we have seen during the past three months. Reinforcing this interpretation is the fact that the decline in average U. S. Treasury bill yields over the last three months has been at an increasing rate.

Schedule 3.3 presents the yields on selected U. S. government bonds. I have selected these bonds, spaced out in maturity, from those maturing within the next few months to those maturing in February, 1995. The figures that I present are weekly averages of daily yield reports.

When we look at the week of November 10 through 14, 1969, we see further expression of the declining yield to maturity curve I spoke of in connection with the previous schedule. From a high of 7.75% for the very short maturities, there is a substantial decline in yield to 5.34% of the very long maturity bonds.

During the interim from the November week to the comparable week in December, these yields rose, on the average, by slightly less than ½ of 1%. The yield curve still maintained its decided downward slope, thus rein-

page 1262 } forcing our interpretation of an expectation of interest rate falls.

During the interim between the December week and the January week there was virtually no change in these average yields. However, between the January week and the comparable February week there was a substantial fall in these bond yields amounting to almost ½ of 1%. Of most interest to our analysis, the yield curve again resumed its decided downward slope. Between the February week and the week of March 9 through 13, there was a further substantial fall in these interest yields with the change averaging a little over 3/10 of 1%.

Again, the yield curve for these government bonds retains its downward slope, thus indicating, according to the most generally-accepted explanation of the meaning of the term structure of interest rates, the holding of substantial expectations concerning lower interest rates for the future. It should be noted that this decline in yields is also moving at an accelerating pace.

page 1263 } Schedule 3.4 shows the course of the commercial bank prime loan rate since September of 1959. In response to the pressures of the money market, precipitated in my view by an increasing rate of price change, the prime rate began to drift up early 1970. This rise was continued at a very slow rate to near the end of 1968.

During the period from December 18, 1968 to June 9, 1969, only 6½ months, the prime rate rose 2 percent, more than the rise over the previous nine years.

We have, however, seen the rate fall on March 25, 1970, to 8 percent. Informed appraisal of the current monetary climate and the probable effect of Federal Reserve monetary policy suggest that reduced monetary stringency will increase the supply of loanable funds, thus making money market conditions even easier in the future than they are at present.

I think that it should not surprise us to see the prime rate fall by one-half percent or more during the coming several months.

Schedule 3.5 presents some selected money market rates for the four months between November 10, 1969 and March 12, 1970. The first of these rates, Bankers Acceptances of maturities from 1 to 180 days, presents for

page 1264 } us the same general picture that we saw in the U. S. government bill yield and the U. S. Government bond yield. That is to say, there was a rise in the gen-

eral level of these rates from November to December and from December to January with a fall in the rates from January to February and from February to March. During the entire time, the longer maturities were yielding less than the shorter maturities, strong evidence of the expectation of lower interest rate levels in the near term.

The second rate, Commerical Paper placed by major finance companies 30 to 89 day maturities, exhibits the same general pattern with a rise from November to December, a constant rate from December to January, a fall from January to February and a further fall in March.

Of some considerable interest to us in assessing money market conditions is the Euro-dollar rate in London. Here again, we see the same general picture of a rise from November 1969 to December 1969, a fall from December 1969 to January 1970, a further fall from January to February and a further fall from February to March. For the most part, the yield curve is a negatively-sloped one in this important segment of the money market.

Schedule 3.6 presents selected public utility corporate bond current yields as of four selected dates, November 10, 1969, January 12, 1970, February 11, 1970, and March 12, 1970.

page 1265 } We can see, interestingly enough, that the average yield on November 10, 1969 for the two A-rated issues is less than for the Aa issues but greater than the Aaa issues. The average yield for all these selected public utility corporate bonds as of this date was 8.32.

When we look at the quotations presented for January 12, 1970, we see that the average yield rose during that interim period by approximately two-tenths of one percent. Between January 12 and February 12, 1970, the average yield on Aaa bonds fell, the average yield on Aa bonds remained approximately constant with the average yield over all quotations being negligibly different from the January 12 levels.

Over the period February 11 through March 12, 1970, there was a rise in the average yield of approximately .15 percent. Many would attribute this rise to an influx into the market place of bonds brought on by declining interest rates.

Schedule 3.7 presents public utility bond issues publicly offered between January of 1970 and March of 1970 for Aaa and Aa issues of $25,000,000 or more, maturing in more than ten years.

Charles Schotta

Q. Are you amending the figure?
A. Yes.

Commissioner Dillon: That was million?
page 1266 } The Witness: Right. Maturing in more than ten years.

In general, the trend of these issues, in terms of the cost to the company has been somewhat downward beginning at about the 8.7 percent level for Aaa's and Aa's and terminating with the March 19, 1970 issue of $40 million by the Public Service Company of Indiana with a cost to the company of 8.22 percent.

Q. Over all, Professor Schotta, what does an analysis of these interest rate trends, coupled with an appraisal of monetary policy over the next four to six to ten months tell us about the probable cost of money for electric utilities in general and VEPCO in particular?

A. I think it cannot be denied that we are seeing a general softening of the economy. Slight falls in the average work week, an increase in automobile inventories, a reduction in automobile output and an increase in some unemployment rates all point to a softening in the economy, no doubt brought on by our strenuous attempts to restrain the very rapid price inflation which has plagued us for the last several years. I think that there can be no doubt but there is now a tendency on the part of our monetary authority, the Federal Reserve System, to ease the conditions of monetary restraint to which they have adhered for the past six to eight months. The recent cut in the margin requirements by the Federal Reserve Board of Governors is further evidence of the tendency toward monetary ease. It is
page 1267 } my judgment, as a monetary economist, that we can look forward to a continued easing in the money markets and further falls in interest rates. This will no doubt bring on additional issues of both bonds and stocks by public utilities and by manufacturing firms to effectuate plans for expansion which were delayed by high money market costs. I believe this may tend to maintain interest rates somewhat, although it cannot, I believe, change the basic downward drift of money costs.

A reflection of the maintenance of the interest rates on bonds which this movement to the market by utilities and other companies has caused in the recent 9.09% cost to the company of the VEPCO bond issue. Currently the Vepco bonds are selling to yield 8.94%.

Charles Schotta

To the extent that the slight recessionary trend continues, this will decrease the demand for capital expansion of many unregulated segments of industry and will, of course, reduce the supply of new issues to the market, thus having a softening effect on interest costs. We cannot, however, expect to see any reduction in the magnitude or quantity of public utility corporate bond offerings.

I should summarize my appraisal of present conditions in the money market and future conditions as affected by monetary policy by saying that there is definite evidence of softening of interest rates, easing of conditions of
page 1268 } monetary restraint and the prospect for the future surely must be one of declining interest costs.

Q. In view of your earlier testimony concerning the risk and comparable return climate which faces the public utilities in general and VEPCO in particular in seeking equity capital funds, and in view of your analysis and appraisal of interest costs and money market conditions, can you give us your opinion of the cost of capital for the Virginia Electric and Power Company?

A. Let me turn to my Schedule 3.8. In this schedule I calculate the embedded cost of senior capital with annualized interest expense as of the end of the test year 1969. At that time, of course, the long-term debt outstanding amounted to $712,000,000, constituting 48.58% of the total system capitalization. The embedded annualized cost of this portion of the capital structure is 4.93 percent. Convertible debentures constitute approximately 3.41 percent of the total system capitalization with an embedded annualized cost of capital of 3.69 percent.

Contrary to some views of the cost of convertible debentures, in a situation such as VEPCO's, where it is not envisioned that additional convertible debentures will be offered and where, in fact, there does not appear at this time to be a probability of conversion due to the lower return which the investor would receive as a dividend payment compared to what he secures as interest, I see
page 1269 } no reason to include these items at an embedded annualized cost of capital greater than the coupon rate.

After all, the company still only pays $36.25 per year per thousand dollar bond; it is difficult to see where they pay out any more money than this for these bonds.

Charles Schotta

Although it appears virtually certain that the short term debt of $53,900,000 will be converted to long term debt, some short term debt is likely to be present. I have, therefore, included the short term debt at an embedded annualized cost of capital of 8½ percent. Although the prime rate has fallen since the end of the test year, I think it is fair to include this short term debt at 8½ percent since it is the expected cost of an issuance of long term bonds, a portion of which may be used to refund this short term debt.

We should note here that the 8½ percent annualized cost of this class of debt does not take account of any compensating balance requirement. However, based on my analysis of the impact of business conditions and Federal Reserve monetary policy on money market conditions and interest rates in the near-term, I would expect this cost to fall further within the next several months.

page 1270 } I have included the preferred stock constituting 8.63 percent of the total system capitalization, at its embedded annualized dividend percent rate of 5.48.

Thus the embedded cost of senior debt is 5.14 percent.

Next turning to Schedule 3.9, I calculate, using the December 31, 1969 or end of test year percent of system capitalization, the cost of capital for financing VEPCO's instruments of production. The senior capital is, of course, included at an embedded cost of 5.14. The common equity is included at an embedded cost of between 11.00 and 12.25 percent since, in my judgment, this is the cost of acquiring common equity for the Virginia Electric and Power Company. Tax deferrals, of course, are a zero cost capital item and must be treated as such in determining the cost of capital for the VEPCO system at large.

I should like to comment here on the determination of my cost of acquiring common equity. The risk adjusted cost of owners' equity which I have calculated at approximately 9.5 to 10.5 percent, is translated up, in VEPCO's case, to a higher return on common equity. In fact, the return on common equity compares very favorably with the return on common equity of the much riskier manufacturing companies and much riskier industrials.

page 1271 } The reasoning underlying my judgment that VEPCO must have a higher rate of return on common equity than a pure risk-adjusted comparable earnings standard might imply is two-fold. First, this utility is growing extremely rapidly—

* * * * *

page 1275 } CHARLES SCHOTTA, called as a witness on behalf of the Commission, after having been previously duly sworn, resumed the stand and testified as follows:

DIRECT EXAMINATION (Continued)

By Mr. Staples:

Q. Mr. Schotta, will you resume your testimony? I believe we stopped on Page 27 in the middle of the paragraph that begins "The reasoning underlying." Maybe you can start there.

A. All right. I was commenting on my determination of the cost of acquiring common equity?

The reasoning underlying my judgment that VEPCO must have a higher rate of return on common equity than a pure risk-adjusted comparable earnings standard might imply is twofold. First, this utility is growing extremely rapidly to meet the service needs of its customers.

In Schedule 3.10 entitled "Percentage Rates of Growth of Assets 1960-1968," I present the average percentage rate of growth of total assets of the 121 manufacturing companies among my 200 who continuously remained in the top 200 over the period 1959 through 1968. I present 55 of the 65 utilities since 10 of them could not be included in these growth comparisons for technical reasons and

page 1276 } 41 of the 50 banks.

Last, I present the percentage rate of growth of VEPCO's assets. These growth rates are presented year by year with the average at the bottom of each column. In addition, I present the standard deviation or variation in these growth rates across the companies and over the entire time period.

Q. What does this evidence on rates of growth of assets tell us about the return on equity which VEPCO must earn to attract capital?

A. As can be seen from this schedule—not chart, but a schedule—VEPCO is growing quite rapidly, and its rate of growth is tending to accelerate. VEPCO's assets are growing almost 2% more than those of the manufacturing companies over the period, and almost 2½% more than the 55 utilities. On the other hand, it is growing only slightly more rapidly than banks.

Charles Schotta

Because of this differential rate of growth, I believe it is necessary that VEPCO have a rate of return on equity capital which is higher than the pure risk adjusted rate of return in order to enable it to compete effectively for capital funds in the market. We all know how many possibilities exist for incorrect prediction of the amount of capital which will be necessary to serve customers in the fu-
page 1277 } ture. This makes forecasting rates of growth of plant and equipment risky business. The faster a utility grows, the more risk is introduced via the investment decision. Basically, it is for this reason that I make my judgment concerning the rate of return on equity which is necessary.

Q. You stated that your reason for judging that VEPCO must have a higher rate of return common equity than a pure risk adjusted comparable earning standings would imply is two fold. You have presented the factor of asset growth. What is the other important factor you have considered in making your judgment?

page 1278 } A. Even though I have suggested and I believe supported the suggestion that interest rates can be expected to soften and fall in the future, nevertheless, it is not conceivable within a relatively short period of time that financing charges for bonds will fall to or below the level of VEPCO's embedded cost of senior debt. Therefore, as the company goes to the market to borrow to buy the capital equipment to service growing demands of Virginia's population, its embedded cost and long-term debt will rise. We have seen an example of this in the recent 9.09 bond issues.

However, none of us can predict with certainty what the exact embedded cost of debt will be at each and every step along the trail of issuance of new debt. There is, therefore, a risk that cost will be higher than we anticipate and a possibility that they will be lower than we predict.

The proper place to compensate for this risk is in the rate of return on equity. It is after all the common stockholders who are the providers of "risk capital" in the Virginia Electric and Power Company. They are the ones who must take the risk of an increase in embedded cost and a fall in coverage ratios and a possible reduction in earnings available for common. They are the ones who will profit should there be a greater fall in the cost in acquiring new debt that many think possible.

page 1279 } I have, therefore, increased the rate of re-

turn on common equity on a judgment basis to a level higher than would be the case were we to expect only a relatively small rise in embedded cost of debt.

Q. Would you summarize for us how these two points are intertwined in your judgment of the rate of return necessary to attract capital?

A. If it were the case that current interest costs were higher than the embedded cost of the debt and VEPCO were not expected to grow particularly rapidly, the embedded cost of debt would rise only as refunding occurs, or if the current interest rates were approximately equal to or only slightly greater than the embedded cost of the debt and VEPCO were growing quite rapidly, the embedded cost of the debt would not tend to rise.

We have, however, a situation where the utility is growing rapidly and expected to continue to do so and where interest charges on long-term debt are above the embedded cost of debt and are expected to fall in the future although not to the level of embedded debt. When these factors are considered together, this introduces a possibility that the embedded cost of debt will rise and that coverage ratios may tend to fall and that earnings available for common may also tend to fall. This is a risk, and risks must be undertaken by the suppliers of risk capital, the common stock-
page 1280 } holders.

It is for that reason, in my judgment, that it is necessary to give a rate of return of common equity greater than the pure risk adjusted comparable earning standards might imply.

This is necessary in order to place VEPCO in a postion not merely to offer a competitive rate of return on common equity for comparable risk, but to offer the marginal increment above that competitive alternative cost of capital, it is my judgment that the cost of common equity should be included at higher than what might normally be considered a fair cost of common equity.

Q. Does the range for cost of capital you have just presented in Schedule 3.9 of 6.89 percent to 7.29 percent represent your determination of the fair rate of re-
page 1281 } turn for VEPCO?

A. No I have determined, and supported with my previous exhibits, the cost of capital to the Virginia Electric and Power Company with reference to the test period. In making this cost of capital determination I have

given careful consideration to present conditions in the money market and future conditions in the money market as evidenced by interest rate trends and an appraisal of the probable impact of economic conditions and Federal Reserve monetary policy.

As I understand the purpose of this case, it is to decide upon the fair rate of return on the Virginia Jurisdictional rate base of the Virginia Electric and Power Company and once that fair rate of return on Virginia Electric and Power Company's Virginia Jurisdictional rate base is determined, then any additional revenues, if any, which might be necessary to secure this fair rate of return can be calculated.

At the time of preparation of my testimony, I had not had access to the determination of the Virginia jurisdictional rate base, therefore, I could not at that time make a recommendation concerning the fair rate of return on the Virginia jurisdictional rate base.

I can make a determination, based on all relevant factors of the fair cost of capital for VEPCO, which I have done, and presented in Schedule 3.9.

page 1282 } Q. Why do you not make use of projections of financing costs into the future in determining the cost of capital to VEPCO as some of the company witnesses have done?

A. While I recognize fully that we are making rates to secure a fair rate of return on the Virginia jurisdictional rate base of VEPCO in the future, I cannot agree that calculating the cost of capital three years hence is a proper method of determining a fair rate of return at the present time and during the interim until the hypothetical "cost of capital" as of December 1972 is reached. I believe that if regulation is to serve as an effective substiture for competition, the regulatory lag must be short.

On the other hand, it seems to me that to give, at the present time, a rate of return which will be fair three years hence is anticipating the regulatory lag by too great a margin.

It is quite true, as I have already testified, that if the current cost of selling debt instruments is above the embedded cost of already outstanding debt, this embedded cost will tend to rise over time for a relatively rapidly growing electric utility such as VEPCO.

This Commission has, wisely in my opinion, elected to use end-of-test-period and end-of-year-rate base in making its calculation of the rate of return. The use of this method has

the singular advantage that already embodied
page 1283 } in the so determined and applied rate of return is the effect of rapid growth. This, of course, is in sharp contrast to the use of an average rate base. After all, it only makes sense, when making rates for a future period of time of two years or more, to utilize the most recent measures of the instruments of production that the utility employs for the convenience and necessity of the public.

page 1284 } Q. When you have access to the detailed data on Virginia Jurisdictional business, will you prepare and enter an exhibit giving your determination of the fair rate of return for the Virginia Jurisdictional rate base of VEPCO?

A. Yes. In my Schedule 3.9, I presented my calculation of the cost of capital to VEPCO. This cost of capital is drawn from a consideration of the embedded cost of senior debt and a fair return on equity based on the capitalization and capital structure at the end of the test year 1969. In determining this cost of capital, as I pointed out, account was taken of both debt cost and the necessary return on equity to attract capital.

The use of end of year capitalization and capital structure is absolutely necessary to secure the cost of getting the money to purchase the physical instruments for production, transmission, and distribution of electrical energy for the citizens of the Commonwealth. This figure, within the range 6.89% to 7.29%, is what must be earned on the assets gotten in exchange for the money raised through issuance of both debt and equity instruments, in order to meet the tests of the fair rate of return I outlined in the earlier portions of my testimony.

On the other hand, just as the use of the
page 1285 } capitalization and capital structure is necessary for determining the cost of capital, the use of a rate base is necessary to secure the revenues needed to pay for the capital. The rate base is, after all, the money measure of the instruments of production, transmission, and distribution which VEPCO employs for the convenience and necessity of the citizens of Virginia.

Let me make myself quite clear on this point. I see capitalization and rate base not as opposing and contradictory conceptual measures but, rather, as the blades of a pair of shears, both being necessary to cut the cloth of the truth.

Charles Schotta

This Commission has avoided many of the sterile arguments which arise from the use of rate base conceptual measures other than net original cost.

Further, by using year end rate base, the possible discrepancy between the measure of the money value of the physical equipment for production, transmission, and distribution of electrical energy and the capital instruments which have secured the funds to buy these self same facilities is minimized. Where a difference arises, as in the instant case, it is usually caused by an allowance for such items as cash working capital in excess of that acutally main-
page 1286 } tained or some like item. It is where some rate base measure such as fair value, reproduction cost, or other non-original cost concept is used that the artificial difference between capitalization, liability plus net worth, and rate base, assets held for the convenience and necessity of the electricity buying public, appears. In this case, although the difference is some 20 millions of dollars, some appropriate adjustment can be made to compensate for this.

Q. Mr. Schotta, do you then say that if Mr. Van Scoyoc's determination of the current rate of return of Virginia Jurisdictional electric rate base of VEPCO is correct that, even at the high end of your fair rate of return determination, 7.29%, the company is earning an excessive return?

A. No. I have pointed out that the cost of money can only be determined for the company as a whole. I know of no way to allocate capital items and their corresponding charges to various items in the electric rate base. Thus, it follows that all segments of the rate base must earn at least the cost of capital. For this Commission to reduce rates under its jurisdiction to the strict cost of capital would result, in the absence of a corresponding im-
page 1287 } mediate increase in rates on the non-jurisdictional portion of the business sufficient to equalize the return there to the cost of capital, in a violation of one of the tests of a fair rate of return, namely, that which requires that the rate of return "moreover, should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital." Clearly any reduction of major proportions and possibly even any reduction at all would violate this important factor in the determination of a fair rate of return.

Q. You seem to be recommending the determination that a fair rate of return must be made on a total company basis?

A. Exactly.

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page 1306 } Q. What conclusion do you draw, Professor Schotta, from your application of the economic concept of the price elasticity of demand to the
page 1307 } rate schedules proposed by VEPCO?

A. First, I conclude that elasticity of demand for electrical energy for residential space heating, while not as high as the figures advanced by Mr. Frazier in support of the summer-winter differential, from an uncritical presentation of the elasticity of the saturation ratio, is, nevertheless, for the most part in excess of any absolute value of one for most feasible training rates.

Aside from cost considerations, there does not appear, on the basis of elasticity of demand studies, to be any reason to reduce the trailing rate below 7 mils, since the revenue gain is either extremely small or nonexistent.

Turning to Chart 6.1, I have plotted the true price elasticity of demand for electrical energy for space heating with respect to the trailing rate based on an estimate of the elasticity of the saturation ratio of approximately -5.1.

This chart tells us that the higher is the existing price of electrical energy for space heating, the greater is the percentage change in quantity demanded with respect to any given percentage decrease in price. The graph is a composit of the true price elasticity figures which
page 1308 } were calculated in Schedules 6.1 through 6.12.

There were, as we can observe, minor differences in the estimate of elasticity for each of the trailing rate points. These have been combined to yield what might be called an average apparent price elasticity of demand for electrical energy for space heating.

Turning now to Chart 6.2, we have plotted a very familiar economic example based on the actual data from Mr. Frazier's testimony plus our modifying calculations.

The first line on the chart, entitled "Average Revenue," is the demand schedule for electrical energy for space heating, and has embodied in it the elasticity estimates we have developed from Mr. Frazier's presentation. From that average revenue or demand schedule, we have secured the marginal revenue schedule or the increase in total revenue generated by the sale of the incremental units purchased because of an infinitesimally small price reduction.

Charles Schotta

Elasticity of demand falls continuously along this demand schedule. At the point where elasticity of demand is equal to one, in absolute numerical value, the value of marginal revenue is, of course, zero since the so-called unitary price elasticity of demand implies that the ratio of page 1309 } price change to quantity change is one of equality.

Now, it is a familiar conclusion of economic analysis that the profit maximizing price is that at which marginal cost and marginal revenue are in equality.

We have secured for the test year the average incremental energy cost per kilowatt-hour. This is the weighted average incremental generating cost for the—let me insert the word "steam."

Q. Before "generating stations"?

A. That was left out.

Cost for the steam generating stations of VEPCO. This charge is 3.44 mils per kilowatt hour. When this marginal energy cost in plotted, we see graphically that the intersection of marginal cost and marginal revenue or the standard condition for profit maximizing behavior is achieved at a price of one cent per kilowatt-hour. This implies maximum revenue for electrical energy for space heating, residentially, at a trailing rate of one cent per kilowatt-hour.

It is necessary to combine the results of our analysis as presented in Schedule 6.1 through 6.12 with an analysis of marginal generating costs in order to secure page 1310 } an estimate of net revenue increase to be gained from moving from the present trailing rate of 1.2 cents per kilowatt-hour to some other trailing rate. An analysis of this type, which we have presented in Chart 6.2, suggests that the profit maximizing winter trailing rate for VEPCO would be one cent per kilowatt-hour. This would generate, based on present schedules, an increase in total revenues in excess of $1 million. The net revenue increase would, of course, be somewhat smaller because of the increase generation of additional electrical energy.

Q. Mr. Frazier testified that the demand elasticity for electrical energy for space air conditioning tended to be near zero. Do you have an opinion with respect to that judgment?

A. Unfortunately, no statistical evidence can be produced at the present time to support or disaffirm this judgment. I do note, however, with interest that Professor Phillips believes that gas represents a significant competitive threat to electrical energy for residential space cooling.

Charles Schotta

A straightforward economic implication of his analysis is that the cross-elasticity of demand, as economists use the term, between gas and electrical energy for residential space cooling is increasing and may be significantly large. This view, which is, of course, not supported by recourse to any kind of data from which inferences can legitimately be drawn, is clearly at variance with Mr. Frazier's characterization of the demand for electrical energy for space cooling as being inelastic.

page 1311

It might be helpful here to review the factors which determine the elasticity of demand for a good or service which is used to produce another good or service. We economists call this the elasticity of derived demand.

For the purposes of analyzing space cooling, it appears that the two most relevant factors determining the elasticity of derived demand are, 1, the possibility of technological substitution of some other energy source for electrical energy; and, 2, the percentage of total costs of the good or service accounted for by the intermediate good itself. Of particular importance here, as well, is the elasticity of demand for the original product itself, air conditioning in this case. I believe, that in the neighborhood of present prices, demand for space cooling is relatively price inelastic.

Q. What summary judgment would you make concerning the elasticity of demand for electrical energy for space cooling?

page 1312

A. I think that we must clearly differentiate between markets for electrical energy for space cooling. The possibilities of technological substitution of gas for electrical energy for space cooling at the present time and for the foreseeable future depends upon the usage of space cooling and the means of furnishing it. If we are talking about central air-conditioning units, whole house cooling, then quite clearly, technologically, gas poses a viable competitive alternative to electrical energy. It is difficult, however, to seriously believe that gas represents a viable competitive threat to electrical energy in the case of small and medium size space cooling units, 5,000 to 15,000 BTU window units.

Therefore, I believe that Mr. Frazier's judgment, in the main, is correct and that the elasticity of demand for electrical energy for residential space cooling is quite likely inelastic. Of course, the elasticity of demand for electrical energy for space cooling, in the case of large commercial and industrial applications where gas service is available,

may be higher than zero. It is not clear, however, that we can assign any numerical measure of elasticity in this case.

page 1313 } Overall, I would agree with Mr. Frazier's characterization of the demand for space cooling as being essentially inelastic.

Q. Does this conclude this portion of your testimony with respect to the elasticity of demand studies introduced by Mr. Frazier?

A. Yes, with the final concluding remark that a summer-winter rate differential appears to me on the basis of demand analysis to be supportable and economically sensible. I believe that conversion of Mr. Frazier's results into the format I have used will be of considerable assistance in fixing the exact differential which should obtain in the trailing rates. It is my judgment, based on appraisal of the economic factor of the elasticity of demand for electrical energy for space heating, that the trailing rate in the heating season for residential use, should be set in the neighborhood of one cent per kilowatt-hour as this is the indicated profit maximizing rate.

Based on my judgment of the probable elasticities of demand for other energy uses, particularly space cooling, I believe that a trailing rate during the cooling season of 1.4 cents or possibly higher could be justified.

page 1314 } I believe that a fair cooling season rate structure might procede in two steps, with a higher rate for the block of electrical energy which would be used by essentially window refrigerated air-conditioning units than for that energy used for space cooling in the case of large residential use through central air-conditioning units.

In any event, I believe that the elasticity of demand studies produced by Mr. Frazier, after conversion and refinement in accordance with generally accepted economic principles, supports a summer-winter trailing differential rate.

Q. You are not recommending any specific set of rates, are you?

A. No, merely that when the final amount of any increased revenues, if any, has been determined, consideration be given to some summer-winter differential rate and to the elasticity measures I have presented.

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page 1390 }

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CROSS-EXAMINATION

By Mr. Parker:

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page 1413 }

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Q. Then on your Exhibit 3.11 you bring those figures over to a fair rate of return, and you show that page 1414 } the fair rate of return on Virginia Jurisdictional electric rate base should be that range, and the same for non-jurisdictional electric rate base. In other words, it is your feeling the return should be the same on all elements of the company's properties; is that correct?

A. The cost of capital to buy the equipment to service Virginia Jursidictional customers has to be the same as the cost of capital to buy the stuff to service these non-jurisdictional customers. If you are not earning the cost of capital on equipment, and you have to borrow money and get hold of money from equity holders to buy it with, you are not maintaining yourself.

I have no way, and I have testified to that, of separating these things out and deciding that it costs more or less to get the money to buy Virginia Jurisdictional rate base than buying non-jurisdictional rate base.

Q. I agree with you, sir.

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page 1419 }

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Economists would have to look here at a going operation, and if regretfully this Commission can't do anything about the rates on one part of this business, it is very difficult if the Commission is charged with maintaining the financial

solvency and integrity of the entire company, for them to make a decision solely on the basis of the re-
page 1420 } lationship between some rate of return that might be earned on Jurisdictional and some cost of capital.

Q. Are you saying, sir, that you must look at the system-wide rate of return?

A. The company-wide. It is a company, and you have to look at its ability to maintain the integrity of its capital and to attract capital on a company-wide basis.

Q. There is no question in your mind that the rate of return today in Virginia Jurisdictional is much higher than it is on North Carolina-West Virginia Non-Jurisdictional and military portions of the revenue-producing property, is there?

Mr. Staples: This is Mr. Van Scoyoc's area.

Mr. Riely: I think Mr. Schotta has not testified on that subject, if Your Honor please. It seems it is outside the scope of the direct examination.

By Mr. Parker:

Q. Assuming that to be correct and that Mr. Van Scoyoc has so testified, is it your position, then, that this Commission should require the Virginia consumers to continue to sub-
sidize North Carolina, West Virginia Non-Jur-
page 1421 } isdictional and military customers in perpetuity?

A. No, that is not my conclusion at all. My conclusion is that this Commission has the responsibility to the consumer, its jurisdictional consumer, to make sure that he has enough electric service of the quality that he needs, and if in so doing the rate of return on this Jurisdictional business has to carry the loading on Non-Jurisdictional business, then this Commission still has the responsibility of making sure that the consumer gets electricity from a company the integrity of which it maintains.

Q. As an economist what conceivable incentive is there on the part of the company to increase its rate of return on the other areas of its business if this Commission or others are going to continue to require Virginia consumers to subsidize the other areas?

Mr. Brasfield: Objection. I don't believe there is any evi-

dence of continued requirement of subsidization of other areas.

Commissioner Catterall: The point is that if your company keeps lowering the rates to get the good will of the cities—not the counties—and the Government, if you put these two things together, if the Legislature doesn't change the law and that keeps on, then the decision will have to be to either bankrupt the company and have no

page 1422 } electricity at all or put it on the Virginia customers to make some money.

A. As an economist from a welfare economic standpoint what you would have to do is this: Look at what the consumer would pay if everything were equalized out. Then look at what he has to pay to maintain a viable rate of return for the company, which would be something higher. That is going to be some couple dollars for him.

The question is, is that couple dollars worth a healthy utility that services him and serves his electrical needs? Is it worth that, or would you rather have an unreliable utility and one which could not maintain its financial integrity?

From a welfare economic standpoint there is a trade-off in dollars. We know this Commission has no jurisdiction over these other rates. We know that it has a responsibility to maintain a viable company to meet the test of a fair rate of return, the financial integrity test.

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page 1451 } PAUL L. HOWELL, called as a witness on behalf of Cities and Counties Intervenors, after having been first duly sworn was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Parker:

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page 1494 } Q. What do you find to be the overall cost of capital for VEPCO?

A. The overall cost of capital for VEPCO is summarized in Table 6.1 on two bases, one as of the end of December 31,

1969, and the other as of May 1, 1970, thus giving effect to the financing which has taken place since the beginning of 1970.

Q. Which do you recommend be used?

A. I recommend that weight be given to the effects of the completed financing. As related piece meal above, the overall rate of return for VEPCO may be calculated as follows for May 1, 1970.

Mr. Parker: Mr. Chairman, at this point we, of course, would like to have the table put in again in tabular form in the record.

Chairman Hooker: It is so ordered.

Commissioner Catterall: Are all these tables to be copied in that way?

Chairman Hooker: I understand both sides want them that way.

Mr. Gibson: We don't want them in. We think they are misleading, but we don't object.

The Witness: This is the calculation:

page 1495

Security	Amount ($000,000)	Rate	Capitalization Percentage	Weight Factor
1. Senior Capital	$ 973.4	5.30%	62.1%	3.30%
2. Tax Deferrals	46.6	—	3.0	—
3. Common Sk. Equity	548.3	10.30	34.9	3.60
Overall Cost	$1,568.3		100.0%	6.90%

Q. Mr. Howell, what is your final conclusion with respect to the overall capital attracting rate and a fair and reasonable rate of return for VEPCO?

A. My conclusion is that rate of return for the foreseeable future of 6.90% to 7.00% will enable the company to raise capital on attractive terms, maintain financial integrity, adequately compensate investors, and also be fair to rate payers.

I might add that attention might be given to the way in which it might be necessary to finance additional debt in the future, but that is in the future and I trust that the Commission will use the test here and make such adjustments as it deems fit.

Q. Have you read Dr. Charles F. Phillips' testimony and exhibits and *listed* to his cross-examination?

A. Yes, I have.

Paul L. Howell

Q. Do you have any comments?

A. Yes. Dr. Phillips testified on cross-examination that he did not prepare a cost of capital attracting

page 1496 } rate of return. He further testified that he relied exclusively on a comparable earnings test. He further testified that he relied on the reported earnings on book value for industrial corporations as providing a guide for appropriate rate of return to be allowed on VEPCO equity.

This is not a valid approach. The Court said in the Bluefield case, cited above, that one of the considerations in arriving at an appropriate return, that is, fair and reasonable rates to be charged to the public, was the return which was earned by similarly situated companies with like risk and operating conditions. Rates of return were not to be based, continued Justice Butler, on enterprises which were speculative or exceedingly profitable. It is respectfully submitted that Dr. Phillips' reliance on either Moody's 125 industrials or Standard and Poor's 425 industrial common stocks is fatally defective on both of two counts.

a, The method does not reflect the cost of attracting capital on the public market, and,

b, These companies are neither comparable in risk, growth, profitability, operating characteristics, accounting practices, *et cetera.*

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page 1509 }

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I would say that the rate of 5.30, which represents the annual cost of senior capital is on the bare bones side. It is the existing amount as of the time presented, which is the *pro forma* financing in April. It would seem appropriate to me that some weight should be given to the current high interest rates and the current and immediate future financing of the company, so I would say that was—I would characterize it as skimpy. I think the calculation is correct for what it represented, but before looking that sector is bare bones.

If we were to take into consideration $100 million of new debt financing in what might be considered the foreseeable

future at the rate which Dr. Phillips presented with his 8½%, we would find that the cost of the amount which I gave and you used for senior capital would be increased $8,500,000, to give an overall senior capital cost of approximately 5.60.

You used the figure of, I guessed, 10% on the common stock equity. I recommend 10.30, which is a little bit more.

page 1510 }

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CROSS-EXAMINATION

By Mr. Gibson:

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page 1513 }

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By Mr. Gibson:

Q. Sir, looking to the next issue just after that, in fact on May 21, Ohio Edison, I ask you if the cost of that issue to the company was 9.14%?

A. I will accept your figure.

Q. That is also a triple A rated bond, is it not, of an electric utility?

A. Yes, sir.

Q. You have no complaint with management of Ohio Edison, I take it?

A. I have no complaint with management of VEPCO.

Q. Or of Ohio Edison?

A. Most certainly.

Q. If you add 25 basis points to 9.14 what do you reach?

A. 9.39%, sir.

Q. How does that compare with your recommendation for rate of return of VEPCO, the cost of raising capital through VEPCO common?

page 1514 } A. About 100 basis points lower, sir. This is a spot calculation, of course.

Q. Your cost of capital on VEPCO common is 9.32; is that correct?

A. Well, I put it 9.3, sir.

Q. It is equivalent in substance to the cost presently to be incurred through financing by a double A bond, isn't that true?

Paul L. Howell

The Witness: May I have that question, Mr. Reporter?

(The Court Reporter read the pending question.)

A. You said 9.35. My common stock was 10.30. That is not equivalent, sir.

Q. In your capacity as manager of a pension fund you made through the years quite a study of return on common stock equity, did you not?

A. Yes.

Q. Did you not say in the Journal of Finance in May 1958, and I quote:

"It was found for the 27-year period, 1929 to 1955, that the average experienced rate of total return on common stock exceeded that of bonds by 100%"?

A. That could be an accurate quote. I haven't read it for some time.

Q. That is in general in conformity with your
page 1515 } experience, is it not?

A. Yes, sir.

Q. Have you not also said that productivity is the overwhelming criterion in determining the investment that pension funds should make?

A. Yes, sir.

Q. With that criterion in mind would you today purchase VEPCO common as against VEPCO Series Y bonds?

A. I think VEPCO common at 18 is a bargain.

Q. At 18 what is the yield on VEPCO common, current yield?

A. Well—

Q. Would you accept subject to check that it is 6.2%?

A. I know you have an electronic calculator in the back, but I would just like to take a look at it.

Q. Don't hurry.

A. Yes, sir.

Q. You referred to the Ohio bonds—

A. Again that is a spot calculation.

Q. You emphasized these quotations representing a spot cost of money, did you not?

A. I don't think cost of money is a spot calculation. Cost of money is something of a less *ephemoral* character.

Q. Can you tell me how long it has been since a double A bond has been sold at a cost of less than 8%?

Paul L. Howell

page 1516 } You said you were familiar with Dr. Phillips' testimony, did you not?

A. Yes. He has got some tables there.

Q. Including Exhibit CFP-1, which enumerates all public utility issues, does it not?

A. For many past months.

Q. For three years?

A. I didn't exactly run into that, but if you have it, I will accept it.

Q. To save time would you accept subject to check that no double A electric utility bond has been sold at less than 8% cost of mony since August 2, 1969?

A. Yes, sir. I thought it might even have been longer.

Q. You can add to that, if you wish.

And that none has been sold at less than 7% cost of money since November 21, 1968?

A. Yes, sir.

Q. And, finally, that none has been sold at less than 6% since July 18, 1967?

A. Six percent since when?

Q. July 18, 1967.

A. Yes, sir.

Q. All right.

A. Yes, I will accept, subject to check, sir.

page 1517 } Q. You would help the Commission. I believe —certainly you would help me a great deal—in understanding your methodology if you were to explain why your Table in 4.5 differs so materially from your Table in 4.16.

Mr. Parker: You mean Page 4.16?

Mr. Gibson: Yes.

Commissioner Catterall: What were those?

Mr. Gibson: 4.5 and 4.16.

Mr. Riely: They are in the text, Your Honor, not exhibits.

A. If I miss the point, they are from different sources, sir. Do you want me to explain?

Q. No; let me ask you more specifically. I may help you.

Looking on Page 4.16 of the text, the first table, the second line, you purport to speak of dividend growth, is that not true?

A. Yes, sir.

Q. Where do you get that from?

A. Well—

Q. Perhaps I can help you. It is Table 4.8, Page 2, is that right?

page 1518 } A. That is what it should be.

Q. In fact, is it true that the 5.7 figure that you represent here does not represent what you call it, dividend growth averaged on the five years, but, in fact, the average annual increased earnings?

Share, not what was paid out, but what was earned per share?

A. You are correct, sir.

Q. If that correction were made, is it not true that your final total investment return as shown on Page 4.16 of the text in the first Table—let me complete my question—would be changed to 11.02%?

A. You are probably correct.

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page 1543 }

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Chairman Hooker: You had a little more testimony, I believe, from Mr. Lim.

JAMES LIM, called as a witness on behalf of Cities and Counties Intervenors, after having been previously duly sworn, resumed the stand and testified further as follows:

DIRECT EXAMINATION

By Mr. Parker:

Q. Mr. Lim, have you reviewed the "Rebuttal Testimony by W. W. Carpenter" received subsequent to your submission of testimony on May 18 on behalf of City and County Intervenors?

A. Yes, I have.

* * * * *

page 1552 } Q. In light of your review of the rebuttal testimony of Mr. Carpenter, which corrects and modifies the testimony of Mr. Sharkey, is there any change in your opinion that the Commission should adopt the method

used by Mr. Van Scoyoc and reject those followed by Mr. Sharkey and *ergo* Mr. Carpenter?

A. I found nothing in Mr. Carpenter's testimony that added any justification to the use that Mr. Sharkey made of his methods.

Q. Is your recommendation, therefore, the same as it was at the conclusion of your prepared direct testimony, that the Commission should reject the Sharkey-Carpenter method and utilize those employed by Mr. Van Scoyoc?

A. Yes, it is.

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page 1594 } JAMES LIM called as a witness on behalf of City and County Intervenors, being previously duly sworn, was recalled and testified further as follows:

DIRECT EXAMINATION

By Mr. Parker:

Q. Within the past half hour have you had the opportunity to review the "Additional Rebuttal Testimony of W. W. Carpenter," which was delivered to me at approximately two o'clock today?

A. Yes, I have.

Q. Had you seen it prior to leaving the stand earlier this afternoon?

A. No, I had not.

Q. Is there a correction to Mr. Carpenter's testimony that you feel should be made?

A. Yes. I think Mr. Carpenter has given an incorrect definition or interpretation of the average and excess demand allocation method which I would like to correct in giving my description of the method.

Q. What is wrong with Mr. Carpenter's description?

A. Well, Mr. Carpenter has used a description which purports to require a minimum system as part of the average in average and excess demand method, and to my thinking such an approach has never been construed or
page 1595 } interpreted to be a part of the method, and would seriously depart from what would result under the widely-understood definition of average and excess demand allocation.

Q. As used by Mr. Van Scoyoc?

A. As used by Mr. Van Scoyoc and as generally under-

stood in the industry, and as is described in well-published materials, both textbooks and articles in the trade.

I would like to point out what the error is and how it departs from the *bonafide* average and excess demand method.

Q. Please do.

A. At page 2 of his additional rebuttal Mr. Carpenter states in describing the method, and I quote, "The first step is to determine the theoretical minimum size distribution system required to meet the annual energy requirements of all customer classes at 100% load factor. Such a theoretical minimum system would require that VEPCO's entire distribution system be redesigned from scratch to create a system operating at 100% load factor. No such system exists. It is purely theoretical and artificial."

In that respect I think Mr. Carpenter is completely in error in attributing that characteristic to the average and excess demand method. I don't know what method he is referring to, but it certainly is a different one from those that have been discussed and used in this case.

page 1596 } The average and excess demand method utilizes what is termed average demand, which is also equivalent to annual energy, to develop an allocation factor with which a portion of fixed costs determined by the proportion which the system average demand or any part of a system that you are looking at is allocated between the average portion and the excess portion.

In other words, it is a proration on the basis of these demand classifications. That is a mathematical approach, and the theory behind it is a cost responsibility theory.

In other words, we should find a way to have customers bear a proportion of costs because of their use of facilities, not because of any particular facility that they should pick up the tab for.

What Mr. Carpenter is talking about is a reversion to his skeleton method, only he is tagging it at a level equivalent to some kind of a system required to meet 100% load factor operation.

The difference in results comes about because any system that is built from a minimum standard approach carries with it a tremendous amount of cost that goes with any kind of construction, whether there is no capacity at all.

In other words, if you say, "Put in a transpage 1597 } former," if you take the smallest size that could be made, or even the smallest size that I have

mentioned here, a 5-KVA transformer, it has a certain price, $150, let us say; and if you take a 10-KVA transformer, it does not cost $300. A 5-KVA additional capacity costs a small fraction of the total cost compared to the first five.

That illustrates the basic difference between a minimum system design cost and a spreading of costs on the basis of demand units.

For that reason this method, whatever you wish to call it, would produce a much different result than an average and excess demand method.

Q. Do you also have a comment on the significance of Mr. Carpenter's new exhibit, No. WWC-3?

A. Yes. I should point out that the exhibit purports to show that the distribution costs, and by inference the costs that the Ebasco witnesses have classified as customer costs as part of distribution, vary in proportion to the number of customers.

Certainly no one would deny that in any operating system as the load grows and additional facilities are required, more load and more customers mean more facilities, and that's about the sum and substance of what this shows.

page 1598 } What Mr. Carpenter concludes from this, however, is that you can reverse the logic of that showing and say, "Therefore, the average cost that you can calculate out of these relationships, the average cost per customer, is properly applicable to each customer."

I think if you stop to consider that the average cost has no significance at all when used to segregate different types of customers, you appreciate that these exhibits offer no support for his conclusion.

Q. Would you say that the additional rebuttal testimony in the exhibit furnished us this afternoon on behalf of Mr. Carpenter is a general reflection on his expertise to testify in this case?

Mr. Riely: Would you like to clarify that a little bit for me? Are you saying he is a bum? If you are saying that, ask him that, and I would like an answer.

Q. (Continued) Is he a bum?

A. I don't want to invoke a lawsuit. I won't comment.

Mr. Parker: I have no further questions.

Mr. Riely: I have one, maybe two.

John M. McGurn

CROSS-EXAMINATION

By Mr. Riely:

Q. Mr. Lim, I don't purport to be an expert in this field, but you said something that intrigued me. In the average and excess method you have two allocations, page 1599 } haven't you, you have an average and you have an excess?

A. You could look at it as two allocations.

Q. You said average demand is equivalent to annual energy?

A. Arithmetically.

Q. What do you do, do you determine the annual energy consumption for each of the classes of customers that are involved in allocation? Is that your method?

A. You can do it that way or you can actually derive—

Q. When you determine the annual energy volume you divide it by 8760 to determine the average demand?

A. Are you asking me what is the average demand?

Q. Would that be the method you can determine the annual demand by from the annual volume?

A. Yes, that would give you the average demand for that.

* * * * *

page 1650 } JOHN M. McGURN, called as a witness on behalf of the Applicant, after having been previously first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Mr. McGurn, you are the Mr. McGurn who has already testified before, are you not?

A. Yes, sir.

Q. Have you caused to be prepared and distributed on Monday of last week to the Commission and all the other parties rebuttal testimony to what we have previously heard, and did you yesterday distribute testimony also prepared by you to the Commission and all counsel to the testimony we were then hearing?

A. Yes.

Q. I have before me papers which, briefly put, make four points:

One, that to annualize the wage increases made effective in 1969 as $860,000 to the electric operating expenses in that year and that the wage increases already committed for in 1970 has an additional $1,949,400, for a total of $2,755,400.

Two, looking only to committed obligations of the company already incurred, the additional cost for en-
page 1651 } vironmental protection relating to transmission, distribution and substation add a further $1,400,523, and those relating to power production add a further $440,000 for a total of $1,444,543.

Number three, VEPCO's policy with regard to environmental protection has always been that of a leader in the field

And finally, four, that VEPCO's employment policy has always been positive and affirmative so that our ratio of blacks is about twice that of the industry.

I ask is this the prepared testimony to which you referred?

A. Yes.

Q. And if those questions were asked of you now, would you answer in exactly the same way?

A. Yes, sir.

Q. And are these three exhibits the ones to which you refer in your testimony identified as Exhibit JMM-9-A, JMM-10-A and JMM-11-A?

A. Yes, sir, they are.

Mr. Gibson: May it please the Commission, I ask that the testimony be copied into the record and I hereby tender these three exhibits.

Commissioner Dillon: Is that the rebuttal or the additional rebuttal?

page 1652 } Mr. Gibson: Both.

Chairman Hooker: They will be received and the testimony will be put in the record.

page 1653 } JOHN M. McGURN being called as a witness on behalf of ~~Cities and Counties Intervenors,~~ VEPCO, being first duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Gibson:

Q. Mr. McGurn, your Exhibit JMM 8, originally offered in the transcript at page 107, is now, by the Commission's ruling of May 11, 1970, in evidence, as well as your Exhibit

JMM 9, 10 and 11, originally offered in evidence at page 215 of the transcript. As I understand, your Exhibit JMM 9 itemizes the increased labor expenses shown in your Exhibit JMM 8. I wonder if you will now comment on your Exhibit JMM 9.

A. The agreement negotiated between the Company and the International Brotherhood of Electrical Workers effective April 1, 1967, and amended December 15, 1968, provided, among other things, for a specific increase in wage rates effective April 1, 1969. Effective as of April 1, 1970, a new agreement was negotiated providing a further wage increase. We also have an agreement with the Utility Employees Association. The agreement negotiated with them and executed on September 2, 1969, provided a wage increase effective October 1, 1969, and a further wage in-
page 1654 } crease effective October 1, 1970. The portions of the wage increases provided for in these agreements and chargeable to electric operating expenses are the first two items under the headings 1969 and 1970 on Exhibit JMM 9. The remaining wage increases are for other employees and merit increases for UEA employees made throughout the year 1969. The purpose of including all the wage increases in the statement is to annualize them and thus show their full effect, which is an addition to electric operating expenses in 1969 of $806,000. I have copies of the labor agreements marked Exhibit JMM 13.

Mr. Gibson: I offer that document in evidence.

Chairman Hooker: It will be received. (The document referred to was marked for identification Exhibit JMM-13 and received in evidence.)

By Mr. Gibson:

Q. Would you now turn to the items under the heading 1970?

A. I have already covered the first two items. The remaining wage increases are for other employees and individual merit increases for UEA employees that have or will be incurred during the course of the year in accordance with the Company's established wage administration procedure. Those increases not yet in effect have such a high degree of certainty that they must be included if the test
page 1655 } year is to be properly adjusted to reflect the

known changes in wage level that will occur in 1970.

Q. In the course of these hearings there have been indications that a greater degree of relevance might be attached, and thus greater weight assigned, to expense increases resulting from signed contracts or presently effective obligations than to others, even though you feel certain that they will be incurred. Have you prepared an additional Exhibit which reflects only wage increases through June 1, 1970, that have already been contracted for or committed by final Company action?

A. Yes. I have had a further statement prepared entitled Exhibit JMM 9-A.

Mr. Gibson: I offer that document in evidence.

Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit JMM-9-A and received in evidence.)

By Mr. Gibson:

Q. Would you comment on this Exhibit?

A. The form and substance of this Exhibit are the same as Exhibit JMM 9 except that I have eliminated all the wage increases expected after June 1, 1970, and included only those which are already committed by contract or final Company action. This in no sense means that I am in any

page 1656 } degree uncertain that the other increases shown on Exhibit JMM 9 will occur. Indeed, I am sure that they will. But, you will note that the total increase shown on Exhibit JMM9-A through June 1, 1970, is $1,949,400 which added to the 1969 increase produces a total amount chargeable to electric operating expenses of $2,755,400.

Q. So far you have dealt only with wage increases. Turning now to additional costs for environmental protection, have you any comment on your original Exhibit JMM 10, which is likewise in the record?

A. Exhibit JMM 10 shows, by years, the nonrevenue-producing environmental costs for transmission, distribution and substation work we expect to incur that exceed such costs in 1969. As mentioned in earlier testimony, it also includes an item for undergrounding existing overhead lines each year to the extent of one percent of our gross sales of electricity, less sales for resale, for the prior year. Only ¼%

of one percent was included in 1970, however, since this program is dependent upon funds being made available and we did not consider we could begin it until the last quarter of the year. In view of the indication that greater weight might be given to costs already committed for, I have prepared another Exhibit identified as JMM 10-A.

Mr. Gibson: I offer that document in evidence.
Chairman Hooker: It will be received.

page 1657 } (The document referred to was marked for identification Exhibit JMM-10-A and received in evidence.)

By Mr. Gibson:

Q. With the same reservation that you are not retreating in any way from your original Exhibit JMM 10, I ask if you will kindly explain this Exhibit.

A. This Exhibit shows the nonrevenue-producing environmental expenditures and expenses for transmission, distribution and substation work for 1970 that is already under construction or committed for construction in connection with obtaining required use permits or similar authorization from Governmental agencies. It shows the total annual cost attributable to electric operations will increase by $1,004,523 in 1970 as compared to 1969.

Q. To conclude this environmental discussion, would you comment on your Exhibit JMM 11?

A. This exhibit shows the minimum nonrevenue-producing expenditures that we feel sure we will incur in the next few years for environmental protection in regard to power production.

As indicated in the note on Exhibit JMM 8, the increased expenditures and carrying charges for additional capital investment for protection of the environmental for both transmission and distribution and power production were based on revenue requirements in 1971 since
page 1658 } this was the first full year in which the rate increase would be fully effective and in which the surtax would be inoperative.

Q. Have you prepared another Exhibit which shows only the increased costs in respect of power production that are being incurred in 1970 as a result of presently effective commitments?

John M. McGurn

A. Yes. Without retreating in any way from Exhibit JMM 11, I have a further Exhibit identified as Exhibit JMM 11-A, which shows only the increased costs related to power production that result from programs already under way or committed for by Company contract or required by Governmental action now effective.

Mr. Gibson: I offer that document in evidence.
Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit JMM-11-A and received in evidence.)

By Mr. Gibson:
Q. Have you any comment on this Exhibit?
A. The Exhibit shows increased expenses in 1970 as compared with 1969 of $440,000 as a result of these new requirements. Let me reemphasize that these are minimum costs, and I fully expect that the actual costs will be much greater.

page 1659 } By Mr. Gibson:
Q. Mr. McGurn, do you have any comment on the assertion by Mrs. Behre that Vepco does not have a good record on air and water pollution abatement?
A. Yes. In my direct testimony I mentioned many of Vepco's past efforts to enhance our environment and I showed how these efforts and costs must accelerate in the future.
Vepco has traditionally been a conservative-minded Company. For example, Vepco's record of achievement on environmental quality includes the following. As early as the mid-1950's Vepco developed an engineering technique to insure the discharge of highly oxygenated water from the surface of deep impoundments, a technique now in common use throughout the United States. We have made thermal and ecological studies of the waters around our power stations since 1941. We have installed dust collection equipment on every generating unit built since 1936. We made one of the first major electrostatic precipitator installations in the United States when we installed such devices on our units at the 12th Street Power Station as early as 1936. We have burned low sulfur coal since 1941. We pioneered in the use of cooling lagoons in conjunction with a main cooling reservoir. We are now in the process of switching to burning No. 2 and No. 4 fuel oil at our urban power stations

page 1660 } at 12th Street in Richmond and at Reeves Avenue in Norfolk in order to virtually eliminate fly ash discharge and to greatly reduce sulfur oxide discharges. We are currently studying significant new engineering techniques for controlling the effects of thermal discharges and sulfur oxide discharges from our power stations.

While I could recount further examples of Vepco's past and present activities, suffice it to say that we believe that our past record on environmental protection is good. As I indicated in my direct testimony, however, legal requirements and technological possibilities are changing rapidly in this area and we wish to take a leading position in reducing pollution and improving the environment. I have submitted to this Commission our program for doing so and I sincerely hope that it will recognize the increased non-revenue producing costs which this program would impose on us.

The inference in Mrs. Behre's statement that our Mt. Storm Power Station is responsible for killing thousands of Christmas trees is unfounded. Vepco has engaged a plant pathology consultant, Dr. F. A. Wood of Penn State University, to conduct very extensive botanical studies at Mt. Storm. His studies indicate to date that air pollution is not the cause of the primary damage symptoms on the evergreen
page 1661 } trees in the area. His studies presently show that the primary symptoms are probably caused either by insect infestation or by winter-kill. We are continuing an extensive experimentation and study program on the affected plantations to try to determine conclusively the exact cause of the primary damage symptom. We are working closely with both Federal and State air pollution regulatory officials on this phase of the problem, as well as on methods for further reducing stack emissions from the Mt. Storm unit.

Q. Mr. McGurn, what is the philosophy and policy of your Company as to employment practices?

A. It is a very positive and affirmative one in that we employ individuals without regard to race, color, Creed or national origin.

Q. Will you briefly state the affirmative action your Company has taken to effectively practice equal opportunity in employment?

A. In 1961, the year Executive Order 10925 was issued prohibiting discrimination in employment, an executive bulletin was issued stating the Company's position and its firm in-

tention to comply with the equal opportunity provisions of the Order. In brief, since that time we have undertaken a positive program to insure full compliance in every area of our operations. Our position was made clear to our employees at every level, as well as to the Unions

page 1662 } representing certain of them. We have met with all of our black employees to be sure they were informed of our policy, to encourage them in efforts toward promotion, and to be sure they were aware of the Company-sponsored educational opportunities available to them. We also requested their help in referring additional blacks to us for employment. We have made our position clear to all high schools in our area. We have participated in career days at such schools. We have met with our supervisors so that there would be no question concerning our firm intention that they put into practice our position on equal opportunity. We have actively recruited in black and predominately black colleges in and out of our territory. We have solicited the aid of the Urban League in providing black applicants. We have restructured certain positions to provide upgrading opportunities. Blacks are employed in scores of different positions in our Company, including such classifications as:

Plant Records Clerk	Technical Clerk
Meter Reader	Personnel Assistant
Programmer	Foreman
Stenographer	Technical Assistant
Clerk-Typist	Welder
Asst. Engineer	Customer Contact Clerk
Tracer	Keypunch Operator
Janitors	Billing and Verification Clerk
Laborers	Home Economist

page 1663 } Our efforts have increased the ratio of black employees to the total. Our ratio of blacks is about twice that of the industry. Twenty-five percent of our increase in employment in 1968 was from minority groups.

Representatives from the Equal Opportunity Commission and the Federal Power Commission have reviewed our programs and actions in the area of equal opportunity. The Office of Federal Contract Compliance has reported that we are in compliance with the requirements of that Office. We shall continue our efforts to be an outstanding equal opportunity employer as a part of our determination to be a good citizen in our area.

page 1664 } Chairman Hooker: All right, Mr. Parker, are there any questions?

Mr. Staples: Mr. Rogers has some questions, Your Honor.

Mr. Rogers: I will be very brief.

CROSS-EXAMINATION

By Mr. Rogers:

Q. Will you look at your answer at the bottom of page 4?

A. At the bottom of page 4?

Q. Right, the answer.

A. Yes.

Q. And you state that "I have a further exhibit identified as Exhibit JMM-11A, which shows only the increased cost related to power production that results from programs already under way."

A. Yes, sir.

Q. Will you tell me briefly what you mean by programs already under way?

A. Well, these are actually committed and contracted for. If you are referring only to power production, it pertains to—as it is listed on that particular exhibit, which is 11A—it shows that capital and operating expenses in 1970 that we have committed and under way in power

page 1665A } production—it lists both capital and operating. There are five items which consist of our monitoring program, which is a capital expenditure for certain equipment. And then under operation, $24,000, which is the operating expense in this program for the period now under way. This would increase in the future because a portion of these programs have only been in effect for a short period of time.

Then we have special monitoring programs which have to do with thermal studies at our Chesterfield Power Station, similar environmental studies of air conditions in and around the Mt. Storm Power Station where we have installed test locations, and then a similar charge for Possum Point where we are measuring the SO2 concentration and the particular fall-out around the Possum Point Power Station, since here we have converted to fuel oil.

Q. Would you consider a program under way if you had hired a consultant to study the feasibility of a program?

A. Well, I think you would have to distinguish the program. These that I have listed here are actually committed

expenditures where consultants have been retained, where equipment, if it has not already been installed, is on order and awaiting installation.

Q. I notice in your expenses listed on Exhibit 11A you explain by way of footnote all except the Reeves Avenue oil conversion. What stage is that in?

page 1665B } A. This is under way. The engineering is now being done and equipment is being ordered and we expect to have this completed by the end of this year. But the work is already under way.

Q. The actual physical work?

A. Yes, sir. At Twelfth Street we had a similar project which is to convert to oil because the precipitators are of early vintage. They are at 90 percent of efficiency. We are now burning coal in those units. The coal is very scarce and it is high cost. We propose, instead of upgrading the efficiency of those particular precipitators, to convert them to fuel oil.

Twelfth Street will not be completed until next year because of the scope of installation and the fact that we have to install permanent tanks.

The Reeves Avenue project can be completed this year because we are going to use barge tanks.

Mr. Rogers: That is satisfactory. No more questions.

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page 1730 }

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ROBERT S. GAY called as a witness in rebuttal, having been previously sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Mr. Gay, you have previously testified in this case, have you not?

A. Yes.

Q. Have you prepared rebuttal testimony in two sections consisting of 21 pages and Exhibits RSG-13,

page 1731 } RSG-14, RSG-15, RSG-16, RSG-17, and then supplemental rebuttal testimony consisting of several pages?

A. That is correct.

Q. If I asked you the questions shown in that testimony would you answer the questions as it is shown in this prepared testimony?

A. I would.

Mr. Riely: May it please the Commission Mr. Gay will testify first as to the adjustment proposed in expenses by Mr. Brown and then will testify in more general terms on the testimony of Mr. Jordan with regard to rates. His supplemental testimony touches very briefly on a matter raised yesterday by Mrs. Behre.

I think Judge Catterall will be interested that the first exhibit that Mr. Gay presents answers the question that you asked and subsequent exhibits indicate the company's position that bimonthly readings and the summer-winter differential will not cause any undue discrimination.

I ask that Mr. Gay's testimony be copied into the record and I ask that these exhibits be received in evidence and I tender Mr. Gay for cross-examination.

Chairman Hooker: It will be copied and they will be received.

(The documents referred to were marked RSG-13 through RSG-17 and were received in evidence.)

page 1732 } ROBERT S. GAY being called as a witness on behalf of Cities and Counties Intervenors, being first duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Mr. Brown states on pages 1029 and 1030 of the transcript that promotional allowances made by the Company in 1969 totaling $2,464,915 and trade ally advertising in the amount of $320,769 should be eliminated as expense items in this rate case. Do you have any comment to make on these adjustments suggested by Mr. Brown?

A. Mr. Brown suggests these two adjustments because the Commission, by order of April 15, 1970, directed that promotional allowances be discontinued. Therefore, he believes these expenses should be regarded as non-recurring for the purposes of this case.

Robert S. Gay

Q. Please discuss these adjustments.

A. I would first like to comment briefly on the adjustment to eliminate from operating expenses trade ally advertising in the amount of $320,769. These expenses represent advertising allowances to specified dealers for advertising space heating and water heating. In the recent order, the Commission permits joint advertising with others, if the utility is prominently identified as a sponsor of the ad-

page 1733 } vertisement. We intend to continue this type of advertising with the Company prominently identified as a sponsor and, therefore, the amount should not be eliminated as a non-recurring operating expense, as our future plans provide for expenditures of at least this amount each year and probably more will be required.

Q. Mr. Gay, what statement do you wish to make with regard to Mr. Brown's elimination of $2,464,915 representing installation allowances recorded during the year 1969?

A. This amount relates solely to allowances made to customers as the result of the installation of particular appliances and equipment. The Commission order does not affect these allowances at all for 1970. Existing promotional allowance plans presently filed with the Commission remain in effect through December 31, 1970. In addition, the order permits the Company to make future commitments to extend to, and in certain cases after, December 31, 1970. This means that the Company will spend no less for promotional allowances in 1970 than in 1969, and perhaps more, and will spend some amount in 1971. Therefore, even if the Company were not to establish programs to replace the promotional allowance program, these expenses should not be deducted from the 1969 test year.

Q. Mr. Gay, will the Company undertake new

page 1734 } programs to replace the promotional allowance program when that program is terminated?

A. Yes. The promotional allowance program was instituted because the Company thought it was the most economical method of promoting the kinds of loads that the Company needed to better balance its summer-winter peak load. Most of the allowances paid under this plan were for water heating and space heating, which are loads that use significant amounts of electricity during off-peak periods. Without this program, we will have to expand other existing programs or develop new ones in order to continue our load balancing efforts effectively.

Robert S. Gay

Q. What are your present plans in this regard?

A. We will replace the allowance program, to the extent possible, by increasing the number of sales personnel and by increasing our advertising program.

Q. Mr. Gay, how many additional sales employees do you propose to add, and what do you estimate to be the cost of adding these additional salesmen?

A. We plan to add 50 salesmen by the end of 1970 or early 1971, whose job will be to promote load balancing sales at a total annual cost of approximately $841,000. We think that this will not be enough salesmen to offset the loss of the allowances. We cannot absorb, however, more

page 1735 } than 50 salesmen into our organization within the next year.

Q. Mr. Gay, why and how does the Company propose to increase its advertising program?

A. Advertising is an essential part of any effective sales program. The Commission's new policy regarding promotional allowances will require more, rather than less, advertising to obtain desirable off-peak loads. We believe that we must at least double our present advertising program, in order to effectively promote these load balancing usages of electricity. In 1969, the Company spent $1,394,583 for advertising, so doubling this amount will mean that $1,394,583 will be added to our advertising program expenses.

Q. Mr. Gay, what is the total cost of increasing your sales force and advertising program as you have described?

A. These increased operating expenses will total $2,235,583.

Q. Mr. Gay, is it your opinion, then, that neither of the items referred to by Mr. Brown should be disallowed for the purpose of this rate case?

A. That is correct. The allowance program has long been considered by the Company to be one of the most effective methods of selectively promoting the use of electricity during off-peak periods, and any method used to re-

page 1736 } place the allowance program will, in my opinion, cost the Company more than the allowance program. Therefore, the expenses referred to by Mr. Brown are continuing expenses and should be included in full in the 1969 test year.

Q. Now, Mr. Gay, let us turn to Mr. Jordan's testimony. On page 1049, Mr. Jordan questions whether the increases to residential customers during the summer months meet the

criteria of rate making with regard to designing rates that are not unduly disruptive of existent patterns of charges. Do you have a comment on this?

A. Mr. Jordan stated on page 1048 that because of the nature of the general service rates, it is difficult to demonstrate the effect of the proposed rates on any customer other than on an annual basis. This same difficulty exists in the residential rates. For example, we have selected a sample of the first meter reading cycle of customers with high usage, mainly space heating customers, who use 19,180 kilowatt-hours annually. We find from this sample that the customers overall receive a 6.6% annual increase. From this group of customers, we also selected those customers who had usage in at least one summer month of 1500 or more kilowatt-hours. There were 59 customers in this subsample and the results show that the average annual use per customer was 28,598 kilowatt-hours and the average annual increase page 1737 } was 7.84%. While it is true that some customers could receive significant increases for some summer months, the overall average annual increase for these customers is much less.

As we have pointed out before, there are some extreme usages that could result in higher increases than the annual average that we have shown in my Exhibit No. RSG 5; however, it is impossible to design any fair rate that would not give some customer with an unusual pattern of usage a higher percentage increase. This is due to the fact that the customer can utilize a service at any time that he so desires in any way that he wishes.

Q. Mr. Gay, do you agree with Mr. Jordan's statement that only a large reduction or increase in the terminal step of residential rate would have significant effect on space heating business? (Testimony page 1953).

A. No. Professor Schotta has testified that the space heating load is quite price elastic. We concluded that he agreed with Mr. Frazier that any change in price would result in an even greater change in demand.

It is true that builders decide upon the type of energy to be used for space *hearing* (Testimony page 1053); however, the customer purchasing a home has choices of homes with different energy sources of heating. The customer or homeowner will take the type of energy used for heating into consideration in determining which house to purchase, and the consumer thus makes the final decision. No

page 1738 } builder or developer will install a type of space heating that keeps him from selling his house. If the terminal rate were lowered to 1% per kilowatt-hour, it would probably make a significant difference in space *hearing* additions. But even if Professor Schotta is right, that a 1¢ terminal step will produce additional revenue, we agree with him that the timing is quite uncertain. The Company will lose a great deal of revenue at once; its increased revenues will come at some undetermined future time. The Company needs additional revenues now; it cannot wait until later.

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page 1741 }

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page 1742 } Q. On page 1061, Mr. Jordan states that he objects to the feature that says the Company will have the option of reading the meters monthly or bimonthly. Do you have any comments on this?

A. I do not understand this objection, because of the fact that the Company has had this option for years, and, to my knowledge, there has been no significant difficulty experienced as a result of this practice. If the Commission wishes to require us to render interim bills to bimonthly customers, we have no objection. In fact, this is what we propose to do.

Q. What is the saving that results from bimonthly meter reading?

A. I have an exhibit on this point.

Mr. Riely: I offer that document in evidence.

Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit RSG-13 and received in evidence.)

By Mr. Riely:

Q. Please discuss this exhibit.

A. This exhibit shows that the total 1969 meter reading cost on Line 1 is $1,497,141. If we are required to read all meters monthly, we estimate our cost as an additional $1,130,000 as shown on Line 2. There were a total

page 1743 } of 985,721 customers, as of December, 1969, as shown on Line 3. The additional cost of reading all meters monthly would be $1.15 per customer per year, or $0.10 per customer per month, based on total customers.

Q. Mr. Gay, on page 1064, Mr. Jordan states that two new problems in the new rates have been introduced that have not previously been considered. Would you please discuss these problems?

A. Mr. Jordan is concerned that bimonthly customers whose meters are regularly read in July and September might not be treated on an equal basis with the bimonthly customers whose meters are normally read in August and October. I have prepared an exhibit entitled, "Comparison of Monthly Kilowatt-hours for Monthly Residential Customers—Four Months Ended September; Four Months Ended October 1968-1969," which shows the difference between the kilowatt-hours that would be used in the two periods.

Mr. Riely: I offer that document in evidence.

Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit RSG-14 and received in evidence.)

Q. Please explain this exhibit.

A. This exhibit shows a tabulation of the kilowatt-hours of monthly billed customers where actual meter readings were taken for each month and combined for the pe-
page 1744 } riod July through October. We did this for the year 1968 and for 1969, as shown on this exhibit. We found that in 1968, the resulting difference based on the June through September period was .18% or less than 2/10 of 1% difference in the kilowatt-hour usage for these two four-month periods. The analysis for 1969 of monthly billed customers for the same months—July through October and June through September—showed that the sum of the kilowatt-hours billed in the June through September period of 4/10 of 1% above the kilowatt-hours that would have been billed July through October.

Q. Mr. Gay, do you have an exhibit that shows the kilowatt-hour as well as the revenue effect of bimonthly meter reading on an annual basis?

A. Yes, I have an exhibit entitled "Comparison of Kilowatt-hours and Revenue for Bimonthly Billing for Customers Whose Meters are Read in Even Months vs. Odd Months."

Mr. Riely: I offer that document in evidence.
Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit RSG-15 and received in evidence.

By Mr. Riely:
Q. Mr. Gay, would you please explain this exhibit?

page 1745 } A. This exhibit is designed to show the annual effect on the revenues paid by customers if their regular bimonthly meter readings occur on odd months and compare this revenue with the revenue that would be obtained from customers who were billed bimonthly and the bimonthly meter readings were on the even months. The data shown are for customers who were actually read on a monthly schedule; therefore, it was possible to obtain a billing for each of these customers if their meters had instead been read on a bimonthly basis either on odd months or on even months. In the lower righthand corner is shown the annual difference between the billing on the two bimonthly bases. This shows that the difference is 2/100 of 1%.

We believe that these statistics support our contention that the proposed method of billing included in the proposed Schedule No. 1 is fair and equitable and is the most economical way to accomplish billing for the seasonal rate.

In the final analysis, this is not unjust discrimination. The small difference is not worth charging all customers an additional million dollars. But the summer differential is vital to the customers as well as to the Company. We would accept monthly meter reading reluctantly, but we must have the summer differential to produce the lowest reasonable rates.

page 1746 } Q. Mr. Gay, also on page 1064, Mr. Jordan states that the second problem presented by the interim bill *proporsal* is the effect on customers billed on a demand charge basis. Would you please discuss this?

A. Mr. Jordan is correct that customers should not be billed on an interim bill basis where demand charges are a part of the rate. The Company bills demand charge customers on the basis of monthly meter readings and will continue to do so.

Q. How many water heaters are now on the Company's system?

Robert S. Gay

A. As of December 31, 1969, there were 274m766 water heating customers on Schedule No. 2; 3128 water heating customers billed on separately metered service under Schedule No. 16; and 58,466 customers billed on Schedule No. 17—Time-Controlled Storage Water Heating and nearly all these customers are residential customers. The total number of water heaters on the system amounted to 336,360 as of December 31, 1969. This shows a 38% saturation of water heating based on total residential customers.

Q. Is the water heating business significantly large?

A. Yes. The average kilowatt-hour use for residential customers without electric water heating for the year 1968 was 5066 kilowatt-hours, and the average use for the residential water heating service alone amounted to in ex-
page 1747 } cess of 4680 kilowatt-hours. In other words, the water heating use alone is equal to approximately 92% of the total use of a customer without water heating. The total kilowatt-hour use for all water heaters is in excess of 1,574,000,000 kilowatt-hours. This is equal to 22.7% of the total kilowatt-hours sold to all residential customers.

This is a highly significant part of the residential business, and water heating, except for space heating, is by far the largest kilowatt-hour use equipment served to the residential customer.

Q. Mr. Gay, do you consider the water heating business to be highly competitive?

A. Yes. Electric water heating competes with gas and oil for this load. The water heating business has been highly competitive and is recognized as highly competitive by a majority of all electric utility companies and commissions in the United States.

Q. How many electric companies now have specific water heating rates?

A. According to the 1969 Edison Electric Institute Rate Book, of the 157 companies listed, 84.1% of the companies have specific lower rates for water heating. This includes companies who served water heating through separately metered, time-controlled rates; separately me-
page 1748 } tered, uncontrolled rates; and through the base use meter as the Company proposes.

Q. Mr. Gay, have you determined from the EEI Rate Book the number of companies that have water heater rate provisions similar to those in the Company's proposed Schedule No. 1?

A. Yes. Upon reviewing the 1959 EEI Rate Book a decade

ago, we found that 43% of the companies at that time had lower water heating rates included in the base meter rate to residential customers. In the 1969 EEI Rate Book, we found that 66% of the companies had rate provisions similar to the water heating provision proposed by the Company. Therefore, it is evident that there has been a widespread adoption by the electric industry, apparently with commission approval, of rates for water heating similar to the provision the Company proposes.

Q. Mr. Gay, do you have any information that relates to the price elasticity of water heating?

A. The Company did not have a water heating provision in its residential rate until 1963. For the five years prior to 1963, the Company added less than 10,000 water heaters per year. Since 1963, we have provided a lower rate for water heaters served through the base meter. In this period, we have averaged approximately 20,000 additional water heaters each year through 1969. This significant improvement in the addition of water heaters indicates
page 1749 } to me that there is significant price elasticity of demand in the water heating business.

Q. Mr. Gay, you have stated that the majority of companies have a lower rate for water heating. Then, do you agree with Mr. Jordan that there has been a trend in recent years to simplification of schedules?

A. I agree with Mr. Jordan that there has been a simplification of residential schedules in general; however, I know of no instance where any company has eliminated lower rate provisions for water heating service.

Q. Mr. Gay, do you agree with Mr. Jordan that there is no reason to have special water heating rates any longer since the institution of these rates was for an introductory period only? (Tr. p. 1067.)

A. I think that a part of the reason for a lower rate for water heating, initially, was as an introductory rate; however, even at the time of introduction, I am sure that the companies asked for these lower rates because they realized the competitiveness of this business. The Company, with the consent of this Commission, has provided a lower rate for water heating for 37 years, based on the basis that this is a highly competitive load, and a lower rate is essential, if this profitable business is to be obtained. We believe this is in the interest of all consumers, that this com-
page 1750 } petitive practice be maintained.

Robert S. Gay

We have tried separately metered rates for water heating and found that this approach was not acceptable to customers because it requires the customer to make significant additional investments for separate entrance cable and fuse boxes. The only other way to offer a competitive but profitable rate is the method adopted by the Company of the insertion of an appropriate water heating provision in the generally applicable residential rate.

Q. Mr. Gay, on page 1066, Mr. Jordan says that there has been considerable difficulty with the application of rates involving water heaters, and he specifically refers to difficulties involving customers who were billed on Schedule No. 1, when they were eligible for Schedule No. 2. Do you have any comments on this?

A. Yes. On December 1, 1962, Schedule No. 2 was made effective, and at that time, the Company had some water heating customers who took water heating service under Schedule No. 1. These customers took service under Schedule No. 1, because, at the time, that the water heater was installed, the Company did not have an uncontrolled water heating rate available, or after Schedule No. 16 became effective, the customer did not wish to make the additional investment necessary to meter his water heating service separately. When Schedule No. 2 was instituted, we knew where all Schedule No. 16 and Schedule No. 17 water heaters were, and we made rate comparisons to demonstrate to these customers whether they would save under the Schedule No. 2 rate or not. Thousands of customers did change at that time. The difficulty was that the Company did not know which Schedule No. 1 customers had electric storage water heating. In view of this, the Company made every effort to locate these customers through newspaper advertising, truck cards, radio, television, and notices mailed with their bills, informing them that they would receive a savings if they would contact the Company and let us know that they had a water heater. Many of these Schedule No. 1 customers did call the Company's office, and they were placed on Schedule No. 2. In some cases, however, the customers did not notify the Company, and, as a result, the Company had no way of knowing that they had electric water heating.

page 1751

Mr. Jordan seems to imply in his testimony that the same situation which occurred in 1962 could happen again, as a result of the water heating provision in proposed Schedule No. 1. We believe that as a result of Mr. Jordan's suggestion

in 1969 that a notice be printed on the bills and the very size of the number of customers responding to these notices, we now have complete and up-to-date information on the location of water heating customers. Therefore, we be-
page 1752 } lieve that the problem that Mr. Jordan discusses is not applicable to this situation at this time.

Q. On page 1067, Mr. Jordan makes a statement that he sees no reason why two customers with equal consumption are charged different rates solely because one customer owns a water heater. What is your comment on this statement?

A. Mr. Jordan states that water heating loads are desirable to electric utilities and can be promoted by the design of a rate schedule to include a block of energy at a reduced rate, where the water heating consumption will normally come. He further states that this is what the Company has done in Schedule No. 1. Mr. Jordan further states that he does not believe that this block of energy should be restricted to customers with water heaters.

The character of use of the customer with water heating is significantly different from the character of use of the customer without water heating. The customer without water heating has an annual load factor of approximately 40% based on the group peak demand, while the corresponding load factor for the residential customer with water heating is 57%. If it were practical to bill residential customers on a demand and energy charge, which is the most exact
page 1753 } method of billing for any service, a Schedule No. 2 customer with water heating would be entitled to a lower rate because of his higher load factor. In addition, the water heating load alone, as I have stated before, is almost equal to the total use of residential customers without water heating. The water heating load factor, based on system peak responsibility, is approximately 76% annually, while the load factor for customers without water heating is only 50.3.% There is a very significant difference between the load characteristics of the water heating and non-water heating customer, and thus, we believe that the only way we can recognize the advantageous characteristics of the water heater is through a provision similar to that included in proposed Schedule No. 1. If Mr. Jordan's suggestion that a water heater differential be allowed to all customers were adopted, the entire economic inducement to install water heaters would be destroyed, and there would be

no justification for allowing the reduced band to non-water heating customers.

Finally, if the Company is to obtain the proposed needed revenue, and we were to do what Mr. Jordan suggests, the revenues would be reduced by approximately $4,370,000. This would mean that other rates would have to be raised to produce the additional $4,370,000, and if some of the increase falls on water heating customers, as it probably

page 1754 } would, we would lose the effect of the promotional rate.

Q. How many customers are on Schedule No. 7—Electric Heating?

A. As of December, 1969, there were 1822 customers.

Q. Mr. Gay, what is the purpose of Schedule No. 7?

A. This schedule is primarily used in conjunction with service to customers now billed on Schedules Nos. 4, 5 and 6, or the small general service schedules. This schedule was adopted by the Company in order to encourage space heating and water heating usage, in balancing the summer and winter peaks. Customers for this service were not being obtained under Schedules Nos. 4, 5 and 6.

Q. Mr. Gay, do you have an exhibit showing how this rate tends to balance the summer and winter loads?

A. Yes, I have an exhibit entitled, "Comparison of Monthly Kilowatt-hour Uses of Small General Service Customers now Billed on Schedules Nos. 4, 5 and 6 vs. Schedule No. 7—Electric Heating."

Mr. Riely: I offer that document in evidence.

Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit RSG-16 and received in evidence.)

By Mr. Riely:

Q. Mr. Gay, will you please explain this exhibit?

A. This chart shows the percent of total annual kilowatt-hours used in each month by the Schedule No. 7 customers, compared with the monthly kilowatt-hours used

page 1755 } by customers now billed on Schedules Nos. 4, 5 and 6. It is obvious from this chart that Schedule No. 7 makes a significant contribution to the balancing of the system summer and winter peaks in that its kilowatt-hour usage is the highest in the winter or base period. The highest monthly usage is in January and amounts to 15.25%

of the total annual use, while the highest kilowatt-hours used in a summer month is only 6.44% of the total annual use. This means that the winter peak month's kilowatt-hour usage is 2.4 times the peak month's kilowatt-hour usage in the highest summer month. This compares with the winter peak month's kilowatt-hour use by customers on present Schedules Nos. 4, 5 and 6 customers of 7.78% of the total annual kilowatt-hours and the highest summer peak month's use of 10.54% of the annual kilowatt-hours used.

In summary, while the peak base period or winter month's kilowatt-hour usage for Schedule No. 7 customers is 2.4 times as great as the peak summer month's usage, the peak winter month for small general service customers in only 7/10 of the peak summer month's usage. This shows that the Schedule No. 7 customer makes a significant contribution to the balancing of the summer and winter peaks and to the improvement in the utilization of the Company's investment to a fuller extent to benefit all customers.

page 1756 } Q. Mr. Jordan states, on page 1069, that the obvious intent of this Schedule No. 7 is to give a special rate during summer months to the water heating customers, but there is no limit on the number of kilowatt-hours billed at the lower rate. Do you have any comment on this?

A. It is obvious from Exhibit No. RSG-16, just discussed, that this is not the case in actual application. I have an exhibit that shows the percentage of the average kilowatt-hours used on a monthly basis for water heating as compared with the total average monthly use per customer for the total use of the Schedule No. 7 customers.

Mr. Riely: I offer that document in evidence.
Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit RSG-17 and received in evidence.)

Q. Will you please explain this exhibit?

A. This tabulation shows the average monthly use for Schedule No. 7 customers and, in addition, shows the average monthly use of those customers with only water heating. The fifth column of figures shows the percent of total use that is attributable to water heating. It will be noted that during the summer months, the water heating use was

page 1757 } about 44% of the total use. In view of this, we believe the 50-50 split of kilowatt-hours used for the design of the summer portion of Schedule No. 7 is reasonable. It is also obvious from these two charts that the loads balancing effect of Schedule No. 7 is performing its desired function of increasing the usage in the base or winter period months.

We believe that if it were not for Schedule No. 7, we would not obtain this desirable load.

* * * * *

page 1797 } WALLACE W. CARPENTER called as a witness in rebuttal on behalf of the Petitioner, being first duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Riely:

Q. Mr. Carpenter, will you state your name, please?

A. I am Wallace W. Carpenter.

Q. Where do you live?

A. I reside in Old Greenwich, Connecticut.

Q. Have you prepared testimony in this case in some several parts, first consisting of 23 pages and additional testimony consisting of six pages and further testimony consisting of four pages and three exhibits, WWC-1, WWC-2 and WWC-3?

A. I have, sir.

Q. If I were to ask you the questions shown on those pages you would give me the answers shown there?

A. I would.

Mr. Riely: May it please the Commission, Mr. Carpenter's testimony relates to allocation. The original testimony is a discussion of Mr. Van Scoyoc's allocation methods in which Mr. Carpenter states his disagreement and shows certain adjustments that he thinks are proper and that with those adjustments, Mr. Van Scoyoc's results would be subject to change. The second section relates to testimony page 1798 } given by Mr. Lim.

With that brief summary I tender Mr. Carpenter for cross-examination and ask that his exhibits WWC-1, 2 and -3 be received.

Chairman Hooker: They will be received.

(The documents referred to, marked WWC-1, WWC-2 and WWC-3, were received into evidence.)

Mr. Parker: I have an objection, Mr. Chairman, if I might be heard. The third item referred to by Mr. Riely entitled Further Rebuttal Testimony of W. W. Carpenter was something which was delivered to us this morning and which is in answer, apparently, to Mr. Lim's additional testimony yesterday afternoon in connection with the additional rebuttal testimony by W. W. Carpenter.

Yesterday Mr. Gibson stated—we were talking about saving time—that you will never save time by admitting uninformative and confusing material.

Mr. Gibson: I can hardly be cited as a precedent.

Mr. Parker: I believe that in the absence of Mr. Lim, who has departed the scene with the understanding that his services were no longer needed, that this so-called further rebuttal testimony of W. W. Carpenter, to which we will not have an opportunity to respond, should not be

page 1799 } admitted.

I believe from reading it—and I am sure the Commission would agree with this—that its purpose is only to confuse the issue.

Mr. Riely: If that is the purpose, to confuse the issue, it is the first time that I, working with a witness, have ever attempted to confuse this Commission. It may be that Mr. Lim was excused yesterday with the understanding that he didn't have to come back, but that was certainly not my understanding. Mr. Lim got on the stand yesterday and testified in testimony that was not available in advance, of which no one that I know of ever saw a copy, and he testified in a very critical manner of Mr. Carpenter's study.

This testimony could not have been prepared before last night because obviously we did not know what Mr. Lim was going to say. It is very brief; it is to the point, and it is designed to rebut what Mr. Lim said. I suggest that any rule of evidence it is admissible.

Chairman Hooker: The objection is overruled. Go ahead.

page 1800 } W. W. CARPENTER being called as a witness on behalf of Applicant Virginia Electric and Power Company, being first duly sworn, testified as follows:

Wallace W. Carpenter

DIRECT EXAMINATION

By Mr. Riely:

Q. Please state your name and residence.

A. My name is Wallace W. Carpenter and I live in Old Greenwich, Connecticut.

Q. What is your occupation, Mr. Carpenter?

A. I am Director of Utility Rate Services for Ebasco Services Incorporated, 2 Rector Street, New York City.

Q. What has been your education and business experience?

A. I was graduated from Carnegie Institute of Technology with the Degree of Bachelor of Science in Electrical Engineering in 1943. From 1944 to 1946 I was on active duty as an officer in the United States Naval Reserve. I received my Master's Degree in Electrical Engineering from Carnegie Institute of Technology in 1947. From 1947 to 1949 I was employed by the Cleveland Electric Illuminating Company as a Senior Engineer in the Technical Studies Division of the Rate Department engaged on system load and cost studies for presentation in rate cases.

Since 1949, I have been with Ebasco Services
page 1801 } Incorporated, successively as Consultant, Senior
Consultant, Chief Rate Consultant, and Director of Utility Rate Services. In the course of my work with Ebasco, I have been engaged, among other things, in analysis of revenue requirements and complete rate structure design and in preparation of the presentation of such material before regulatory commissions for seven electric systems in various parts of the United States; in major rate structure analyses for fifteen electric systems in the United States and one foreign electric system; in specific design for competitive service rates for six electric systems in the United States; in cost of service analyses for negotiation of retail customer contracts for three electric systems in the United States; in cost of service analyses for wholesale customer contracts for six utility systems in the United States; and in market survey, revenue requirements and rate design for natural gas pipeline extensions for two gas pipeline utilities in the United States.

I may add that Ebasco Services Incorporated has been in the business of providing electric and gas utilities with financial and rate services for more than sixty years.

Q. Are you a member of any industry committees?

A. Yes. I am a member and have followed the activities of the Rate Research Committee of the Edison

page 1802 } Electric Institute for a number of years. I am an advisory member of the Load Research Committee of the Association of Edison Illuminating Companies.

Q. What appearances have you made before regulatory commissions in which allocation of cost of service was at issue?

A. I have appeared as a witness for Bangor Hydro-Electric Company before the Maine Public Utilities Commission in 1969; for Niagara Mohawk Power Corporation before the New York Public Service Commission in a 1968 electric rate case; for the Public Utilities Board of Manitoba in a 1969 hearing on the rates of Manitoba Hydro; and for the Nantahala Power & Light Company before the North Carolina Public Utilities Commission in 1962.

Q. What has been your participation in the work that Ebasco has performed for Vepco?

A. Since 1967, when I became Director of the department, all of the rate studies, including the load research based on customer sampling, rate design and a series of cost analyses, have been under my general supervision. I have the responsibility for the methodology used in Vepco's continuing cost studies.

Q. Mr. Carpenter, what is the purpose of your appearance before the Commission in this case?

page 1803 } A. Mr. Van Scoyoc presented to the Commission an allocation of rate base and operating expenses to the Virginia jurisdictional service that was quite at variance from the Ebasco allocation presented to the Commission by Mr. Sharkey on behalf of the Company. I think that Mr. Van Scoyoc's allocation is incorrect. The purpose of my appearance before the Commission is to show the Commission why the allocation that we prepared, although subject to one error of significance, is reasonable in all the circumstances, and why that presented to the Commission by Mr. Van Scoyoc is not reasonable.

Q. What areas, Mr. Carpenter, will your testimony cover?

A. My testimony will consider first the conceptual differences in the methods of allocation of power supply and distribution plant that have arisen between Mr. Van Scoyoc and Ebasco. I shall then examine the reasonableness of the allocation of distribution plant made by Mr. Van Scoyoc and by us. I shall test the reasonableness against a detailed 1969 study of the entire distribution plant and expenses that has been made by us since the testimony was originally filed in

this case. I shall also mention the error made by Mr. Van Scoyoc in the allocation of Federal income taxes.

Q. Mr. Carpenter, what do you mean when you say "a detailed 1969 study"? I thought that Ebasco had
page 1804 } made a 1969 study to be filed with the original testimony in this case.

A. We have made a complete detailed analysis of distribution plant for 1969 to test the results that were obtained in the allocation study introduced by Mr. Sharkey. The study introduced by Mr. Sharkey was a projection or updating of a detailed study for 1968. The 1969 Company figures were not available until the middle of February. The testimony was filed on March 9. The intervening time was not long enough to permit us to prepare a detailed study. In anticipation of this *prolem,* we devised a method that would produce a proper result in this limited period of time.

Q. Did the detailed 1969 study that you have made confirm the results of the study introduced by Mr. Sharkey?

A. With the exception of one item, yes. That one item is the treatment of street lighting plant which we had in part improperly allocated to Virginia jurisdictional service. I say it was improperly allocated only in part because a portion of that plant represents outdoor lighting service, which is furnished under outdoor lighting rate Schedules Nos. 24, 25 and 26, subject to the jurisdiction of this Commission. Our 1969 detailed study has properly allocated this portion of street lighting service to the Virginia jurisdis-
page 1805 } tional classification and the remainder to the appropriate non-jurisdictional classifications.

Q. How did the result of your 1969 detailed study compare with that introduced by Mr. Sharkey?

A. It confirmed the allocation of distribution plant in Mr. Sharkey's study, with the exception of street lighting. When street lighting is excluded from both studies, the difference in distribution plant allocated to the Virginia jurisdictional classification is 0.7%, and the difference in total rate base so allocated is only 0.3%.

Q. You have stated that you have the responsibility for the methodology used in Vepco's continuing cost studies. Please describe these cost studies.

A. They were: Analysis of Electric Operations among service classifications for the calendar years 1966 and 1968; cost separations according to FPC standards for resale service for the calendar years 1966 and 1967; separations by states and jurisdictional and non-jurisdictional service classi-

fications for the calendar year 1968 and on a projected basis for the calendar year 1969. I assumed joint supervision of that 1969 study with Mr. Sharkey. The latest study is that detailed analysis of the use of distribution plant in Virginia by jurisdictional and non-jurisdictional classes to which I just referred.

page 1806 } Q. What demand allocation methods applicable to Vepco's power supply system have been used in Ebasco's various studies?

A. With respect to demand-related costs of power supply, the methods of allocation have been coincident peak responsibility, non-coincident peak responsibility, and average and excess demand. We have found no significant difference in result as to Virginia jurisdictional service between these methods applied to the Vepco system, at the power supply level.

Q. Mr. Carpenter, I note the three methods that you have used do not include the Atlantic Seaboard 50-50 formula, that Mr. Van Scoyoc used. Why did you not use this method?

A. Ebasco has never considered the Atlantic Seaboard formula appropriate for allocation of demand-related costs for an electric utility, whether in a proceeding like this, where cost responsibility among jurisdictions is to be determined, or as a test of reasonableness of the level of rates.

I do not agree with Mr. Van Scoyoc that the basic principles of cost allocation are equally applicable to electric utilities and to natural gas pipelines (Tr. 1155). There are basic regulatory differences between natural gas pipeline companies and electric companies that are essential to recognize at the power supply level.

page 1807 } Q. What are they?

A. My reasons are well stated in a quotation from the opinion of the Maine Public Service Commission, in the case of *I.M.C. Chlor-Alkali, Inc.* v. *Bangor Hydro-Electric Company,* in which I testified. In that case, the Maine Commission said, and I quote:

"We are not convinced that a pricing formula adopted for the natural gas pipeline industry is appropriate for our present purpose of making allocations of cost of Bangor Hydro, an electric utility. There are many pertinent differences between the two industries; differences in ability to store the utility product; differences in their duty to serve; differences in scope of the jurisdiction of the regulatory agencies involved; *et cetera.*"

Wallace W. Carpenter

Q. The Maine Commission referred to the formula as a pricing formula. Does that categorization affect your conclusion?

A. The Atlantic Seaboard formula was developed by the FPC Staff for pricing non-jurisdictional direct interruptible gas sales of pipeline companies. As Mr. Van Scoyoc testified (Tr. 1150), what he was requested to do was to find costs properly applicable to jurisdictional and non-
page 1808 } jurisdictional service. The Atlantic Seaboard formula relates to pricing. It is neither generally recognized nor applied in electric utility cases at the state or Federal level.

In this case, the application of the Atlantic Seaboard formula to the power supply system of Virginia Electric and Power Company results in a larger Virginia jurisdictional rate base when compared with the coincident peak method. However, I believe its application was in error, and that the coincident peak method is the most appropriate method for determining cost responsibility in allocating the power supply system of Vepco, whose principal problem is achieving greater utilization of the facilities required to serve peak power demands.

Q. Turning to distribution plant, Mr. Carpenter, will you explain how you go about its allocation?

A. The function of distribution plant is to deliver electricity from the power supply to all of the Company's customers. The design of that system necessarily must recognize two *dactors:* the location of all those customers, and the amount of those customers' loads, which is demand.

It takes a certain amount of distribution plant investment to reach each customer without regard to the use that cus-
tomer makes of electric service; that is what I
page 1809 } call the customer component of distribution plant.

The rest of the distribution investment is the additional plant investment to provide for the maximum demand of each customer; that is what I call the demand component of distribution plant.

Q. Did the approach taken in this area by Mr. Van Scoyoc differ from that adopted by Ebasco?

A. Yes. Mr. Van Scoyoc's methodology differed from that used by Ebasco in four important particulars: First, he excluded from the customer component of distribution plant everything except services, meters and street lighting and traffic signals; secondly, he recognized no distinction between

the primary and secondary functions of his remainder of distribution plant; thirdly, he used the average and excess demand allocation method to allocate his remaining component of distribution plant, while we used the non-coincident peak method; and finally, different treatment was accorded to street lighting by each of us.

Q. What was the aggregate of these differences?

A. As a result of these differences, Mr. Van Scoyoc's study allocated nearly $40,000,000 less of net distribution plant to the Virginia jurisdictional classification than we did.

Q. Mr. Carpenter, please discuss the first of
page 1810 } the differences that you mentioned—the exclusion from the customer component of everything except services, meters and street lighting and traffic signals.

A. I believe that the best way to explain this critical difference in methodology is first to explain in general terms, what Ebasco did, then to show why Mr. Van Scoyoc's method is not as satisfactory; and, finally, to give some detailed justification of the Ebasco method with citations of authorities.

Q. Please do so.

A. We use a method of allocation that is based on what is sometimes termed the "skeleton system." By this method, we assign to the customer component of distribution plant the minimum facilities necessary to bring electricity to all the customers. The book cost of the distribution system in excess of the cost of this skeleton system is considered to be demand related.

Q. Do you have an exhibit which portrays this method of determining the customer demand related items of distribution costs?

A. Yes.

Mr. Riely: I offer that document in evidence.

Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit WWC-1 and received in evidence.)

page 1811 } By Mr. Riely:

Q. Would you briefly describe this exhibit?

A. This exhibit demonstrates the dollar effect of the application of the skeleton system principle. The diagram on the left shows a typical configuration of a distribution branch. Deliveries are made at transmission voltage to the distribu-

tion substation. From the distribution substation, deliveries are made to line transformers from primary lines at primary voltage. As shown, certain customers take service at primary voltage. From secondary lines emanating from line transformers at secondary voltage, attachments are made to customer service wires to deliver electricity to the customer. This exhibit is based on our 1969 detailed study of system totals.

The column headed "customer" shows the amount and percent of total plant investment in primary lines, line transformers, secondary lines and services assigned to the customer component by application of the skeleton system principle. The demand component is the difference between the customer component and the total.

This sheet shows that 45.31% of distribution plant is properly allocable on the basis of the customer component.

Q. How did Mr. Van Scoyoc's treatment of the
page 1812 } customer-related component differ from yours?

A. As I stated, Mr. Van Scoyoc assigned to the customer component only service wires, meters, street lighting and traffic signals. The exclusion of all primary and secondary distribution lines, that is poles, conductors and line transformers, from the customer component is a critical difference. We believe this exclusion is improper because it is obvious that the length of distribution lines, the number of poles and the number of customers per transformer are factors that control distribution investment, and are related not to demand but to the number of customers and their location. This is the reason that we include the skeleton system in the customer component of distribution plant, and we consider that the exclusion of such facilities from the customer component creates substantial inaccuracies in the distribution plant allocation among jurisdictions.

Q. Does the Ebasco method reflect differences in customer density in the customer component?

A. Yes, but only in part. This factor is recognized only in the separation among the three states. Within Virginia, the skeleton portion of primary and secondary lines and line transformers, that we have identified as the customer com-
ponent, is allocated among service classifications
page 1813 } on the basis of number of customers. This as-
signs the same amount of distribution lines and line transformers to each customer in each service classification in Virginia. This average distribution plant per customer recognizes average customer location density and is the cornerstone of postage stamp or systemwide rate making.

It is important to distinguish between customer location density and customer load density. The skeleton method that I have used recognizes only average location density in the customer component; load density is recognized in the demand component.

Mr. Van Scoyoc's exclusion of all primary and secondary lines and line transformers from the customer component ignores average location density and thereby eliminates any recognition of the basic costs incurred to provide service to each customer. Instead, he has allocated $134 million of these customer-related costs on an average and excess demand allocation factor, which means that larger customers are assigned much more than their fair share of the total cost of reaching all customers. Since the non-jurisdictional customers are, on the whole, much larger than jurisdictional customers, Mr. Van Scoyoc's method has allocated $18 million more to them than their fair share.

Q. What authority exists for the use of the
page 1814 } skeleton method?

A. While this skeleton method, to my knowledge, has not been an issue in rate litigation, there has been comment on it in authoritative publications.

L. R. Nash's classical volume, "Public Utility Rate Structures," published in 1933, states clearly that the investment in both distribution lines and transformers is affected both by customer demands and number of customers.

The volume entitled, "Gas Rate Fundamentals," published by the American Gas Association in 1960, has a chapter on Cost of Service Studies. A section of this chapter, shown on page 133 is designated "Customer Component of Cost," a portion of which reads:

"Customer costs are directly related to the number of customers served. The closer the origin of a cost is to the customer's premises the more pronounced is the customer element. Moving away from the customer and toward the source of supply or production plant the customer component of cost diminishes until it is considered to be insignificant beyond the distribution mains level. The major portion of meter investment and expense is a customer component. The same is true of service pipes, house regulators and perhaps a portion of the district regulators.

page 1815 } "Any distribution facilities not directly assignable but containing both customer and de-

mand components must be allocated in one of two ways. The customer component may be determined by establishing a minimum size of 'skeleton' system adequate to supply a usable pressure to the customers with the balance of the investment and attendant expense considered to be related to demand. Each is then apportioned according to its corresponding factors. Alternatively, the distribution facilities as a whole may be allocated to classes without segregation into customer and capacity components on the basis of a weighting by customer characteristics with the assumption that customer size takes care of the demand relationship."

Unlike natural gas pipelines, gas distribution systems are sufficiently similar to electric companies to make these distribution system allocation principles applicable.

The Cost Allocation Committee of the Engineering Committee of National Association of Railroad and Utilities Commissioners issued a report in 1955 entitled, "Comparison of Methods of Allocating Demand Costs (Electric Utilities)." This report contains a paper entitled, "Allocation of Costs of Electric Service to Various Classes of Cus-
page 1816 } tomers."

This paper among other things deals with the determination of the capital costs of the customer-related components of electric utility distribution systems. This paper states in part:

"The cost of electric service may be apportioned between three elements, all of which are approximately measurable. These elements are namely, consumer cost, demand cost, and energy cost.

"The consumer cost is made up of such costs as vary approximately with the number of consumers or some weighting of the number of consumers. An example of consumer cost would be the interest, depreciation, taxes and operating of that part of the distribution systems which would be needed in a theoretical system designed only to deliver the proper potential to the customer's meter under no load conditions. Consumer cost also includes such costs as the reading of meters, keeping records, billing, meter testing and other costs of a similar nature."

Q. In the cross-examination of Mr. Sharkey, questions were raised as to the propriety of some of the components of your skeleton system. Are these criticisms justified?

Wallace W. Carpenter

A. No. No. 2 aluminum wire is the standard,
page 1817 } justified by its mechanical strength. It makes no difference whether the 10 KVA transformer is proper or not; the actual cost per transformer of 10 KVA or less capacity on Vepco's system is $216. In our 1968 study, we used a transformer cost of $195.70; therefore, our allocation of cost to the skeleton system is, if anything, understated. 1/0 aluminum with cross-link polyethylene insulation for underground primary and 4/0 for underground secondary and service laterals are the smallest actually used for direct burial because of the high expense of replacement.

Q. Now, let's turn to Mr. Van Scoyoc's failure to recognize the difference in use of the primary and secondary distribution systems. What was the effect of his failure to make a proper distinction between *seconday* distribution plant and primary distribution plant in his allocation of distribution plant?

A. One effect of this, as was shown on cross-examination (Tr. 1223), was to allocate to non-jurisdictional customers, such as resale and military service customers, $17.5 million of secondary distribution plant, even though it was admitted that these customers owned their own secondary distribution system and, therefore, very little of Vepco's secondary distribution plant was used to serve them.

page 1818 } Q. Can this possibly be a proper allocation?

A. No. 649,928 kilowatts of non-coincident demand is placed on the primary distribution system by military and resale customers. Of this, only 3,980 kilowatts of demand is imposed at the secondary level, that is, is supplied through secondary lines and line transformers. It is obvious that the secondary distribution plant necessary to supply this small demand cannot in any way have an original cost of as much as $17.5 million.

Q. Mr. Carpenter, have you made any other studies that confirm your conclusion that Mr. Van Scoyoc's allocation of distribution plant to resale customers is unreasonable?

A. Yes. In 1967, the Company, with our assistance, presented to the Federal Power Commission a detailed study of its plant that is properly allocable to service subject to the jurisdiction of the Federal Power Commission. This study was not in any respect a theoretical study; it was a study made by measuring the wires and counting the poles. It was a physical inventory of the property used for that service. That study shows that 1.59% of Vepco's distribution plant

was properly allocable to the FPC service. Mr. Van Scoyoc, on Schedule 3 of his Exhibit MVS-1 allocates 4.6% of all net utility distribution plant to the resale category in Virginia and North Carolina. This is much more than

page 1819 } twice as much as was allocated in the 1967 detailed inventory. This supports my conclusion that Mr. Van Scoyoc's allocation of distribution plant among jurisdictional classifications is not reasonable.

Q. But did not Mr. Van Scoyoc indicate (Tr. 1223) that Mr. Sharkey likewise had failed to make the distinction between the primary and secondary systems?

A. He so indicated, but this was not correct. Mr. Sharkey used two overall allocation factors that were developed from twenty individual allocation factors in his 1968 detailed study. These two overall allocation factors reflected the appropriate separation of secondary and primary distribution plant. Mr. Van Scoyoc, however, developed a different set of allocation factors by use of the average and excess method, and these factors did not reflect this important distinction.

Q. Concerning Mr. Van Scoyoc's use of the average and excess method of allocating distribution plant, why do you believe this to be improper?

A. The fundamental defect in the use of the average and excess method to allocate the demand component of Vepco's distribution system is substantially the same as the fundamental defect previously discussed in regard to the 50-50 method of allocation of power supply plant.

The problem here is to allocate essentially

page 1820 } fixed costs—costs that are determined by the size of the facilities required to serve the customers' demands. These are demand-related costs, but the average and excess method allocates these fixed costs to a substantial extent on the basis of the energy variable which does not control the size of the facilities required. One effect of this, as pointed out on cross-examination of Mr. Van Scoyoc, is that the customers and classes of customers that help improve Vepco's deteriorating load factor by the addition of winter load will be penalized, while those customers who contribute to the deterioration by the addition of relatively low load factor summer load will be benefited. It seems to us that this result is inconsistent with the position taken in this case, both by the applicant and by the staff, as to cost responsibility.

Q. But is it not true that Ebasco uses the average and excess method?

Wallace W. Carpenter

A. To my knowledge, Ebasco has never applied the average and excess demand allocation method to distribution plant. Ebasco has applied this method to the allocation of power supply plant. We did that in the 1954 study prepared for this Commission. As Mr. Sharkey pointed out in his cross-examination, we, in fact, allocated power supply plant by three different methods in the 1954 study and the results were substantially identical. For simplicity, we
page 1821 } showed the average and excess method used in the final report. The average and excess method is not appropriate in a system where the peak load is seasonally stable and the critical need of the system is to provide better utilization of the power supply facilities required to meet the rapidly growing peak load. For the same reason, in my opinion, the use of non-coincident peak demand is the proper method for the allocation of the demand component of distribution plant. The average and excess method is not the proper method to use because it recognizes kilowatt-hours in the allocation of fixed costs.

Q. What are the differences between the Ebasco study and Mr. Van Scoyoc's study, with respect to the treatment of street lighting?

A. As was developed on cross-examination, in the study presented by Mr. Sharkey, street lighting was erroneously allocated. The allocation of this plant was not erroneous in its entirety, however, because there is in the street lighting category all of the plant used to furnish service to outdoor lighting customers that are served under the jurisdiction of this Commission. Thus, while the updating of the 1968 detailed study erred in allocating more than the outdoor lighting plant to the Virginia jurisdictional customers, Mr. Van Scoyoc erred in not allocating the outdoor light-
page 1822 } ing plant to the Virginia jurisdictional customers. He did, however, allocate the revenues from this outdoor lighting service to the Virginia jurisdictional classification with the result that there is a distortion in his study. In his study, he assigned revenues to the Virginia jurisdictional classification that were produced by plant that was assigned entirely to non-jurisdictional customers, and this has the effect of increasing apparent jurisdictional rate-of-return. Of the $17,519,523 included in the Virginia portion of the street lighting plant account, there is $4,434,326 of plant devoted to jurisdictional outdoor lighting service. Thus, Mr. Van Scoyoc's allocation understated Virginia jurisdictional rate base in the amount of $3,787,000.

Wallace W. Carpenter

Q. Have you prepared an exhibit that shows the effect of Mr. Van Scoyoc's errors in allocation of distribution plant?
A. Yes, I have.

Mr. Riely: I offer that document in evidence.
Chairman Hooker: It will be received.

(The document referred to was marked for identification Exhibit WWC-2 and received in evidence.)

By Mr. Riely:
Q. What does this exhibit show?
A. This exhibit relates only to the Virginia jurisdictional service. It shows, in Column 2, Mr. Van Scoyoc's
page 1823 } allocation of net distribution of net distribution plant and related expenses as a component of his total rate base and expense.

In Column 3, I have eliminated Mr. Van Scoyoc's reduction of Federal income taxes allocable to the Virginia jurisdictional service. I make the suggestion because I do not consider that Mr. Van Scoyoc's adjustment for negative income taxes is proper, and because my remaining adjustments will eliminate any negative income tax in the non-jurisdictional classification of the business, as shown by the note and the figures just above it.

In Column 4, is shown the adjustment required because of the failure of Mr. Van Scoyoc to classify distribution plant properly in respect of its customer component. This results in the increase of total rate base by $18,290,000 and the increase of total operating expenses *fy* $1,301,954.

In Column 5, I have shown the adjustment that is required because of the failure of Mr. Van Scoyoc properly to take into account the usage of secondary distribution plant as distinguished from the usage of primary distribution plant. This results in the increase of total rate base by $8,092,000 and the increase in total operating expenses by $576,023.

In Column 6, I have shown the adjustment
page 1824 } required because of Mr. Van Scoyoc's failure to take into account the outdoor lighting that is provided under Schedules 24, 25 and 26. This results in the increase of total rate base in the amount of $3,787,000 and the increase of total operating expenses in the amount of $339,523.

Column 7 shows the result of adjustments made in Mr. Van Scoyoc's allocation study in Columns 3, 4, 5 and 6. It

shows that, when all these adjustments are made, the experienced rate of return on Virginia jurisdictional business as determined by Mr. Van Scoyoc is reduced to 7.52% during the test year.

Mr. Van Scoyoc started with Mr. Brown's Exhibit JHB-1 and, on his Exhibit MVS-4, he shows the effect in his results of the adjustments made by Mr. Brown to the system figures shown by Mr. Clement, which were the starting point for our study. These adjustments made by Mr. Brown are shown in Column 8 of Exhibit WWC-2, and the figures there are taken exactly from Exhibit MVS-4. The effect of eliminating Mr. Brown's adjustments is shown in Column 9 where it will be seen that, on the basis of Mr. Van Scoyoc's allocation study, as properly adjusted, the experienced rate of return during the test year on Virginia jurisdictional business is further reduced to 6.88%.

page 1825 } Q. Mr. Carpenter, what is shown in the last three columns to the right on Exhibit WWC-2?

A. In Column 10 is shown the results of Mr. Sharkey's study as shown by Mr. Van Scoyoc on Exhibits MVS 2 and 4. The total rate base and net operating income shown on Exhibits MVS 2 and 4 and in Column 10 conform to the figures shown by Mr. Sharkey in his Exhibit No. TLS-1. In Column 11, we have made the necessary adjustment to eliminate the portion of the street lighting account which is properly assignable to the state, county and municipal category. The effect of this elimination is shown in Column 12. It will be seen from Column 12 that Mr. Sharkey's study, when adjusted for this street lighting assignment, produces a rate of return of 6.98% on Virginia jurisdictional business for the test year 1969.

The interesting thing to me about this exhibit is that, when Mr. Van Scoyoc's allocation study is properly adjusted for his four conceptual errors and for Mr. Brown's adjustments, his rate of return for the test year on Virginia jurisdictional business is lower than the rate of return shown for Mr. Sharkey's study after its street lighting adjustment.

Q. Mr. Carpenter, you stated that you did not consider Mr. Van Scoyoc's adjustment for negative income taxes to be proper. Would you please elaborate?

page 1826 } A. In his testimony, Mr. Van Scoyoc stated that the state, county and municipal, military service and resale categories all showed negative taxable income. He then stated and I quote, "The resulting negative income tax amount needs to be reduced to a zero basis."

(Tr. 1180) He did this by redistributing the negative income taxes to reduce the amount of income taxes chargeable against those classifications that produce positive taxable income. This redistribution resulted in the reduction of the income taxes he computed for the Virginia jurisdictional retail sales by the amount of $1,597,560.

There is no justification at all for this redistribution of Federal income taxes. As was pointed out in Mr. Van Scoyoc's cross-examination, an unusual phenomenon results from his method of redistribution of Federal income taxes. If the Company were to obtain an increase in its rates for resale service, the amount of income taxes allocable to the Virginia retail business would be increased and the Virginia retail rate of return would decline. Under Mr. Van Scoyoc's approach, any change in the revenue received for any non-jurisdictional service will result in a change in the cost allocated to the Virginia jurisdictional classification. This makes no sense to me. It is, I think, a fundamental concept that revenue is not used in the determination of cost, and cost is what Mr. Van Scoyoc set out to determine. It seems to me improper to make the experienced rate of return

page 1827 } of one classification depend on the experienced rate of return of another classification, and that is what his redistribution of Federal income taxes accomplishes. In my view, each classification should stand on its own feet.

Q. Has the Federal Power Commission recently taken action to indicate the desirability of recording negative income tax in the accounts of electric utilities?

A. Yes. On October 9, 1969, in its Order No. 389, the Federal Power Commission made extensive revisions to the uniform system of accounts for electric companies—revisions of which Mr. Van Scoyoc testified that he was not aware (Tr. 1202). In Account 409, the Commission required income taxes to be recorded as a positive or negative amount as the case may be. For example, in the Account 409.1, Income taxes, utility operating income, the instructions are as follows:

This account shall include the amount of those state and federal income taxes reflected in account 409, Income Taxes which relate to utility operating income. This account shall be maintained so as to allow ready identification of tax effects (both positive and negative) relating to Utility Operating Income (by departments), Utility Plant

page 1828 } leased to Others and Other Utility Operating Income.

It will be seen from this determination by the Federal Power Commission that it now requires that income taxes be recorded in a negative manner if they are in fact a negative figure.

Q. What conclusion do you draw from your review of Mr. Van Scoyoc's testimony and exhibits?

A. It would be idle for me to say that the Ebasco statement is right in every figure, because an allocation study is not, by its very nature, susceptible of proof to the penny. At the beginning of my review, I said I would consider whether the original Ebasco study presented by Mr. Sharkey was reasonable in the light of all the circumstances. To this end, I have performed a detailed study of the proper allocation of distribution plant using 1969 data. I did this because the distribution allocation represents by far the greater portion of the difference between Mr. Sharkey's study and that of Mr. Van Scoyoc. From this and from Exhibit WWC-2, I conclude that Mr. Sharkey's allocations are reasonable and that all of the available evidence shows to me that their results, with the sole exception of street lighting, are amply supported by the available data. My next concern was whether, in my opinion, the results reached by Mr. Van Scoyoc were likewise reasonable. I conclude page 1829 } that, for all the reasons that I have given in my testimony, the differing results reached by Mr. Van Scoyoc are not reasonable. Accordingly, in my opinion, the Commission, for the reasons that I have stated, cannot reasonably rely on Mr. Van Scoyoc's results.

* * * * *

page 1857 } AFTERNOON SESSION

WALLACE W. CARPENTER, called as a witness on behalf of the Applicant, after having been first previously duly sworn, resumed the stand and was examined and testified further as follows:

CROSS-EXAMINATION

By Mr. Rogers:

* * * * *

Wallace W. Carpenter

page 1877 }

* * * * *

Q. In your further rebuttal testimony at the bottom of page 1 you state that the average and excess method, like the skeleton system method used by Ebasco, involves two steps. The first step in each case is a theoretical separation of a portion of the distribution system.

Are you contending that the skeleton system approach is an integral and necessary prerequisite to the use of the average and excess method of allocating demand costs?

A. No, sir. I have obviously failed to get my story across to you.

page 1878 } What I am saying is that my method requires an initial separation of the dollar investment in the distribution system into two parts. I have a customer-related number of dollars and a demand-related number of dollars. To accomplish that I have used the skeleton system method, and I am drawing the simile that the same kind of theoretical, hypothetical, unsound, adjectives that can be slung at the skeleton method, can be equally slung at the average and excess method which requires in its two-step determination a very comparable separation.

The dollars of distribution plant by the application of the average and excess method are broken into two pots. The first pot is the amount of distribution plant that would be required as an absolute minimum if all the customers on VEPCO's system took all of their annual energy requirements at 100 percent load factor. That establishes an absolute minimum amount of distribution plant.

What we have left above that, the remainder, the excess, is the amount of distribution plant capacity that is caused because the customers don't take service at 100 percent load factor, and the average and excess method simply distributes that excess capacity among the excess demands of those jurisdictional classes, or the classes, jurisdictional and non-jurisdictional.

That is the average and excess method.

page 1879 } What I am simply trying to point out is that it is a theory also.

When Mr. Green developed it, Mr. Green was interested in developing the cost of service for railroads. His was a power supply consideration, and his thought process said, "If all the customers on Iowa System took service at 100 percent

load factor, I could get by with a very much smaller generator."

Q. You thought the average and excess method was a very good theory in the Bangor situation.

A. I think it is a great theory for power supply, and I have so testified, and I have very grave reservations about the application of it to the distribution system, particularly with the mixture of demands on primary and secondary system. I think to properly apply the average and excess or any other demand allocation method on VEPCO's system I would have to do it in at least two pieces. I would have to recognize the fact that there are 650,000 kilowatts of non-jurisdictional load that are not imposed on VEPCO's secondary distribution system. That is the heart of the problem.

I would have to make two allocations. They are different loads on the secondary than they are on the primary. The 20-component study that we have done does it in more than two pieces. It has one load ratio for secondary.

page 1880 } It has one load ratio for line transformers. It has one load ratio for primary. It has another load ratio for distribution substations. All the factors are recognized.

Mr. Rogers: Thank you, Mr. Carpenter.

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page 1881 } By Mr. Parker:

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page 1890 }

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Q. At the bottom of page 10 of your rebuttal the question was, "Does the Ebasco method reflect differences in customer density in the customer component?" And the answer was "Yes, but only in part." Then it goes on.

Is it true that the part that we are talking about here, whether or not there was a distinguishment between jurisdictional and non-jurisdictional sales in Virginia, that it has not been taken into account?

Wallace W. Carpenter

A. No, sir; it is not true.

Perhaps I can make myself clearer on that point if you recognize that the 20-factor study gives recognition separately among the primary and secondary components of the distribution system.

For instance, the customer component that relates to a customer served from the primary system on an overall basis is perhaps $63. There may be another $101 of
page 1891 } cost in addition to that which is customer related for service on the secondary system.

So this difference between $63 on the primary and $164 on the secondary is certainly recognized as among jurisdictional classes. The jurisdictional classes have completely different proportions of primary and secondary service.

The testimony is perfectly clear that military and resale is predominantly primary service.

Does that make it clear?

Q. Not particularly.

The attribution by you of 100 percent load factor to the average portion of the average and excess method used by Mr. Van Scoyoc, do you contend that the article by W. J. Green that we referred to earlier requires this?

A. It is inherent in the method, sir. The name of the method itself says this. Think of the problem the system has. We have had testimony from Mr. McGurn and everyone in this hearing, the subject of the utilization of their plant investment, low load factor, load factor improvement. What does this mean inherently? It means that the facilities exist beyond the minimum facilities required.

If the power supply on this system only had
page 1892 } to serve customers with 100 percent load factor requirements, we would save one large amount of investment in power supply. That minimum amount of capacity in a facility that is being allocated is an inherent concept in the Green average and excess theory. Green's theory says, "If all our customers took 100 percent load factor, we could get by with this much less plant; this theoretical minimum size capacity is all that would be required. Actually, we have this much more capacity, and we will simply pro-rate the excess capacity among the excess demands of our customer classes."

It is in the name of the system, average and excess.

Q. He doesn't presuppose that everyone has
page 1893 } 100% load factor. His thesis lies in avoiding discriminatory rates.

A. Well, I have already testified that I haven't read that article in 15 years, yet I have used the average and excess method several times in the last 15 years.

Q. Fine; that is all I have.

A. I would like to make it clear that I have not used it on distribution plant.

Q. Well, that seems to be open to debate according to Mr. Rogers, but I have no further questions.

Chairman Hooker: Stand aside.

REDIRECT EXAMINATION

By Mr. Riely:

Q. Have you ever used it on distribution plant? If it's open to debate, I would like to get an answer to that.

A. I have never used it on distribution plant, period.

Mr. Riely: I have no further questions.

Chairman Hooker: Stand aside.

(Witness stood aside)

page 1894 } Mr. Brasfield: I call Mr. Roseman.

HERMAN G. ROSEMAN, called as a witness on behalf of the Applicant, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Brasfield:

Q. Please state your name and residence.

A. Herman G. Roseman, 145 Fourth Avenue, New York City, New York.

Q. Mr. Roseman, have you prepared rebuttal testimony consisting of 34 pages, additional rebuttal testimony consisting of 12 pages, and an exhibit consisting of 6 schedules entitled Exhibit No. HGR-1?

A. Yes, I have.

Q. If I were to ask you the questions set forth in this prepared testimony, would your answers be as stated therein?

A. Yes.

Mr. Brasfield: If it please the Commission, Mr. Roseman's testimony first will respond to that of Mr. Schotta's testimony related to his major reliance on variation in rate of return among companies in an industry as a measure of risk.

The additional rebuttal testimony will respond
page 1895 } to Mr. Howell's testimony respecting a fair rate of return.

I would introduce as exhibit identified as HGR-1 the 6 Schedules, and ask it be accepted in evidence.

Chairman Hooker: Received.

Mr. Brasfield: I submit the prepared testimony of Mr. Roseman with the request that it be copied into the record, and I tender Mr. Roseman for cross-examination.

Chairman Hooker: All right.

page 1896 } HERMAN G. ROSEMAN called as a witness in rebuttal on behalf of the Petitioners, being first duly sworn, testified as follows:

DIRECT EXAMINATION

Mr. Brasfield:

Q. Will you give your name and address, please?

A. My name is Herman G. Roseman. My office is at 80 Broad Street, New York City.

Q. What is your occupation?

A. I am an economist, employed by National Economic Research Associates, Inc.

Q. Would you briefly describe your educational and employment background before becoming associated with National Economic Research Associates?

A. I received an A. B. degree from Temple University and an M. A. degree from the University of Pennsylvania. My major subject was economics. After receiving my M. A. degree in 1955, I did an additional two years of graduate study in economics and statistics at the University of Pennsylvania. I was also an instructor in economics at the Wharton School and was associated as a research fellow with the Study of Consumer Expenditures, a joint research project of the Wharton School and the Bureau of Labor Statistics. In 1960-1961, I taught economics in the Evening Session of The City College of New York.

page 1897 } My first nonacademic position was with the National Industrial Conference Board, a nonprofit research organization, where I was employed from

1958-1960. Under supervision, I administered the Conference Board's Quarterly Survey of Capital Appropriations, collecting and editing the survey data, analyzing the statistical trends, and preparing detailed reports which were published in the Conference Board Business Record.

I also participated in the initiation of new surveys of capital appropriations in the metalworking industries and of capital appropriations for foreign operations, which were also published in the Conference Board Business Record. In addition, I assisted in the preparation of addresses and Congressional testimony analyzing the capital goods markets.

In 1960 I joined the firm of Boni, Watkins, Jason & Company, Inc., which firm divided its activities in May 1961. At that time, I stayed with the section reorganized as National Economic Research Associates, Inc., an economic consulting firm specializing in regulatory and antitrust economics.

Q. Have any of your writings been published?

A. Yes. In addition to the quarterly reports published in the Conference Board Business Record, I co-authored a paper entitled "A Cross-Section Analysis of Manufacturing Investment," which was read before the American Statistical Association meeting in 1957. I also wrote articles on the steel industry published in The Reporter magazine in 1960, and in Challenge Magazine in 1961. In 1969, I wrote an article on measuring the cost of capital which was published in the American Bar Association's Annual Report Section of Public Utility Law, 1969.

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Q. Have you ever appeared as an expert witness before a regulatory commission?

A. Yes. I have presented testimony in many natural gas cases before the Federal Power Commission. My testimony in those proceedings related to the current industry costs of finding and producing new supplies of natural gas, trends in the demand, cost and supply of natural gas, and other matters bearing on the gas producing industry's financial requirements.

In 1968, I presented testimony before the Pennsylvania Utility Commission, the subject of which was the cost of capital for The Peoples Natural Gas Company, a subsidiary of Consolidated Natural Gas Company. In 1969 I presented testimony before the Federal Power Commission on the cost of capital of Consolidated Gas Supply Corporation, also a subsidiary of Consolidated Natural Gas Company. In 1969

Herman G. Roseman

I also presented testimony before the Federal Power Commission on the fair rate of return for New England
page 1899 } Power Company, a subsidiary of New England Electric System. In 1969 I also presented testimony before the New York Public Service Commission on the cost of capital of the Long Island Lighting Company.

Q. What is the purpose of your testimony in the present proceeding?

A. The purpose of my testimony in this proceeding is to present rebuttal to the risk and rate of return studies of Mr. Charles Schotta. I have read his direct testimony as well as his cross-examination and have also examined his workpapers. I will also present rebuttal to Mr. Schotta's projections of interest rates.

Q. Do you recommend to this Commission that it rely upon Mr. Schotta's methods of measuring risk and the conclusions he draws with respect to the fair rate of return for VEPCO?

A. Definitely not. I believe his study suffers from numerous errors in conception and execution which render it useless for the purpose of determining a fair rate of return for VEPCO.

Q. Would you please list the major criticisms you have of Mr. Schotta's procedures?

A. First, Mr. Schotta places heavy reliance on the cross-sectional standard deviation, that is, variation in rate of return among companies in an industry, as a measure of risk. However, relatively few economists place
page 1900 } reliance on this measure, contrary to Mr. Schotta's assertion at page 5 of his testimony that economists "generally use" it. Indeed, a number of economists have sharply criticized this approach. Moreover, those who do use this approach implement it in a very different way from Mr. Schotta and do not apply it to regulated industries such as the electric utilities.

Second, in Mr. Schotta's use of the "cross-sectional standard deviation" as a measure of risk, the existence of a few highly profitable firms in an industry makes it appear much more risky than it otherwise would appear to be. This is an illogical result.

Third, Mr. Schotta's use of data on "owners' equity," rather than common equity results in distorted and misleading comparisons.

Fourth, even if one were to grant the validity of Mr. Schotta's approach to measuring risk, his method of making risk and return comparisons is illogical, and a more consistent application of his methods would lead to very different conclusions from those he has drawn.

Herman G. Roseman

Q. Turning to the first of your criticisms, would you please comment on Mr. Schotta's statement, transcript at 1239, that "Economists generally use this standard deviation of the cross-sectional rates of return as a measure of page 1901 } the risk faced by an investor in acquiring one from among the group of stocks for which this cross-sectional variance was calculated."

A. This statement is highly misleading in several respects. First, there are very few economists who use the cross-sectional standard deviation of rates of return as a measure of risk; much more common, although also controversial, is the use of time-series standard deviation.

Second, the method has been severely attacked by some economists. Such an attack, of course, does not in itself mean that the attack is either valid or widely accepted, but it does mean that the use by any economist of this method of measuring risk should be accompanied by a thorough presentation of the evidence in favor of using the method and a response to the critics of the method. This Mr. Schotta has not done.

Third, economists who do use the cross-sectional standard deviation as a measure of risk make their measurements for relatively homogeneous industries, whereas Mr. Schotta measures the "risk" of the 200 largest manufacturing companies as if they were all in a single industry. This computation of risk by Mr. Schotta is completely at odds with what other experts in this field are doing and with the economic theories underlying what those economists are doing.

Fourth, no economist has ever applied the page 1902 } cross-sectional standard deviation to the electric utility industry or to any industry similarly regulated. The published studies have generally aimed at testing the rates of return of the drug, insurance, and aerospace industries. The meaningfulness of applying this measure to the electric utility industry, where rates of return vary among companies in significant measure because of the variety of regulatory statutes and methods, is highly questionable.

Fifth, the leading published risk study, by Irving Plotkin referred to by Mr. Schotta at transcript pages 1350, 1359 and 1361, utilizing cross-sectional rates of return as the measure of risk uses return on total capital, including debt, and not return on equity, and in fact that study purports to show statistically that the standard deviation of rates of

return on equity is not a useful measure of risk. Mr. Schotta, however, does not measure the standard deviation of rates of return on total capital, but only on equity.

Sixth, contrary to Mr. Schotta's claim, no economist has used the cross-sectional standard deviation of rates of return on book equity as a measure of the risk faced by investors in the company's stock.

Finally, Mr. Schotta's use of the standard deviation as a measure of risk overlooks the fact, commonly recognized by economists, that in the computation of the standard deviation extremely high profit rates have the same effect on his results and, therefore, on his measure of "risk" as do extremely low profit rates. A number of economists have recognized this shortcoming. While I will discuss this matter in greater detail later, I would like to quote what is probably a fairly representative opinion on this matter as it appears in a recently published work on the theory of finance by Basil J. Moore.

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Q. Please explain why you are quoting from this particular work.

A. Mr. Moore is one of the authorities on whom Mr. Schotta claims to rely. Mr. Schotta provided me with copies of two articles and a chapter of one book on the theory of risk. This was in response to a workpaper request addressed to Staff Counsel asking for a list of the economists who, as alleged on page 5 of Mr. Schotta's prepared testimony, transcript page 1239, "generally use this standard deviation of the cross-sectional rates of return as a measure of risk . . . " The book to which Mr. Schotta referred me was Basil J. Moore's An Introduction to the Theory of Finance, published in 1968 by The Free Press.

Q. What is the passage to which you have reference?

A. On page 41 of his book, Mr. Moore says the following with respect to the standard deviation as a measure of risk:

"A more basic limitation with the above measures is that dispersion per se is not the property of the probability distribution of outcomes relevant to the utility function of wealthowners. Risk averters are not deterred by the chance of above-average gains, but only by the likelihood of loss or unsatisfactory return. Similarly risk lovers are not attracted by the possibility of exceptional loss, but attach positive utility only to the chance of exceptional gain. The probability of exceptional loss and exceptional gain must therefore be distinguished, while vari-

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ance and standard deviation treat high and low returns as equally undesirable. Only if subjective probability distributions are symmetrical will the above measures of dispersion also provide a measure of these likelihoods."

In other words, Mr. Schotta's measure of risk treats as equally "risky" the chance of an exceptionally large profit and the chance of an exceptionally large loss. He did not distinguish between exceptional loss and exceptional gain as advised by this author and as implemented in statistical studies by other economists.

Q. This brings us to your second area of criticism, which is that Mr. Schotta's use os the cross-sectional standard deviation overlooked the difference between the effects of exceptionally large profits and exceptionally large losses on his risk measure. Could you illustrate what you mean by that?

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A. Yes. I have constructed hypothetical examples which illustrate the weaknesses of the cross-sectional standard deviation as a measure of risk. These are shown on Schedules 1 and 2 of my Exhibit HGR-1.

Q. Was this Exhibit, consisting of six Schedules, prepared by you or under your supervision?

A. Yes.

Mr. Brasfield: I offer Exhibit HGR-1.

Chairman Hooker: It will be received.

(The document referred to, marked Exhibit HGR-1, was admitted into evidence.)

Q. Please discuss what is shown by these hypothetical examples on Schedules 1 and 2.

A. On Schedule 1 is shown a comparison of two hypothetical industries with four companies in each industry.

In the first industry, the four companies have rates of return of 6, 7, 8, and 9 percent, respectively, with an average return of 7.5 percent and a cross-sectional standard deviation of 1.118. In the second industry there are four companies, three of which earn returns of 6, 7, and 8 percent, respectively, but there is also a fourth company which has a rate of return of 19 percent, instead of 9 percent. In this second industry the average rate of return is 10.0 percent and the standard deviation is 5.244, which, by Mr. Schotta's

page 1906 } measure, makes it seem 4.7 times "riskier" than the first industry. It is hard to see in what regard, however, the second industry can be considered riskier than the first industry, since the only respect in which the two industries differ is that the second industry has one company in it which has a very high rate of return compared with the companies in the first industry.

The second example is shown on Schedule 2 of Exhibit HGR-1. Now one of the industries, Industry III, has companies in it with rates of return of 6, 7, 8, and 19 percent, respectively. Once again, its average rate of return is 10.0 percent and its standard deviation is 5.244. The other industry, Industry IV, has companies with rates of return of 6, 7, 8, and -5 percent, respectively. The two industries only differ in that the second industry has a company with a -5 percent rate of return whereas the first has a company earning 19 percent. For this second industry the average rate of return is 4.0 percent and the standard deviation is 5.244, exactly the same as the first industry. Thus, according to the measure of risk used by Mr. Schotta, the two groups of companies have identical risk. Yet, in the one industry no company earns less than 6 percent and one company earns as much as 19 percent, whereas in the second industry no company earns more than 8 percent and one company is actually suffering losses.

page 1907 } Q. What is the general conclusion you draw from these illustrative examples?

A. The conclusion I draw is that Mr. Schotta's measure of risk, which mathematically treats exceptionally large profits as if they make the same contribution to riskiness as do exceptionally large losses, is insupportable.

Q. Will not very large losses in an industry tend to offset very large gains?

A. They will only on the assumption that the profit data *ore* "normally" distributed. Indeed, at Tr. 1259, Mr. Schotta stated: "I assume that profits are distributed according to a normal distribution . . . " At Tr. 1341, he said, "If you are going to calculate a standard deviation generally speaking, we calculate these for normal distributions." A "normally distributed" body of data is one which has the property, among others, that the data are symmetrically distributed above and below the average.

Q. Was it reasonable for Mr. Schotta to assume that his profits data are normally distributed?

A. No. Economists are generally aware that profits data

are not normally distributed. More important, there are standard statistical tests which enable us to determine empirically whether or not a given body of data are normally distributed.

Q. Do the work papers supplied to you by Mr. Schotta indicate that he has made such tests?

page 1908 } A. No.

Q. Have you conducted such tests?

A. Yes, and I have found that Mr. Schotta's data are not normally distributed, contrary to his underlying assumption about the data. Of special importance is the fact that the data for the manufacturers and the banks, but not the utilities, are characterized by numbers of companies with very high returns which are not offset by companies with returns very much below the average. These very high rates of return of some companies result in very high standard deviations for banks and manufacturers, which Mr. Schotta interprets as evidence of high risk. But this is just an illusion of high risk which is created by the fact that a few companies in a group are enjoying extraordinary profitability.

Q. Can you provide a concrete example where this occurs?

A. Yes. A particularly glaring example occurs in the case of the banks in 1968. In that year one of the banks included in Mr. Schotta's study, Bank of the Commonwealth, Detroit, had the remarkable rate of return of 29.5 percent on equity. When we look at Mr. Schotta's Schedule 2.2, we see that in 1968 the 50 banks had an average return of 12.721 percent and a standard deviation of 2.996 percent. I

page 1909 } have recomputed these figures simply excluding the one bank with a 29.5 percent return. The average return drops from 12.721 percent to 12.357 percent, but the standard deviation, which is Mr. Schotta's measure of risk, drops from 2.996 percent to 1.708 percent.

Thus, excluding only one bank with an abnormally high profitability cuts the industry's apparent risk almost in half.

Comparing the banks with the utilities in 1968, we find that the utilities had a standard deviation of 1.838 percent. If we include the one bank with a 29.5 percent profit rate, the standard deviation of 2.996 makes the banks seem much more risky than the utilities. If we exclude the one high-profit bank, then the banks have a standard deviation of 1.71 percent, and seem less risky than utilities. In the case of the utilities, I was able to find no case in which exclusion of a single high-profit company had a major impact on the standard deviation.

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This example drawn from Mr. Schotta's data reveals how the appearance of high risks for banks can arise out of the inclusion in his data of a few highly profitable companies. The same applies to manufacturing. No sensible person would think that an industry which offered the possibility of earning very high returns is on that account alone a "risky" industry; the opposite view would seem more reasonable. Yet, Mr. Schotta's uncritical use of the standard deviation as a measure of risk leads to such paradoxical and utterly illogical conclusions.

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Q. Have you also examined the data to see whether there are banks with abnormally low rates of return?

A. Yes. I found that no bank earned less than 7.0 percent on equity in any year. There were ten such instances for the electric utilities. Mr. Schotta's work papers show that the Chase Manhattan Bank earned only 5.50 percent in 1967, but this is due to an error in his data, as may be seen from Schedule 3 of my Exhibit HGR-1, and the true return figure is more than twice as great.

Q. Is there some way of systematically eliminating the influence of very high profit rates on the standard deviation?

A. Yes. One way of doing this is by computing what is known as the "semi-variance." This statistical measure, which is one recommended by Basil Moore, is very similar to the standard deviation used by Mr. Schotta. It differs in that the semi-variance gives weight only to rates of return falling below the group average. Thus, it focuses on the basic aspects of risk, namely, the probability of earning less than one had anticipated. Illustrative calculations of both the standard deviation, which, as noted by Mr. Schotta at Tr. 1348, is the square root of the variance, and the square root of the semi-variance are shown on my Schedule 4. The square root of the semi-variance is shown to place it on a common scale basis with Mr. Schotta's standard deviation.

page 1911

Q. Have you computed the semi-variance for the industries for which Mr. Schotta computed his cross-sectional standard deviations?

A. Yes. The cross-sectional semi-variance for the 65 electric utilities, the 50 banks, and the 200 manufacturing companies was computed for each of the years 1959-1968. The results are shown on my Schedule 5.

Q. Please summarize these results.

A. For the 65 electric utilities, the average value of the semi-variance measure of risk, expressed in the same units

as the standard deviation, in 1959-1960 was 1.2. For the 50 banks, the comparable figure was 1.0. For the 200 manufacturers it was 2.8. Thus, according to the semi-variance measure of risk, the utilities are riskier than the banks and less risky than the manufacturers.

I should repeat that this semi-variance measure of risk differs from Mr. Schotta's "cross-sectional standard deviation," solely by giving weight to below-average returns, whereas Mr. Schotta's measure weighs in very high rates of return as part of the risk. Thus, the semi-
page 1912 } variance is on this ground clearly preferable to the standard deviation as a measure of risk.
I should add, however, that the semi-variance suffers from all the other shortcomings I have attributed to the cross-sectional standard deviation, as used by Mr. Schotta, to measure risk.

Q. You stated earlier that your third criticism of Mr. Schotta's analysis is that his use of return on "owners' equity" tends to yield misleading results. Please explain.

A. A large portion of the equity capital of utilities is made up of preferred stock capital—the average is about 16 percent for all utilities, and in the case of Vepco, it is over 20 percent. For banks and manufacturing companies, however, preferred stock accounts for only 1 or 2 percent of total equity. Yet, Mr. Schotta's comparisons of utilities with banks and manufacturers are all in terms of risks and returns on "owners' equity," which is preferred plus common stock capital. These are comparisons of apples and oranges, as the saying goes.

Q. How does that affect Mr. Schotta's risk comparisons?

A. It probably tends to reduce the measure of riskiness of utilities relative to manufacturing companies and banks. I have not been able to recompute the rates of
page 1913 } return on common equity instead of return on total equity. However, Mr. Schotta shows rates
of return both on the common as well as total equity of Vepco on his Schedule 1.1. Thus, I have been able to compute the time-series standard deviation for Vepco, for both the return on common equity and the return on total equity. The time-series standard deviation measures the degree to which the rate of return varies from year to year.

Q. What results do you obtain?

A. For the return on total equity, the time-series standard deviation for Vepco is 0.591. This is shown on Mr. Schotta's

Schedule 2.16. For the return on Vepco's common equity, the standard deviation is 0.852. Since Mr. Schotta's figures for the banks and manufacturers contain very little preferred stock capital, it seems reasonable to compare their time-series "risk" with that of Vepco's common equity. The respective standard deviations are:

Manufacturing	1.246
Banks	0.905
Vepco (Common)	0.852
Vepco (Total Equity)	0.591

Q. What conclusions do you draw from these data?

A. The only point I seek to make here is that Mr. Schotta, by lumping common and preferred equity to-
page 1914 } gether, distorts the risk comparisons, on his own definition of risk. The so-called time-series risk of Vepco is 44 percent greater when computed for common equity than when computed for total "owners' equity." No wonder that his risk comparisons on Schedule 2.16 reveal such great differences between Vepco and the banks and manufacturers.

Q. Let us turn now to your fourth criticism of Mr. Schotta's testimony. You stated earlier that, even if one were to accept his methods of measuring risk, his implementation of those methods is inconsistent and illogical. Please explain.

A. Preliminarily, I would like to comment on the character of the data he has used in his study. His data for the electric utilities include the operating-company subsidiaries of a number of electric utility holding companies. But these subsidiaries do not issue publicly-held common stock, so these data cannot provide "a measure of the risk faced by an investor in acquiring one from among the group of stocks . . ." (Tr. 1239)

Q. What instances of this can you cite?

A. Of Mr. Schotta's 65 electric utilities, there are 19 subsidiaries of 8 holding companies, some of whom have other subsidiaries not included in Mr. Schotta's list. Thus, over a fourth of the electric utilities in his study have no publicly-held common stock.

page 1915 } Mr. Schotta includes Texas Electric Service, Dallas Power and Light, and Texas Power and Light, as if they were all separate companies when, in fact, they are all subsidiaries of Texas Utilities.

Similarly, he includes Alabama Power and Georgia Power,

both subsidiaries of the Southern Co., but he does not include Mississippi Power Co., and Gulf Power, which are also subsidiaries.

He includes the American Electric Power subsidiaries, Appalachian Power, Ohio Power, and Indiana and Michigan Electric, but fails to include other subsidiaries such as Kentucky Power.

He includes Central Power and Light, Public Service Co. of Oklahoma, and Southwestern Public Service, all subsidiaries of Central and South West Corp., but does not include West Texas Utilities and other subsidiaries.

He includes Jersey Central Power and Light, Metropolitan Edison, and Pennsylvania Electric, all subsidiaries of General Public Utilities, but does not include New Jersey Power and Light.

He includes Massachusetts Electric and New England Power Co., subsidiaries of New England Electric System, but does not include other subsidiaries such as Narragansett Electric.

He includes Connecticut Light and Power, a
page 1916 } subsidiary of Northeast Utilities, but excludes other subsidiaries such as Western Massachusetts Electric and Hartford Electric Light.

He includes Louisiana Power and Light and Arkansas Power and Light, both subsidiaries of Middle South Utilities, but excludes other subsidiaries such as Mississippi Power and Light, and New Orleans Public Service.

Q. Have you any criticism of Mr. Schotta's groupings of banks and manufacturing companies?

A. Yes, Mr. Schotta fails to group the manufacturing companies into homogeneous industries. I would criticize this on two grounds.

First, it is not really meaningful to talk about the riskiness of "manufacturing," as if the latter were a single industry. It actually consists of many industries whose risks may differ greatly among industries. Yet, Mr. Schotta lumps together oil companies, computer companies, steel companies, chemical companies, food companies, etc., as if they all were equally risky.

Second, the cross-sectional standard deviation measures the degree to which rates of return vary among companies. But one reason why various companies may have differing rates of return is that they are in industries of differing risk.

These inter-industry differences in rate of re-

page 1917 } turn tend to increase Mr. Schotta's measure of risk, although they have nothing to do with the risks faced by investors. The cross-sectional approach to the measurement of risk implies that potential investors or entrants into an industry may consider the variability of rates of return among the companies in that particular industry. They may, for example, observe that aluminum companies generally tend to have highly similar rates of return, whereas the rates of return in the automobile industry vary very *widlly*. They may, if this theory of risk is correct, consider on that account that the aluminum industry is less risky than the automobile industry. But they would not do what Mr. Schotta does, namely, consider that the riskiness of the manufacturing industry as a whole can realistically be related to a measure which translates the large differences in rates of return between the aluminum industry and the automobile industry into an indication that "manufacturing" is risky. In other words, because Mr. Schotta's measure of the cross-sectional standard deviation in the manufacturing industries is affected by and reflects differences between the average rates of return of different industries such as aluminum, where the average rate of return is relatively low, and automobiles, where the average rate of return is relatively high, this does not mean that "manufacturing" is a risky line of endeavor.

page 1918 } Q. Please continue with your criticism of Mr. Schotta's application of his theories.

A. Let me begin with Mr. Schotta's statement, at Tr. 1246 of his direct testimony, that "the rate of return on equity of banks has, in general, only been 4 percent greater than that of utilities, while the average measure of risk has been one percent greater than that of electric utilities." This statement is based on his Schedule 2.10. He goes on to say that "this is strong evidence that in seeking a comparable unregulated or semi-regulated industry for developing comparable risks and comparable rates of return to electric utilities, banks must be a leading candidate." (Tr. 1246-1247)

One would expect Mr. Schotta at this point to recommend that the utilities be allowed a return on total "owners' equity," similar to that of banks. This would come to 10.88 percent on total "owners' equity" (Chart 2.19). If this return on total "owners' equity" were allowed for Vepco, the implicit return on common equity would be 12.33 percent before allowances for the special risk and growth factors he discusses on Tr. 1284-1289. These factors add approximately 0.4 per-

centage points to the return on common equity above what would otherwise be implied by his "pure risk-adjusted" cost of equity.

page 1919 } Q. Does Mr. Schotta recommend that the 10.88 percent return on total "owners' equity" is appropriate for an electric utility?

A. No.

Q. What does he do instead?1

A. He compares risks and returns of utilities, banks, and manufacturers of similar sizes and bond ratings. As he testified at Tr. 1385-1386, his rate-of-return conclusions were based on three comparisons: (1) utilities with over $1 billion in assets compared with manufacturers with over $1 billion in assets, (2) utilities with over $1 billion in assets compared with banks with over $1 billion in assets, and (3) utilities with Aa bond ratings compared with manufacturers with Aa ratings. These comparisons all involved rates of return and risk (cross-sectional standard deviations) on total "Owners' equity" averaged for the years 1959-1968.

Q. What criticisms have you of this procedure?

A. My criticisms of this procedure fall into three main categories. First, there is no sound or logical basis developed for making these comparisons by size and bond-rating groups. Second, while he compared cross-sectional standard deviations for these groups, he did not compare time-series risks for these groups. Third, he could equally well have chosen other size groups for comparisons, with markedly different results.

page 1920 } Q. Please explain your first criticism relating to the entire process of comparing similarly sized and bond-rated groups of companies.

A. I will begin by observing that there is no consistent relationship in Mr. Schotta's data between size and relative risk, as measured by the cross-sectional standard deviation. There is also no relationship, although Mr. Schotta seems to expect one, between this measure of risk and the rates of return earned in the various groups.

Second, there is no rational basis for computing cross-sectional standard deviations for groups of companies classed by bond rating. As Mr. Schotta testified at Tr. 1370, there is no necessary relationship between risks and returns on equities and those on bonds. Moreover, Mr. Schotta found that the bond rating classifications were not very meaningfully related to his own measure of risk. It is hard to see,

therefore, any reason why he should restrict his comparisons to groups of companies with similar bond ratings.

Third, as Mr. Schotta conceded at Tr. 1367, his method of grouping companies by asset size results in changing the composition of the groups over time. For example, the utilities with $500 million to $1 billion in assets are a very different set of companies in 1968 than in 1959.

page 1921 } Since the companies in all the size groups in all the industries are constantly changing in identity, there is no consistent basis for comparison of similarly sized companies in different industries over a period of years.

Fourth, assuming for the sake of argument, that such comparisons are meaningful, it is hard to see why Mr. Schotta relied on the comparisons of companies with over $1 billion in assets. One can only conjecture that this was done because Vepco has over $1 billion in assets. But Vepco has only been in the over -$1 billion class since 1966, whereas in 1959-1965, it was in the $500 million-$1 billion class. But the return comparisons from which Mr. Schotta derived his ultimate conclusions are comparisons over the entire ten-year period, 1959-1968, during most of which period Vepco was in the $500 million-$1 billion size class. It would therefore seem at least as appropriate for him to have made his comparisons for this intermediate-sized group of companies.

Q. What result would he have obtained, had he done so?

A. He would have obtained an" adjusted comparable rate of return on owners' equity" (Tr. 1257) of 10.9 percent, instead of the 10 percent he actually got.

Q. What would this return on total equity imply for the return on common equity of Vepco?

A. This would have resulted in a 12.33 percent return on common equity, before the upward adjustment

page 1922 } of 0.4 percent for the factors he discussed at Tr. 1284-1289.

Q. You mentioned earlier that Mr. Schotta compared the cross-sectional standard deviations of similarly sized and bond-rated groups, but did not compare the time-series standard deviations of those groups. What would such a comparison have shown?

A. The resultant figures are shown on Schedule 6 of Exhibit No. HGR-1. The utilities with over $1 billion in assets had a time-series standard deviation of 0.837. The comparable "risk" figures for banks and manufacturers in the same size class are 0.988 and 0.874 respectively. Considering that

we are comparing the total equity of utilities with, in essence, the common equity of banks and manufacturers, the utilities do not seem to have significantly less risk by this measure. Also, the time-series risk of Aa utilities is 0.817, whereas that of Aa manufacturers is only 0.641, indicating greater risk for the utilities.

If we do the same kind of comparisons for the $500 million-$1 billion size *clase,* the time-series risk figure for the utilities is 0.778, while the figures for the banks and manufacturers are 0.618 and 1.311, respectively. This result indicates that the utilities in the intermediate size group are "riskier" than banks of that size and less risky than manufacturers of that size.

page 1923 } Q. Let us turn now, Mr. Roseman, to a consideration of Mr. Schotta's view concerning interest rate trends. Do you agree with Mr. Schotta's opinion that interest rates will be "softening" in the near future?

A. I do not believe that Mr. Schotta has provided a sound basis for such an expectation. In fact, I do not believe that *economista* have developed sufficiently accurate forecasting techniques to enable them to project interest rate trends with any degree of confidence.

Q. Why do you believe economists cannot yet provide satisfactory forecasts of interest rate trends?

A. Because, in order to forecast interest rates, it is necessary to forecast many other economic factors, with a high degree of accuracy. The money markets are the focus of numerous factors operating throughout the economy. Whether money costs go up or down depends on the balance of a large number of supply and demand factors. On the demand side, *three* is a demand for funds to finance (1) the federal deficit, (2) state and local construction, (3) new housing, and (4) capital investments by industrial and public utility firms. On the supply side, funds in varying quantities may come from (1) insurance companies and pension funds, (2) private savings, (3) internally generated cash flow in corporations, profits plus depreciation less dividends. To com-
page 1924 } plicate matters further, there is the factor of the Federal Reserve's monetary policy and how it may be affected by international monetary developments as well as by fears of inflation or recession. To come to some reasonably accurate determination of just how powerful each of these factors will be, and to sum them up to their net influence on money costs, is a task of enormous difficulty and

complexity, which economists and statisticians cannot yet satisfactorily perform.

Even if it were possible to make reasonably reliable forecasts of the basic economic forces influencing money markets, the fact that speculation plays an important role in money markets would tend to frustrate efforts to *forecase* money costs. The forecaster of money costs must therefore also be able to determine whether speculators have already anticipated the forecasted change, and if so, to what extent.

Q. What evidence have you of *conomists'* ability to make short-term economic forecasts?

A. Recently published studies surveying the forecasts made by leading economists show this quite clearly. For example, a substantial number of economic forecasts made during the 1960's by leading economists has recently been analyzed by the Federal Reserve Bank of Richmond. This analysis was published in the Bank's *Monthly Review,* April 1970, in an article entitled "Forecasting Accuracy in the Sixties." The conclusions of this study may be briefly quoted: " . . . forecasters have been quite inaccurate in forecasting annual GNP changes during the past decade." Also, "Forecasters have had almost as little success in predicting price changes as they have in predicting GNP changes."

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Q. At Tr. 1272-1273, Mr. Schotta testified that we are entering a recessionary period. Do you agree?

A. Yes. The evidence is clear that the economy is now in a recession.

Q. Does this not imply that interest rates will decline significantly?

A. Based on past experience, it would seem doubtful even if there were a temporary decline in long-term interest rates, that the total decline would be as much as one percentage point.

This may be seen from the data in Dr. Phillips' Exhibit CFP-1, Schedule 6. These data show that declines in Aa utility bond yields occurred in 1949, 1954, 1958 and 1960-1961—the four postwar recessions. Yet, the steepest decline in interest rates, which occurred in the particularly severe recession of 1958, was only about 0.7 percentage points.

Considering the fact that governmental monetary policy generally aims at making money easier during recessions, these declines have been remarkably shallow.

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Thus far in the presently developing recession, long-term

interest rates have actually risen, contrary to earlier post-war experience. Whether they will decline significantly in the months ahead is therefore all the more dubious.

Q. What evidence other than the mere fact of recession, does Mr. Schotta offer in support of his forecast of declining interest rates?

A. He presents evidence showing that the" yield curve" is declining—i. e., that long-term interest rates are lower than short-term interest rates. The "yield curve" is a curve showing yields to maturity for debt instruments of varying maturities. Sometimes, bonds which are due to mature in a long period from now will have higher yields than bonds of shorter maturity, and sometimes the reverse will be the case. The relationship of yields on long-term maturities to those on shorter term bonds is thought to reflect the expectations of bond investors with respect to future trends in long-term rates. When long-term interest rates are expected to decline, this means that it is also expected that the prices of long-term bonds will increase, and will increase more than the prices of shorter term bonds. Thus, investors in bonds will be willing to accept lower apparent yields to
page 1927 } maturity on longer term bonds than on shorter term bonds. The reverse holds when interest rates are expected to decline.

At Tr. 1268, Mr. Schotta makes the following observation: "Again the yield curve for these government bonds retains it downward slope, thus indicating, according to the most generally accepted explanation of the meaning of the term structure of interest rates, the holding of substantial expectations concerning lower interest rates for the future." Emphasis added. This conclusion is based on data appearing in the last column of his Schedule 3.3.

Q. Do you agree that Mr. Schotta's analysis of the "yield curve" provides a sound basis for expecting a decline in interest rates?

A. No. Even if one accepts Mr. Schotta's explanation of why the yield curve is declining, it, by no means, follows that there will indeed be a decline in interest rates in the future. At best, Mr. Schotta's theory indicates that bond investors expect a decline in long-term interest rates. But they can easily be wrong. How easily they can be wrong is shown on Mr. Schotta's own Schedule 3.3. The first column of that Schedule clearly shows that in the week of November 10-14, 1969, the yields on 1995 Treasury Bonds were lower than the

yields on all other bonds. This could be interpreted as reflecting an expectation that long-term bond
page 1928 } rates would be declining. Yet, by January 12-16, 1970, the yields on bonds had generally risen, especially on long-term bonds. The 1995 bonds rose from an average yield of 5.34 percent to 6.71 percent. Thus, any bond investor who, in November of 1969 had followed Mr. Schotta's theory would have concluded, because there were expectations of a decline in long-term interest rates, that such rates were indeed going to decline, and the investor would have erroneously been led toward buying such long-term bonds; in the two months thereafter he would have found that the yield on long-term bonds had risen substantially and their price had fallen very considerably. Investors in bond markets are by no means omniscient; they can erroneously forecast future trends in interest rates, and when they do so, they lose money. Yet the declining yield curve is, according to Mr. Schotta, solely the result of the forecasts being made by bond investors. Certainly, the data on Schedule 3.3 could not have led anyone to expect that Vepco would be selling bonds at a coupon of 9 percent in mid-April of 1970.

Thus, Mr. Schotta's own presentation provides no firm basis for his conclusions on Tr. 1273-1274, that interest rates will be declining, and events since the date of the figures shown in his Exhibit belie the validity of the types of conclusions he there seeks to draw.

Q. Please summarize your rebuttal to Mr.
page 1929 } Schotta's testimony on rate of return.

A. For the reasons I have indicated, Mr. Schotta's testimony on risk suffers from serious deficiencies in concept and execution, and I would not recommend that this Commission rely on that testimony in its ultimate rate of return determination in this case. Also, Mr. Schotta uses an illogical and inconsistent method of applying his approach to arrive at a rate-of-return recommendation, and a more consistent application of his methods would lead to very different conclusions from those he has drawn. Furthermore, Mr. Schotta has provided no sound basis for projecting any significant decline in long-term interest rates.

page 1930 } By Mr. Brasfield:

Q. Please outline what your rebuttal testimony to Mr. Howell will cover.

A. The scope of my rebuttal will be restricted to Mr. Howell's determination of a fair rate of return on VEPCO's

common equity. Mr. Howell uses a variety of methods to arrive at or to support his recommended common equity return of 10.30%. Some of these methods seem to me to be without any validity, and I shall first criticize his reliance on these methods. Other approaches he employs are not wholly without merit. In my judgment, however, he has misapplied these methods. While time does not permit a thorough recasting of his calculations, I hope briefly to show what errors he has made in his application of these methods and what corrections might be made to give more reasonable results.

Q. Please describe briefly the methods used by Mr. Howell in determining the fair rate of return.

A. These are listed by him on Page 4.1 of his prepared testimony. The first of these is the "divided yield" approach, in which the cost of common equity is estimated by adding the current dividend yield and the growth rate.

page 1931 } This is theoretically a correct method of determining the "bare-bones" cost of common equity but, as I shall show, he misapplies it. The second method is the earnings-price ratio approach. Mr. Howell's version of this erroneous method employs a number of arbitrary adjustments to the earnings-price ratio. The third method, which Mr. Howell calls the "Earnings/Book Value approach" involves study of the earnings-book ratios of VEPCO and of other companies. This method, if properly applied, is in my judgment the correct way of approaching determination of the fair rate of return. But as I shall show, Mr. Howell does not apply it correctly. The fourth method he calls the "maintenance of established dividend." This method seems to me to have no merit at all.

Q. Why do you say the earnings-price ratio is an erroneous method?

A. This method would only have validity if investors did not expect, or placed no value upon, growth in earnings. But as Mr. Howell points out, at page 4.11 of his testimony, the prudent investor would expect VEPCO's earnings to continue to grow in the future and this investor would pay a price not for just last year's earnings but for all future earnings. This elemental fact invalidates the basic approach of the earnings-price ratio.

page 1932 } Q. Is it not possible to adjust the earnings-price ratio to take these shortcomings into account?

A. No. All of the adjustments which Mr. Howell makes are

essentially arbitrary in character. What an investor pays for a stock is a payment not just for last year's earnings, or 1975 earnings, but for all future earnings. There is no way of adjusting the earnings-price ratio to achieve this result. Also, Mr. Howell fails to show why his 35% adjustment, which is supposed to result in a price which is 35% above book value, can actually achieve that result.

Q. Why do you say that Mr. Howell has misapplied the earnings-book value approach?

A. He has misapplied this method by only comparing VEPCO with other electrical utilities. This is an entirely circular process of reasoning. Its consistent application would make this Commission rely, not on its own judgment of the facts, but on the composite judgments of other Commissions in other situations. It is doubtless for these reasons that Mr. Howell himself seems to place little reliance on this approach.

Q. In what ways has Mr. Howell misapplied his dividend yield approach?

A. I have three main criticisms of his application. It will be recalled that this method involves adding the

page 1933 } dividend yield and the growth rate. My first two criticisms involve his methods of measuring, first, the dividend yield, and second, the growth rate. My third criticism involves his erroneous inference that this method will result in an appropriate price-book ratio.

Q. What is your criticism of Mr. Howell's measurement of the dividend yield?

A. He seems to place principal reliance on the average dividend yield over the past five years. He argues that it is appropriate "to use the dividend yield of a longer period of time," Page 4.5. While it certainly is desirable not to be tied to day-to-day movements in the stock market, Mr. Howell's use of a 3.22% dividend yield carries that logic to the opposite extreme. VEPCO's dividend yield has not been that low for two or three years. The most recent yield has been 6.2%. If the 3.22% is a more "normal" figure, this implies, given the present dividend of $1.12 per share, that the "normal" price of the stock would be $35, instead of the current $18. Thus, Mr. Howell is, in effect, suggesting that this Commission base its decision in this case on a method which assumes that the price of VEPCO stock will be in the near future rising from $18 to $35.

Q. Is there any alternative way of avoiding

page 1934 } the use of "spot" prices?

A. Yes. I think that reliance on prices over the past one or two years is a more reasonable approach. So far in 1970, the average dividend yield has been 5.2%. Over the 12 months through May 1970, the yield averaged 4.6%. I think it is more reasonable to use a yield figure in the range of 4.5 to 5.2 percent than to use a figure of 3.22%.

Q. What is your criticism of Mr. Howell's growth estimate?

A. Mr. Howell refers only to the growth rate over the past five years. He seems to think that this is all that the "prudent investor" would consider.

The prudent investor might also consider longer-term trends in the growth of VEPCO. For example, in the past 10 years VEPCO's dividends per share have grown 7.28% per year, compared to the 6.12% growth rate over the past five years which Mr. Howell uses. Similarly, VEPCO's earnings have grown 7.44% per year over the past decade, compared with the 5.77% growth over the past five-year period which he uses. It seems to me at least as reasonable to assume that investors are projecting future growth for VEPCO of 7.3 to 7.4 percent per year, based on long-term trends, as to assume that investors are only considering the
page 1935 } most recent past and are expecting growth of only 6% per year.

Another thing which the "prudent investor" might consider is the informed opinion of those security analysts who listen to Mr. McGurn's speeches and who analyze public utility securities. In the course of my work I have followed the work and reports of those analysts on a systematic basis for some years and note that they generally conclude that VEPCO will probably grow about 7% annually, and that it can be expected to grow more rapidly than most other electric utilities, whose average growth rate has been about 6%.

I conclude that it would be more reasonable to assume that investors are expecting a 7% growth rate rather than the 5.77 or 6.12 percent figures which Mr. Howell has selected.

Q. Please turn now to your third criticism of Mr. Howell's application of the dividend yield approach. Why do you say that he has drawn incorrect inferences with respect to the price-book ratio?

A. At Page 4.5 of his testimony, Mr. Howell says that it is not necessary to adjust the result obtained from his dividend yield method for market pressure and costs of flotation.

His reason is that "this is a rate of return

page 1936 } which enables the stock to sell substantially above book value . . ."

This argument is false. It is well known, and can be shown algebraically, that the dividend yield method, even if correctly applied, results in a rate of return which, if applied to the book equity, will result in earnings such that the price of the stock will ultimately equal the book value.

Q. At Page 4.13 of his testimony, Mr. Howell says: "I think the stock should sell somewhere between 25% and 40% above book value." Is it your testimony that even a correct application of the dividend-yield method will not give that result?

A. Yes. Application of the method will result in a price exactly equal to book. It would require a return higher than the figure derived from the dividend-yield method to give a price above the book value.

Q. How high would the return on common equity have to be in order for the price of the stock to be 40% above the book value?

A. The rate of return to be applied to the book equity would have to be 1 or 2 percentage points higher than the "investors' total expected return" derived by the dividend-yield method.

Q. Please summarize the total impact of your

page 1937 } suggested revisions to Mr. Howell's application of the dividend yield method.

A. First, I found that Mr. Howell's use of a 3.22% dividend yield was a serious understatement of VEPCO's circumstances for the past year. I recommended instead using a dividend yield of 4.5 to 5.2 percent.

Second, I found that Mr. Howell's estimate of growth of 6.12% failed to take into account VEPCO's more rapid growth rate over the longer term. In my judgment, a growth rate of 7% is more in line with what investors have been expecting in the way of long-term growth.

These two adjustments would indicate a capital attracting cost in the neighborhood of 11.5 to 12.5 percent. This rate of return would be just sufficient to maintain a price of the stock equal to the book value per share. In order to have the price of stock exceed the book value by the 40% or so which Mr. Howell recommends, an additional 1 or 2 percentage points would have to be added to the 11.5-12.5 "bare bones" cost of common equity capital.

Q. Would you comment on Mr. Howell's assertion that utilities and industrials are not comparable as regards risk.

Herman G. Roseman

A. I disagree with Mr. Howell on this point.
page 1938 } It is certainly possible to make meaningful risk comparisons between utilities and industrials. In fact, investors, who must choose among available alternatives, make such comparisons every day, and their determinations of relative riskiness are capable of measurement.

Q. Please explain how one can determine how investors view the relative riskiness of VEPCO and the industrials.

A. If investors believe that one company is riskier than another, they will be willing to invest in the riskier company only if they can expect a higher rate of return on their investment in the stock of the riskier company. In other words, the riskier company will have a higher cost of attracting capital.

Q. Please illustrate how this difference in the cost of attracting capital is a reflection of investor opinion on relative risks.

A. Let us suppose there are two companies which have the same dividends and earnings per share and which have the same growth rate. But investors believe that one of these companies is riskier than the other. They express this belief very directly: they will pay less for the stock of the riskier company than for the stock of the less risky company. This means that the riskier company will have a higher cost of attracting capital.
page 1939 } This can be shown in a simple numerical example, using the dividend yield method employed by Mr. Howell. Suppose that both companies have a growth rate of 6% and both are paying a dividend of $1. Investors are willing to pay only $20 for the stock of the riskier company but will pay $25 for the less risky stock. Now, the cost of attracting capital, by the dividend yield method, is equal to the growth plus the dividend yield. For the riskier company, the dividend yield is $1 divided by the $20 price, or a yield of 5%; to this we add the 6% growth to get a total of 11%, which is the cost of attracting capital. For the less risky company, the dividend yield is $1 divided by the higher price of $25, or a yield of only 4%; when we add the same growth of 6% we get a capital attracting cost of only 10%. Thus, the risky company has a cost of capital of 11% while the less risky company has a cost of capital of 10%.

Q. Have you made such risk comparisons between VEPCO and the industrials?

A. Yes.

Q. Please describe those comparisons.

A. Using the identical method employed by Howell to compute VEPCO's cost of attracting common equity capital, I computed the cost for the Standard and Poor

page 1940 } 425 Industrials. Their average dividend yield for the past five years—1965-1969—has been 3.12%. Their average growth in dividends has been 4.89%. Thus, the cost of attracting equity capital for the S & P Industrials has been 8.01%. This figure is directly comparable to the 9.34% cost for VEPCO derived by Mr. Howell at Page 4.5 of his testimony.

Q. Since you have criticized Mr. Howell's derivation of the 9.34% figure for VEPCO, would it not be more appropriate to make this comparison on a sounder basis?

A. Yes. Over the past 10 years the S & P 425 Industrials have had an average annual growth of 6.11% in earnings per share and 5.34% in dividends per share. Their average dividend yield in 1969 was 3.05%. This indicates a cost of attracting capital of no more than 9.16%. On a comparable basis, the cost of equity capital to VEPCO would be about 11.5%, 7.3% growth and 4.2% dividend yield in 1969.

I made similar computations on a "spot" basis, using closing prices on Friday, May 22, 1970. Comparing the last four quarters of dividends with the most recent price, gives a dividend yield of 4.2% for the S & P 425 Industrials. The dividend yield for VEPCO, computed on the very same basis, is 6.2%.

page 1941 } Q. Please summarize what these figures show.

A. The dividend yield for VEPCO used to be about the same as that of the industrials, but in 1969 and 1970 VEPCO's has been considerably higher. Yet VEPCO's growth rate in earnings and dividends per share has been higher than that of the industrials on any consistent basis of comparison. Thus, it can only be concluded that VEPCO's cost of attracting common equity capital is higher than that of the industrials, and was higher in the past.

Q. What conclusion do you draw from that fact?

A. I conclude that common stock investors require a higher return to invest in VEPCO than to invest in the stock of the average industrial. From this, I further conclude that as far as investors are concerned, the common stock of VEPCO is at least as risky as that of the industrials and probably riskier.

page 1942 } Chairman Hooker: Mr. Staples?

Herman G. Roseman

CROSS-EXAMINATION

By Mr. Staples:

Q. Mr. Roseman, in your testimony on the cost of capital and a fair return to VEPCO, if Dr. Phillips in his testimony quoted a passage of the United States Supreme Court in the 1944 Hope Natural Gas decision, stating that in economic terms then a fair rate of return has three main functions:

One, to maintain the financial integrity of the enterprise;

Two, to permit the enterprise to attract capital it needs to serve the public; and,

Three, to provide a return to the equity owner that is commensurate with returns on investment and in other enterprise having corresponding risk.

Are you familiar with that?

A. I recall that testimony, yes.

Q. Did you take a position then in opposition to these elements of a fair rate of return cited by Dr. Phillips?

A. No.

page 1943 } Q. You then would agree that the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks?

A. Yes.

Q. As we understand your testimony in rebuttal to the risk analysis conducted by Professor Schotta, your criticism is directed at his measurement of risk and not at the idea that it is necessary to determine corresponding risk before we can ascertain a return to the equity owners commensurate with that being earned in other enterprises of corresponding risk?

A. What?

Q. Is that right?

A. That is correct. I certainly would adopt that distinction.

Q. Do you understand that the purpose of this hearing is to ascertain a fair rate of return on Virginia jurisdictional business of the Virginia Electric and Power Company?

A. Yes.

Q. In your rebuttal to Professor Schotta's testimony, Mr. Roseman, you seem to be saying one of two things:

Either, A, that Professor Schotta has measured risk incorrectly; or,

page 1944 } B, that the measurement of risk is not useful

in determining a fair rate of return to VEPCO.

You have said that you believe the measurement of fair rate of return involves measurement of risk. Do you say that he has measured risk incorrectly?

A. What was that?

(The Court Reporter read the pending question.)

A. (Continued) The thrust of my testimony is to the appropriateness of the measurement of risk and not to—let me go back. Even that doesn't make the distinction. It is the way in which he measured risk and not the fact that he measured it and wanted to set that up as part of the standard cited in the Hope case to which this rebuttal is addressed.

Certainly a risk measurement should be attempted or risk evaluation should be made, if you don't make a measurement, and a fair rate of return arrived on the basis of it.

I am not contesting that. It is only the manner in which the measurements were made to which my rebuttal is addressed.

page 1945

By Commissioner Catterall:

Q. You mean his quantity of risk is wrong or his quality of risk?

A. I should say I think quality. I don't know that the result that he obtained—I am not really stating he has overstated the risk or he has understated the risk. I don't believe that the method gives a correct or can give a correct evaluation of it.

Q. Then you agree that the probable error is plus or minus 5% or 10%?

Mr. Staples: Or no probable error.

Q. (Continued) Nobody is going to say no probable error on this.

A. I couldn't assign a probable error to it.

Q. The range of choice is what I am asking. What is the range of choice for this tribunal, between plus and minus 5 or plus and minus 10 between your views and his views? or do your views and his overlap between pluses and minuses?

A. I really can't reach a judgment. I really haven't even attempted to reach a judgment as to whether or not Mr.

Schotta overstated the relative risk or understated it; or into what he has done. I think the testimony is aimed a little more. Well, he went to measure how long this bolt
page 1946 } of cloth is and he used a scale to do it with.

Q. Does his highest figure overlap your lowest figure? If not, what is the gap between them?

A. I haven't made an estimate myself, so I don't know if he is overstating or understating.

If I had to give an off-the-cuff opinion, essentially I should think that there is some understatement on his part, but not by a very wide margin, let us say 1, 2, or 3 percentage points; but that is a highly subjective reaction.

Q. All right.

A. That would apply as regards the common equity.

By Mr. Staples:

Q. Let me get that down. 1, 2, or 3 percentage points on common equity?

A. Yes.

By Commissioner Catterall:

Q. Anywhere from 10 and 13 would be a reasonable decision?

A. That is my general feeling, yes, but that wasn't what I attempted to establish in this body of testimony.

Mr. Parker: Mr. Chairman, I am not sure I understand the answer. Is he saying it is 3% off of 10, which would be .3, or 3% in addition to 10?

page 1947 } The Witness: I said 3 percentage points.

Judge Catterall was asking me a question to which I had not addressed myself specifically in this testimony.

Mr. Parker: You said 1, 2, or 3.

The Witness: Yes. So the witness concluded for a return on the common equity, as Mr. Schotta has attempted to do, in the range of 11 to 12¼%, and it is my general feeling with Judge Catterall's gun on my head in giving this answer that it is understated by 1, 2, or 3 percent.

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At Richmond, June 10, 1970

Application of

Virginia Electric and Power Company Case No. 18759

For an increase in electric rates.

THIS PROCEEDING, which was instituted by order entered herein under date of November 25, 1969, upon the application of Virginia Electric and Power Company for approval of revised schedules of rates, charges, rules and regulations to become effective on January 1, 1970; and the effective date of said revised schedules of rates, charges, rules and regulations having been suspended by said order of November 25, 1969, so as to permit an investigation concerning the reasonableness and justice of the proposed rates, came on to be heard on May 4, 5, 6, 7, 8, 11, 12, 25, and 26 and was thereupon taken under advisement.

UPON CONSIDERATION WHEREOF the Commission is of the opinion and finds:

(1) That the present schedules of rates and charges of the Virginia Electric and Power Company are insufficient to produce the amount of earnings necessary to attract capital to build needed facilities;

(2) That the proposed revised schedules of rates, charges, rules and regulations filed on November 25, 1969, to produce additional gross revenue from Virginia consumers of approximately $25,823,000, are unreasonable and unjust and should be denied;

(3) That the applicant should file with the Commission, within 15 days, revised schedules of rates, charges, rules and regulations to produce additional gross revenue from Virginia consumers of approximately $22,482,000;

(4) In the revised schedules of rates, charges, rules and regulations:

a. The minimum charge will be increased to $3.00 per month.

page 2043 } b. The present practice of reading meters bimonthly for most customers will be continued; in addition, for the months when the meter is not read, interim estimated bills will be rendered, marked "Estimated."

c. The "30-day rate" as proposed by the applicant is approved for Schedule No. 6, Large General Service, only.

d. Late payment charges will not be approved at this time.

e. The proposed summer-winter differential in rates is approved.

f. The water heater rider is approved under proposed Schedule No. 1, Residential Service.

g. A restriction shall be placed in Schedule No. 7, Electric Heating, limiting the number of kilowatthours eligible for a reduced rate in the summer months because of the use of an electric water heater.

h. The ratchet clause in Schedule No. 6, Large General Service, [Par. III (a) (2) and Par. III (b) (2)] should be reduced from 95% to 90%.

i. The charge for energy under Schedule No. 1, Residential Service, should be reduced to 1.0¢ for kilowatthours in excess of 1500 monthly for meter readings taken during the months of November through June.

j. Under Schedule No. 5, Small General Service, the energy block proposed to be charged at 3.0¢ per kilowatthour for meter readings taken in July through October should be reduced to 2.95¢.

IT IS, THEREFORE, ORDERED:

(1) That the Virginia Electric and Power Company is authorized to put into effect revised schedules
page 2044 } of charges, rules and regulations on all bills rendered on and after July 1, 1970, to produce additional gross revenue of approximately $22,482,000;

(2) That within 15 days the applicant shall file revised schedules of rates, charges, rules and regulations consistent with the preceding paragraph (4) to provide for the additional gross revenue of approximately $22,482,000; and

(3) There appearing nothing further to be done in this cause, that the same be, and hereby is, dismissed from the docket of the Commission and the papers placed in the file for ended causes.

AN ATTESTED COPY hereof shall be sent to George D. Gibson, P. O. Box 1535, Richmond, Virginia 23212; to Honorable Andrew P. Miller, Attorney General of Virginia, Supreme Court Building, Richmond, Virginia 23219; Peter Parker, 300 Title Building, Baltimore, Maryland 21202; Harry T. Marshall, City Attorney, Princess Anne Station, Virginia Beach, Virginia 23456; Leslie G. Fleet, Washington Gas Light Company, 1100 H Street, N. W., Washington, D. C. 20005; R. O. Graham Guthrie, 2400 Wilson Boulevard, Arlington, Virginia 22204; William R. Durland, P. O. Box 3103, Alexandria, Virginia 22302; and to the Chief Accountant and Chief Engineer—Electric Utilities for the Commission.

page 2045 } COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

Application of

Virginia Electric and Power Company Case No. 18759

For an increase in electric rates. June 10, 1970

Opinion, CATTERALL, *Commissioner.*

At page 139 of Vol. 1 of his book on "Principles of Public Utility Regulation," Professor Priest says:

"It is suggested from time to time that the conventional step of establishing a rate base should be eliminated. According to several students of the problem, the ultimate figure to be determined by a regulatory agency when rate relief is sought is what revenue will enable the utility to attract capital. And regulators are urged to proceed directly to that determination. But at least there 'has been no concerted attempt to break away from rate base/rate of return' and it will be assumed, for the purposes of this discussion, that the rate base technique will be with us for a great while."

The rate base technique is peculiarly inappropriate to the present case because the lawyers have joined issue on what they call "the jurisdictional rate base."

§56-234 of the Code of Virginia provides that companies like Vepco are under no obligation to furnish adequate service or any service to the United States or to the State of Virginia or to any municipal corporation. Vepco is not required to charge them reasonable rates and can discriminate among them without restraint. The Commonwealth has relinquished all control over the rates charged to those customers and the utility is as free as the corner grocery store to charge them what it pleases. It so happens that Vepco charges the unprotected customers lower rates than it charges the consumers whose rates are subject to the jurisdiction of this Commission, with the paradoxical result that the protected customers are paying higher rates than

page 2046 } the unprotected customers. There is nothing we can do to overcome the evil so long as §56-234 is not amended to give us jurisdiction to overcome it.

There is a widespread misconception that regulatory commissions "guarantee" utilities a fixed profit. There is no

such guarantee, but the paramount duty of a regulatory commission is to guarantee that the consumers will not run out of electricity. If there should come a time when there was no electricity, a consumer who wanted a drink of water would have to go on foot to the nearest unpolluted stream. Carried to its logical conclusion the jurisdictional rate base theory could put a utility out of business. If a company needs X dollars to stay in business it has to get that number of dollars or cease to operate. For that very obvious reason, every judicial decision in this branch of the law declares that a utility must earn enough to attract capital. Since that law applies regardless of the rate base that the court favors, its pronouncement of that rule of law is a ruling that it makes no difference what rate base is used.

Petersburg Gas Company v. *Petersburg,* 132 Va. 82 (1922) was decided in the days when a utility was entitled to earn a return on the present *fair value* of its property. And the court said (p. 90):

"In fixing a rate, therefore, which will be just and reasonable, it must be borne in mind that the utility shall be allowed to realize such a net income upon the value or amount of its investment as will, when prudently managed, render its securities attractive to the investing public. Otherwise, there will result inferior service to the public and ultimately bankruptcy of the utility, and disaster, as well to the public as the utility."

Arlington County v. *Vepco,* 196 Va. 1102 (1955) was decided after the Commission had adopted an *original cost* rate base. And the court said (p. 1119):

"In determing what was a proper and reasonable rate of return for the Company, in the light of the evidence before it, the Commission followed the standard set and stated many times by the courts.

page 2047 } "In *United Railways & Electric Co.* v. *West,* 280 U. S. 234, 251, 252, 50 S. Ct. 123, 74 L. ed. 390, 409, this was said:

"'It is manifest that just compensation for a utility, requiring for efficient public service skillful and prudent management as well as use of the plant, and whose rates are subject to public regulation, is more than current interest on mere investment. Sound business management requires that after paying all expenses of operation, setting aside the necessary sums for depreciation, payment of interest

and reasonable dividends, there should still remain something to be passed to the surplus account; and a rate of return which does not admit of that being done is not sufficient to assure confidence in the financial soundness of the utility to maintain its credit and enable it to raise money necessary for the proper discharge of its public duties.'

"In *Petersburg Gas Co.* v. *Petersburg,* 132 Va. 82, 110 S. E. 533, we said:

" 'The rate of return on such "fair value" which the utility company should be allowed to receive should be fair and just to the company and such as will make its securities attractive to investors when the company is prudently and carefully operated.' "

The federal case and the state case cited in support of the holding were both *reproduction cost* rate base cases. Earnings sufficient to attract capital will be the same number of dollars whether or not a rate base is computed, and, if a rate base is computed, whether the rate base used is a reproduction cost rate base or an original cost rate base or any other rate base.

The amount of earnings necessary to attract capital is a question of fact that cannot be found with mathematical certainty because it involves a prediction. The so-called "cost of money" evidence in these cases is received in an effort to make a correct prediction. The hundreds of pages of that evidence in this case and in all other cases deal with percentages that are not percentages of any rate base. A decision that that kind of evidence is relevant amounts to a holding that the rate base is immaterial.

page 2048 } The capital that must be raised by selling stocks and bonds is capital in addition to the capital represented by outstanding stocks and bonds. Vepco's capital structure as of to-day is:

Common stock and surplus	$ 548,272,000
Preferred stock	126,447,000
Bonds and debentures	847,000,000
Total	$1,521,719,000

The amounts that the company must pay annually on its fixed capital obligations, add up to $51,617,000. It must have net earnings equal to that total plus sufficient additional net earnings to attract several hundred million dollars in the next two or three years. The present investment of common stockholders in the company is $548,272,000. As near as I can judge from the voluminous evidence in this case, the company can-

not attract the equity capital it must attract unless it is given a chance to earn about ~~1/2~~ 12½% of its net worth or $68,534,000.

In short, it needs net earnings after taxes of $120,151,000 a year. The cost of attracting equity capital is as much a cost of producing electricity as the cost of raising debt capital or the cost of wages and taxes. A regulated utility is required to sell its product at the cost of production. The profits that a utility must earn in order to attract capital are part of the cost of furnishing its services.

The company's net earnings from the sale of electricity during 1969 were $102,000,000. If Vepco continues to charge in North Carolina and West Virginia the same rates that it charges in Virginia, it will earn an additional $1,200,000. Vepco, in 1969, earned $2,797,000 from its sales of gas. The company's recent stock issue will be spent on increasing its capacity. If, through new customers and sales, it earns 8% of that amount, its earnings will increase by
page 2049 } $5,760,000. The company's earnings will be reduced by $1,600,000 because of increased wages and salaries of $3,200,000. Mr. Brown, in his exhibit, excluded the costs of the promotional allowances, but the company will have to spend at least $1,500,000 in its campaign to improve the load factor by encouraging the installation of electric heating. The expenditure of that amount will reduce its net earnings by $750,000. Mr. Brown's exhibit did not include an estimated amount of $1,004,523 on account of additional environmental protection. The allowance of this amount will reduce the company's net earnings by $500,000. Putting these figures together it appears that, without an increase in rates, the company will have net income of $108,910,000, as shown by the following summary. The difference between that figure and $120,151,000 is $11,241,000.

Because taxes take about half of a company's net earnings, it has to earn $22,482,000 net before taxes in order to realize $11,241,000 net after taxes. Accordingly the applicant should be allowed to increase its electric rates in Virginia by $22,482,000.

page 2050 } SUMMARY

Expected Annual Revenue Requirements

Amount needed to pay interest on bonds and dividends on preferred stock ..... $ 51,617,000
Amount needed to pay dividends on common

stock	68,534,000
Total amount needed to pay interest and dividends	$120,151,000

Expected Annual Net Earnings

Earnings from sale of electricity in 1969 in Va., W. Va. and N. C.	$102,000,000
Earnings from sale of electricity to new customers during the coming year	5,760,000
Additional earnings from W. Va. and N. C. if Vepco continues to charge in those states the same rates as in this State	1,200,000
Earnings from sale of gas	2,800,000
	$111,760,000
Less increased expenses	2,850,000
Available to pay interest and dividends	$108,910,000

Additional Earnings Required from Sale of Electricity in Virginia

Amount required	$120,151,000
Amount available	108,910,000
Increase after taxes required	$ 11,241,000
Increase before taxes required	$ 22,482,000

HOOKER, *Chairman,* and DILLON, *Commissioner,* concur in the result.

page 2051 }

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Application of

VIRGINIA ELECTRIC AND POWER COMPANY

Case No. 18759

For an increase in electric rates. June 22, 1970

Opinion, HOOKER, *Chairman*

The Virginia Electric and Power Company, on November 25, 1969, filed with the Commission an application for increases in electric rates and revised schedules of rates and charges for electric service to become effective on and after

January 1, 1970. The Commission, by order dated November 25, 1969, suspended the operation of the schedules, instituted this proceeding and set the case for hearing at 10:00 a. m. on May 4, 1970, in the courtroom of the Commission. The Commission's order directed that an investigation of the reasonableness and justice of the proposed rates and charges be entered upon; the applicant was directed to file with the Commission by March 9, 1970, the direct testimony and exhibits proposed to be offered by witnesses for the applicant in its presentation in chief at the hearing; the staff of the Commission was likewise directed to file with the Commission, and deliver to the applicant, by April 6, 1970, the direct testimony and exhibits proposed to be offered by witnesses for the Commission in their presentation in chief
page 2052 } at the hearing. The order also directed the applicant to give notice of the time, place and general object of the hearing and investigation by publishing at least once a week for four consecutive weeks in a newspaper or newspapers of general circulation published in each of the Cities of Alexandria, Buena Vista, Charlottesville, Chesapeake, Clifton Forge, Covington, Colonial Heights, Emporia, Fairfax, Falls Church, Franklin, Fredericksburg, Hampton, Harrisonburg, Hopewell, Lexington, Newport News, Norfolk, Petersburg, Portsmouth, Richmond, South Boston, Staunton, Suffolk, Virginia Beach, Waynesboro, and Williamsburg. It further required that copies of the application and the proposed new schedules of rates and charges be served by the applicant by certified mail on the Commonwealth's Attorney and the Chairman of the Board of Supervisors of each county, or on the County Manager in each county having that form of government, in this State in which the applicant operates and on the Mayor or City Manager and the City Attorney of every city in this State in which the applicant operates. Proof of publication of such notices and of the mailings, as required by the order, were submitted by the Company at the initial hearing on May 4, 1970.

Public hearings were held on May 4, 5, 6, 7, 8, 11, 12, 25, and 26, 1970.

page 2053 } The following appearances were entered during the hearing of this case: George D. Gibson, John W. Riely, George C. Freeman, Jr., Evans B. Brasfield and Guy T. Tripp, III, counsel for the Company; Andrew P. Miller, Attorney General of Virginia; Anthony F. Troy, Assistant Attorney General; Harry T. Marshall, City Attorney of Virginia Beach and Peter Parker, counsel for the Ad Hoc Committee on Vepco Rates for the following cities and

counties: Arlington, Alexandria, Fairfax County, Falls Church, Greensville, Loudoun, Norfolk, Virginia Beach, and Williamsburg; Leslie G. Fleet, counsel for Washington Gas Light Company; R. O. Graham Guthrie, counsel for Arlington County; William R. Durland, counsel for Virginia Citizens Consumer Council, Inc.; and A. Grey Staples, Jr. and Richard D. Rogers, Jr., counsel for the Commission.

Several individual objectors not represented by counsel appeared and were heard. In addition, the Commission received 31 letters and two telegrams expressing views concerning the application which were passed to the file.

Never in the history of utility regulation in Virginia has an application been so thoroughly investigated. The hearing was set for a day more than five months after the application was received. The Accounting Division of the Commission made an examination of the books and records of

page 2054 } the Virginia Electric and Power Company. Six Commission accountants participated in the audit which took two and one-half months to complete. The applicant's testimony was available to all parties for eight weeks prior to the start of the hearing.

Staff testimony was offered in every area covered by the company witnesses, and was made available to all parties four weeks prior to the start of the hearing. The Ad Hoc Committee on Vepco rates (hereinafter referred to as the Cities and Counties) presented the testimony of three expert witnesses concerning the rate base, the level of earnings required by Vepco, and cost allocations. The transcript of the testimony in this proceeding exceeds two thousand pages and approximately one hundred exhibits were admitted.

The Commission, sitting in its legislative capacity, gave every consideration to the intervenors. The record will show that every request of any significance made by the intervenors was granted. All of the evidence and material, relevant or otherwise, offered by the intervenors was admitted and duly considered. Never has there been more thorough and painstaking consideration given to all of the evidence and other information, whether relevant or not, than was given by the Commission in reaching its decision in this matter.

page 2055 } On June 10, 1970, the Commission entered its final order authorizing Virginia Electric and Power Company to put into effect revised schedules of rates, charges, rules and regulations on bills rendered on and after July 1, 1970, to produce additional gross revenue of approximately $22,482,000. The Company was directed to file revised schedules of rates, charges, rules and regulations consistent

with the Commission's order within fifteen days of the date of the order. Commissioner Catterall prepared an opinion which was released simultaneously with the Commission's order of June 10, 1970. We concur in the results reached by Commissioner Catterall but not in the method used in reaching it. The Supreme Court in the landmark case of *Federal Power Commission* v. *Hope Natural Gas Company,* (1944) 320 U. S. 591, 88 L. ed. 333, said at page 602:

"Under the statutory standard of 'just and reasonable' it is the result reached not the method employed which is controlling . . . It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry under the Act is at an end. The fact that the method employed to reach that result may contain infirmities is not then important."

The result is obviously of paramount importance. It is demonstrated in this opinion that the result reached by Commissioner Catterall in his opinion is just and
page 2056 } reasonable under the long established rate making *polices* which have been followed by this Commission.

Section 156 (f) of the Constitution of Virginia states:

"The Commission shall, whenever an appeal is taken therefrom, file with the record of the case, and as a part thereof, a written statement of the reasons upon which the action appealed from was based . . . "

In compliance with that requirement, our opinion sets forth the reasons upon which a majority of the Commission based its decision.

The June 12th issue of the *Richmond Times-Dispatch says*: "(Attorney General Andrew P.) Miller said he . . . expected to take the position in court that the SCC may have exceeded its quasi-judicial authority . . . " In rate cases the Commission's function is neither quasi nor judicial; it is purely legislative. In *Board of Supervisors* v. *Vepco,* 196 Va. 1102, 1109, the Court said:

"In performing the duty of fixing reasonable and just rates for a public service corporation providing heat, light and power service, the Commission exercises a legislative function delegated to it by the legislature of Virginia by Code, §56-

235, by virtue of §156 (c) of the Constitution of Virginia. The power delegated by the legislature has the same attributes as the power directly delegated by the Constitution to the Commission for the regulation of 'transportation and transmission companies' under §156 of the Constitution." * * *

page 2057 } "In the fixing of rates deemed just and reasonable, there is a reasonably wide area in which legislative discretion is involved. Therefore, a rate of return allowed by the Commission may not be changed or set aside as unfair or unjust unless there appears an abuse of legislative discretion."

The Commission is obligated to establish rates for the Company that are reasonable and just. The function of the Commission in this case is to determine whether the rates proposed by the Company, which are higher than those in effect, are reasonable and just; and, if not, to prescribe for the Company rates that are reasonable and just under all the facts and circumstances of this case. The manner in which this result is to be reached has become clearly defined by the decisions of the Commission and the Supreme Court of Appeals in the numerous rate cases in the past 25 years. We do not propose in this case to depart from this long-established policy. The Commission must consider the rate base upon which the Company is to be permitted to earn a fair return, the current level of revenues and expenses, and the fair, just and reasonable rate of return under all the circumstances of the case. It must also consider whether the rates proposed are unjustly discriminatory. This Commission was one of the first to adopt the net original cost rate base. (Twenty states continue to use the reproduction cost rate base.) An end-of-period rate base was used. The test period

page 2058 } adopted for the purpose of showing the revenues and expenses was the calendar year 1969. The court has agreed with the Commission concerning and end-of-period rate base and in *Board of Supervisors* v. *Vepco,* 196 Va. 1102, at page 1121, said:

"We agree with the Commission that an end-of-period rate base is fair and reasonable, especially under the circumstances presented here. Its use tends to offset the lag in the return of earnings during the period between the time the money is invested and the time earnings are received."

Because of the rapid expansion which must be made by the Company in order to meet the sharply increased demand for

electric energy and because of the persistent inflation which exists in our economy today, we hold that the use of the end-of-period rate base is more necessary today than it was in 1954. The only difference in the rate making procedure used in this case and in the procedures followed in the last Virginia Electric and Power Company rate case in 1954, is that testimony was received concerning the allocation of the rate base, revenues and expenses not only among the several jurisdictions in which the Company operates, but also separating the Virginia business over which this Commission has jurisdiction from the business in Virginia that is exempted from the jurisdiction of this Commission.

page 2059 } THE RATE BASE

There was no substantial difference in the total system electric rate base as determined by the Company and by the Commission Accountants as of the end of 1969. The Company's Senior Assistant Treasurer, Mr. Alvis M. Clement, found the Company's total electric rate base to be $1,444,491,000 (Tr. p. 151). The Commission's Chief Accountant, Mr. James H. Brown, determined the Company's total system electric rate base to be $1,444,190,320 (Tr. p. 1035). The difference of approximately $300,000 is less than .02 percent and is not significant. The rate bases allocated to Virginia jurisdictional service by witnesses for the Company and the staff were substantially different. According to testimony originally submitted by the staff and Company witnesses the net difference between the staff and Company rate bases amounted to $37,528,765 (Tr. p. 1190). A portion of the difference between the rate base found by the staff and the Company for the Virginia jurisdictional service was due to an error in the allocation by the Company's witness, Thaddeus L. Sharkey. Mr. Sharkey allocated the investment in street lighting equipment to the Virginia jurisdictional service. Since this Commission does not have jurisdiction over rates charged by the Virginia Electric and Power Company to cities, counties and the state government for
page 2060 } street lighting service, this was not properly allocated. Company witness, Wallace W. Carpenter, explained this (Tr. p. 1823) and introduced an exhibit, WWC-2, making the necessary adjustment to eliminate a portion of the street lighting account which was properly assignable to the state, county, and municipal category.

It was shown on cross-examination of the staff witness Melwood W. Van Scoyoc (Tr. p. 1223) that his allocation had

included secondary plant to resale and military customers who have their own secondary distribution systems. Witness Carpenter in Exhibit WWC-2 proposed an adjustment to be made to Mr. Van Scoyoc's allocation to reflect the appropriate separation of primary and secondary distribution plant. Mr. Carpenter also stated that Mr. Van Scoyoc erred in not allocating the outdoor lighting plant to the Virginia jurisdictional business (Tr. p. 1840). This was not contested by the staff. This had the effect of understating the Virginia jurisdictional rate base.

The remaining differences between the two experts were due to a minor adjustment proposed by the Commission's Chief Accountant, Mr. Brown, and to differences in the methods used by the two cost allocation experts in arriving at their conclusions. The Company witness used a method known as the peak-responsibility method. The Commission staff witness used a method known as the average and

page 2061 } excess method. Considerable testimony was presented as to the validity of the two methods. Both company witnesses and the staff witness are experts in the cost allocation field. Both the company and staff witnesses felt that their respective methods were more appropriate for use in this case. An expert witness for the Cities and Counties, Mr. James Lim, supported Mr. Van Scoyoc's method of allocation. We are not convinced that either cost allocation method is superior to the other. Therefore, it appears appropriate to determine the rate base by using an average of that proposed by the staff witness and the Company witness. Before this can be done, it will be necessary to make the appropriate adjustments for error and one adjustment in the staff rate base which was proposed by Mr. Brown. After these adjustments are made, the differences between the staff witnesses and the Company witnesses will be those brought about by their different methods of allocation.

Mr. Van Scoyoc's allocation included all adjustments proposed by Mr. Brown for expenses and rate base. In order to bring Mr. Van Scoyoc's allocations to the point where they will be comparable to the Company's allocations, and reflect only the difference in the allocation method, it will be necessary to restore the staff adjustments to Mr. Van

page 2062 } Scoyoc's allocations. The adjustment proposed by Mr. Brown was $487,297. Using Mr. Van Scoyoc's allocation factor for cash working capital (Exhibit MVS-1, Schedule 12, Sheet 3, Line 31, Column 4) the portion of this adjustment allocable to the Virginia jurisdictional rate base is $369,531. This should be added to the rate base

of $1,064,871,164 as shown in Mr. Van Scoyoc's Exhibit MVS -2. This amount will be further increased when the adjustments necessary to include secondary distribution plant and outdoor lighting plant are made. These adjustments are shown in Columns (5) and (6) on Exhibit WWC-2 and together total $11,879,000. Adding this to the previous adjustment gives an adjusted staff jurisdictional rate base of $1,077,119,695. After the Company made the necessary adjustments to correct the error of including street lighting plant in the jurisdictional rate base, they determined the total Virginia jurisdictional rate base to be $1,092,355,281. This amount is shown on Exhibit WWC-2 Column (12). Averaging these two rate bases produces a rate base which we conclude to be reasonable and proper. The amount so determined is $1,085,028,852 when cash working capital is changed by the adjustments in operation and maintenance expenses, which will be discussed later.

page 2063 } REVENUE AND EXPENSES

There was little difference in the gross operating revenues allocated to Virginia jurisdictional service by the staff and Company witnesses. The difference was less than .03 percent. Using the average of the operating revenue allocated by the staff and the Company, as was done in the rate base, produces an amount of $245,670,182, which we used as the gross operating revenue for rate making purposes.

The total operational expense as originally allocated by the staff included the adjustments proposed by Mr. Brown. In order to determine an amount for operational expense which will reflect only the differences due to allocation methods used, it is necessary to restore the staff adjustments. Certain of these will be put back in after the average of the two methods is taken. The adjustments to be made to the total operation expense allocated by Mr. Van Scoyoc are as follows: to the total operation expense as shown on Exhibit No. MVS-4, Line 21, Column 2, should be added an amount of $7,072,728 (Exhibit MVS-4, Line 21, Column 5). This amount should then be adjusted to include secondary distribution plant and outdoor lighting plant, as was done in the rate base. The total amount of this adjustment is $915,546 (Exhibit N. WWC-2, Columns (5) and (6). This results in an adjusted total operation expense for the staff
page 2064 } of $167,527,215. When this amount is averaged with the adjusted total operation expense shown the Company in Column (12) of Exhibit WWC-2, an amount

of $168,493,260 is obtained. Certain staff adjustments as proposed by Mr. Brown, which would have the effect of reducing this amount, will now be considered.

THE STAFF ADJUSTMENTS

Mr. Brown proposed a number of adjustments, and counsel for the Company vigorously objected to the introduction of Mr. Brown's exhibit containing the proposed adjustments. The Commission had previously refused to accept exhibits submitted by Mr. McGurn which annualized increases in wages and expenses for environmental protection for which the Company was already committed or were projected. Counsel for the Company argued that Mr. Brown had proposed an adjustment in the 1969 results of the Company to reflect the effect of a change in the tax law that occurred in 1970, which was after the end of the test year. Company counsel argued that this was the same type of adjustment that was proposed by Mr. McGurn and had been rejected. In the course of the ensuing discussion (Tr. p. 1011-1024), in which counsel for the Company attempted to have Mr. Brown's exhibit proposing an adjustment for the surtax rejected, Company counsel presented a newspaper

page 2065 } article proporting to show that tax increases may be needed to balance the Federal budget starting July 1. Of course, this would not be a relevant matter for consideration. On the other hand, the surtax is an expense item which the Company incurred in 1969. In 1970, this surtax will apply to the first six months of the year only, at a rate of 5 percent. The new rates are to become effective July 1, 1970. This Commission has always taken the position that rates are made for the future. Since the surtax will not apply in the future it is entirely proper that an adjustment be made to the Company's 1969 expenses for this item. The exhibit which Mr. Brown submitted was accepted.

The argument of Company counsel concerning the rejection of Mr. McGurn's exhibit containing *pro forma* adjustments for the increases in wages for 1969 and 1970, for which the Company is already obligated, is not without merit. Therefore, the Commission announced at the beginning of the hearing on May 11, that, this being a purely legislative proceeding, we would permit the record to contain all material offered. The bailiff was instructed to cross out the notation "Refused" which was noted on some of the exhibits.

Mr. Brown proposed an adjustment to increase the amortization of the Company's investment tax credit

page 2066 } reserve so that the balance as of December 31,

1969, would be disposed of within a ten-year period. The Company's practice has been to accumulate the credit in a reserve account. The Commission has authorized the spreading of these savings over the service life of the property which gave rise to the credits. Congress has now eliminated the investment tax credit and it appears appropriate to dispose of the accumulated credit over a shorter period of time than the service life of the property. Mr. Brown stated (Tr. p. 1032) that these savings can now be spread in a manner that will benefit both consumers and the Company. He recommended a period not to exceed ten years for this amortization. We believe that Mr. Brown's recommendation is sound and will include this adjustment along with the adjustment for the surtax in the adjustments to be made to the Company's operating expenses.

Mr. Brown has proposed adjustments of more than two million dollars to eliminate from operation expenses promotional allowances and trade ally advertising recorded during the year 1969. His basis for this recommendation was the fact that the Commission, by order entered on April 15, 1970, *dissapproved* further use of promotional allow-
page 2067 } ances and trade ally advertising in the form engaged in by the Company. Mr. Brown is correct in assuming that these expenses will not be incurred in the future for this type of sales promotion. However, it does not appear reasonable to assume that the Company, having been denied this particular form of sales promotion activity, would not substitute some other form of sales promotion activity which would have an equal, or possibly even greater, cost than the programs which have been eliminated. Therefore, we do not believe that these adjustments should be accepted.

?

Mr. Brown proposed an adjustment to reduce, for rate making purposes, the charges to maintenance expenses during the year 1969, representing damage resulting from hurricane "Camille" and the December, 1969, ice storm. He also proposed an adjustment to reduce charges to maintenance expenses recorded in 1969 for internal inspection of Unit No. 1 of the Mount Storm generating plant, for which the work was performed during 1968. Both of these adjustments appear to be reasonable and are accepted for inclusion with the other adjustments previously discussed.

In preparing his exhibits, Mr. Brown did not include some of the donations which the Company had assigned to electric operations. The amount on the Company's books
page 2068 } was recorded as $224,836. Mr. Brown included

donations in his exhibit of $183,437, eliminating more than $41,000 of the donations which the Company had on its books. The detail of the donations which were eliminated was discussed in Mr. Brown's cross-examination (Tr. p. 1080-1086). Essentially, Mr. Brown has allowed all those items which appear to be of a charitable, educational or civic nature. Mr. Brown has proposed several other adjustments, most of which are relatively minor. We do not agree with Company witness Clement, who indicated that he did not believe that an abnormal test year is possible (Tr. p. 1723). We believe that the adjustments which have been previously allowed eliminate from the test year certain expenses which were abnormal. It is difficult to conceive of a test period without some adjustments which could be made. The adjustments which have been discussed cover the bulk of the non-recurring expenses which the Company recorded during 1969. The amount of the remaining adjustments proposed by Mr. Brown would not be atypical of any other test year.

The staff adjustments which have been allowed have the effect of reducing the averaged total operation expense on Virginia jurisdictional service by $4,241,642.

page 2069 } OTHER ADJUSTMENTS

Without question, the issue in this case which produced the most controversy was the Company's attempt to justify adjustments due to increased operating expenses and carrying charges brought on by protection of the environment. The issue was first brought up when the staff testimony was filed four weeks before the hearing began. The Commission's Chief Engineer for Electric Utilities, Ernest M. Jordan, Jr., opposed any adjustment for environmental control measures for money to be spent in the future (Tr. p. 1071). On the opening day of the hearings the Attorney General opposed any increase for prospective expenditures (Tr. p. 19). In the final arguments of counsel on the last day of the hearing, counsel for the Cities and Counties opposed any adjustment for environmental control (Tr. p. 2041). Throughout the hearing this was a point of controversy.

We are in agreement with those who oppose any specific allowance or adjustment for unascertained expenditures to be made in the future. On the other hand, those expenditures which are already underway, or for which the Company is already obligated by contract, or required by governmental regulations, are certain. An adjustment for
page 2070 } these expenditures is equally as proper as the adjustment for the surtax.

The Company presented three exhibits (JMM-9a, JMM-10a, JMM-11a) which show the increased expenses for which the Company is presently obligated for wage increases and environmental protection. The total increased system annual expenses shown by these exhibits is approximately $4,200,000. These are non-revenue producing expenses. We believe that an adjustment for this additional expense is proper. After computing the tax effect, this adjustment will increase the Virginia jurisdictional expenses by $1,676,626. The net effect of the staff adjustment and other adjustments is to decrease the total operating expenses for the test year by $2,565,016. This reduces the previously determined total operating expense for Virginia jurisdictional service to $165,928,244. This is the appropriate total operating expense to be used for rate making purposes in this proceeding.

RATE OF RETURN

The hearings in this proceeding were conspicuously lacking in witnesses who would express themselves in terms of the return required on the rate base. The Company presented financial witnesses who gave their opinion as to the return required on common equity and the total capitalization. The total capitalization of the Company is not significantly different from the total rate base. Dr. Charles F. Phillips, Jr. recommended a return of 12.5 to 13.5 percent on common equity and 8.32 to 8.66 percent on capitalization. Mr. Carl H. Seligson expressed the opinion that a return of from 13.5 to 14.5 percent on common equity would be appropriate. Dr. Leon H. Kyserling recommended a return of 12.4 to 13.3 percent on common equity and 8.30 to 8.60 percent on capitalization. Their opinions range from 12.5 to 14.5 percent on common equity and from 8.3 to 8.66 percent on the total capitalization. The total capitalization of the Company is not significantly different from the total rate base.

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Professor Charles Schotta, a staff witness, recommended 11 to 12.25 percent on common equity and 6.89 to 7.29 percent on capitalization. There is no doubt about the need of this Company to attract capital. Mr. T. Justin Moore, Jr., the President of the Virginia Electric and Power Company, testified that the Company construction requirements for the next five-year period will likely total 1.9 billion dollars. This is an increase of more than 100 percent of the total present investment of this utility. Mr. Moore stated that 1.4 billion dollars of the 1.9 billion dollars will have to be raised through

the sale of securities. He further stated that in his opinion the Company needed additional gross revenues in excess of $25,000,000 in order to support the expansion
page 2072 } of the Company's facilities necessary to provide service to the public. Mr. Moore's focus was on the additional dollars of gross revenues required. Mr. McGurn, the Chairman of the Board of Directors and Chief Executive Officer of the Company, testified that since 1954 the Company's kilowatt-hour sales have increased nearly fivefold and that the corresponding increase for all electric companies in the United States was only threefold.

Mr. J. C. Wheat, a Richmond investment banker and one of the Company's financial witnesses, clearly set forth the two basic questions which are before the Commission when he said (Tr. p. 442):

"First, will Vepco be able to compete in the capital markets for the funds necessary to provide the service required, and, second, will the Commonwealth have a reliable and adequate supply of the electrical energy completely essential for continued economic growth?"

As we see it, the Commission has the duty and obligation to see that the answer to both of these questions is "yes".

A fair rate of return can never be established by a rule of thumb. It requires a consideration of all evidence of record and a conclusion based on the evidence and on judgment and experience. In the light of all the evidence it is our opinion that the proper rate of return for this Company on the rate base determined in this opinion is within the range of 8.0 to 8.5 percent.

page 2073 } The Commission's decision in this case grants the Company authority to put into effect revised schedules of rates to produce additional net income of approximately $11,200,000. The result for this test year, using the rate base, revenue and expenses previously determined as applicable for Virginia jurisdictional service, is shown below, before and after the increase:

	Before Increase	*After Increase*
Rate Base	$1,085,028,852	$1,085,028,852
Gross Revenues	245,670,182	268,152,182
Expenses	165,928,244	177,176,240
Net Income	79,741,938	90,975,942
Rate of Return	7.35%	8.38%

Several things should be noted from the above tabulation. The rate base, revenues, and expenses used are not the same as those determined by the Company. The Company originally determined their rate of return on Virginia jurisdictional service, before any increase in rates, to be 6.85 percent. This was based on an allocation which was later found to contain plant and expenses which were not under the jurisdiction of this Commission. Therefore, the Company figure was in error. When the application was filed in November, 1969, the Company requested an increase in
page 2074 } rates which would permit it to raise its rate of of return on Virginia jurisdictional business by 1.06 percent. Mr. Moore testified that the increase sought was the minimum which is necessary to meet the Company's financing needs. In view of the continuing inflation which exists in our economy today, we do not believe that the increase in rate of return of 1.03 percent which has been granted can be questioned. The impact of inflation on Vepco was dramatically demonstrated when its sale of $85,000,000 in bonds on April 21, 1970, at a cost to the Company of 9.09 percent, increased its embeded cost of debt from 4.85 percent to 5.30 percent. On June 15, 1970, a $100,000,000 bond offering of the New Jersey Bell Telephone Company was sold to yield 9.35 percent.

THE RATES

The Company proved that the summer load has increased at a more rapid rate than the winter load. As a result, the Company has had to provide some 500,000 kilowatts of generating capacity with corresponding transmission facilities to meet the requirements of the summer load. This capacity is unused most of the year and has the effect of increasing the Company's annual revenue requirements by
page 2075 } $15,000,000. Since increased winter loads could be served with this capacity, it is obviously in the interest of all the consumers to increase the winter load.

A Company witness, Charles H. Frazier, testified that the demand for electric energy for house heating is elastic, meaning that a small percentage change in the price causes a larger percentage change in demand for the service. Vepco proposed to leave the bottom step of their residential rate structure at 1.2¢ per kilowatt-hour during the months of November through June and charge a higher rate during the summer months. Professor Charles Schotta, a staff witness, supported Mr. Frazier's testimony and further suggested that

the bottom step of the trailing rate for residential service be reduced to increase the demand even further. The company did not contradict the testimony, but asserted that while the lower rate can be expected to increase revenues in the long run, it would necessarily result in an immediate short term reduction in revenue. The reduction in winter rates was supported by the Attorney General, the Cities and Counties, and by the Commission's staff. The Commission's Order of June 10, 1970, directed the Company to reduce the bottom step of the residential rate to one cent per kilowatt-hour. In order to soften the impact of the short-term

page 2076 } revenue reduction, the bottom step is to apply after 1500 kilowatt-hours monthly consumption. The consumers who will receive the benefit of this reduction will be mainly those who heat their houses with electricity.

A question was raised concerning the legality of the Company's proposed application of the summer-winter rates. An exhibit, EMJ-4, was introduced raising this point. The Company offered rebuttal testimony on this issue (Tr. p. 1764). The intent of §56-234 of the Code which requires utilities to charge uniformly for service rendered under like conditions is to prevent unjust discrimination. It is impossible to read all meters on the same day. If a differential in rates applies for a specified period, some discrimination exists unless all meters are read simultaneously. This unavoidable discrimination, coupled as it is with substantial benefits to all consumers, is not serious enough to be unjust or unreasonable. We approve the present practice of reading meters bi-monthly for most customers. The interim bills proposed by the Company are not objectionable and are approved.

The Company proposed a late payment charge on its bills, although it offered no evidence in justification of such a charge. Since the interim bills will alter the Company's cash flow, we do not believe that the late payment

page 2077 } charge should be approved. The Company proposed to increase the minimum charge under its rate schedules from $1.50 per month to $3.00 per month. There was no substantial objection to this and the Commission approved it.

The Company proposed to pro-rate bills on a 30-day basis. The Commission's Chief Engineer for Electric Utilities, Mr. Jordan, opposed this feature of the Company's rates in all schedules except Schedule No. 6, Large General Service. His objection was that the calculation of bills would be further complicated and would not be readily understood by many consumers. The Company's witness, Robert S. Gay, stated (Tr. p. 560-561) that one of the major objectives in

the development of the proposed rate schedules was to simplify the rate structure so that the application of the schedules may be better understood by the customers. The Commission does not believe that this feature of the proposed rates meets this criterion; and, therefore, it is rejected for all schedules except Schedule No. 6, Large General Service.

Mr. Jordan pointed out (Tr. p. 1069) that the Company rate Schedule No. 7 had no limit to the energy which could be billed at the lower rate intended to be for water heater use. It would be possible for a customer to receive the benefit of the lower rate on a greater number of kilo-
page 2078 } watt-hours than the water heater is capable of consuming. A restriction should be placed in this rate schedule to limit the number of kilowatt-hours eligible for a reduced rate because of the use of an electric water heater. Mr. Jordan objected (Tr. p. 1067) to special rates for electric water heaters in residential use. The Company opposed his suggestion that the rate for water heating customers be made available to customers not using electric water heaters. Since his suggestion would decrease the Company's revenue by $4,370,000 annually we have rejected it.

A representative of Continental Can Company, Inc., Michael J. Dunford, objected to Section III of the Company's proposed Schedule No. 6, Large General Service. This section of the rate schedule deals with the determination of kilowatt demand. One of the clauses in this section provides that the demand charge be based on 95 percent of the highest demand used during June through September. This clause is known as a ratchet clause. Mr. Dunford's objection has merit and the Commission directed the Company to reduce the ratchet clause from 95 percent to 90 percent.

page 2079 } CONCLUSION

The establishment of just and reasonable rates is not a matter of mathematical certainty. Any conclusion as to the rate of return involves an exercise of informed judgment in the light of the evidence. In arriving at the decision reached in this case, we have followed the method that has been used by the Commission and approved by the Supreme Court of Appeals for the past 25 years. This method was succinctly stated by the Court in *Norfolk* v. *Chesapeake, etc. Tel. Co.* 192 Va. 292, 301;

"Upon undertaking to fix rates for a public utility company of this character, the Commission must necessarily first

ascertain (a) the value of the Company's property used and useful in the rendition of its intrastate service, (b) its annual gross revenues, and (c) its annual operating expenses. Upon accomplishing these objectives, it must then determine upon and set the percentage rate of return at such a figure as will afford the utility reasonable opportunity to earn a fair and just return on its investment."

From the evidence, the Commission finds as a fact that the applicant is entitled to the increase allowed by our final order.

DILLON, *Commissioner,* concurs.

* * * * *

page 2084 } COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

CERTIFICATE

Pursuant to an order entered herein on June 22, 1970, the original exhibits listed therein are hereby certified to the Supreme Court of Appeals of Virginia to be returned by the Clerk thereof with the mandate of that Court.

It is further certified to the Supreme Court of Appeals of Virginia that the foregoing transcript of the record in this proceeding, with the original exhibits, contains all of the facts upon which the action appealed from was based, together with all of the evidence introduced before or considered by this Commission.

Witness the signature of H. Lester Hooker, Chairman of the State Corporation Commission, under its seal and attested by its Clerk, this 22nd day of June, 1970, at Richmond, Virginia.

H. Lester Hooker
Chairman

Attest: William C. Young
Clerk

CERTIFICATE

I, William C. Young, Clerk of the State Corporation Commission, certify that within sixty days after the final order in this case, the Attorney General, on behalf of the Commonwealth, filed with me notice of appeal which has been delivered

to counsel for the applicant, Counsel for the State Corporation Commission and to counsel for the interveners pursuant to the provisions of Section 13 of Rule 5:1 of the Rules of the Supreme Court of Appeals of Virginia.

Subscribed at Richmond, Virginia, this 22nd day of June, 1970.

William C. Young
Clerk

* * * * *

A Copy—Teste:

Howard G. Turner, Clerk.

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