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MEMORANDUM

October 30, 1990

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TO : DIVISION OF RECORDS AND REPORTING

FROM: DIVISION OF LEGAL SERVICES (ELIAS) RVE

RE : DOCKET NO. 900151-GU - PETITION OF FLORIDA PUBLIC UTILITIES COMPANY FOR A RATE INCREASE - NATURAL GAS OPERATIONS.

Attached for filing in the above-referenced is the original and 8 copies of Prefiled Direct Testimony of Andrew Maurey.

(8121L)RVE:bmi

Attachment

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application for a rate increase in natural gas operation by Florida Public Utilities Company.	))))	DOCKET NO. 900151-GU

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the Direct Testimony of Andrew L. Maurey, has been served by First Class U. S. Mail, postage prepaid, to the following parties of record, this 30 day of October, 1990:

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FLORIDA PUBLIC UTILITIES COMPANY

DOCKET NO. 900151-GU

TESTIMONY OF ANDREW L. MAUREY, BUREAU OF FINANCE

ON BEHALF OF THE FLORIDA PUBLIC SERVICE COMMISSION

DIVISION OF AUDITING AND FINANCIAL ANALYSIS

FILED: OCTOBER 30, 1990

DIRECT TESTIMONY OF ANDREW L. MAUREY

Q. Please state your name and address.

A. My name is Andrew L. Maurey. My business address is 101 East Gaines Street, Tallahassee, Florida 32399-0850.

Q. By whom are you employed and in what capacity?

A. I am employed by the Florida Public Service Commission as a regulatory analyst in the Bureau of Finance.

Q. Please outline your education qualifications and work experience.

A. I graduated Magna Cum Laude from Florida State University in 1983 with a Bachelor of Science degree in Finance. In 1988, I received a Master of Business Administration degree with a concentration in Finance from Florida State University.

Upon graduation in 1983, I accepted a credit analyst and commercial loan representative position with the First National Bank and Trust Company of Naples, Florida. After successfully completing the holding company management training program, I performed the credit analysis and loan review functions for the bank as well as other assigned duties for the commercial loan department. While with the bank, I attended several finance-related seminars and completed course work for and received American Institute of Banking diplomas in Foundations of Banking and Commercial Lending.

In 1986, I accepted a regulatory analyst position with the Hospital Cost Containment Board in the Office of the Governor. In this capacity my duties included analyzing hospital financial statements and operating budgets for regulatory compliance.

After receiving my MBA in Finance in 1988, I accepted my current position as a regulatory analyst with the Florida Public Service Commission. My primary responsibilities include analyzing

and evaluating financial and economic data in rate case filings, preparing and presenting testimony on the cost of capital and other related issues, and preparing and presenting recommendations to the Commission regarding the cost of capital and other related issues. In addition, I also conduct research, perform financial analyses as required, and provide technical expertise to the Commission regarding public utility finance. I have been certified by the Florida Public Service Commission as a Class B practitioner in the area of finance, financial analysis, cost of capital, and return on equity.

Q. What is the purpose of your testimony in this Docket?

A. The purpose of my testimony is to establish the appropriate cost of common equity capital for Florida Public Utilities Company (FPUC or Company) for use in determining an appropriate allowed rate of return for FPUC.

Q. What principles provided the framework for your determination of a fair rate of return?

A. The principles established by the Supreme Court of the United States in Bluefield Waterworks and Improvement Company v. Public Service Commission of West Virginia, 262 U.S. 679 (1923) and Federal Power Commission v. Hope Natural Gas Company 320 U.S. 591 (1944) provided the primary basis for my analysis. The Supreme Court held in both the Hope and Bluefield decisions that the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. The return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain credit and attract capital.

Q. In addition to the principles established by the Hope and Bluefield decisions, what other guidelines did you consider?

A. Based upon my understanding of the Hope and Bluefield decisions, a regulated utility should be allowed to recover all costs prudently incurred in the provision of utility service, including an appropriate return on common equity capital. Recovery of all prudently incurred costs, including capital costs, effectively balances the interests of investors and ratepayers. Investors are provided with a return commensurate with returns on investments of comparable risk, while ratepayers pay the true cost for the services provided.

Q. How does the allowed return on common equity relate to a balancing of the interests of investors and ratepayers?

A. The adequacy of expected earnings can be determined by a comparison of market price of a firm's common stock to its book value. If the expected return on common equity equals investor requirements, the market-to-book ratio can be expected to approximate one over the long run. If the expected return on book equity exceeds the cost of common equity, investors will bid the price of the stock up such that the market price per share will exceed the book value per share resulting in a market-to-book ratio above one. The market price will move up or down in response to the level of the utility's expected returns relative to the investor's risk driven, required rate of return. To the extent utility rates reflect a return above that required by investors, ratepayers are overcharged. Conversely, if a utility's market-to-book ratio is less than one, external issues of common stock will confiscate shareholders' wealth through the dilution of earnings per share and book value per share. Therefore, regulators should strive to set authorized rates of return that result in market-to-book ratios of approximately one over the long run.

Q. How does your analysis of a fair rate of return on the Company's common equity capital meet these basic criteria?

A. My analysis of an appropriate rate of return on the Company's common equity capital is based upon an evaluation of return requirements for comparable risk common equity investments as determined through the direct application of capital market valuation models to current financial and economic data. In my opinion, a market based equity pricing analysis satisfies the comparable returns, capital attraction, and financial integrity guidelines established by the Hope and Bluefield decisions for determining a fair and reasonable rate of return on common equity capital.

Q. What have you concluded is the cost of common equity capital for FPUC?

A. Based upon the results of my analysis, I conclude the current cost of common equity capital for FPUC is 13.0%.

Q. Would you describe your general approach to determine the cost of common equity capital?

A. In order to properly evaluate the returns obtained through use of a market based equity pricing analysis, I first examined general economic conditions, as well as industry and company factors, which drive capital market return requirements. I then applied two generally accepted market rate of return models to an index of comparable companies as a means to estimate the cost of common equity capital for FPUC.

Q. How do economic conditions impact capital market return requirements?

A. The interrelated factors of inflation and interest rates have a significant impact on investor return requirements.

Q. Please elaborate.

A. Increases in the general level of prices affect interest rates because investors are unwilling to commit their funds unless they are adequately protected against future losses in purchasing power. If investors anticipate a higher rate of inflation, they will adjust their return requirements upward to guard against the erosion of purchasing power.

Q. Please discuss the current economic environment and current expectations regarding inflation and interest rates.

A. The latest government statistics on the condition of the economy showed that the U.S. economy slowed appreciably in the second quarter of 1990. Nearly every major indicator of private economic activity declined, the government reported, making it about the weakest performance in nearly eight years of expansion. Only a buildup of business inventories and a rise in government spending kept the overall economy from contracting during the period. Personal consumption, construction, business investment, and exports all declined during the second quarter.

Final government figures show that the annual rate of expansion for the second quarter was 0.4% after adjusting for inflation. The performance, far weaker than the 1.2% rate the government estimated in two earlier reports, is of particular concern because the economy has since been socked by soaring oil prices in the aftermath of Iraq's invasion of Kuwait on August 2, 1990. The numbers were contained in a report on the nation's gross national product (GNP), the market value of all the goods and services the economy produces, released by the Commerce Department. This report indicates that even before the jump in oil prices piled new burdens on businesses and consumers, the nations's GNP was barely rising. The earlier estimates indicated a sluggish pace but clearly one of expansion.

Economists generally define a recession as two consecutive quarters of negative growth. Although the economy has weakened substantially over the past year, it has yet to have a negative quarter. An increasing number of private analysts, however, think the weakened economy will be hurt enough by rising oil prices to slip into a downturn after nearly eight years of expansion.

The Bush administration expressed concern over the new figures but continued to insist that the economy is not in a recession. Mr. Michael Boskin, chairman of the White House Council of Economic Advisors, conceded that the economy is now on a weaker growth path than during the summer due partly, but not exclusively, to the oil-price shock. However, Mr. Boskin contends that the economy is better equipped to weather the jolt in oil prices than it was in the 1970s when Arab oil embargoes sent petroleum prices soaring and pitched the U.S. economy into recessions in 1973 and 1979. He explains that because of new efficiencies in U.S. industrial production, the country now requires about one-third less oil for each dollar of GNP than it did in the 1970s.

To skirt a possible recession, the Bush administration is hoping that the Federal Reserve Board (Fed) will give the economy a boost by pushing down interest rates as it did in mid-July. In the summary of the August 21, 1990 open-market committee meeting, released after the customary six-week lag, the Fed confirmed that it was leaning toward lower interest rates in late August despite concern that surging oil prices might rekindle inflation. However, Fed Chairman Alan Greenspan recently indicated to Congress that the central bank's policy makers would move to ease interest rates only after Congress and the president approve a substantial deficit-reduction package.

Q. What other economic factors have you considered?

A. The latest official White House estimate projects a fiscal 1991 budget deficit of $253.6 billion even after the tax increases and spending cuts outlined in the current budget package. If the economy continues to weaken, many economists fear the deficit could grow much larger. Analysts contend that the continuation of such a huge budget deficit erodes confidence in both the dollar and the U.S. economy and, absent productivity gains, will reduce the standard of living in the U.S.

The future course of the economy remains unclear. In any case, a component of required yields is compensation for expected inflation, the level of which directly affects the cost of debt and equity. Schedule 1 is a summary of various interest rates and inflation rates. Schedule 1 also shows Blue Chip forecasts for various measures of inflation and interest rates.

Q. What financial models did you use to determine the required return on common equity for FPUC?

A. I used a discounted cash flow (DCF) model and a risk premium analysis to determine the required return on common equity.

Q. How did you apply these models to obtain the cost of common equity capital for FPUC?

A. I conducted a DCF and a risk premium analysis on Moody's Natural Gas Distribution Index and adjusted the results for the difference in risk between FPUC and the index. Relying on an index of companies, rather than a single company, helps minimize forecasting errors and should provide more reliable information for estimating the cost of common equity.

Q. Please describe the investment risk characteristics of the companies that comprise Moody's Natural Gas Distribution Index?

A. The investment risk characteristics for the index are: a

Value Line Safety Rank of 1.6; a Value Line beta of .71; an S&P stock ranking of A-; and an S&P and a Moody's bond rating of AA- and Aa3, respectively. Schedule 2 provides the investment risk characteristics for the index.

Q. Briefly describe the models you used.

A. The discounted cash flow model is the most generally accepted method of estimating a utility investor's expected return on equity capital. In a DCF analysis, the cost of equity is the discount rate which equates the present value of expected cash flows associated with a share of stock to the present price of the stock.

A risk premium analysis recognizes that equity is riskier than debt. Equity investors thus require a "risk premium" over the cost of debt as compensation for assuming additional risk.

Q. Would you provide the equation and define the terms for the discounted cash flow model?

A. Yes, I will. This information is provided on Schedule 3. Inherent in this basic model are several simplifying assumptions: 1) dividends are paid annually and grow at a constant rate; 2) the price, Po, is determined on a dividend payment date; and 3) dividends increase once a year starting exactly one year hence.

Q. Is Equation (4), Schedule 3, the DCF model you used to determine the cost of common equity capital?

A. No, it is not. Although Equation (4) is the most commonly used version of the DCF model, it underestimates investors' required return because it does not properly reflect the timing of expected cash flows when dividends are paid quarterly rather than annually. However, DCF models can be derived to evaluate cash flows of any periodicity (monthly, quarterly, annually, etc.) and/or growth. The DCF model actually used should be derived to

accurately reflect the timing and amount of expected cash flows. Since dividends associated with common equity are commonly paid on a quarterly basis, the investors' required return on common equity should be determined using a DCF model which reflects the quarterly payment of dividends. The derivation of the quarterly compounded DCF model from the basic annually compounded DCF model is explained in Appendix A.

An additional derivation of the basic DCF model was made to better reflect analysts' expectations of dividend growth rates. As mentioned above, the basic DCF model assumes that the dividend growth rate is constant over time. If, however, the future growth rate is expected to change, a two-stage or variable growth rate model should be used. Equation (5) on Schedule 4, shows a two-stage DCF model. In the two-stage model, dividend growth is estimated on an individual basis for an initial growth period. Dividends are then assumed to grow infinitely at the expected long-term growth rate.

Q. How did you determine the inputs required for the DCF model you used to estimate the cost of common equity capital for the index?

A. The current stock price (Po) was determined by averaging the high and the low stock prices of each company for September 1990. I first assumed an initial growth period based upon Value Line's explicit dividend forecasts (n). I used Value Line's forecast of dividends for 1991 and 1994, and assumed a constant rate of growth in between, to estimate the expected dividends (Dt) during the initial growth period. Quarterly dividends were assumed to be paid in four equal installments. The long-term constant rate of growth expected after 1994 (G) was calculated by the earnings retention method (b x r approach) using Value Line's expected

return on equity (r) and expected retention rate (b) for 1994.

Q. Does your DCF calculation include an allowance for issuance costs?

A. Yes, it does. Historically, utility underwriting expenses associated with issuing common stock have averaged three to six percent of gross proceeds. (See Pettway, R. H., "A Note on the Flotation Costs of New Equity Capital Issues of Electric Companies," Public Utilities Fortnightly, March 18, 1982, pp. 68-69.) My DCF calculations include an adjustment of three percent to recognize the expenses associated with issuing common stock. Equation (6), Schedule 4, includes the adjustment for issuance costs.

Q. Why is it necessary to recognize the expenses associated with issuing common stock?

A. An allowance for issuance costs enables a utility to recover the costs incurred for issuing common stock. Issuance expenses include registration, legal and underwriter fees, and printing and mailing expenses. Without an underwriting cost adjustment, investors will never be able to earn the required return on their investment since the sales price will exceed the net proceeds to the utility as a result of the issuance costs.

Conceptually, the situation with common stock is similar to that of bonds and preferred stock. With bonds for example, the issuance expenses are reflected in the effective cost of the bond and are recovered over its life. The cost to the utility for a specific bond issue is the interest expense plus the amortization of issuance costs divided by the principal value less the unamortized issuance costs. The result is that the costs to the utility is greater than the return to the creditor.

Unlike the case of bonds, however, common stock does not

have a finite life. Therefore, issuance costs cannot be amortized and must be recovered by an upward adjustment to the allowed return on equity. This adjustment reflects the fact that the utility continually pays a return on an equity balance that is greater than the actual amount received due to issuance costs. (See Brigham, E. F., Aberwald, D. and Gapenski, L. C., "Common Equity Flotation Costs and Rate Making," Public Utilities Fortnightly, May 2, 1985, pp. 28-36.)

Q. Based on your DCF analysis, what is the required return on equity for the Moody's Natural Gas Distribution Index?

A. Solving Equation (6) on Schedule 4, I estimated a cost of common equity for the index of 11.50%. Schedule 5 contains the results of my analysis.

Q. Please describe your risk premium analysis.

A. First, I estimated the average expected return on equity for Moody's Natural Gas Distribution Index. Next, I subtracted the yield to maturity on long-term treasury bonds, as a proxy for the concurrent risk-free rate, from the average expected return on equity for the index. This difference represents the expected risk premium for the period. I calculated monthly risk premiums for the 120 month period October 1980 through September 1990 and then averaged the results.

Q. Based upon this analysis, what is your estimate of the risk premium?

A. The risk premium averaged 419 basis points (or 4.19%) for the period October 1980 through September 1990 (See Schedule 6).

Q. What measure of debt cost did you use as a proxy for the risk-free rate?

A. I used the October 1, 1990 Blue Chip Financial Forecasts (Blue Chip) consensus forecast of long-term government bond yields.

Blue Chip Financial Forecasts is a publication that provides interest rate forecasts from 50 leading financial analysts. The Blue Chip consensus forecast of long-term government bond yields for the next four quarters is 8.55%.

Q. What is the risk premium cost of common equity for the index of gas utilities?

A. I added a risk premium of 4.19% to the expected yield on long-term government bonds of 8.55%. The result is a risk premium cost of equity for the Moody's Natural Gas Distribution Index of 12.74%. (Schedule 7).

Q. Based upon the combined results of your DCF and risk premium analyses, what have you concluded is the cost of common equity for the index?

A. I have concluded that the cost of common equity for Moody's Natural Gas Distribution Index falls within a range of 11.50% to 12.74%. For comparative purposes, if annual models which do not reflect the quarterly compounding of dividends had been used, the cost of equity range for Moody's Natural Gas Distribution Index would be 11.16% to 12.25%.

Q. Is the cost of equity estimated for the index an appropriate measure of the cost of equity for FPUC?

A. No, it is not. My estimate of 11.50% to 12.74% reflects the cost of equity for an index of large publicly traded natural gas distribution companies. In my opinion, FPUC is riskier than the companies that comprise the index and thus should be allowed a higher cost of equity.

Q. How is FPUC riskier than Moody's Natural Gas Distribution Index?

A. The investment risks facing a common equity investor can be broken down into business risk and financial risk. Business risk

is defined as the uncertainty surrounding a company's level of expected operating income. Financial risk refers to the way in which a company finances its activities. FPUC faces greater business and financial risk than the companies comprising Moody's Natural Gas Distribution Index.

Q. Please continue.

A. FPUC faces greater business risk than does Moody's Index due to the following reasons. First, unlike most of the companies comprising the index, FPUC is served by only one pipeline, Florida Gas Transmission (FGT). FPUC's reliance on FGT significantly reduces its bargaining power and ability to purchase cheaper gas.

Second, FPUC is significantly smaller than the companies comprising Moody's Natural Gas Distribution Index. As such, FPUC is less diverse with respect to its markets and may be more severely affected by economic or demographic changes. Furthermore, several empirical studies suggest that smaller companies have higher costs of equity capital than larger companies. These studies indicate that smaller companies have higher business risk and increased instances of business failures. In addition, these studies suggest that the market for the shares of smaller companies is narrower and therefore less liquid. (See Roll, R., "A Possible Explanation of the Small Firm Effect," The Journal of Finance, September 1982, pp. 879-888.)

Q. How does the financial risk of FPUC compare to that of Moody's Natural Gas Distribution Index?

A. To compare the financial risk of FPUC to that of the index, I examined their respective equity ratios. Equity as a percentage of investor capital is a widely accepted measure of financial leverage and financial leverage determines financial risk. The companies comprising Moody's Index have equity ratios that range

between 44.0% and 60.0% with an average of 51.8%.

FPUC Gas Operations is a division of Florida Public Utilities Company. It is capitalized with approximately 37.7% equity and 62.3% debt. Therefore, FPUC is also subject to greater financial risk than Moody's Natural Gas Distribution Index.

Q. Based on your assessment of business and financial risk, please summarize how FPUC compares to Moody's Natural Gas Distribution Index?

A. FPUC faces greater business and financial risk than the companies comprising Moody's Gas Index. Hence, the total risk of FPUC is higher than that of the index. In order to reflect the Company's higher risk, I adjusted upwards the cost of equity obtained for the index.

Q. How did you adjust the cost of equity obtained for the index to estimate the cost of common equity for FPUC?

A. My adjustment was based on a bond rating differential to estimate the additional return required by FPUC over Moody's Natural Gas Distribution Index. I first assumed that FPUC is no riskier than a utility whose debt securities are rated BBB by Standard & Poor's. I base this assumption on Standard & Poor's description of bonds rated lower than BBB as "predominately speculative with respect to the capacity to pay interest and repay principal..." (Standard & Poor's Bond Guide, 10/90). Assuming efficient management and a sound regulatory climate (Florida is ranked B+ by Salomon Brothers) I would not classify the Company's credit as "predominately speculative".

I used the bond-yield differential that exists between the yields of Aa3-rated utility bonds (average bond rating for the index) and the yields of Baa-rated bonds (bond rating assumed for FPUC) as a proxy for the higher returns required for FPUC. I

added the bond-yield differential to the DCF and risk premium estimates of the cost of equity for the index. This adjustment provided me with an estimate of the cost of equity range for FPUC.

Q. How did you determine the bond-yield differential that exists between Aa3-rated and Baa-rated public utility bonds?

A. First, I subtracted the yield on Aa3 bonds from the yield on Baa-rated bonds as reported in Moody's Bond Survey for the last 60 months. I then averaged the results (See Schedule 10). The average bond-yield differential between the yield on Aa3-rated and Baa-rated bonds for the last 60 months is approximately 53 basis points.

Q. What is your estimate of the cost of common equity for FPUC?

A. My estimate of the cost of common equity for FPUC is 13.00%. By adding 53 basis points to the DCF and risk premium estimates obtained for the index, I determined that the cost of common equity for FPUC fell within the range of 12.03% to 13.27%. After rounding, the range of 12.05% to 13.30% is an appropriate range for FPUC. I used an estimate above the middle of the range to best reflect the risk of FPUC relative to Moody's Gas Index.

Q. Is the capital structure for FPUC appropriate?

A. A company's capital structure is a function of the overall risk to which its assets are exposed. An operation exposed to high business risk will minimize its total risk, i.e. business and financial risk, by financing its assets with less debt and more equity capital. In general, regulated utilities are exposed to less business risk than non-regulated businesses. Hence, utilities are capitalized with less equity and more debt than non-regulated businesses. To the extent that the Company's allocations reflect the capital structure supporting just their regulated operations, then the capital structure of FPUC appears

to be appropriate.

Q What is your recommendation regarding the appropriate regulatory treatment of non-utility related investments?

A. I recommend non-utility investments be removed from the capital structure directly from equity unless the Company can show, through competent evidence, that to do other wise would result in a more equitable determination of the cost of capital for regulatory purposes.

Q. In making this recommendation, are you assuming the investment in non-regulated assets can be traced directly to equity funds?

A. No, assets cannot be associated with specific sources of funds. Funds are fungible.

Q. If funds cannot be traced, why do you recommend, in the absence of persuasive evidence to the contrary, non-regulated investments be removed from equity?

A. I recommend this treatment for two reasons. The first is the basic principle that the cost of capital allowed for ratemaking purposes should be the cost of capital associated with the provision of utility service. The second relates to the signals and incentives sent to the companies.

Q. Please continue.

A. The cost of capital is the minimum rate of return necessary to attract capital to an investment. It is a function of the risk of the investment. The greater the risk the greater the return investors require.

Regulated utilities are of relatively low risk and have correspondingly low costs of capital. There are very few investments a regulated company can make that are of equal or lower risk. Therefore, investments in non-regulated assets will almost certainly increase a regulated utility's cost of capital.

The effects may be difficult to quantify, but the fundamental risk-return relationship points to their existence. It is important that these effects be removed from the Company's overall cost of capital in order that ratepayers are charged only for the cost of capital associated with the provision of regulated service.

Removing the effects of investments in non-utility assets can present a more difficult problem. For example, it may be difficult to quantify the cost of capital effects associated with a utility officer's purchase of an automobile for personal use. In this circumstance, I believe the signals and incentives associated with the Commission's policies should be of primary concern. If a utility can finance non-utility property at the utility's cost of capital rather than at market rates, it will have every economic incentive to do so. If this is allowed to occur, ratepayers will be subsidizing, through capital costs, investments not necessary for the provision of regulated service.

Q. Please summarize your testimony.

A. The purpose of my testimony was to determine the appropriate cost of common equity capital for FPUC to use in determining an appropriate allowed overall rate of return. I also discussed the appropriate regulatory treatment of non-utility investments.

Using the widely accepted discounted cash flow and risk premium methodologies, I estimated a cost of common equity range of 11.50% to 12.74% for Moody's Natural Gas Distribution Index. I then adjusted this range to account for the difference in risk between FPUC and the index. I determined that the Company's cost of common equity fell within a range of 12.05% to 13.30%. I recommend that FPUC be allowed a rate of return on common equity of 13.00% for the purpose of determining the appropriate allowed

...m.

...inds your testimony?

INDEX OF EXHIBITS

INTEREST RATES

	ANNUAL AVERAGES			AVERAGE SEPTEMBER	BLUE CHIP FORECAST			
	1987(1)	1988(1)	1989(1)	1990(1)	FOURTH QUARTER 1990(2)	FIRST QUARTER 1991(2)	SECOND QUARTER 1991(2)	THIRD QUARTER 1991(2)
Aaa Utility	9.52	10.05	9.32	9.73				
Aa Utility	9.77	10.26	9.56	9.87				
A Utility	10.10	10.49	9.77	10.12	10.1	9.9	9.7	9.6
Baa Utility	10.53	11.00	9.97	10.32				
Prime Rate	8.10	9.44	10.83	10.00	9.8	9.5	9.2	9.1
Commercial Paper (30 day)	6.70	7.72	9.05	8.09	7.8	7.5	7.3	7.3
Long Term Treasury Yield	8.70	9.04	8.51	9.08	8.9	8.6	8.4	8.3

INFLATION RATES (3)

	ANNUAL AVERAGES			LATEST ACTUAL(2)	BLUE CHIP FORECAST			
	1987(4)	1988(4)	1989(4)	9/27/90	FOURTH QUARTER 1990(2)	FIRST QUARTER 1991(2)	SECOND QUARTER 1991(2)	THIRD QUARTER 1991(2)
Consumer Price Index	3.7	4.1	4.8	3.8	6.9	5.0	4.2	4.0
GNP Deflator	3.3	3.4	4.2	4.7	5.4	4.7	4.1	3.9

STOCK MARKET PERFORMANCE

	12/31/88	12/29/89	PERCENT CHANGE	10/1/90(6)	PERCENT CHANGE(5)
S & P 500	277.72	353.4	27.25%	314.9	-10.88%
Dow Jones Industrial Average	2168.57	2753.2	26.96%	2515.8	-8.62%
Dow Jones Utility Average	186.28	235.04	26.18%	203.4	-13.48%

(1) Moody's Bond Survey, October 8, 1990
(2) Blue Chip Financial Forecasts, October 1, 1990
(3) % change from prior years
(4) Value Line, October 5, 1990
(5) Not Annualized
(6) WSJ, October 2, 1990

MOODY'S NATURAL GAS DISTRIBUTION INDEX
INVESTMENT RISK CHARACTERISTICS

UTILITY	VALUE LINE SAFETY RATING	S&P STOCK RATING	S&P BOND RATING	MOODY BOND RATING	VALUE LINE BETA	1990 EQUITY RATIO	1990 DEBT RATIO
ATLANTA GAS LIGHT	2	B+	A-	A3	0.70	48.0%	50.0%
BROOKLYN UNION GAS	1	A	A+	A1	0.60	46.5%	49.5%
DIVERSIFIED ENERGIES	2	B	AA	Aa2	0.70	60.0%	40.0%
INDIANA ENERGY	1	A-	AA-	Aa3	0.70	53.5%	41.0%
LACLEDE GAS	1	A	AA	Aa2	0.65	56.0%	43.0%
NORTHWEST NATURAL GAS	2	A-	A	A1	0.75	44.0%	49.5%
PEOPLES ENERGY	2	B+	AA-	Aa3	0.95	52.0%	46.0%
WASHINGTON GAS LIGHT	2	A	AA-	Aa3	0.60	54.5%	39.5%
AVERAGE	1.6	A-	AA-	Aa3	0.71	51.8%	44.8%

SOURCE: Value Line, Edition 3, October 5, 1990
S&P Stock Guide, October 1990
Moody's Public Utility Manual, 1989
C. A. Turner Utility Reports, October 1990

DCF MODEL EQUATION

(1) $$P_o = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ldots + \frac{D^{oo}}{(1+k)^{oo}}$$

Where:

D_t = Dividend paid at the end of period t

k = Investor's required rate of return (the market cost of equity)

P_o = The current price of the stock

g = The dividend growth rate

Assuming a constant growth in dividends and $g < k$, Equation (1) can be rewritten as:

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

Which can be reduced to:

(3) $$P_o = \frac{D_1}{k-g}$$

Which, after rearranging terms, results in the familiar infinite horizon, constant growth, annual DCF model:

(4) $$k = \frac{D_1}{P_o} + g$$

TWO STAGE GROWTH QUARTERLY COMPOUNDED DCF MODEL

(5) $$Po = \sum_{t=1}^{n} \left(\frac{D_t}{(1+k)^t} \right) + \left(\frac{D_n(1+G)}{k-G} \right) \left(\frac{1}{(1+k)} \right)^n$$

Where:

P_o = The current stock price

D_t = The dividends expected during the period of non-constant growth.

n = The years of non-constant growth

D_n = The dividend expected in year n

G = The constant rate of growth expected after year n

k = Investor's required rate of return (the market cost of equity)

ISSUANCE COSTS ADJUSTMENT

(6) $$P_o(1-FC) = \sum_{t=1}^{n} \left(\frac{D_t}{(1+k)^t} \right) + \left(\frac{D_n(1+G)}{k-G} \right) \left(\frac{1}{(1+k)} \right)^n$$

Where:

FC = Flotation Costs

TWO STAGE GROWTH, INFINITE HORIZON DISCOUNTED CASH FLOW MODEL
MOODY'S NATURAL GAS DISTRIBUTION INDEX

	•••••• EXPECTED DIVIDENDS •••••••					••••••••• EXPECTED •••••			SEPT 90
COMPANY	1990	1991	1992	1993	1994	EPS 1994	ROE 1994	GROWTH 1994+	STOCK PRICE
ATLANTIC GAS LIGHT	1.96	2.08	2.21	2.35	2.50	3.10	12.50	2.42%	26.563
BROCKLYN UNION	1.84	1.90	1.96	2.03	2.10	2.90	12.00	3.31%	29.563
DIVERSIFIED ENERGY	1.58	1.62	1.74	1.86	2.00	3.05	16.00	5.51%	32.938
INDIANA ENERGY	1.30	1.35	1.41	1.48	1.55	2.60	15.00	6.06%	20.625
LACLEDE GAS	2.36	2.42	2.48	2.54	2.60	3.40	13.00	3.06%	30.500
NORTHWEST NAT'L GAS	1.65	1.70	1.78	1.86	1.95	2.80	13.00	3.95%	25.750
PEOPLES ENERGY	1.65	1.70	1.75	1.80	1.85	2.90	14.00	5.07%	22.563
WASH. GAS LIGHT	2.02	2.08	2.17	2.26	2.35	3.10	13.00	3.15%	28.500
AVERAGE	1.80	1.86	1.94	2.02	2.11	2.98	13.56	4.06%	27.125

THE COST OF EQUITY IS CALCULATED USING A TWO STAGE GROWTH, INFINITE HORIZON DISCOUNTED CASH FLOW MODEL:

$$Po * (1 - FC) = D1/(1+k) + D2/(1+k)^2 + D3/(1+k)^3 + D4/(1+k)^4 + ((D4*(1+G))/(k-g))/(1+k)^4$$

SOLVING FOR k, THE REQUIRED RETURN EQUALS 11.50%

SOURCES: Value Line, Edition 3, October 5, 1990
Standard & Poor's Stock Guide, October 1990

ESTIMATED MONTHLY RISK PREMIUMS
MOODY'S NATURAL GAS DISTRIBUTION INDEX
OCTOBER 1980 - SEPTEMBER 1990

YEAR	MONTH	Cost of Equity Gas	Risk Free Rate	Risk Premium
1980	OCT	16.963	11.360	5.603
	NOV	16.984	11.630	5.354
	DEC	17.344	12.300	5.044
1981	JAN	17.480	12.350	5.130
	FEB	17.425	12.050	5.375
	MAR	17.020	12.680	4.340
	APR	17.200	12.590	4.610
	MAY	17.835	13.080	4.755
	JUN	18.450	13.440	5.010
	JUL	18.290	12.820	5.470
	AUG	18.173	13.490	4.683
	SEP	17.850	14.050	3.800
	OCT	18.810	14.590	4.220
	NOV	19.080	14.590	4.490
	DEC	18.757	13.080	5.677
1982	JAN	18.434	13.280	5.154
	FEB	18.970	14.160	4.810
	MAR	19.480	14.070	5.410
	APR	19.783	13.370	6.413
	MAY	19.614	13.240	6.374
	JUN	19.930	13.050	6.880
	JUL	19.450	13.750	5.700
	AUG	19.963	13.400	6.563
	SEP	19.990	12.540	7.450
	OCT	18.962	11.860	7.102
	NOV	18.576	10.840	7.736
	DEC	18.625	10.460	8.165
1983	JAN	18.054	10.600	7.454
	FEB	17.806	10.640	7.166
	MAR	17.800	10.890	6.910
	APR	17.464	10.650	6.814
	MAY	17.364	10.490	6.874
	JUN	17.180	10.520	6.660

ESTIMATED MONTHLY RISK PREMIUMS (continued)

YEAR	MONTH	Cost of Equity Gas	Risk Free Rate	Risk Premium
	JUL	16.505	10.950	5.555
	AUG	16.429	11.440	4.989
	SEP	16.493	11.780	4.713
	OCT	16.226	11.620	4.606
	NOV	15.903	11.550	4.353
	DEC	16.072	11.680	4.392
1984	JAN	15.862	11.810	4.052
	FEB	15.870	11.650	4.220
	MAR	15.825	11.810	4.015
	APR	15.736	12.280	3.456
	MAY	15.627	12.580	3.047
	JUN	15.776	13.320	2.456
	JUL	16.334	13.430	2.904
	AUG	16.429	13.240	3.189
	SEP	16.453	12.630	3.823
	OCT	16.508	12.340	4.168
	NOV	15.927	12.000	3.927
	DEC	15.640	11.550	4.090
1985	JAN	15.290	11.510	3.780
	FEB	15.051	11.460	3.591
	MAR	14.917	11.560	3.357
	APR	14.673	11.920	2.753
	MAY	14.694	11.550	3.144
	JUN	14.588	11.080	3.508
	JUL	14.886	10.480	4.406
	AUG	15.017	10.620	4.397
	SEP	15.604	10.700	4.904
	OCT	15.030	10.780	4.250
	NOV	15.122	10.660	4.462
	DEC	14.672	10.190	4.482
1986	JAN	13.857	9.680	4.177
	FEB	13.780	9.590	4.190
	MAR	13.644	9.260	4.384
	APR	12.944	8.150	4.794
	MAY	12.684	7.580	5.104
	JUN	12.726	8.130	4.596
	JUL	11.818	8.270	3.548
	AUG	11.683	7.880	3.803
	SEP	11.653	7.740	3.913

ESTIMATED MONTHLY RISK PREMIUMS (continued)

YEAR	MONTH	Cost of Equity Gas	Risk Free Rate	Risk Premium
	OCT	11.408	8.100	3.308
	NOV	11.617	8.060	3.557
	DEC	11.336	7.820	3.516
1987	JAN	11.847	7.660	4.187
	FEB	11.642	7.620	4.022
	MAR	11.563	7.710	3.853
	APR	11.293	7.640	3.653
	MAY	11.759	8.350	3.409
	JUN	11.903	8.850	3.053
	JUL	11.738	8.670	3.068
	AUG	11.856	8.770	3.086
	SEP	11.858	9.060	2.798
	OCT	12.148	9.670	2.478
	NOV	12.926	9.730	3.196
	DEC	13.078	9.100	3.978
1988	JAN	13.226	9.230	3.996
	FEB	12.850	8.930	3.920
	MAR	12.416	8.480	3.936
	APR	12.396	8.640	3.756
	MAY	12.398	8.970	3.428
	JUN	12.378	9.300	3.078
	JUL	12.049	9.110	2.939
	AUG	12.027	9.280	2.747
	SEP	12.314	9.420	2.894
	OCT	12.070	9.140	2.930
	NOV	12.036	8.960	3.076
	DEC	12.088	9.090	2.998
1989	JAN	12.028	9.100	2.928
	FEB	12.050	9.050	3.000
	MAR	12.060	9.150	2.910
	APR	12.580	9.310	3.270
	MAY	12.480	9.170	3.310
	JUNE	12.312	8.930	3.382
	JUL	12.071	8.370	3.701

ESTIMATED MONTHLY RISK PREMIUMS (continued)

YEAR	MONTH	Cost of Equity Gas	Risk Free Rate	Risk Premium
	AUG	11.882	8.160	3.722
	SEP	11.788	8.230	3.558
	OCT	11.450	8.290	3.160
	NOV	11.462	8.120	3.342
	DEC	11.320	8.000	3.320
1990	JAN	10.978	8.000	2.978
	FEB	11.130	8.370	2.760
	MAR	11.252	8.630	2.622
	APR	11.416	8.730	2.686
	MAY	11.620	8.920	2.700
	JUN	11.710	8.870	2.840
	JUL	11.468	8.600	2.868
	AUG	11.550	8.620	2.930
	SEP	11.830	8.930	2.900
	OCT	11.500	9.080	2.420
	AVERAGE			4.194

SOURCES: Value Line Investment Survey
S&P Stock Guide
Moody's Bond Survey

RISK PREMIUM ANALYSIS

(7) $k_e = R_f + R_p$

where:

k_e = The cost of common equity

R_f = The yield on U.S. Long-term Treasuries

R_p = The risk premium on common stock

therefore:

$k_e = 8.55\% + 4.19\%$

$k_e = 12.74\%$

Note: The yield on long-term treasuries was obtained from Blue Chip Financial Forecasts, October 1, 1990.

FPUC GAS OPERATIONS
THERM SALES AND REVENUES UNDER PRESENT RATES

	NUMBER OF BILLS	TOTAL THERM SALES	TOTAL REVENUES	REVENUES AS % of TOTAL
RESIDENTIAL	365,310	$8,585,864	$6,299,984	26.87%
GENERAL SERVICE	17,360	3,377,253	1,798,253	7.67%
GENERAL SERVICE LARGE VOLUME	15,440	19,822,158	8,232,401	35.11%
OUTDOOR LIGHTING	405	11,203	6,004	0.03%
PUBLIC HOUSING AUTHORITY	11,346	356,277	162,813	0.69%
INTERRUPTIBLE	158	3,270,286	927,159	3.95%
LARGE VOLUME INTERRUPTIBLE	12	24,844,860	6,021,609	25.68%
TOTALS	410,031	$60,267,901	$23,448,223	100.00%

SOURCE: MFRs Schedule E-1

MOODY'S NATURAL GAS DISTRIBUTION INDEX
REVENUE BREAKDOWN

	REVENUE BREAKDOWN %			
UTILITY	**INDUSTRIAL**	**COMMERCIAL**	**RESIDENTIAL**	**OTHER**
ATLANTA GAS LIGHT	16.00%	24.00%	55.00%	5.00%
BROOKLYN UNION GAS	20.00% •		80.00%	0.00%
DIVERSIFIED ENERGIES	NA	NA	NA	NA
INDIANA ENERGY	11.00%	21.00%	41.00%	27.00%
LACLEDE GAS	10.00%	30.00%	60.00%	0.00%
NORTHWEST NATURAL GAS	12.00%	35.00%	53.00%	0.00%
PEOPLES ENERGY	5.00%	13.00%	54.00%	28.00%
WASHINGTON GAS LIGHT	55.00% •		45.00%	0.00%
AVERAGE	18.43%	17.57%	55.43%	8.57%

• Commercial and Industrial Revenues Combined

SOURCE: Value Line, Edition 3, October 5, 1990

BOND YIELD DIFFERENTIALS
Moody's Bond Survey/Public Utility Bond Yield Averages

YEAR	MONTH	Aa2	SPREAD	Aa3	SPREAD	A1	SPREAD	A2	SPREAD	A3	SPREAD	Baa1	SPREAD	Baa2
	SEP	9.87	0.08	9.95	0.08	10.04	0.08	10.12	0.07	10.19	0.07	10.25	0.07	10.32
	AUG	9.78	0.05	9.83	0.05	9.87	0.05	9.92	0.07	9.99	0.07	10.05	0.07	10.12
	JUL	9.61	0.05	9.66	0.05	9.70	0.05	9.75	0.06	9.81	0.06	9.86	0.06	9.92
	JUN	9.60	0.07	9.67	0.07	9.73	0.07	9.80	0.05	9.85	0.05	9.91	0.05	9.96
	MAY	9.83	0.06	9.89	0.06	9.94	0.06	10.00	0.05	10.05	0.05	10.11	0.05	10.16
	APR	9.81	0.04	9.85	0.04	9.88	0.04	9.92	0.07	9.99	0.07	10.06	0.07	10.13
	MAR	9.60	0.08	9.68	0.08	9.77	0.08	9.85	0.07	9.92	0.07	9.99	0.07	10.06
	FEB	9.57	0.06	9.63	0.06	9.70	0.06	9.76	0.07	9.83	0.07	9.89	0.07	9.96
1990	JAN	9.39	0.06	9.45	0.06	9.50	0.06	9.56	0.06	9.62	0.06	9.68	0.06	9.74
	DEC	9.26	0.06	9.32	0.06	9.38	0.06	9.44	0.05	9.49	0.05	9.55	0.05	9.60
	NOV	9.25	0.09	9.34	0.09	9.42	0.09	9.51	0.04	9.55	0.04	9.60	0.04	9.64
	OCT	9.28	0.09	9.37	0.09	9.45	0.09	9.54	0.03	9.57	0.03	9.61	0.03	9.64
	SEP	9.35	0.08	9.43	0.08	9.50	0.08	9.58	0.04	9.62	0.04	9.66	0.04	9.70
	AUG	9.27	0.08	9.35	0.08	9.44	0.08	9.52	0.04	9.56	0.04	9.60	0.04	9.64
	JUL	9.23	0.09	9.32	0.09	9.41	0.09	9.50	0.05	9.55	0.05	9.59	0.05	9.64
	JUN	9.37	0.09	9.46	0.09	9.55	0.09	9.64	0.05	9.69	0.05	9.75	0.05	9.80
	MAY	9.79	0.07	9.86	0.07	9.92	0.07	9.99	0.10	10.09	0.10	10.19	0.10	10.29
	APR	10.02	0.05	10.07	0.05	10.13	0.05	10.18	0.10	10.28	0.10	10.39	0.10	10.49
	MAR	10.05	0.06	10.11	0.06	10.17	0.06	10.23	0.09	10.32	0.09	10.41	0.09	10.50
	FEB	9.93	0.05	9.98	0.05	10.02	0.05	10.07	0.10	10.17	0.10	10.28	0.10	10.38
1989	JAN	9.89	0.06	9.95	0.06	10.02	0.06	10.08	0.10	10.18	0.10	10.28	0.10	10.38
	DEC	9.90	0.05	9.95	0.05	10.01	0.05	10.06	0.13	10.19	0.13	10.31	0.13	10.44
	NOV	9.79	0.06	9.85	0.06	9.91	0.06	9.97	0.11	10.08	0.11	10.20	0.11	10.31
	OCT	9.80	0.03	9.83	0.03	9.87	0.03	9.90	0.15	10.05	0.15	10.20	0.15	10.35
	SEP	10.34	0.09	10.43	0.09	10.52	0.09	10.61	0.17	10.78	0.17	10.96	0.17	11.13
	AUG	10.85	0.11	10.96	0.11	11.06	0.11	11.17	0.17	11.34	0.17	11.52	0.17	11.69
	JUL	10.76	0.09	10.85	0.09	10.95	0.09	11.04	0.16	11.20	0.16	11.36	0.16	11.52
	JUN	10.52	0.09	10.61	0.09	10.70	0.09	10.79	0.16	10.95	0.16	11.11	0.16	11.27
	MAY	10.53	0.09	10.62	0.09	10.72	0.09	10.81	0.19	11.00	0.19	11.19	0.19	11.38
	APR	10.29	0.08	10.37	0.08	10.46	0.08	10.54	0.23	10.77	0.23	11.00	0.23	11.23
	MAR	9.92	0.06	9.98	0.06	10.03	0.06	10.09	0.20	10.29	0.20	10.49	0.20	10.69
	FEB	9.91	0.06	9.97	0.06	10.04	0.06	10.10	0.18	10.28	0.18	10.47	0.18	10.65
1988	JAN	10.52	0.08	10.60	0.08	10.68	0.08	10.76	0.19	10.95	0.19	11.15	0.19	11.34
	DEC	10.78	0.07	10.85	0.07	10.91	0.07	10.98	0.19	11.17	0.19	11.36	0.19	11.55
	NOV	10.62	0.07	10.69	0.07	10.75	0.07	10.82	0.19	11.01	0.19	11.21	0.19	11.40
	OCT	11.11	0.08	11.19	0.08	11.26	0.08	11.34	0.19	11.53	0.19	11.72	0.19	11.91
	SEP	10.66	0.19	10.85	0.19	11.03	0.19	11.22	0.12	11.34	0.12	11.46	0.12	11.58
	AUG	10.05	0.13	10.18	0.13	10.32	0.13	10.45	0.15	10.60	0.15	10.75	0.15	10.90
	JUL	9.70	0.15	9.85	0.15	10.00	0.15	10.15	0.16	10.31	0.16	10.46	0.16	10.62
	JUN	9.61	0.14	9.75	0.14	9.88	0.14	10.02	0.15	10.17	0.15	10.31	0.15	10.46
	MAY	9.63	0.09	9.72	0.09	9.82	0.09	9.91	0.16	10.07	0.16	10.24	0.16	10.40
	APR	9.15	0.08	9.23	0.08	9.30	0.08	9.38	0.16	9.54	0.16	9.69	0.16	9.85
	MAR	8.64	0.10	8.74	0.10	8.83	0.10	8.93	0.09	9.02	0.09	9.10	0.09	9.19
	FEB	8.69	0.10	8.79	0.10	8.90	0.10	9.00	0.08	9.08	0.08	9.16	0.08	9.24
1987	JAN	8.62	0.11	8.73	0.11	8.84	0.11	8.95	0.11	9.06	0.11	9.16	0.11	9.27
	DEC	8.81	0.10	8.91	0.10	9.02	0.10	9.12	0.12	9.24	0.12	9.37	0.12	9.49
	NOV	9.01	0.09	9.10	0.09	9.19	0.09	9.28	0.14	9.42	0.14	9.55	0.14	9.69
	OCT	9.24	0.09	9.33	0.09	9.43	0.09	9.52	0.14	9.66	0.14	9.81	0.14	9.95
	SEP	9.28	0.08	9.36	0.08	9.44	0.08	9.52	0.15	9.67	0.15	9.81	0.15	9.96
	AUG	9.03	0.09	9.12	0.09	9.20	0.09	9.29	0.14	9.43	0.14	9.56	0.14	9.70
	JUL	9.05	0.11	9.16	0.11	9.26	0.11	9.37	0.11	9.48	0.11	9.58	0.11	9.69
	JUN	9.36	0.09	9.45	0.09	9.53	0.09	9.62	0.14	9.76	0.14	9.89	0.14	10.03
	MAY	9.38	0.07	9.45	0.07	9.52	0.07	9.59	0.14	9.73	0.14	9.88	0.14	10.02
	APR	8.87	0.09	8.96	0.09	9.05	0.09	9.14	0.16	9.30	0.16	9.47	0.16	9.63
	MAR	9.16	0.11	9.27	0.11	9.37	0.11	9.48	0.14	9.62	0.14	9.77	0.14	9.91
	FEB	9.98	0.09	10.07	0.09	10.17	0.09	10.26	0.16	10.42	0.16	10.58	0.16	10.74
1986	JAN	10.44	0.12	10.56	0.12	10.67	0.12	10.79	0.15	10.94	0.15	11.09	0.15	11.24
	DEC	10.57	0.13	10.70	0.13	10.84	0.13	10.97	0.17	11.14	0.17	11.31	0.17	11.48
	NOV	11.10	0.13	11.23	0.13	11.36	0.13	11.49	0.18	11.67	0.18	11.86	0.18	12.04
	OCT	11.61	0.13	11.74	0.13	11.88	0.13	12.01	0.17	12.18	0.17	12.35	0.17	12.52
	SEP	11.68	0.15	11.83	0.15	11.98	0.15	12.13	0.20	12.33	0.20	12.52	0.20	12.72
		Aa2	SPREAD	Aa3	SPREAD	A1	SPREAD	A2	SPREAD	A3	SPREAD	Baa1	SPREAD	Baa2
AVERAGE		9.783	0.085	9.869	0.085	9.954	0.085	10.04	0.123	10.16	0.123	10.28	0.123	10.40

DERIVATION OF THE TWO-STAGE GROWTH, QUARTERLY COMPOUNDED DCF MODEL

Assume the market price is the present value of all dividends expected to be paid in the future including any liquidating dividend, the firm pays dividends quarterly, and dividends grow at a constant annual rate, g, or:

$$P_o = \sum_{t=1} \frac{D_t}{(1+k)^{f_t}} \qquad (1)$$

where: D_t = the dividend paid at the end of quarter t

k = the quarterly DCF cost of equity

Also, we assume that:

$$D_t = D_{t-4} (1 + g)$$

where g < k. Multiplying equation (1) by $\frac{(1+k)}{(1+g)}$ we get:

$$P_o \frac{1+k}{1+g} = D_{-3}(1+k)^{1-f_1} + D_{-2}(1+k)^{1-f_2} + D_{-1}(1+k)^{1-f_3}$$

$$+ D_o(1+k)^{1-f_4} \ldots + D_{-5}(1+k)^{1-f_{-1}} + D_{-4}(1+k)^{1-f} \qquad (2)$$

where D_{-3} through D_0 are the quarterly dividends already paid in the previous year. If we now subtract equation (1) from equation (2), we will obtain:

$$P_o \frac{1+k}{1+g} - P_o = D_{-3}(1+k)^{1-f_1} + D_{-2}(1+k)^{1-f_2} + D_{-1}(1+k)^{1-f_3}$$

$$+ D_o(1+k)^{1-f_4} - D_{-3}(1+k)^{1-f_{-3}} - D_{-2}(1+k)^{1-f_{-2}}$$

$$- D_{-1}(1+k)^{1-f_{-1}} - D\,(1+k)^{1-f} \qquad (3)$$

Assuming that dividends grow at annual rate of g, the last four terms on the right hand side of Equation (3) will approach zero as we approach infinity. Therefore:

$$P_o \frac{k-g}{1+g} = D_{-3}(1+k)^{1-f_1} + D_{-2}(1+k)^{1-f_2} + D_{-1}(1+k)^{1-f_3} + D_o(1+k)^{1-f_4} \qquad (4)$$

Multiplying both sides of Equation (4) by $\frac{(1+g)}{(k-g)}$ gives:

$$P_o = \frac{D_1(1+k)^{1-f_1} + D_2(1+k)^{1-f_2} + D_3(1+k)^{1-f_3} + D_4(1+k)^{1-f_4}}{k-g} \qquad (5)$$

Next, assume n periods of non-constant growth of dividends after which dividends will grow at the constant annual rate, G.

Therefore, the price of the stock at the beginning of the constant growth period will be equal to:

$$P_n = \frac{D_{n+1}(1+k)^{.75} + D_{n+2}(1+k)^{.50} + D_{n+3}(1+k)^{.25} + D_{n+4}(1+k)^{0}}{k - G} \quad (6)$$

Therefore, the price at of the beginning of the nonconstant growth period (time period zero) will be equal to:

$$P_o = \frac{D_1}{(1+k)^{f_1}} + \frac{D_2}{(1+k)^{f_2}} \cdots + \frac{D_n}{(1+k)^{f_n}} +$$

$$\frac{D_{n+1}(1+k)^{.75} + D_{n+2}(1+k)^{.50} + D_{n+3}(1+k)^{.25} + D_{n+4}(1+k)^{o}}{k - G} * \left(\frac{1}{1+k}\right)^{f_n} \quad (7)$$

Solving Equation (7) for k, we then obtain:

$$k = \frac{D_1}{(1+k)^{f_1}} + \frac{D_2}{(1+k)^{f_2}} \cdots + \frac{D_n}{(1+k)^{f_n}} * (k - G)$$

$$+ D_{n+1}(1+k)^{.75} + D_{n+2}(1+k)^{.50} + D_{n+3}(1+k)^{.25} + D_{n+4}(1+k)^{0}$$

$$* \frac{1}{1+k}^{f_n} P_o + G \qquad (8)$$

which can be expressed as:

$$P_o = \sum_{t=1}^{n} \frac{D_t}{(1+k)^t} + \frac{D_n(1+G)}{k - G} * \frac{1}{1+k}^{n} \qquad (9)$$

MEMORANDUM

November 7, 1990

ORIGINAL
FILE COPY

TO: DIVISION OF RECORDS AND REPORTING

FROM: DIVISION OF AUDIT AND FINANCE (DOUD)

RE: DOCKET NO. 900151-GU -- FLORIDA PUBLIC UTILITIES
RATE CASE AUDIT - 12 MONTHS ENDED DECEMBER 31, 1989

Forwarded. Audit exceptions document deviations from the Uniform System of Accounts, Commission rule or order, Staff Accounting Bulletin and generally accepted accounting principles. Audit findings disclose information that may influence the decision process.

Audit was prepared using micro computer and has been recorded on two (2) diskettes. The diskettes may be reviewed using IBM compatible equipment and LOTUS 1-2-3 software. There are no confidential working papers associated with this audit.

Please forward a complete copy of this report to:

Florida Public Utilities
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West Palm Beach, FL 33402-3395

FD/sp
Attachment
cc: Chairman Wilson
Commissioner Beard
Commissioner Easley
Commissioner Gunter
Commissioner Messersmith
Bill Talbott, Deputy Executive Director/Technical
Legal Services
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