

Before the  
PUBLIC SERVICE COMMISSION  
of the  
STATE OF SOUTH CAROLINA  
in re  
—  
CAROLINA POWER AND LIGHT COMPANY  
Docket Numbers 18361 and 18387

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REGULATORY DOCKET FILE

Testimony of Ronald P. Wilder  
In regard to  
Fair Rate of Return  
June, 1976

Q. Please state your name and address.

A. My name is Ronald P. Wilder and I live at 707 Trafalgar Drive, Columbia, South Carolina.

Q. What is your present occupation and place of employment?

A. I am an economics professor and am an Associate Professor of Economics in the College of Business Administration at the University of South Carolina, Columbia, South Carolina. My appearance before the Commission is as an individual and not as a representative of the University.

Q. What is your educational background?

A. I studied economics at Rice University, Houston, Texas, where I received the B.A. in economics in 1963 and the M.A. in economics in 1964. I entered the doctoral program in economics at Vanderbilt University, Nashville, Tennessee in 1964 and was awarded the Ph.D. in economics in 1969. While at Vanderbilt I specialized in Industrial organization, which is the study of market structures, including regulated industries. I also served as a teaching assistant in economics and statistics. In the summer of 1965 I was awarded a summer internship at the U. S. Department of State, where I worked in the Bureau of Economic Affairs. In the summer of 1966 I served as a consultant to Southern Bell Telephone Company.

Q. Please summarize your experience since leaving graduate school.

A. Having received a reserve commission in the U. S. Army in 1963, I entered active duty as a First Lieutenant in October, 1968. After attending the Ordnance Officer Basic Course at Aberdeen, Maryland, I served at Headquarters, U. S. Army Materiel Command, Washington, D. C. during the period December, 1968 to March, 1970. My duties at the Army Materiel Command related to cost analysis of weapons systems,

including the performance of life cycle cost studies. I was promoted to Captain in October 1969. During the period April, 1970 to August, 1970, I served with the First Logistics Command, Vietnam and with Headquarters, U. S. Army, Vietnam. My duties during this period were as a maintenance staff officer. I was released from active duty in August, 1970 and subsequently received an honorable discharge.

In September, 1970, I joined the faculty of the University of South Carolina as an Assistant Professor of Economics. Since joining the faculty, I have taught courses in principles of economics, managerial economics, engineering economics, government regulation of business, industrial organization, and the economics of regulation. I was promoted to Associate Professor in May, 1975.

Q. What has been your experience relating to public utility regulation?

A. My teaching experience has included courses dealing with the managerial topics of cost of capital and capital budgeting as well as economic aspects of utility regulation.

My research experience has been heavily oriented toward aspects of public utility regulation. I have written several articles on public utility regulation, which have been published in journals such as Land Economics, The Bell Journal of Economics and Management Science, Business and Economic Review and Southern Economic Journal.

I was an invited participant in two seminars on public utility regulation sponsored by AT & T; in 1974 at the Graduate School of Management at UCLA and in 1975 at the Graduate School of Business at the University of Chicago.

During the past year I served as a consultant to the Special Committee

to study Electric Rates and the structure of the Public Service Commission, which is composed of State legislators and private citizens.

Q. What is the subject of your research and testimony in these proceedings?

A. I have been asked to perform a study of the fair rate of return for the Carolina Power and Light Company.

Q. Why is the determination of a fair rate of return central to most public utility hearings-relating to requests for rate increases?

A. This question can best be answered by contrasting the operations of a firm in the unregulated, market sector of the economy (e.g. General Motors) with the operations of a regulated public utility such as CP & L. To simplify matters, let us assume that market sector firms such as GM are totally unregulated, although this is, of course, an oversimplification since market sector firms are subject to variety of government controls such as antitrust, wage-price guidelines, environmental controls, etc. Still, the important difference between CP & L and GM is that CP & L is subject to systematic rate and rate of return regulation, while GM is not.

Consider first how GM sets prices for its various products. The management at GM presumably bases its actions on a set of objectives of which a primary concern is to maximize profits or maximize stockholders wealth. In pursuit of this objective, GM management sets prices and rates of output at levels which will best achieve the objective, taking into account cost structures, the extent of competition, and demand conditions. Neither GM's prices nor its profits are regulated by government; rather, the forces of competition are left

to perform this function. The adequacy of competition in this regard if, of course, highly controversial.

Now CP & L is also operated by a management group which is interested primarily in maximizing profits or stockholders' wealth. The difference between CP & L and GM is that CP & L is a regulated public utility. This regulated status is a result of a public policy decision by the state that electric utilities, because of economies of size and other reasons are more efficient operating as regional monopolies, than if two or more utilities served a particular locality. Because this protected monopoly status removes virtually all direct competition, rate and rate of return regulation have been instituted in lieu of competitive forces to attempt to insure that electric service will be provided at the lowest price commensurate with the long-run survival of the utility firm as a viable economic unit. Consequently, the pursuit of profit maximization by the regulated utility is subject to the constraint that its rate of return not exceed the lowest level which will allow it to continue to attract capital on a competitive basis, which is the legal concept of fair rate of return as set forth in the Hope decision:

The return to the equity owner should be commensurate with returns on investment in other enterprises 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.  
[FPC v. Hope Natural Gas, 320 U. S. 591 (1944) at 603.]

- Q. What economic principles are relevant to your study of the fair rate of return for CP&L?
- A. There are two fundamental principles involved. The first of these

principles, relating to the expansion of the firm and its demand for capital resources, is that the firm should increase its capacity by purchasing new plant and equipment to the point at which the rate of return on the last dollar of investment is equal to its cost of capital, i.e. the cost of obtaining funds. If this condition is not met, expansion will reduce, rather than increase or hold constant, the profitability of the firm.

The second principle applies to the supplier of capital funds. It states that the supplier of capital, the individual who purchases the stock or bonds of the firm, should purchase a given financial instrument only if its return is at least as great as that available on other investments of comparable risk. If this condition is not met, the supplier of capital is not maximizing his wealth.

It should be pointed out that these two economic principles are consistent with the legal principles as set forth in the Hope case, mentioned above.

Further, a rate of return which satisfies these two economic principles will be fair to the utility in the sense that it be able to continue to raise capital; it will be fair to stock-and-bond-holders in the sense that they earn their opportunity cost. (a return as good as that available on similar investments having comparable risk), and it will be fair to rate-payers in the sense that average rates associated with this rate will be the lowest possible rates which cover all the utility's costs including the cost of capital and hence allow the firm to continue operation. The concept of fairness to consumers assumes that the rate of return is the minimum rate of return which

satisfies the two above economic principles and also assumes that the utility operates efficiently, that is, that it minimizes the cost of producing a given level of output. The assurance of cost-minimization is a regulatory function.

Q. How sensitive are utility rates to the allowed rate of return?

A. Return on capital is one of the major items in the utility's cost structure, since electric utilities are relatively capital intensive. For a rough idea of the importance of the rate of return to the utility's rate-payers, let us consider the revenue and cost structure of CP&L during 1975. Of total operating revenues of \$606.3 million, the total return on capital (the sum of interest paid plus preferred dividends, plus return on equity capital) was \$191.6 million or 31.6 percent of total operating revenue.

Focusing on return on equity, which is the major item of controversy in rate of return determination, we find that the return on common equity for 1975 for CP&L was \$75.9 million, or 12.5 percent of total operating revenues, which equates to a return on common equity of 10.5 percent.

To illustrate the sensitivity of average rates to rate of return, suppose that CP&L had earned a rate of return of common equity which was one percentage point higher than that actually observed, i.e. that rate of return on common equity in 1975 was 11.5 percent rather than 10.5 percent. If all other costs had remained the same, by how much would revenues have had to increase to achieve this higher rate of return, assuming that demand conditions permitted the same kilowatt hour sales at the higher rates? Required revenues would be \$7.2

million greater, an increase of 1.2 percent. Average rates for all classes of customers would be increased from 2.49 to about 2.52 cents per kilowatt-hour and the average annual residential bill would be increased from \$347.54 to about \$352 per year.

From these estimates, it can be seen that a 10 percent increase in the rate of return on equity for CP&L would be associated with about a 1.3 percent increase in required revenue, assuming no change in output, costs, or taxes.

This discussion of sensitivity of electric rates to rate of return illustrates why consumers tend to be interested in the outcome of rate cases, particularly during periods of inflation when other costs such as fuel and interest expenses are also increasing at rapid rates.

Q. What role does the determination of the fair rate of return have in regulatory proceedings relating to utility's application for a rate increase?

A. The general practice in utility regulation is to set a utility's prices so that it covers all costs, including taxes and depreciation, plus the allowed return on investment. The return on investment is computed by multiplying the rate base by an allowed rate of return, where the rate base is the book value (original cost less depreciation) of the utility's capital investment in plant and equipment.

Given the allowed rate of return, the total revenue required to achieve that rate of return can be computed as follows:

$$\text{Revenue required} = \text{Total operating costs} + (\text{Allowed rate of return} \times \text{Rate base})$$

and the average rate per kilowatt hour would then be:

$$\text{Average rate} = \frac{\text{Revenue required}}{\text{Expected Total kilowatt hour sales}}$$

Of course, utility rate structures are much more complex than simply determining the average rate. This testimony is not considering the question of rate structures.

From the above relationships, it can be seen that the analysis by a regulatory body of a utility's request for a rate increase involves the determination of the following items:

- 1) Expected kilowatt hour sales
- 2) Expected operating costs to produce the level of output in 1)
- 3) Rate base
- 4) Allowed rate of return.

Since items 1), 2), and 3) are usually estimated based on accounting records of a historical test period, the main item of contention in most rate cases is item 4), the allowed or fair rate of return.

It is to the level of the fair rate of return for CP&L that my testimony is addressed.

Q. What are the major elements involved in estimating the fair rate of return?

A. Taking the utility's capital structure as given, the overall rate of return on rate base is computed as the weighted average of required returns on each element of the capital structure. Suppose, for example, a firm has 60 percent debt requiring a return of 7 percent and 40 percent equity requiring a return of 10 percent. Then the overall required rate of return is:

$$7\% (.6) + 10\% (.4) = 8.2\%$$

The cost of debt capital for the test year is a known quantity, based on the average interest rate of the embedded (outstanding) debt instruments. The cost of preferred stock is also known. Hence, the major unknown in the determination of the fair rate of return is the cost of equity capital.

- Q. Briefly outline your procedures for determining a fair rate of return on rate base for CP&L.
- A. My determination of fair rate of return focuses on the cost of equity capital. The cost of equity capital is estimated using the discounted cash flow approach. This cost of equity is then checked for reasonableness by comparing it with historic and current rates of return on equity for other regulated and non-regulated firms and the project the likely rate of return for CP&L in the immediate future. The final step is to compute the overall rate of return on rate base as the weighted average of cost of debt, cost of preferred stock, and cost of equity.
- Q. What is the conceptual basis for the use of the discounted cash flow approach in estimating the cost of equity capital?
- A. The starting point is the previously mentioned principle that the rational, wealth maximizing investor will purchase a given common stock only if its return is at least as great as that of other investments with comparable risk. The crucial problem here is that investors are interested in the future, expected returns on investments. It is the investor's concern for the future rather than the past which makes the estimation of the cost of equity capital difficult and which requires the use of subjective judgement in the estimation of the cost

of equity capital. This focus on the future is the basis for using the discounted cash flow approach to estimating the cost of equity capital.

Q. Describe the use of the discounted cash flow model in estimating the cost of equity capital.

A. The price an investor is willing to pay for a share of common stock will be equal to his estimation of its present value. The present value of a share of stock is the sum of the discounted proceeds which the investor expects to receive as a consequence of buying the stock. The discount rate reflects the opportunity cost of the investor, that is, the return which the investor could earn on the next best alternative investment of comparable risk. The discounting procedure reflects the time-value of money, which means that a sum received today is worth more than the same amount received in the future because of the earnings available if the present sum is invested during the interim period.

Pages 1-2 in the exhibits show an example of the algebraic derivation of the discounted present value approach to stock prices and the cost of equity capital.

The investor is assumed to select stocks for purchase on the basis of expected rate of return,  $k$ , which depends on current price, current dividends, and the expected annual rate of growth of dividends,  $g$ , as shown in equation 5) of Page 2 of the exhibits.

Unless the expected rate of return for CP&L stock is as large as that available on other investments of comparable risk, the investor cannot be induced to buy the stock. Hence, the approach in using the dis-

counted cash flow approach to estimating the cost of equity capital,  $k$  is based on current market prices for the common stock, current dividend levels, and estimates of the future rate of growth of dividends which investors can reasonably expect.

The reasoning used in the discounted cash flow approach, therefore, is that current stock prices reflect investors' expectations of the future earnings and dividends of the company. If expectations become more optimistic, present value (equation 4) increases and the stock price increases. If expectations become more pessimistic, the stock price decreases. At any point in time, we can infer the cost of equity capital by estimating the expected growth of dividends of the firm and adding that rate of growth to the current dividend yield to obtain the estimated cost of capital.

Q: To what extent does the discounted cash flow approach require the use of judgement on the part of the analyst?

A. Since current stock prices and dividend yields are observable, the main element for which judgement is required is the estimation of the future growth rate in dividends expected by investors. Investors' expectations are dependent in part on historical trends, but it is clear from observed fluctuations in stock prices that expectations can change dramatically in the face of sudden changes in the general economic environment, such as an energy crisis, a recession, or an acceleration of rates of inflation. Because the period 1973-1975 was characterized by such rapid and significant changes in the economic environment, changes in growth rates of dividends in the recent past are probably misleading as indicators of future growth rates. Therefore, considerable judgement is called for in order to weigh the

relative importance of historical versus recent growth rate as indicators of future growth rates.

Q. How did you use this discounted cash flow approach as a basis for estimating the cost of equity capital for Carolina Power and Light Company?

A. The basic rate of return on equity,  $k$ , was estimated by applying the equation  $k = \frac{D_1}{P_0} + g$  (From Exhibit-Page 2), both to Carolina Power

and Light Company and to a sample of comparable electric utilities. Expected growth rates of dividends,  $g$ , were estimated in alternative ways based on varying assumptions about the future economic environment. This basic rate of return on equity was then checked for reasonableness by comparing it with current and historical rates of return on equity. A further comparison was made with the current bond yields, taking into account historical and current risk premia of stock versus bond yields and taking into account current and expected future rates of inflation.

Q. Describe how you estimated the expected dividend growth rate for Carolina Power and Light Company.

A. Since long range trends in dividend payments are directly tied to the earnings of the firm, I have looked at historical rates of growth of both dividends per share and earnings per share. Historical data for these items for CP&L during the period 1960-1975 are shown in Exhibit-Page 3. This period is long enough to include three recessions (1961, 1970, and 1974) with subsequent recovery years. In addition to the earnings and dividends data, it is also useful to examine the annual average stock prices (Page 4) and rates of return on common equity

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and dividend yields on market value of the common stock. (Exhibit-Page 5.)

The major conclusion derived from the examination of these data is the following: Although the rate of return on common equity has been generally stable (in the range of 11-12 percent) throughout the period, with the exception of the recessionary years 1970 and 1974, stock prices have fallen substantially since the middle to late 1960's with a corresponding increase in dividend yields.

The implication of these changes is that stockholders have lowered their expectations of the future rate of growth of dividends. As this occurred, stock prices fell, and dividend yields increased. At the bottom of Exhibit-Page 3 are shown annual compounded rates of growth of earnings and dividends per share between selected years during this period. The high stock price and relatively low dividend yield of the mid-1960's are associated with the very rapid growth rates (12 percent for dividends per share and 10 percent for earnings per share) during the period 1960-65. As growth rates decreased, stock prices fell. Although the overall average growth rates between the years 1960 and 1975 are 5.9 percent for dividends per share and 6.1 percent for earnings per share, stockholders are behaving as though they believe that the much lower growth rates of the past few years are the best indication of the firm's growth in the next few years.

Q. What is your estimate of the expected growth in dividends per share for CP&L?

A. I believe that the period 1973-1975 is a starting point for establishing investors' expectations, with the qualification that investors expect growth to be slightly higher than in this period because 1974 was a recessionary year and

1975 was a year in which recovery from the 1974 recession did not begin until the end of the first quarter.

The annual growth rate in earnings per share during 1973-75 was 2.3 percent. The last previous "normal" historical period (without recession, price controls, or the effects of the energy crisis) was 1965-69 during which earnings per share grew at an annual rate of 3.1 percent. Therefore, I believe a reasonable estimate of stockholders' expectations of the growth rate in dividends per share is 3.1 percent. This estimate is based on my judgement that the experience of late 1960's provide the best precedent for what investors can expect in the next few years. It also reflects the argument that growth in earnings per share is a better indication of growth than the pattern of dividends actually paid in the past.

- Q. What rate of return on equity for CP&L is consistent with this growth rate?
- A. The dividend yield on the average stock price for 1975 was 9.7 percent (Exhibit-Page 5). Applying the capitalization equation  $k = \frac{D_1}{P_0} + g$ , I obtain:  $k = 9.7\% + 3.1\% = 12.8\%$ . Therefore, my basic estimate of the cost of equity capital for CP&L is 12.8 percent. This estimate is a starting point only, and will be modified by the subsequent analysis of alternative investments and by consideration of the cost of issuing new common stock.
- Q. Did you also estimate the basic rate of return on equity for a group of electric utilities comparable to CP&L?
- A. Yes, I did. I selected the Moody's utility sample as a comparison group, since it contains CP&L, as well as other large electric uti-

ilities. Utilities in this group represent alternative common stocks which investors could purchase rather than purchasing CP&L common stock. As will be shown, these stocks have a risk status which is similar to that of CP&L and therefore form the basis for a reasonable estimate of rate of return on alternative investments of comparable risk.

Q. What utilities are included in the Moody's Sample?

A. There are 24 electric and combined gas-electric utilities in the Moody's sample. A list of the companies is shown on Page 6 of the Exhibits.

Q. What has been the recent experience of this sample of utilities with respect to dividends, earnings, and stock prices?

A. The dividends per share and earnings per share trends are shown in Page 7 of the Exhibits, with stock prices and dividend yields shown on Page 8. The performance of this group has been similar to that of CP&L. Earnings per share grew at a rapid pace in the early 1960's and at a slower rate in the late 1950's and early 1970's. Stock prices reached their peak in 1965, slumped during the 1970 recession, and slumped drastically with the 1974 recession. Recovery appeared to be underway in 1975..

Q. What rate of return on equity is suggested by the experience of the Moody's utility average?

A. The 1975 dividend yield on average market value for the Moody's group is 9.8 percent (Exhibit-Page 3). This provides the first element in the rate of return equation. The second element is the growth rate in dividends per share expected by investors. Again, my judgement is that the 1965-69 growth experience of earnings per share provides the

most reliable evidence for the future growth of dividends per share for the Moody's group. From Exhibit-Page 8 we find that the 1965-69 rate of growth of earnings per share of the Moody's group was 4.0 percent. Applying the capitalization equation  $k = \frac{D_1}{P_0} + g$

where  $\frac{D_1}{P_0} = 9.8\%$  and  $g = 4.0\%$  we obtain an estimated rate of return on equity of 13.8 percent for the Moody's group.

Q. How does this rate of return for the Moody's group compare with that previously calculated for CP&L?

A. The 13.8 percent basic rate of return for the Moody's group is one percentage point higher than the 12.8 percent estimate for CP&L. This difference could be due to a number of reasons, but the major difference is likely to be differences in perceived risk.

Q. What concepts of risk are applicable to investor' assessments of common stocks?

A. There are two major conceptual categories of risk: business risk and financial risk. The concept of business risk is concerned with the variability of operating income of the firm. It assumes that investors have a preference for earnings that grow in a stable fashion, rather than erratically. Financial risk, on the other hand, reflects the capital structure of the firm. The higher the proportion of debt in the firm's capital structure; the greater the proportion of fixed charges (interest costs) to total operating income.

Q. Did you compare CP&L and the Moody's utility sample with respect to business risk and financial risk?

A. Yes, I did. Let's consider financial risk first. Electric utilities

are highly capital intensive enterprises and therefore have very large and continuous requirement for additional capital investment as total demand grows. Additionally, the demand for electricity is somewhat more stable over the business cycle than is the demand for many manufactured goods, especially durable goods. Because of these structural features of electric utilities, they tend to have higher proportions of debt in the capital mix than do industrial firms. This extensive use of debt is true for CP&L as well as the Moody's sample. To illustrate this point, I show in Exhibit-Pages 9 and 10 the capital structure of CP&L and the Moody's sample for several recent years.

- Q. How does the financial risk for the Moody's group compare with that for CP&L?
- A. Financial risk refers to the risk to which common stockholders are exposed due to the priority of debt service and preferred stock dividends over common stock dividends. Because common stockholders are the last in line to be paid out of the operating income of the firm, their receipts are subject to more uncertainty. As a firm increases its debt ratio, other things remaining the same, the proportion of its fixed charges relative to operating income increases, and the uncertainty to which common stockholders are exposed also increases.

Because of these considerations, the relative financial risk of common stockholders of CP&L and of the Moody's group can be assessed by a comparison of their recent capital structures. This comparison is made in Pages 9 and 10 of the Exhibit. As can be seen, the proportions of common equity in total capitalization are very similar for

CP&L and the Moody's group. For 1974, the last year for which complete data were available, CP&L had a common equity ratio of 29.3 percent compared to 33.9 percent for the Moody's group. The respective averages for the 1970-1974 period were 32.2 percent (CP&L) versus 34.6 percent (Moody's):

I conclude from this comparison that CP&L and the Moody's group have capital structures which are quite similar and that their common stockholders are subject to a comparable degree of financial risk.

Q. How does CP&L compare with the Moody's sample with respect to business risk?

A. Given that the respective capital structures are similar, the fluctuations in earnings per share are due primarily to changing business conditions (e.g. demand, rates and costs). One commonly used method of measuring business risk is the coefficient of variation, defined as the ratio of the standard deviation to the arithmetic mean of a sample. As an example of how this measure could be used, consider two firms, both having the same mean earnings per share of \$5 over a five year period. Suppose that Firm A had a series of annual earnings per share as follows: \$4, \$5, \$5, \$5, \$6, while Firm B experienced the series \$2, \$5, \$5, \$5, \$8. Then the arithmetic means, ( $\bar{X}$ ), standard deviations ( $\sigma$ ) and coefficients of variation ( $V$ ) are as follows:

	<u>Firm A</u>	<u>Firm B</u>
Arithmetic Mean ( $\bar{X}$ )	\$5	\$5
Standard Deviation ( $\sigma$ )	.73	2.12
Coefficient of Variation ( $V$ )	.14	.42

In this example, Firm B would be considered more risky than Firm A because the variability of earnings per share is greater.

I applied this measure of business risk to CP&L and to the Moody's group, with the results shown on Page 11 of the Exhibit. Although CP&L earnings per share were somewhat more variable than the Moody's group for the entire 1960-75 period, for the period 1965-69 on which I based my estimates of dividend growth, the coefficients of variation were virtually identical (.06 for Moody's group versus .05 for CP&L). I conclude, therefore, that the Moody's group and CP&L have similar business risk and that the estimated rates of return on equity should be comparable.

Q. If rates of return are comparable, why is the estimated rate of return on equity for CP&L (12.8 percent) one percentage point lower than that for the Moody's sample (13.8 percent)?

A. Primarily because earnings per share grew slightly faster for the Moody's group during the 1965-69 test period (4.1 percent for Moody's versus 3 percent for CP&L). The current dividend yields are almost identical (9.7 percent for CP&L versus 9.8 percent for the Moody's group).

Q. Did you use any other approaches to verify the reasonableness of the basic rate of return on equity for CP&L?

A. I used one additional approach which takes into account the effect of inflation rates on interest rates and investors' required rates of return. Conceptually, we can think of the nominal interest rate or rate of return as consisting of three components: a real interest rate, a risk premium, and a compensation for inflation. This concept takes into account the fact that nominal returns are influenced by

both perceived risk and by expectations regarding future inflation. The risk premium of concern here is the difference in required return between bond yields and rates of return to common equity. This difference in return is a reflection of how much more compensation investors require to induce them to purchase common stock, with a less certain future payment stream, rather than bonds, with a more certain stream of future payments.

The data underlying this approach to estimating the rate of return on equity is shown in Pages 12 and 13 in the Exhibit for CP&L and the Moody's average, respectively.

Price adjusted bond yields and rates of return on common equity are shown in columns 4 and 5 of these exhibits. The price adjustment is made by subtracting the annual rate of change of the consumer price index from the nominal returns on bonds and stocks.

The risk premium between return on common equity and bond yields is then calculated by subtracting the price adjusted bond yield from the price adjusted rate of return on common equity, with the results shown in column 6 of Exhibit-Pages 12 and 13. This risk premium was relatively large during the early and mid-1960's, with a decline during the 1970's as inflation rates increased. The years 1974 and 1975 were unusual years in that risk premium became very small or even negative. This negative value of the risk premium was a result of the combination of recession and inflation, particularly in 1974. It suggests that bond holders did not expect the abnormally high inflation rates to persist.

Examining the average (arithmetic mean) values for the price-adjusted

risk premia, I find the following results for CP&L and Moody's:

<u>Period</u>	<u>CP&amp;L</u>	<u>Moody's Average</u>
1960-1975	4.44	3.87
1965-1969	6.41	5.03

As before, I chose the 1965-69 period as the period best representative of likely future conditions. The average annual rate of change in the consumer price index during this period was 3.8 percent, which is reasonably close to the 4 percent-5 percent range which many economic forecasters expect for the year 1976. (The annual rate of change in the Consumer Price Index for the first quarter of 1976 was 2.9 percent.)

The next step in this real rate of return analysis is to estimate a nominal rate of return on equity as the sum of the expected inflation rate, the average price-adjusted return on bonds, and the average risk premium of common stock relative to bonds. This computation for both CP&L and the Moody's average is shown in Exhibit-Page 14, using alternative rates of inflation of 4 percent and 5 percent.

It is my judgement, based on reading economic forecasts for 1976 and examining current conditions, that 5 percent is the most reasonable estimate for the annual rate of inflation over the next few years. Given this expected inflation rate, the range of nominal rates of return on equity as estimated in this fashion is between 12.41 percent (Moody's) and 13.88 percent (CP&L).

- Q. What is your estimate of the basic rate of return on equity for CP&L?
- A. Based on the two approaches used to estimate rate of return on equity

for Moody's and CP&L and given the demonstration that CP&L and the Moody's average represent investments of comparable risk, the basic rate of return has been found to lie in the range between 12.41 percent and 13.88 percent. A basic rate of return on equity of 13 percent is a representative value within this range. I conclude that the basic rate of return on equity for CP&L should be 13.0 percent.

Q. Are there other considerations in arriving at the fair rate of return on equity for CP&L?

A. The remaining consideration is by how much the fair rate of return to CP&L should exceed the required rate of return of its investors. The difference between these two returns is due to the cost of issuing new common stock. Because of this cost, the net proceeds to the company when a new issue of common is made are less than the price paid by the purchasers of the stock. The size of this difference between gross and net proceeds from stock sales are illustrated by the data in Exhibit-Page 16.

The data in this exhibit show the average relationship between gross price per share (the price at which the stock was offered) to the net price per share (the average proceeds per share received by the company after the costs of issuance were paid). Over the 1960-75 period, the average ratio of gross price to net price was 1.03. Over the more recent 1973-75 period the ratio was 1.05, suggesting that issuance costs were somewhat higher in the early 1970's than in the 1960's. I believe that the latter ratio (1.05) is the best indication of current issuance costs.

Q. Is there also an effect of new issues of common stock on stock prices?

A. New issues of moderate size may tend to depress stock prices slightly,

but this effect tends to be overshadowed by general stock market movements due to changing market conditions. In an effort to measure the effect of new issues of common stock on stock prices, I have tabulated in Exhibit-Page 16 the average CP&L stock prices in the calendar quarter in which the new issue took place, compared to the average prices in the first quarter prior to and the first quarter subsequent to the quarter of issue. The effect of the new issue on the stock price is estimated by the ratio of the average stock price in the first quarter after issue to the average stock price in the first preceding quarter. The average over the 1960-1975 period of this ratio is 1.05, which suggests that there is no general tendency for stock prices to fall as a result of new issues. In other words, the potentially depressing effect of new issues is, on the average, outweighed by changes in general market conditions.

Q: What is your conclusion regarding a fair rate of return on equity for CP&L?

A. Taking into account the basic rate of return previously estimated of 13.0 percent, and the cost of issuance of new common stock of 1.05 times the net price received by the company, we may compute the fair rate of return on equity as follows:

On the basis of the discounted cash flow model, the cost of equity capital ( $k$ ) is  $k = \frac{D_1}{P_0} + g = 13.0\%$ , where  $D_1$  is the current annual dividend per share,  $P_0$  is the current market price per share and  $g$  is the expected annual rate of growth in earnings and dividends. As shown previously, the 1975 values for CP&L for  $D_1$  and  $P_0$  were:

$$D = \$1.60; P_0 = \$16.46 \text{ and } \frac{D_1}{P_0} = \frac{\$1.60}{\$16.46} = 9.7\%$$

This current dividend yield is now to be adjusted to reflect the difference between price paid by purchasers of new shares ( $P_0$ ) and the net price received by the company ( $P_n$ ) where  $\frac{P_0}{P_n} = 1.05$  or  $P_n = \frac{P_0}{1.05}$ .

Making this substitution, we obtain  $\frac{D_1}{P_n} = \frac{D_1}{P_0/1.05} = \frac{\$1.60}{\$16.46/1.05} = 10.2\%$ .

Therefore, the effect of taking into account the cost of issuance of new common stock is to increase the cost of equity by .5% (the difference between 10.2% and 9.7%).

I conclude that the fair rate of return on equity for CP&L is 13.5 percent. This rate of return earned by the company would allow purchasers of new issues of common stock to earn the 13.0 percent return which my analysis suggests they would require in order to purchase the stock under conditions in effect during 1975.

- Q. What rate of return on rate base is consistent with the rate of return on equity of 13.5 percent?
- A. The rate of return on rate base is computed as the weighted average of the respective rates of return to debt, to preferred stock, and to common equity. The computation of the weighted average cost of capital requires knowledge of the capital structure, as well as the embedded costs of debt and preferred stock and the rate of return to equity capital.

The embedded cost of debt is shown on Page 18 of the Exhibit. Because of historically increasing rates of interest in the period since 1960, the embedded (average) cost of debt capital has steadily increased. At the end of 1975, the embedded cost of debt was 7.75 percent on total debt of \$1.15 billion.

The embedded cost of preferred stock is shown in Exhibit-Page 18.

Its average cost as of the end of 1975 was 8.06 percent.

Combining these costs with the previously estimated cost of equity capital, and with the capital structure of CP&L, the weighted average cost of capital is derived in Exhibit-Page 19. The weighted average cost of capital, using capital structure as of December 31, 1975, is 9.67 percent.

I conclude that the fair rate of return on rate base for CP&L is 9.67 percent. This rate of return on rate base is consistent with a rate of return on common equity of 13.5 percent, which my analysis suggests is an ample rate of return for the purpose of attracting new equity capital.

Q. How does this rate of return on equity for CP&L compare with recent rates of return in other jurisdictions?

A. This rate of return is somewhat higher than that allowed in two recent FPC wholesale rate cases. In April 1976, the FPC allowed Wisconsin Power a 12 percent return on equity and allowed Connecticut Light and Power Company a 12.25 percent on equity. In other state jurisdictions, some recently allowed rates of return on equity have been considerably higher than that found here; for example, a 16 percent return on equity allowed for Utah Power and Light Company, and a 14.5 percent return on equity allowed for Houston Lighting and Power Company, both in the spring of 1976. A rate of return on equity of 13.5 percent appears to lie within the range of recent commission decisions.

Q. What are the implications of the rate of return which you find in your study for the future operations of CP&L?

- A. The consideration of the implications of this rate of return should include its effects on the three major constituencies of the firm: its creditors (bondholders), its owners (common stockholders), and its customers.

With respect to its creditors, the primary question is whether the rate of return found in my study would maintain the financial integrity of the firm. The financial integrity of CP&L has been under some pressure, particularly as a result of the unexpectedly high rates of inflation in 1973 and 1974. A summary measure of the ability of the firm to meet its fixed interest obligations is the coverage ratio, which is the ratio of net income (before income taxes) plus fixed interest charges to the fixed charges. Historical data regarding the trend of this coverage ratio for CP&L are shown on Page 20 of the Exhibit.

The significance of the 1974 coverage ratio of 1.92 is that it appears to have been a major factor in the down-rating of CP&L's bond rating from A to Baa by Moody's Investors Services in February, 1975. This down-rating means that Moody's analysts believe that the investment grade of CP&L securities is somewhat below the "good" rating implicit in an A or better rating. (This Baa rating was still in effect as of May, 1976.) The effect of the Baa rating is that interest costs on new bond issues are somewhat higher than they would be if an A rating by Moody's were regained.

What effect would an allowed rate of return on common equity of 13.5 percent have on CP&L's bond rating? If CP&L had earned 13.5 percent on common equity in 1975, its interest coverage ratio would have

been approximately 3.0, had capital structure remained the same.

(The estimate of this ratio is shown on Page 21 of the Exhibit.)

Based on Moody's ratings of recent utility bond issues as shown on Page 22 of the Exhibit, it appears that a coverage ratio of 3.0 would have been more than adequate to restore an A rating, although Moody's stresses that it does not use a purely statistical approach in arriving at its bond ratings.

I conclude that the rate of return arrived at here meets the criterion of financial integrity.

With regard to the common stockholders, if the firm were allowed to earn 13.5 percent on common equity, and if investors expected earnings at that rate to continue indefinitely, then the common stock would tend to sell at or slightly above book value. A constant rate of earnings would imply no reinvestment of earnings and hence all earnings paid out as dividends. (This constant rate of earnings assumption is used here to simplify the discussion.)

To illustrate that an allowed rate of return equal to the cost of equity capital tends to result in share prices approaching book value, consider the 1975 results for CP&L. Earnings on common equity were 2.70 per share or 10.5 percent on book value. If CP&L had earned 13.5 percent, earnings would have had to increase by the ratio  $\frac{13.5\%}{10.5\%} = 1.29$ .

If all earnings were paid as dividends, with no growth expected, the share prices would tend to be  $P_0 = \frac{D_1}{k} = \frac{\text{Earnings}}{k} = \frac{2.70 \times 1.29}{.135} = \$25.80$ ,

which is slightly above the actual book value per share at the end of

1975.

I conclude from this analysis that a rate of return on equity of 13.5 percent would be sufficient to allow the common stock to sell at or slightly above book value.

With regard to CP&L customers, the rate of return arrived at here is sufficient to allow the company to continue to meet growth in demand and to provide service of adequate quality. The customers' concern is two-fold: he is interested in both adequate quality of service and in obtaining service at the lowest possible price. The set of prices which would allow CP&L to earn a rate of return in the vicinity of the rate suggested here meets the concerns of the customers, provided that CP&L minimizes its costs of operations. Although efficiency of operation is beyond the scope of my testimony, it is a subject which the regulatory commission must always be concerned with in rate cases.

Derivation of the Discounted Cash Flow Formula  
for the Cost of Equity Capital

Definitions of symbols:

$P_0$ : Current price per share of common stock

$D_j$ : Expected annual dividend per share, where  $j=1$  for first year, 2 for second year, etc.

$k$ : Investor's discount rate, which is firm's cost of equity capital since it reflects rate of return available to investor on the next best investment of comparable risk

$P_n$ : Price per share investor expects to receive if he sells stock at the end of  $n$  years.

The present value of a share of stock purchased at the beginning of year 1, with dividends  $D_j$  received at the end of each year, and stock sold at the end of year  $n$  is:

$$1) P_0 = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n} + \frac{P_n}{(1+k)^n}$$

If the investor holds the stock indefinitely, the present value is

$$2) P_0 = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

where  $n$  is indefinitely large.

If we assume that dividends grow indefinitely at an annual rate of growth  $g$  after the first year, the present value of a share of stock is:

$$3) P_0 = \frac{D_1}{(1+k)} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{n-1}}{(1+k)^n}$$

It can be shown that equation 3) can be simplified to:

$$4) P_0 = \frac{D_1}{k-g} \text{ provided } k > g.$$

If equation 4) is solved for  $k$ , we obtain the equation for estimating the cost of equity capital:

$$5) k = \frac{D_1}{P_0} + g$$

LEVELS AND RATES OF GROWTH OF DIVIDENDS  
PER SHARE AND EARNINGS PER SHARE  
CAROLINA POWER AND LIGHT COMPANY

Year	(1) Dividends Per Share	(2) Earnings Per Share	Ratio (1)÷(2)
1960	\$ .68	\$1.12	.61
1961	.76	1.22	.62
1962	.845	1.33	.64
1963	.94	1.41	.67
1964	1.04	1.62	.64
1965	1.19	1.80	.66
1966	1.295	1.88	.69
1967	1.35	1.91	.71
1968	1.39	1.99	.70
1969	1.43	2.04	.70
1970	1.46	1.56	.94
1971	1.46	1.95	.75
1972	1.49	2.85	.52
1973	1.56	2.59	.60
1974	1.60	2.21	.72
1975	1.60	2.71	.59

Annual Compounded Rates of Growth

1960-1965	12%	10%
1965-1969	4.7%	3.1%
1969-1972	1.3%	12%
1973-1975	1.3%	2.3%
1960-1975	5.9%	6.1%

SOURCE: Computed from Carolina Power & Light response to South Carolina Public Service Commission data request.

CAROLINA POWER & LIGHT  
Annual Average Stock Price

Year	Average Price Per Share
1960	\$20.06
1961	27.39
1962	28.36
1963	33.52
1964	39.11
1965	45.33
1966	45.03
1967	40.58
1968	38.38
1969	34.80
1970	26.13
1971	25.13
1972	26.98
1973	24.51
1974	16.00
1975	16.46

SOURCE: Computed from Quarterly Average Prices, CP&L response to South Carolina Public Service Commission data request.

CAROLINA POWER AND LIGHT  
Return on Common Equity and Dividend Yield

Year	Return on Common Equity	Dividend Yield (Average Market Value)
1960	11.40%	3.4%
1961	11.84	2.8
1962	11.85	3.0
1963	11.89	2.8
1964	12.76	2.7
1965	13.31	2.6
1966	12.89	2.9
1967	12.45	3.3
1968	12.40	3.6
1969	12.10	4.1
1970	8.64	5.6
1971	10.54	5.8
1972	13.85	5.5
1973	11.45	6.4
1974	9.60	10.0
1975	12.04	9.7

SOURCE: CP&L response to South Carolina Public Service Commission data request and Exhibit-Pages 3-4.

COMPANIES INCLUDED IN THE MOODY'S  
UTILITIES AVERAGES

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Baltimore Gas & Electric Co.  
Boston Edison Co.  
Carolina Power & Light Co.  
Central Hudson Gas & Elec. Corp.  
Central Maine Power Co.  
Cincinnati Gas & Electric Co.  
Cleveland Electric Illuminating Co.  
Commonwealth Edison Co.  
Consolidated Edison Co. (N. Y.) Inc.  
Dayton Power & Light Co.  
Delmarva Power & Light Co.  
Detroit Edison Co.  
Florida Power Corp.  
Houston Lighting & Power Co.  
Idaho Power Co.  
Indianapolis Power & Light Co.  
Northeast Utilities Co.  
Pacific Gas & Electric Co.  
Pennsylvania Power & Light Co.  
Philadelphia Electric Co.  
Public Service Co. of Colorado  
Southern California Edison Co.  
Tampa Electric Co.  
Utah Power & Light Co.

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MOODY'S UTILITES AVERAGE: DIVIDENDS PER SHARE,  
EARNINGS PER SHARE AND GROWTH RATES, 1960-1975

Year	Dividends Per Share	Earnings Per Share
1960	\$2.68	\$4.12
1961	2.81	4.33
1962	2.97	4.73
1963	3.21	4.99
1964	3.43	5.41
1965	3.86	5.92
1966	4.11	6.30
1967	4.34	6.67
1968	4.50	6.67
1969	4.61	6.92
1970	4.70	6.89
1971	4.77	7.14
1972	4.87	7.73
1973	5.01	7.55
1974	4.83	7.63
1975	4.91 <sup>e</sup>	7.77

Annual Compounded Rates of Growth

1960-1965	7.6%	7.6%
1965-1969	4.5%	4.0%
1969-1972	2.0%	3.9%
1973-1975	-1.0%	1.5%
1960-1975	4.1%	4.3%

SOURCE: Moody's Utility Manual 1975 (1960-1974), Moody's Public Utility News Reports (1975).

<sup>e</sup>Estimated.

MOODY'S UTILITIES AVERAGE: ANNUAL AVERAGE  
COMMON STOCK PRICES, 1960-1975

Year	Average Price Per Share	Dividend Yield on Average Market Price
1960	\$ 69.82	3.8%
1961	90.55	3.1
1962	94.50	3.1
1963	102.79	3.1
1964	108.76	3.2
1965	117.08	3.3
1966	102.90	4.0
1967	101.87	4.3
1968	98.37	4.6
1969	94.55	4.9
1970	79.06	5.9
1971	84.16	5.7
1972	80.20	6.0
1973	71.21	7.0
1974	48.26	10.0
1975	50.35 <sup>e</sup>	9.8

SOURCE: Moody Public Utility Manual (1960-1974), Moody Public Utility News Reports (1975).

<sup>e</sup>Estimated.

CAROLINA POWER & LIGHT CAPITAL STRUCTURE,  
1960-1975

Year	Total Capital (\$Millions)	Debt Percentage	Preferred Stock Percentage	Common Equity Percentage
1960	288.7	50.0%	11.9%	38.1%
1961	324.7	52.1	10.6	37.4
1962	334.0	51.6	10.3	38.1
1963	339.1	50.6	10.1	39.3
1964	384.5	52.3	8.9	38.8
1965	291.2	51.2	8.8	40.0
1966	438.1	52.3	7.9	39.9
1967	510.2	52.7	11.6	35.6
1968	558.3	55.4	10.6	34.0
1969	595.2	51.9	10.0	38.1
1970	744.5	53.6	12.0	34.4
1971	954.2	56.0	13.0	31.0
1972	1,301.4	52.6	13.4	34.1
1973	1,633.7	54.0	13.7	32.3
1974	1,870.7	55.3	15.4	29.3
1975	2,213.6	52.2	15.2	32.6

SOURCE: Carolina Power & Light response to South Carolina Public Service Commission data request.

TOTAL CAPITALIZATION AND CAPITAL STRUCTURE,  
MOODY'S UTILITIES GROUP,  
1970-1974

Year	Total Capitalization (\$Millions)	Debt Percentage	Preferred Stock Percentage	Common Equity Percentage
1970	28,149	54.4%	10.9%	34.7%
1971	32,227	53.5	11.8	34.6
1972	35,792	52.3	12.8	34.9
1973	39,756	52.0	12.9	35.1
1974	44,168	52.7	13.3	33.9

SOURCE: Computed from Moody's Public Utility Manual (1975).

Measures of Business Risk for CP&L and  
the Moody's Utility Sample

1. Definitions:

$X_i$ : individual items in a sample,  $i=1, n$

$n$ : number of items in a sample

$\bar{X}$ : Arithmetic mean where  $\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$

$\sigma$ : Standard deviation, a measure of variation or "scatter" around the mean where

$$\sigma = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}}$$

$V$ : Coefficient of variation, a measure of variation relative to the mean value, where  $V = \sigma/\bar{X}$

2. Comparisons of relative dispersion of earnings per share

<u>Time Periods</u>	<u>CP&amp;L</u>	<u>Moody's</u>
1960-75		
$\bar{X}$	1.89	6.30
$\sigma$	.52	1.20
$V$	.28	.19
1965-69		
$\bar{X}$	1.92	6.50
$\sigma$	.10	.39
$V$	.05	.06

RATES OF INFLATION, BOND YIELDS AND RATES OF RETURN,  
CAROLINA POWER & LIGHT, 1960-1975

Year	(1) Bond Yields (Average of New Issues) rated Baa and Higher	(2) Rate of Return on Common Equity	(3) Rate of Change in Consumer Price Index (annual rates)	(4)=(1)-(3) Price-Adjusted Bond Yield	(5)=(2)-(3) Price-Adjusted Return on Common Equity	(6)=(5)-(4) Price-Adjusted Risk Premia, Common Stock Versus Bonds
1960	4.91%	11.40%	1.5%	3.41%	9.90%	6.49%
1961	4.54	11.84	.7	3.84	11.14	7.30
1962	-*	11.85	1.2	-	10.65	-
1963	-*	11.89	1.6	-	10.29	-
1964	4.50	12.76	1.2	3.30	11.56	8.26
1965	-*	13.31	1.9	-	11.41	-
1966	5.18	12.89	3.4	1.78	9.49	7.71
1967	6.45	12.45	3.0	3.45	9.45	6.00
1968	6.87	12.40	4.7	2.17	7.70	5.53
1969	-*	12.10	6.1	-	6.00	-
1970	8.83	8.64	5.5	3.33	3.14	-0.19
1971	7.60	10.54	3.4	4.20	7.14	2.94
1972	7.81	13.85	3.4	4.41	10.45	6.04
1973	7.94	11.45	8.8	-0.86	2.65	2.51
1974	10.63	9.60	12.2	-1.57	-2.60	-1.03
1975	11.27	12.04	7.0	4.27	5.04	0.77
Average 1960-1975			4.1	2.64		4.44
Average 1965-1969			3.8	2.47		6.41

SOURCE: Columns 1, 2 - Carolina Power & Light response to South Carolina Public Service Commission data request; Column 3 - Survey of Current Business, April 1976, and previous issues.

\* No new bond issues.

RATES OF INFLATION, BOND YIELDS AND RATES OF RETURN,  
MOODY'S UTILITIES, 1960-1975

Year	(1) Bond Yields (Average of New Issues) rated Baa and Higher	(2) Rate of Return on Common Equity	(3) Rate of Change in Consumer Price Index (annual rates)	(4)=(1)-(3) Price-Adjusted Bond Yield	(5)=(2)-(3) Price-Adjusted Return on Common Equity	(6)=(5)-(4) Price-Adjusted Risk Premia, Common Stock Versus Bonds
1960	4.72%	10.00%	1.5%	3.22%	8.50%	5.28%
1961	4.72	10.08	.7	4.02	9.38	5.36
1962	4.40	10.54	1.2	3.20	9.34	6.14
1963	4.40	10.42	1.6	2.80	8.82	6.02
1964	4.55	10.67	1.2	3.35	9.47	6.12
1965	4.61	11.24	1.9	2.71	9.34	6.63
1966	5.53	11.55	3.4	2.13	8.15	6.02
1967	6.07	11.59	3.0	3.07	8.59	5.52
1968	6.80	10.94	4.7	2.10	6.24	4.14
1969	7.98	10.83	6.1	1.88	4.73	2.85
1970	8.76	10.17	5.5	3.26	4.67	1.41
1971	7.71	10.17	3.4	4.31	6.77	2.46
1972	7.50	10.30	3.4	4.10	6.90	2.80
1973	7.91	9.8	8.8	.89	1.00	1.89
1974	9.65	9.5	12.2	-2.55	-2.70	-0.15
1975	9.91	9.3 <sup>e</sup>	7.0	2.91	2.30	-0.60
Average 1960-1975			4.1	2.48		3.87
Average 1965-1969			3.8	2.38		5.03

SOURCE: Columns 1, 2 - Moody's Public Utility Manual; Column 3 - Survey of Current Business, April 1975 and previous issues

<sup>e</sup>Estimated.

REAL RATE OF RETURN CONCEPT OF RATE OF RETURN ON  
EQUITY, CP&L AND MOODY'S AVERAGE

(1) Expected Inflation Rate	(2) * Average Price Adjusted Bond Yield	(3) * Average Risk Premia Common Stock vs. Bonds	(4)=(1)+(2)+(3) Estimated Nominal Rate of Return on Common Equity
CP&L			
4%	2.47%	6.41%	12.88%
5%	2.47%	6.41%	13.88%
Moody's Average			
4%	2.38%	5.03%	11.41%
5%	2.38%	5.03%	12.41%

SOURCE: Computed from Exhibit-Pages 12 and 13.

\* Based on average for 1965-69.

CAROLINA POWER AND LIGHT  
COMMON STOCK PRICES, AVERAGES FOR CALENDAR  
QUARTER OF NEW ISSUE, QUARTER BEFORE AND  
QUARTER AFTER NEW ISSUE, 1960-1975

(1) Quarter of New Issue	(2) Quarter Before New Issue	(3) Quarter After New Issue	(4) Ratio (3) ÷ (2)
4-61 \$27.55	3-61 \$30.18	1-62 \$29.77	.986
2-64 \$37.27	1-64 \$36.91	3-64 \$41.12	1.114
2-66 \$46.43	1-66 \$45.67	3-66 \$43.71	.957
3-69 \$36.37	2-69 \$32.81	4-69 \$31.75	.968
4-70 \$23.89	3-70 \$22.70	1-71 \$27.60	1.216
2-71 \$24.64	1-71 \$27.60	3-71 \$24.29	.880
1-72 \$26.18	4-71 \$24.00	2-72 \$25.81	1.075
4-72 \$29.64	3-72 \$26.27	1-73 \$27.14	1.033
4-73 \$21.66	3-73 \$23.54	1-74 \$21.69	.921
1-75 \$14.94	4-74 \$12.73	2-75 \$15.63	1.228
4-75 \$18.35	3-75 \$16.92	1-76 \$20.00 <sup>e</sup>	1.182
Average 1960-1975			1.053

SOURCE: Computed from Carolina Power and Light response to South Carolina Public Service Commission data request.

<sup>e</sup>Estimated.

CAROLINA POWER AND LIGHT  
RELATIONSHIP BETWEEN GROSS PRICE AND NET PRICE  
PER SHARE, COMMON STOCK ISSUES, 1960-1975

Date	(1) Number of Shares Sold	(2) Gross Price Per Share	(3) Net Price Per Share	(4)=(3)÷(2) Ratio: Gross Price/Net Price
11-15-61	150,000	\$62.25	\$61.10	1.02
06-24-64	250,000	\$37.125	\$36.225	1.02
04-06-66	250,000	\$43.00	\$41.70	1.03
09-17-69	1,000,000	\$29.50	\$28.54	1.03
10-14-70	1,250,000	\$23.00	\$22.12	1.04
06-23-71	1,500,000	\$22.25	\$21.50	1.03
01-19-72	2,000,000	\$27.375	\$26.625	1.03
11-01-72	2,500,000	\$28.75	\$28.05	1.06
11-08-73	3,000,000	\$21.25	\$20.31	1.06
01-16-75	4,000,000	\$14.75	\$14.00	1.05
11-05-75	5,000,000	\$17.875	\$17.215	1.04
Average 1961-1975				1.03
Average 1973-1975				1.05

SOURCE: Moody's Public Utility Manual and Carolina Power and Light Response to South Carolina Public Service Commission data request.

CAROLINA POWER AND LIGHT  
EMBEDDED COST OF LONG TERM DEBT, END OF YEAR,  
1960, 1965, AND 1970-75

End of Year	Cumulative Net Proceeds	Cumulative Annual Cost	Weighted Average Cost
<u>First Mortgage Bonds</u>			
1960	\$ 144,238,285	\$ 1,221,327	3.62%
1965	199,099,607	7,703,507	3.87
1970	397,764,934	22,428,992	5.64
1971	532,115,739	32,653,676	6.14
1972	631,432,705	40,409,636	6.40
1973	831,188,759	56,286,863	6.77
1974	982,139,502	71,561,263	7.17
1975	1,102,910,320	85,148,118	7.72
<u>Term Note</u> (issued 1972- due 1978)			
1975	\$ 50,000,000	\$ 4,165,000*	8.33%
<u>Total</u>			
End of Year			
1975	\$1,152,910,320	\$89,313,118	7.75%

SOURCE: Carolina Power and Light response to South Carolina Public Service Commission data request.

\* Floating interest rate. Rate shown based on rate in effect 12-31-75.

CAROLINA POWER AND LIGHT  
EMBEDDED COST OF PREFERRED STOCK

End of Year	Cumulative Net Proceeds	Cumulative Annual Cost	Weighted Average Cost
1960	\$ 34,030,205	\$ 1,606,295	4.72%
1965	34,030,205	1,606,295	4.72
1970	88,246,204	5,696,295	6.46
1971	122,751,754	8,478,795	6.91
1972	172,115,287	12,338,795	7.17
1973	222,013,493	16,063,795	7.24
1974	286,244,312	21,515,795	7.54
1975	333,988,354	26,925,795	8.06

SOURCE: Carolina Power and Light response to South Carolina Public Service Commission data request.

CAROLINA POWER AND LIGHT  
 CALCULATION OF WEIGHTED AVERAGE COST OF CAPITAL  
 AS OF END OF YEAR, 1975

Type of Capital	Millions of Dollars	Cost Rate	Percentage of Total Capitalization	Weighted Rate
Debt	\$1,152.9	7.75%	52.2%	4.05%
Preferred Stock	334.0	8.06	15.2	1.22
Common Equity	722.3	13.50	32.6	4.40
TOTAL	\$2,209.2	-	100.0	9.67
Weighted Average Cost		9.67%		

CAROLINA POWER AND LIGHT  
FIXED CHARGE COVERAGE RATIO

Year	Fixed Charge Coverage Ratio
1960	5.70
1965	5.77
1970	2.25
1971	2.50
1972	2.90
1973	2.34
1974	1.92
1975	2.27

SOURCE: Carolina Power and Light response to South Carolina Public Service Commission data request.

ESTIMATE OF FIXED CHARGE COVERAGE  
RATIO AT 13.5% RETURN ON EQUITY, 1975  
(Thousands of Dollars)

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Total Fixed Charges	<u>99,886</u>
Net Income (1.21 x actual 1975 earnings)	122,962
Add: Federal & State Income Taxes (1.21 x actual 1975 taxes)	30,975
Deferred Taxes	25,748
Investment Tax Credit	20,192
Add: Above Fixed Charges	<u>99,886</u>
Earnings for Coverage Ratio Computation:	299,763
Coverage Ratio:	<u>3.00</u>

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SOURCE: Estimated from Carolina Power and Light 1975 Annual Report.

RECENT BOND ISSUES, AMOUNTS, MOODY'S RATINGS  
AND COVERAGE RATIOS

Date	Company	Amount (\$Million)	Moody's Bond Rating	Coverage Ratio
3-76	Mississippi Power	25	A	2.92
3-76	Jersey Central Power	60	Baa	2.34
3-76	Utah Power & Light	35	A	2.79
3-76	Southern California Edison	125	Aa	2.85
3-76	Philadelphia Electric	100	A	2.36
3-76	S. W. Public Service	40	Aa	3.62
3-76	Metropolitan Edison	50	A	3.41
3-76	Portland General Elec.	50	Baa	2.14
3-76	Alabama Power	50	A	2.47
3-76	Iowa-Illinois Gas & Elec.	20	Aa	3.80
3-76	Public Service Elec. & Gas	60	Aa	2.57
4-76	Utah Power and Light	32	A	3.14
5-76	Wisconsin Power & Light	35	Aa	4.18
4-76	Appalachian Power	60	Baa	1.95
5-76	Union Elec. Co.	70	A	2.51
5-76	Iowa Public Service	25	A	3.89
5-76	Central Illinois Light	40	A	2.28
5-76	Ohio Power	80	Baa	2.11
4-76	Kansas Power & Light	45	Aa	4.00
4-76	Central Maine Power	35	Baa	2.53
4-76	S. W. Electric Power	45	Aa	4.42
5-76	Long Island Lighting	60	A	2.58
5-76	Indianapolis Power	25	Aa	2.89
5-76	Kansas City Power	40	Aa	3.00
5-76	Kentucky Utilities Co.	30	Aa	3.80

Interest Coverage Ratios by Rating:

Average Aa ratings:	3.4
Average A ratings:	2.9
Average Baa ratings:	2.2