BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITIES COMMISSION

v.

DUQUESNE LIGHT COMPANY

DOCKET NO. R-00061346

DIRECT TESTIMONY

OF

STEPHEN G. HILL

ON BEHALF OF

THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

JULY 7, 2006

INTRODUCTION / SUMMARY

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: sghill@compuserve.com).

Q. BRIEFLY, WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. After graduating with a Bachelor of Science degree in Chemical Engineering from Auburn University in Auburn, Alabama, I was awarded a scholarship to attend Tulane Graduate School of Business Administration at Tulane University in New Orleans, Louisiana. There I received a Master's Degree in Business Administration. I have been awarded the professional designation, "Certified Rate of Return Analyst," by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. I have also been selected to be on the Board of Directors of that national organization. A more detailed account of my educational background and occupational experience appears in Appendix A.

Q. HAVE YOU TESTIFIED BEFORE THIS OR OTHER REGULATORY COMMISSIONS?

A. Yes, I have appeared previously before this Commission. In addition, I have testified on cost of capital, corporate finance and capital market issues in more than 225 regulatory proceedings before the following regulatory bodies: the West Virginia Public Service Commission, the Arizona Corporation Commission, the Oklahoma State Corporation Commission, the Public Utilities Commission of the State of California, the Texas Public Utilities Commission, the Maryland Public Service Commission, the Public Utilities Commission of the State of Minnesota, the Ohio Public Utilities Commission, the Insurance

Commissioner of the State of Texas, the North Carolina Insurance Commissioner, the Rhode Island Public Utilities Commission, the City Council of Austin, Texas, the Texas Railroad Commission, the Missouri Public Service Commission, the South Carolina Public Service Commission, the Public Utilities Commission of the State of Hawaii, the New Mexico Corporation Commission, the State of Washington Utilities and Transportation Commission, the Georgia Public Service Commission, the Public Service Commission of Utah, the Illinois Commerce Commission, the Kansas Corporation Commission, the Indiana Utility Regulatory Commission, the Virginia Corporation Commission, the Montana Public Service Commission, the Public Service Commission of the State of Maine, the Public Service Commission of Wisconsin, the Vermont Public Service Board, the Federal Communications Commission and the Federal Energy Regulatory Commission. I have also testified before the West Virginia Air Pollution Control Commission regarding appropriate pollution control technology and its financial impact on the company under review and have been an advisor to the Arizona Corporation Commission on matters of utility finance.

Q. ON BEHALF OF WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of the Pennsylvania Office of Consumer Advocate (OCA)

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In this testimony, I present the results of studies I have performed related to the establishment of an appropriate return on equity and overall cost of capital for the electric transmission and distribution operations of Duquesne Light Company (DLC, Duquesne, the Company), a subsidiary of Duquesne Light Holdings, Inc. (DQE, the Parent). In addition to my testimony regarding the Company's current cost of capital, I review the cost of capital testimony provided by Mr. Paul Moul and discuss certain aspects of that testimony that lead to an overstatement of the cost of equity capital. I also discuss the testimony of Company witness Julie Cannel.

Q. MR. HILL ARE YOU AWARE OF THE COMPANY'S RECENT ANNOUNCEMENT REGARDING ITS PURCHASE BY A PRIVATE EQUITY FIRM, McQUARIE INFRASTRUCTURE PARTNERS?

A. Yes. I have reviewed the July 5, 2006, press release issued by the Company regarding the leveraged buy-out of Duquesne Light Holdings by McQuarie.

Q. DOES THAT TRANSACTION IMPACT YOUR RECOMMENDATION IN THIS PROCEEDING?

A. At this point in the proceeding, I do not believe there will be an impact on my recommendation due to the buy-out. However, because the announcement occurred immediately prior to the filing of intervenor testimony and without any prior notice by the Company, I will reserve comment on the buy-out until the surrebuttal portion of this proceeding.

Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR TESTIMONY?

A. Yes, Exhibit_ (SGH-1) consists of 13 Schedules and provides the analytical support for the conclusions reached regarding the overall cost of capital for Duquesne Light Company presented in the body of the testimony. This Exhibit was prepared by me and is correct to the best of my knowledge and belief. Also, I have provided four Appendices ("A" through "D"), which contain additional detail regarding certain aspects of my narrative testimony in this proceeding.

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND FINDINGS CONCERNING THE RATE OF RETURN THAT SHOULD BE UTILIZED IN SETTING RATES FOR DUQUESNE LIGHT COMPANY'S ELECTRIC UTILITY OPERATIONS IN THIS PROCEEDING.

A. My testimony is organized into five sections. First, I discuss recent findings in the field of financial economics that are germane to the determination of the cost of capital as well as other factors that support the reasonableness of single-digit cost of capital estimates. Second, I review the current economic environment in which the equity return estimate is made. Third, I review the capital structure requested by DLC for ratemaking purposes in comparison to capital

structures employed by the Company and its parent company historically. From that review, I develop a capital structure appropriate for ratemaking purposes.

Fourth, I evaluate the cost of equity capital for similar-risk utility operations using Discounted Cash Flow (DCF), Capital Asset Pricing Model (CAPM), Modified Earnings-Price Ratio (MEPR), and Market-to-Book Ratio (MTB) analyses. Fifth, I comment on the pre-filed cost of capital testimony submitted by Company witness, Paul Moul.

I have estimated the equity capital cost of electric transmission and distribution companies to fall in a range of 9.25% to 9.75%. Within that range, I estimate the equity cost of the Company's electric utility operations to be at the mid-point of a reasonable range of equity costs for electric utilities—9.50%.

Applying that 9.50% equity capital cost to a capital structure that is reasonable for ratemaking purposes produces an overall cost of capital of 7.85% (Exhibit_ (SGH-1), Schedule 12). That overall cost of capital affords the Company an opportunity to achieve a pre-tax interest coverage level of 3.21 times. That level of pre-tax coverage is well above the level of interest coverage actually achieved by DLC over the past three years, which has averaged 2.33x.[1] Therefore, the equity return I recommend is sufficient to support and improve the Company's financial position and fulfills the requirement of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation while maintaining the Company's ability to attract capital.

Q. WHY SHOULD THE COST OF CAPITAL SERVE AS A BASIS FOR THE PROPER ALLOWED RATE OF RETURN FOR A REGULATED FIRM?

A. The Supreme Court of the United States has established, as a guide to assessing an appropriate level of profitability for regulated operations, that investors in such firms are to be given an opportunity to earn returns that are sufficient to attract capital and are comparable to returns investors would expect in the unregulated sector for assuming the same degree of risk. The Bluefield and Hope cases provide the seminal decisions [Bluefield Water Works v. PSC,

[1] Duquesne Light 2005 S.E.C. Form 10-K, Exhibit 12.

262 US 679 (1923); FPC v. Hope Natural Gas Company, 320 US 591 (1944)]. These criteria were restated in the Permian Basin Area Rate Cases, 390 US 747 (1968). However, the Court also makes quite clear in Hope that regulation does not guarantee profitability and, in Permian Basin, that, while investor interests (profitability) are certainly pertinent to setting adequate rates, those interests do not exhaust the relevant considerations.

As a starting point in the rate-setting process, then, the cost of capital of a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. Since financial theory holds that investors will not provide capital for a particular investment unless that investment is expected to yield the opportunity cost of capital, the correspondence of the cost of capital with the Court's guidelines for appropriate earnings is clear.

I. INVESTOR RETURN EXPECTATIONS

Q. UTILITY EQUITY RETURN AWARDS IN THE U.S. OVER THE PAST YEAR HAVE AVERAGED ABOUT 10.5%. YOUR EQUITY RETURN RECOMMENDATION FOR DLC IS BELOW RECENT ALLOWED RETURN AVERAGES. ARE THERE OBJECTIVE INDICATORS THAT SHOW YOUR ESTIMATE IS REASONABLE?

A. Yes, there is both theoretical and practical evidence, which shows that an equity return of 9.50% for a pure transmission and distribution (T&D) electric utility operation is not only reasonable, but may, in fact, be generous.

Q. WHAT OBJECTIVE PRACTICAL EVIDENCE CAN YOU CITE THAT INDICATES YOUR EQUITY RETURN RECOMMENDATION IN THIS PROCEEDING IS REASONABLE?

A. The most compelling evidence that investor equity return expectations are likely to be below my estimate of the current cost of equity in this proceeding and far below average allowed returns for utilities is provided by Duquesne Light Holdings. In its 2005 S.E.C. Form 10-K, at pages 69, Duquesne Light Holdings, Inc. published data regarding the Company's pension plan

and the expected return on the invested assets in that portfolio. The Company's published data indicate that its 2005 investment mix in its pension fund portfolio was approximately 60% equities and 40% debt. Also, the Company informs investors that it expects to earn an 8.00% return on its pension fund portfolio.

Assuming that the debt component of its pension fund earns a 5% return approximating the current yield on Treasury bonds, we can estimate that a total portfolio return of 8.00% implies an expectation of a 10% return on its equity investments [8.00% = 5% bond return x 40% + X% equity return x 60%; X = 10%]. Of course, if Duquesne Light Holding's return expectation on its bond portfolio were higher than the risk-free yield from Treasury bonds, the algebra would produce a lower equity return estimate.

In fact, the equity return expectation of Duquesne's pension fund portfolio is lower than the back-of-the-envelope estimate set out above. In response to OCA Request No. III-2, the Company provided support from its pension fund managers (Trust Investments & Risk Management) regarding the long-term equity return expectation. The Company's pension plan administrator projects a long-term return for a diversified portfolio of common equities, based on an analysis of historical and projected data ranging from 8.5% to 9.25%. That equity return expectation is for common stocks, generally, not for utility stocks, which would have a lower equity return expectation due to their lower risk.

The definition of the cost of equity capital for a firm is investors' expected long-term return. Duquesne's long-term expected return on the portfolio of common stocks in its pension fund is roughly 9%. That is the cost of equity capital on the stock market, in general. That long-term equity return expectation for the common stocks in Duquesne's own pension fund is below the equity return I recommend in this proceeding for a T&D utility operation with substantially lower operating risk. Therefore, the Company's own investment return projections published in its S.E.C. filings, provide compelling evidence that, 1) my 9.50% recommendation is reasonable if not conservative and 2) Mr. Moul's 11.75% recommendation is substantially inflated.

Q. ISN'T IT POSSIBLE THAT THE EQUITY RETURN PROJECTIONS FOR THE COMPANY'S PENSION FUND ARE LOW IN ORDER NOT TO EXAGGERATE THE FUTURE VALUE OF THAT FUND?

A. Yes. It is reasonable to believe that the Company would not want to use return expectations that are too high for its pension fund assets because that would exaggerate the expected future value of that fund. Moreover, if the assumed returns are continually over-estimated and are not ultimately realized, the Company would be left with unfunded pension liabilities that could add unnecessarily to the Company's financial risk profile.

However, a high estimate of future pension portfolio returns also has positive near-term implications that would prohibit management from "low-balling" its projected portfolio returns. A higher return estimate causes a reduction in annual pension fund expense (i.e., a lower annual contribution would be necessary to reach the future targeted amount of funds required if the expected return on those assets is higher) and a lower expense would result in a concomitant increase in the company's bottom line. That increase in profitability provides positive incentive to over-estimate the return. Prudent management, then, would seek to balance the positive and negative aspects of over-estimating the return on pension fund assets.

It is also reasonable to believe that the Company would not want to underestimate the pension fund return estimates, because that would call for an unnecessarily high annual contribution every year to reach the future targeted amount of pension funds. An unnecessarily large pension expense would reduce the Company's earnings. In addition, if ultimate returns turn out to be higher than predicted, the Company will, effectively, have pre-funded its pension requirements, using funds that could have been put to other, more economically beneficial uses such as production or transmission facilities.

Therefore, because there are negatives associated with either over- or under-stating expected pension portfolio returns, we must assume the Company and its pension fund managers actually believe that, over the long-term, its common equity return expectations for its pension fund investments are 8.5% to 9.25%.

Q. EXPECTED EQUITY RETURNS IN THE SINGLE-DIGIT RANGE SEEM TO BE LOW. ARE THERE OTHER EXAMPLES OF INVESTOR-EXPECTED EQUITY RETURNS SIMILAR TO THOSE USED IN THE COMPANY'S PENSION FUND PLANNING?

A. Yes. There are examples in the capital marketplace and the financial media indicating that investor return requirements are quite modest. For example, a recent A.G. Edwards report on the gas utility industry, shows that market return expectations for gas utility stocks are well below 10%.[2] The report states that, for a sample of 16 large and small gas distributors, the median total return expectation (dividend yield plus expected growth—a DCF-type calculation) is 8.1%.

Value Line publishes similar expected returns for gas distribution utilities. As part of the data array published for each of the companies it follows, Value Line publishes its expectations for a three- to five-year total return (dividends plus stock price change). For the gas distributors that I use as part of a similar-risk sample group to estimate the cost of equity in this proceeding, Value Line currently projects an average three- to five-year total return expectation of 9.125%. The return expectations for gas distributors published by AG Edwards and Value Line are representative of the equity return expectations presented to investors today and are below my recommended return on common equity in this proceeding.

In addition, in a letter published in late 2004 by Public Utilities Fortnightly, a prominent electric industry analyst confirms that single-digit return expectations are reasonable for utility investments, and those expectations comport with recent economic research:

> "Finally, let's get real about investor expectations, now that investors have begun to get real. Articles on the topic fill the financial journals. They feature variants on this theme: Over time the average equity investment produces an annual total return (dividends plus stock price appreciation) of 6.5 per cent per year in real terms, the bulk of which comes from the dividend component. Add inflation expectations to that number, and you get an 8.5 to 9.5 percent return in nominal terms. The average back-to-basics utility yields about 5 to 6 percent and might grow 3 to 4 percent per year, which adds up to produce a total return expectation of 8 to 10 percent per year, not far from the return the journals posit for the market." (Hyman, Leonard, Senior Consultant, R.J. Rudden

2 A.G. Edwards, "Gas Utilities Quarterly Review," April 6, 2006.

> Associates, "Letters to the Editor, *Public Utilities Fortnightly*, August 2004, p. 10)

The "articles in the financial journals," to which the author of the preceding quote refers, relate to recent research involving the market risk premium. The market risk premium is the additional return above the risk-free rate of interest that investors expect to earn by investing in stocks rather than risk-free U.S. Treasury securities. This recent research indicates that the market risk premium based on the often-cited Ibbotson historical data substantially overstates investor expectations for returns in the future.

Finally, the expectation of lower equity returns and lower risk premiums is not confined to academic journals. It has been published in the popular financial media. As the excerpt from a 2003 article in *Fortune* cited below notes, double-digit returns on the stock market are not a reasonable expectation for investors today.

> "For the real story, we turned to some top quantitative scholars. This cabal of quants [quantitative analysts] follows the market's most fundamental math, and it's telling them that investors should downsize their expectations. Yes, some individual stocks will return 10% or better. And yes, even we at FORTUNE think we can identify a few of the winners—as you'll see in the stories throughout this special issue. But the best the market *as a whole* can pull off is 6% to 8% annual returns....
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> [Cliff] Asness is not the only scholar urging caution. He's joined by such heavyweights as Kenneth French of Dartmouth, who wrote some of the most important stock market studies of the past two decades with Eugene Fama of the University of Chicago. Also in this pack is Jeremy Siegel of Wharton, whose book, *Stocks for the Long Run*, helped mold academic thinking on how equities perform over long periods. They have all come to the same cautious predictions about the markets because a crucial number in investing—their Holy Grail— is pointing toward lower returns. That number is the 'equity risk premium.' Since the mid-1980s the risk premium has been one of the key concepts in academic work on the stock market. 'It's the core number,' says French. 'If anything exercises a gravitational pull on stocks, it's the risk premium.'" (Greif, G., "Can Stocks Defy Gravity?"*Fortune*, June 16, 2003, pp. 44-50.)

Q. PLEASE EXPLAIN HOW THE CURRENT RESEARCH RELATED TO THE MARKET RISK PREMIUM SUPPORTS YOUR ESTIMATE OF THE COST OF EQUITY CAPITAL.

A. As noted above, the market risk premium is the difference between the return investors expect on stocks and the return they expect on bonds (often a risk-free rate of return like a U.S. Treasury bond). The "traditional" view, supported primarily by the earned return data over the past 80 years published by Ibbotson Associates[3], is based on the historical difference between the returns on stocks and the returns on bonds. That view assumes that the returns actually earned by investors over a long period of time are representative of the returns they expect to earn in the future.

For example, the Ibbotson data show that investors have earned a return of 12.3% on stocks and 5.8% on long-term Treasury bonds since 1926.[4] Therefore, based on those historical data, it is often assumed that investors require a risk premium of 6.5% above the long-term risk-free rate to invest in stocks [12.3% - 5.8% = 6.5%]. With a current long-term T-Bond yield of 5%, that assumption indicates an investor expectation of an 11.5% return for the stock market in general [5.0% + 6.5% = 11.5%]. Of course, expected utility returns would be lower, because utilities have less investment risk than the stock market generally.

However, in addition to the fact that past experience (even long term experience) may not necessarily be representative of current expectations for future returns, there are aspects of the Ibbotson data that, when examined, point not only to lower historical risk premiums than those reported by Ibbotson but also expected risk premiums that are much lower.

One recent article that evaluates returns over the past 100 years in the U.S. as well as other established stock markets "Risk and Return in the 20th and 21st Centuries," is authored by Dimson, March and Staunton. Those researchers summarize their findings this way:

> "The single most important contemporary issue in finance is the equity risk premium. This drives future equity returns, and is the

3 Ibbotson Associates is an investor service firm that publishes historical data related to the stock and bond markets from 1926 through the most recent year. The publications are updated each year.

4 Ibbotson Associates, SBBI Valuation Edition, 2006 Yearbook, p. 28.

> key determinant of the cost of capital. The risk premium—the expected reward for bearing the risk of investing in equities, rather than in low-risk investments such as bills or bonds—is usually estimated from historical data....The authors show that the historical equity risk premium has been lower than previously believed, and argue that the future risk premium is likely to be lower still." (Dimson, March, Staunton, "Risk and Return in the 20th and 21st Centuries," *Business Strategy Review*, 2000, Volume 11, Issue 2, pp. 1-18)

Dimson, et al, show that the Ibbotson historical data set, which measures return data from 1926 forward, suffers from survivor bias. Simply put, Ibbotson's data is based on the stock market results of only the successful stocks, i.e., those that were successful enough to be listed on a major exchange. The return data of the stocks that did not grow large enough to be listed on a stock exchange or data from markets that were difficult to measure are simply not included in the Ibbotson data. Dimson, et al, also measures returns over a longer period—100 years of data—and includes an analysis of the returns of stock markets in other countries (Ibbotson's data is limited to the US equity markets).

Researching more data over a longer period of time, those authors come to the conclusion that over the past 100 years common stocks have earned an average arithmetic return that is 5.0% above Treasury bonds.[5] Ibbotson's return difference between stock and long-term bonds is 6.5%. However, Dimson argues that historical results, alone, are not accurate measures of future return expectations unless the abnormalities in the historical record are removed in order to project for the future. Taking those facts into account, the authors conclude that, "the key qualitative point is that [the expected risk premium] is lower than the raw historical risk premium."

There is other research on historical returns that uses even longer time periods than the 100-year span used by Dimson. In Stocks for the Long Run, A Guide to Selecting Markets for Long-term Growth (Irwin Professional Publishing, Chicago, IL, 1994, pp. 11-15), Professor Jeremy Siegel concludes that between 1802 and 1992, the return differential between stocks and long-term Treasuries ranged from 3.4% to 5.1%.

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5 A market risk premium of 5% added to a current T-Bond yield of 5% would indicate an equity return expectation for common stocks of 10% (expected utility stock returns would be lower).

Therefore, recent academic research on the historical market risk premium, using longer time periods and a broader range of stock market data than the Ibbotson data show that the Ibbotson data risk premiums overstate long-term market risk premiums. Moreover, that other research indicates that the risk premium investors expect for the future—the prime determinant of today's equity return requirements—is lower than even long-term historical experience would indicate.

Q. IS THERE ADDITIONAL RECENT RESEARCH REGARDING THE MARKET RISK PREMIUM THAT IS NOT BASED PURELY ON HISTORICAL EARNED RETURNS, AND WHICH SHOWS THE RISK PREMIUM TO BE SUBSTANTIALLY LOWER THAN THAT PUBLISHED BY IBBOTSON?

A. Yes, there is new research regarding the risk premium, which is not based on historical earned returns. That research indicates the Ibbotson data is skewed upward and that the forward-looking market risk premium is much lower. In 2003, widely respected researchers Eugene Fama and Kenneth French published an article in *The Journal of Finance* focusing on the equity risk premium and measured (instead of the realized return) the expected return on the market less the expected return on bonds (the yield) over a long-term period as well as several sub-periods. Their research based on long-term historical expected returns indicates that the *expected* risk premium is in the range of 2.6% to 4.3%.[6]

More recently, Graham and Harvey (Duke University), in conjunction with *CFO Magazine* polled corporate financial officers regarding their expectations regarding the expected market risk premium. The most recent result of the quarterly poll (January 2006) indicates that the financial executives polled expect stock returns over the next ten years to be only 2.4% higher than bond returns. Since the survey was initiated (2000), the forward-looking market risk premium has ranged from about 2.5% to 4.5%. That means that corporate financial officers expect equity returns to range from 2.5% to 4.5% above ten-year US Treasury bonds. With current Treasury bond yields of approximately 5%, the Duke survey pegs investor equity return

6 Fama, E., French, K., "The Equity Premium," *The Journal of Finance*, Vol. LVII, No. 2, April 2003, pp. 637-659.

expectations ranging from 7.5% to 9.5%. In comparison to that expected range of returns for the stock market in general, my 9.50% equity return recommendation for DLC's transmission and distribution utility operations can only be characterized as generous.

Another survey approach to determining the market risk premium, was recently published by Professor Ivo Welch in the *Journal of Business*. The survey polled more than 500 finance and economics professors regarding their expectations about the long-term market risk premium and stock market return. That survey indicated that the median risk premium expectation was 5%, and the median geometric long-term stock market return expectation was 9% (implying an arithmetic stock market return expectation of 10%). Again, a 10% expected return for the stock market generally would imply lower returns for utility operations.

Finally, even Roger Ibbotson, whose firm (Ibbotson Associates) is the largest purveyor of historical market return data, recently published a paper confirming that risk premium expectations for the future are below what they were in the past. [7] Ibbotson's projected risk premium of 3.97% to 5.90%, is about 1.25% lower than pure historical return averages indicate; and the long-term return for the stock market he projects using those risk premiums is 9.37%. Even though Ibbotson's projected return for the stock market is similar to my equity return estimate for DLC in this case, it is important to understand that a) his forward-looking estimate is for the stock market as a whole, not for lower-risk utilities and b) his estimate is at the upper end of the spectrum produced by the current research on the market risk premium.

I have mentioned only a few of the research articles regarding the market risk premium that have been published over the last few years. There have been many and the vast majority of them indicate that the expected market risk premium is below that exhibited in the Ibbotson historical data. That information as well as the research cited above indicate, that my 9.50% equity return recommendation for the pure T&D utility operations of DLC in this proceeding is certainly reasonable and, if the new research regarding risk premiums is correct, may be too high.

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7 Ibbotson, R, Chen, P., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts Journal*, January/February 2003, pp. 88-89.

Q. IF THE CURRENT EQUITY RETURN INVESTORS ACTUALLY EXPECT IS WELL BELOW 10%, HOW DO YOU EXPLAIN THE FACT THAT REGULATORS, INCLUDING THIS COMMISSION, HAVE BEEN ALLOWING UTILITIES TO EARN EQUITY RETURNS OF ABOUT 10.5%, ON AVERAGE?

A. I believe that regulatory commissioners are generally not aware of the significant new research regarding the market risk premium and the reduction of long-term investor return expectations. As that information becomes more widely known and understood, I would expect allowed returns to decline. In addition, DCF cost of equity estimates have tracked actual capital costs quite well (DCF results have been below 10% for some time now), however other evidence considered by regulators is based primarily on historical risk premium information, which, as noted above, substantially overstates current investor expectations. In that way, I believe those equity return awards are based on inaccurate risk premium information that tends to overstate the cost of capital.

Clearly, investment advisors and their clients (e.g., Duquesne Light Holdings) believe that over the long-term equity returns will be below 10% as the evidence provided above indicates. I believe that regulators will eventually follow their lead.

II. ECONOMIC ENVIRONMENT

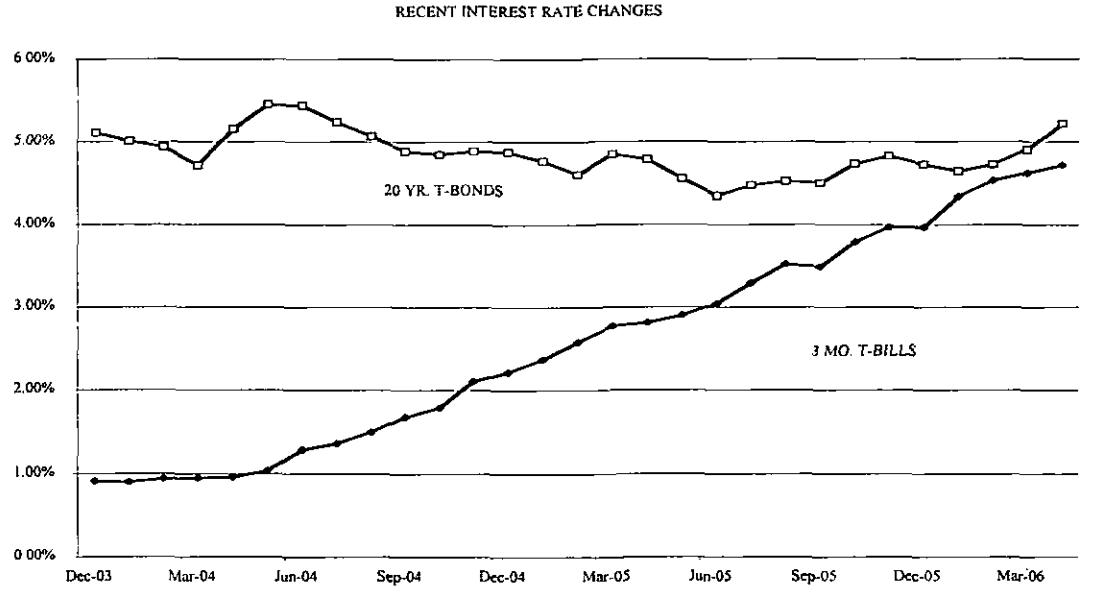
Q. WHY IS IT IMPORTANT TO REVIEW THE ECONOMIC ENVIRONMENT IN WHICH AN EQUITY COST ESTIMATE IS MADE?

A. The cost of equity capital is an expectational, or *ex ante*, concept. In seeking to estimate the cost of equity capital of a firm, it is necessary to gauge investor expectations with regard to the relative risk and return of that firm, as well as that for the particular risk-class of investments in which that firm resides. Because this exercise is, necessarily, based on understanding and accurately assessing investor expectations, a review of the larger economic environment within which the investor makes his or her decision is most important. Investor expectations regarding the strength of the U.S. economy, the direction of interest rates and the level of inflation (factors

that are determinative of capital costs) are key building blocks in the investment decision. Those factors should be reviewed by the analyst and the regulatory body in order to assess accurately investors' required return—the cost of equity capital to the regulated firm.

Q. DOES THE OBJECTIVE EVIDENCE AVAILABLE IN THE CURRENT ECONOMIC ENVIRONMENT INDICATE THAT CAPITAL COSTS CONTINUE TO BE LOW?

A. Yes. First, the overall level of fixed-income capital costs has been relatively low for several years, and continues to be low at the current time. Although, as shown in the chart below, there has been steady upward movement in *short-term* interest rate levels over the past year as the Federal Reserve (the Fed) has raised the Federal Funds rate, long-term interest rates have remained in a range of 4.5% to 5.5% over the past two years. This indicates that even though the Fed has raised short-term interest rates and the spread between long-term and short-term treasuries is well below the historical average, investors are not convinced that the overall level of economic growth will be sufficient to warrant an increase in long-term interest rates and long-term capital cost rates. As a result, long-term capital costs have not increased to any substantial extent even though the Federal Reserve has drastically increased short-term rates.



Data from Federal Reserve Statistical Release H.15

Another indication of the reason investors are willing to buy and hold stocks that offer what seem to be relatively low returns is shown in Exhibit__(SGH-1), Schedule 1, page 1, which depicts Moody's Baa-rated bond yields from 1984 through April 2006. Page 1 of Schedule 1 shows that interest rates over the past couple of years are very low relative to the interest rate levels that existed in the mid-1980s, and have continued a downward trend begun in 2000.

Also, page 2 of Schedule 1 (Exhibit__(SGH-1)), which presents the year-average Moody's Baa-rated bond yields for each year over the past 37 years (1968-2006), shows that Baa-rated bond yields thus far in 2006, even with a slight increase from 2005 levels, were below the bond yield levels seen in the U.S. in the late 1960s. Also, the most recent average Baa-rated utility bond yield, 6.4%[8], falls at the lower end of the range of interest rates that have existed over the past 30 years (See Schedule 1, page 2). Simply put, a fundamental reason that the current cost of common equity capital for electric utility operations of 9.25% to 9.75% is reasonable is that long-term capital cost rates are as low as they have been in more than thirty years.

The above data indicate that capital costs, even with the recent credit tightening by the Federal Reserve Bank (the Fed), remain at low levels and generally support the reasonableness of relatively low equity capital costs.

Q. WHAT IS THE CURRENT EXPECTATION WITH REGARD TO THE ECONOMY AND INTEREST RATES?

A. As Value Line notes in its most recent Quarterly Review the current expectation is that the economy will continue to expand at a moderate pace during 2006 and 2007, and inflation and interest rates will continue to be moderate. The following excerpts from Value Line explain how a relatively low interest rate environment will be preserved:

> **Economic Growth**: We think that further moderate growth will be the rule for the rest of 2006. Leading the way should be the industrial and capital goods areas. Retail spending is likely to press forward at a solid pace, while we would expect reduced housing

8 Value Line *Selection & Opinion*, most recent six weekly editions (3/31/06-5/5/06, inclusive), 20/30-year Baa-rated utility bond yield averages.

> activity. Our current forecast assumes that oil prices remain in the area of $60 a barrel, the Federal Reserve will stop raising interest rates by the middle of the year, and there will be no major deterioration on the global front. The latter expectation is always a risky assumption.
>
> **Inflation**: Our sense is that "core" inflation (that is, inflation, excluding food and energy from the pricing mix) will remain under control at the producer and consumer levels, especially if our forecast of slowing GDP growth in 2006 and 2007 is on the mark. Aggregate inflation, which includes food and energy, may prove more volatile on a month-to-month basis, given the short-term swings in oil prices [Chart omitted].
>
> **Interest Rates**: Moderating growth and benign inflation would probably be the combination needed for the Federal Reserve Board to abandon its nearly two-year-long program of measured interest-rate increases in the next few months....The series of data issued between now and early May, when the Fed meeting will be held, will then probably dictate the future course of action. Should our economic growth and inflation scenarios prove close to the mark, the Fed might soon after be inclined to halt its credit tightening. We think the Fed will move toward a neutral stance by midyear, keeping rates fairly level, or even pushing them down a little by early 2007. [Chart omitted]. (The Value Line Investment Survey, *Selection & Opinion*, February 24, 2006, pp. 1258-60.)

In that most recent Quarterly Economic Review, cited above, Value Line projects long-term Treasury bond rates will average 5.3% through 2007 and 5.6% through 2008. The recent six-week average 30-year T-bond yield is 4.97% (data from Value Line, *Selection & Opinion*, six weekly editions, March 13, 2006, through May 5, 2006). Therefore, the indicated expectation with regard to interest rates is that they are likely to move somewhat higher, but remain within a range near current levels.

Q. IS IT REASONABLE TO CONCLUDE THAT UTILITY INVESTORS ARE AWARE OF THE EXPECTATIONS FOR SOMEWHAT HIGHER INTEREST RATES IN THE FUTURE, AND HAVE REACTED TO THAT NEWS?

A. Yes. A widely accepted tenet of modern finance is that U.S. capital markets are efficient

in quickly assimilating into stock prices news that impacts stock valuation. Higher interest rates have been forecast for some time and, it is reasonable to believe, utility investors have incorporated that expectation into the prices they are willing to pay for utility stocks. Therefore, when estimating the cost of equity capital it is necessary to consider current interest rate levels, not projected levels, because current interest rates best represent investors' current expectations for the future. Just as it is standard procedure to use current market prices rather than prices projected sometime in the future in order to determine DCF-type equity cost estimates, the use of current bond yields rather than projected yields provides the best indication of investors' return expectations.

Q. DOES THE CURRENT LEVEL OF MARKET-TO-BOOK RATIOS EXISTING IN THE ELECTRIC INDUSTRY, ALONG WITH INVESTORS' EXPECTATIONS REGARDING THE RETURN ON BOOK EQUITY THAT ELECTRIC UTILITIES ARE EXPECTED TO EARN, SUPPORT YOUR EQUITY COST ESTIMATE IN THIS PROCEEDING?

A. Yes. It is a long-held and widely-understood tenet of regulatory finance that when investors are providing market prices above the book value of utility stocks, the return investors expect (the cost of capital) is below the return the utility will earn on that book value. In other words, when market prices are above book value, investors expect utilities to earn accounting returns (ROEs, returns on book value) that are greater than the market-based cost of equity capital for those companies.

In the current market environment, the market price of electric utility stocks used in my testimony to estimate the cost of equity is 66% higher than their book value (i.e., M/B = 1.66).[9] Moreover, Value Line reports that those electric utilities are expected to earn returns on the book value of their equity capital over the next three to five years of 10.46%[10]. Those data indicate that it is unreasonable to believe the cost of equity capital for electric utilities is even near, much less above 11% (e.g. 11.75%, as Mr. Moul indicates), and that the lower cost of equity that I recommend, is more representative of investor expectations.

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9 See Exhibit__ (SGH-1), Schedule 5, p. 1.

10 See Exhibit__ (SGH-1), Schedule 10, p. 1.

Q. WHAT IS THE DIFFERENCE BETWEEN THE EXPECTED RETURN AND THE COST OF CAPITAL?

A. The expected return is the return on book equity (ROE) that the utility is expected to earn. That return is an accounting return. It is based, in part, on the return allowed by the regulator, the company's operating efficiency and on other income available to the firm (if the firm has unregulated operations). The cost of equity capital is the return investors require to commit equity capital to a particular enterprise. That is the cost of equity capital to the firm—the minimum return investors require in order to invest in a particular type of company. That return is a market-based return, because whatever return the investor receives (yield + dividend growth) will be measured against the market price the investor provided to purchase the stock.

Regulators seek to set the allowed return equal to the cost of equity capital for the same reason they set the return allowed on utility debt equal to the cost of that type of capital. Utility rates should be cost-based. That includes the cost of money—equity and debt. Investors understand that utility returns are allowed and earned on the book value (original cost less depreciation) of the utility's plant investment. That long-standing regulatory paradigm has been in existence for many, many years and, through informationally efficient markets, utility investors are aware of that fact.

Q. PLEASE EXPLAIN IN MORE DETAIL WHY A UTILITY'S MARKET-TO-BOOK RATIO IS INDICATIVE OF THE RELATIONSHIP BETWEEN THE EXPECTED RETURN AND THE COST OF EQUITY CAPITAL.

A. A simple example will illustrate this important point. Assume that a utility has a book value of equity capital equal to $10 per share. Let's also assume, for simplicity of exposition, this utility pays out all its earnings in dividends. If regulators allow the utility a 12% return on that equity, investors will expect the company to earn (and pay out) $1.20 per share. If investors require a 12% return on this investment, they will be willing to provide a market price of $10 per share for this stock ($1.20 dividends/$10 market price = 12% required return). In that case, the

allowed/expected return (12%) is equal to the cost of capital (investors' required return, 12%), and the per-share market price is equal to the book value (M=B, or M/B=1.0).

To conform our example to the market situation that presently exists with electric utilities, let's assume that investors' required return (the utility's cost of equity capital) falls to 10%, but the utility continues to be allowed a 12% return on the equity portion of its rate base investment. Investors would be drawn to a utility stock in a risk class for which they require a 10% return but which was expected to pay out a 12% return. This increased demand by investors would result in an increase in the market price of the stock until the total share yield equaled the investors' required return. In our example, that point would be $12 per share ($1.20 dividends/$12 market price = 10% required return). In that case, the allowed/expected return (12%) is greater than the required return (10%, the cost of equity capital) *and* the per-share market price ($12/share) exceeds the book value ($10/share), producing a market-to-book ratio greater than one ($12/$10 = 1.20).

Therefore, the market-to-book / expected return relationship that actually exists today in the market for utility stocks indicates that investors expect that those companies will earn a return on the book value of their equity (ROE) which exceeds the cost of equity capital.

Q. HOW CAN ELECTRIC UTILITIES HAVE PROJECTED BOOK EQUITY RETURN OF 10.5% AND A COST OF EQUITY OF 9.50%?

A. If investors were providing stock prices (market prices) that approximated the book value of electric utilities, that is if M/B ≈ 1.0, and those companies were expected to earn a 10.5% return on book value, then it would be reasonable to believe that the cost of capital (investors' market-required return) would approximate 10.5%. However, if investors are willing to provide a stock price that is considerably more than book value for a group of stocks that is expected to earn an 10.5% return on book value, their expected return on that stock price (the cost of equity capital to the firm) must be less than the expected return on book value—i.e., less than 10.5%. Currently, investors are paying about 165% of book value for their electric utility investments. Therefore, they must require a return below the 10.5% expected to be earned on book value. In

that regard, the range of cost of equity estimates I provide in this proceeding (between 9.25% and 9.75%) is reasonable.

Finally, the market price/book value data cited above provides dramatic evidence that Mr. Moul's equity return estimate of 11.75% cannot represent investor's expectations. If an investor required an 11.75% return on a stock that she expected to earn 10.5% on book value, would she pay more than book value for that stock? Clearly, the answer is no. Therefore, Mr. Moul's cost of equity estimate cannot be accurate.

Q. IS THE RELATIONSHIP BETWEEN A UTILITY'S MARKET-TO-BOOK RATIO, THE EXPECTED BOOK RETURN, AND THE COST OF EQUITY CAPITAL YOU HAVE JUST OUTLINED WELL DOCUMENTED IN THE REGULATORY FINANCIAL LITERATURE?

A. Yes. The DCF model is often referred to as the "Gordon model" because of the definitive work Professor Myron Gordon has done regarding the DCF model and the cost of equity capital of utilities. Professor Gordon understood that market prices are not necessarily equal to book value and the DCF is not predicated on that concept. Further, he has shown that the market-to-book value ratio is greater than (equal to, less than) one when the ratio of the allowed (or expected) rate of return to the cost of capital is greater than (equal to, less than) one. Gordon, M.J., The Cost of Capital to a Public Utility, 63-64 (1974). There is also additional support in the financial literature for the value of market-to-book ratios in regulation.[11]

It is important to realize that the relationship between market price and book value for a utility operation is not a linear or one-for-one relationship. That is, just because the stock price of a particular utility is, say, 50% above its book value does not indicate that its cost of equity is 50% below the utility's expected book return. Also, there are differences between book value and rate base, which means that, even if a utility is allowed and expected to earn its cost of equity capital, the market price may not exactly equal book value. For utility operations, it will

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[11] Kolbe, Read, Hall, The Cost of Capital, Estimating the Rate of Return for Public Utilities, 25-33 (1986); Lawrence Booth, ("The Importance of Market-to-Book Ratios in Regulation," NRRI Quarterly Bulletin, Vol. 18, No. 4, at 415-16 (Winter 1997)

approximate book value, however, as supported in the financial literature noted above. Nevertheless, while market-to-book ratios do not provide a definitive answer with regard to a utility's cost of equity capital, when they are reviewed in conjunction with expected returns on book equity, market-to-book ratios provide valuable information regarding the proper range of equity capital costs for utilities.

Q. MR. HILL, ARE YOU INDICATING THAT UTILITY STOCK PRICES SHOULD EQUAL BOOK VALUE?

A. No. Regulation is not designed to be a stock price setting mechanism, and regulators should not target any particular stock price in the ratesetting process. Investors set the market price, depending on the risk/return matrix presented to them in the current and expected market environment. However, the relationship among utility market price, book value, expected ROE and the cost of capital is well known and offers valuable information regarding the reasonableness of a cost of equity estimate. Without making any determination of what electric utility stock prices ought to be, we can observe these facts: utility market prices are about 65% higher than book value. Utilities are projected to earn a return on book value of 10.5%. Because utility investors are paying substantially more than book value for a share of utility stock, their required market return (the cost of equity capital to the utility) must be well below that expected return on book value.

III. CAPITAL STRUCTURE

Q. WITH WHAT CAPITAL STRUCTURE DOES THE COMPANY REQUEST RATES BE SET IN THIS PROCEEDING?

A. Company witness Moul, at page 23 of his Direct Testimony in this proceeding presents the Company's requested ratemaking capital structure. The Company has filed its rate request based on a capital structure consisting of 47.85% common equity, 9.06% preferred stock and 47.85% long-term debt.

Q. IS THE COMPANY'S REQUESTED CAPITAL STRUCTURE SIMILAR TO THE MANNER IN WHICH IT HAS BEEN CAPITALIZED RECENTLY?

A. No. As shown on Company's witness Moul's Schedule 2, Duquesne Light Company was capitalized from 2000 through 2004 with an average capital structure that consisted of 31.3% common equity, 5.1% preferred stock and 63.5% long-term debt. More recently, as shown on page 1 of my Schedule 2 and according to data presented by the Company to the financial community in its S.E.C. filings, over the most recent five quarters, Duquesne Light began the period with a capital structure that was similar to that which had existed on average over the previous five years. In March and June of 2005, DLC was capitalized with about 33% common equity, 9% preferred and 58% long-term debt.

In September 2005, the Company's common equity ratio jumped dramatically to approximately 43% of total capital. By the first quarter of 2006, through an $80 million equity contribution by DQE, the parent, Duquesne Light's common equity ratio had jumped to almost 46% of total capital. Over the past five quarters, as shown on page 1 of Schedule 2 attached to my testimony, DLC was capitalized with 39.46% common equity, 9.73% preferred and 50.80% long-term debt.[12]

Therefore, the manner in which the Company has been capitalized for many years is very, very different from the capital structure requested by the Company in this proceeding. In addition, because the Company witnesses make cautionary statements regarding the Company's financial risk and its bond rating, it is important to understand that during the time that Duquesne Light was capitalized with a 33% common equity ratio, it maintained its current "BBB" bond rating.[13] In other words, the Company has maintained an investment-grade "BBB" bond rating with a 33% common equity ratio and, now requests that rates be set using a much more expensive capital structure containing about 47% common equity.

[12] See Exhibit__ (SGH-1), Schedule 2, page 1, based on data from Company response to OCA-1-1, p. 1.
[13] Company Filing: Exhibit 1, Pat III, Rate of Return, DFR_III-F4, Attachment III-F-4-B.

Q. WHAT CAUSED THE SHIFT IN THE COMPANY'S CAPITAL STRUCTURE?

A. The shift to a more equity-heavy capital structure was a result of actions by the parent company, Duquesne Light Holdings. In the third quarter of 2005, the parent company issued $320 Million of debt and used the monies raised from that debt issuance to buy-back a similar amount of debt that resided on the balance sheet of its regulated subsidiary, Duquesne Light. In effect, the parent company shifted $320 Million of long-term debt off of the balance sheet of its subsidiary, Duquesne Light, and onto its own balance sheet.

As shown on page 2 of Schedule 2 attached to my testimony, DQE's parent-only capital structure had no long-term debt until the third quarter of 2005. The funds from the issuance of that debt were used to recall a similar amount of debt on DLC's balance sheet. The result of that action was to shift the equity ratio portion of the capital structure of Duquesne Light from the 33% range in which it had resided for several years to approximately 45% of total capital. In addition, before the end of 2005, the parent company also contributed $82.5 Million to Duquesne Light to again increase its common equity balances.

Q. WAS THE CONSOLIDATED CAPITAL STRUCTURE OF DUQUESNE LIGHT HOLDINGS AFFECTED BY THE CAPITAL STRUCTURE SHIFT AT THE SUBSIDIARY LEVEL?

A. No. As shown on page 3 of Schedule 2, the common equity ratio of the parent company has been very consistent, and has averaged approximately 36.56% of total capital over the past five quarters. When the parent replaced $320 million of debt on Duquesne Light's balance sheet with monies from a like amount of debt on its own balance sheet, there was no change in the parent company's consolidated capital structure. The total debt was the same. In a holding company corporate structure, the parent company has great latitude in selecting the capital structure of its subsidiaries by effectively shifting capital from one corporate entity to another without changing its overall consolidated capital structure. For that reason, the regulatory authority should be cautious about automatically relying on the capitalization of the regulated subsidiary in setting rates.

Q. WHAT ARE THE IMPLICATIONS OF THE CAPITAL STRUCTURE CHANGES YOU HAVE DESCRIBED?

A. For years, without the prospect of a rate case, Duquesne Light has maintained an investment grade bond rating with a capital structure consisting of 33% common equity as a percentage of total capital. Then, immediately prior to the filing of this rate case, through parent company accounting transactions, the parent company has rearranged the mix of debt and common equity in its regulated subsidiary so that the common equity ratio of the latter is approximately 46% of total capital—13% percentage points higher.

While the Company, through its witness Cannell paints a dire picture of its current financial risk, it makes no claims that its operational risk has substantially increased over the past few years. In fact, in its Annual Report and S.E.C. filings the parent company touts its sell-off of unregulated operations and a focus on its low-risk transmission and distribution utility business (a "back-to-basics" strategy) as reasons why its current risk profile is lower than it has been in recent years. Therefore, there is no clear operational-risk rationale that supports an increase in the common equity ratio.

In addition, the Company indicates that after this rate case, its current common equity ratio will not be sustained. In its Filing Exhibit III-F-2, DLC indicates that over the next four years external debt issues will out-pace equity contributions by the parent company by more than 10-to-1. Those data indicate that following the rate case, the Company's common equity ratio will trend downward from its currently elevated levels.

The only conclusion one can reach when reviewing the published facts cited above is that the Company's common equity ratio has been inflated prior to the rate proceeding, and using that inflated equity ratio as the basis for the projected capital structure on which this Commission traditionally relies will substantially overstate the cost of capital. In that way, the Company can have rates set with a capital structure that is far more costly than the one with which it has actually been capitalized over the past five years, and pass that higher cost on to its customers in Pennsylvania. Following the ratesetting process, the Company will be free to lower its overall

cost of capital by again re-capitalizing its utility operations through parent company intervention or through attrition by financing future operations with substantially more debt than equity.

Q. WHAT SORT OF ANNUAL COST INCREASE IS IMPLIED BY THE COMPANY'S CAPITAL STRUCTURE SHIFT?

A. Based on data provided by the Company, the capital structure shift would add approximately $20 Million to rates annually. Page 4 of Schedule 2 shows the Company's requested capital structure and cost rates at the top of the page. Assuming a combined State and Federal tax rate of 40%, the Company's requested capital structure implies a pre-tax overall cost of capital of 13.16%. Using a capital structure that Duquesne actually used from 2000 through 2004 (taken from Company witness Moul's Schedule 2, p. 1) and increasing the Company-requested cost of equity by 75 basis points to account for the additional financial risk, the pre-tax overall return would be 11.36%.[14] The difference in overall return (1.81%) multiplied by the Company-requested rate base ($1.143 Billion), indicates that the capital structure shift made just prior to the filing of this rate proceeding, if approved by this Commission, would cost Pennsylvania ratepayers $20.6 Million annually.

Q. HOW IS DLC's PARENT COMPANY, DUQUESNE LIGHT HOLDINGS, CAPITALIZED?

A. Page 3 of Schedule 2 shows the capital structure of DLC's parent company, Duquesne Light Holdings, Inc., over the past five quarters. The parent company's capital structure over that time period averaged 36.56% common equity, 8.26% preferred stock, 53.69% long-term debt and 1.49% short-term debt.

[14] The Company's return on equity request substantially exceeds its cost of capital. Nevertheless, in order to base this analysis on the Company's request, the equity return on the capital structure that contains more debt leverage should be higher.

Q. HOW DOES THE DQE's AVERAGE CAPITAL STRUCTURE COMPARE TO THAT UTILIZED IN THE UTILITY INDUSTRY?

A. The parent company is capitalized with considerably less common equity than is used, on average in the utility industry. As shown on page 5 of Schedule 2 attached to my testimony, the average common equity ratio of the electric utility industry is 44%, and page 6 of Schedule 2 shows that the average common equity ratio of the gas distribution industry is 43% of total capital. Mr. Moul's Exhibit PRM-1, Schedules 3 and 4 show that his selected similar-risk sample group has had an average common equity ratio of 43.3% and the S&P Public Utilities have had an average common equity ratio of 37.9% over the past five years.

Q. THE PARENT COMPANY HAS A MUCH HIGHER LEVERAGE RATIO (GREATER FINANCIAL RISK) THAN THE RATEMAKING CAPITAL STRUCTURE REQUESTED BY DUQUESNE LIGHT (OR THE UTILITY INDUSTRY AS A WHOLE). DOES THE PARENT COMPANY ALSO HAVE LOWER OPERATIONAL RISK THAN UTILITY OPERATIONS?

A. No. Duquesne Light Holdings (DQE) is an energy services holding company that contains several business platforms. The majority of those operations are the regulated T&D operations of Duquesne Light, which have relatively low operational risk. DQE also owns the following unregulated operating units: Duquesne Power, LLC (a subsidiary that maintains a portfolio of energy commodity contracts), Duquesne Light Energy, LLC (a competitive retail electric generation supplier to large commercial and industrial users), Duquesne Energy Solutions, LLC (an energy facilities management company that provides energy outsourcing solutions), DQE Financial Corp. (owns and operates landfill gas processing systems), DQE Communications, LLC (owns and operates a fiber optic telecommunications network), and DQE Capital Corporation (provides financing to the parent company for use with its affiliates). As a result, on a consolidated basis, Duquesne Light Holdings has greater operating (business) risk than DLC. As Moody's noted in August 2005, "[t]he company's efforts to scale back its non-regulated

businesses and reposition its operations around Duquesne Light Company's core regulated transmission and distribution utility will result in a reduction of overall business risk for the company."[15]

Q. WHAT DOES THE RELATIVE BUSINESS RISK OF A FIRM HAVE TO DO WITH ITS CAPITAL STRUCTURE?

A. The manner in which a firm is most economically capitalized is a function of the volatility of the income stream generated by the assets of the firm or, in other words, the firm's operating (business) risk. For example, if a firm has an income stream that is not volatile and which can be predicted with near certainty, then a capital structure consisting of even 100% debt would not be problematic or risky. In fact, it would be the most cost-effective capital structure in that instance because debt is the least expensive form of investor-supplied capital for a firm and, without the possibility of operating income being insufficient to meet the debt service requirements, a 100% debt capital structure would be the prudent choice.

As the income stream of a firm becomes more volatile (more risky), financial theory holds that the amount of debt used should decline in order to avoid a default event (the failure to meet the required debt service costs). Although the reduction of lower-cost debt and the addition of higher-cost common equity will raise the firm's overall cost of capital, that increase is appropriate and economically efficient because it more appropriately matches the firm's financial risk with the increase in business risk. In that way, given an increased level of business risk, the cost of capital is minimized and the financial health of the firm is better assured.

[15] Company Filing, Attachment III-F-4-C

An example of how the amount of debt in the capital structure varies with the operational or business risk of a firm is found in a recent publication by Standard & Poor's regarding utility business risk. A June 2004 publication by Standard & Poor's, in which that bond rating agency re-aligned its business risk profile scores for utility companies, indicates that the companies with higher business risk are required to have a lower debt ratio (less debt, more equity) in order to earn the same bond rating as a firm with lower business risk.[16]

For example, Standard & Poor's indicates that energy merchant/marketing companies have high business risk. On a scale of 1 to 10, with 10 representing the highest risk, energy-trading companies have an average business risk profile score of 9. In order to achieve a bond rating of "BBB", companies with a business risk profile of 9, according to Standard & Poor's, should have a total debt ratio ranging between 40% and 50% of total capital. (A debt ratio between 40% and 50% corresponds to an equity ratio between 50% and 60%.)

In contrast, T&D utilities, like DLC, have much lower business risk than energy trading companies. S&P currently assigns DLC a business risk profile score of 4. According to Standard & Poor's, in order to achieve a "BBB" bond rating, companies with a business profile score of "4"should be capitalized with a total debt ratio between 52% and 62% of total capital (or an equity ratio between 38% and 48% of total capital).[17] Therefore, companies with lower business risk (like T&D operations) are effectively capitalized with more debt and less equity than companies with higher business risk (like energy marketing companies).

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16 See Company Filing, Attachment III-F-4-C, Standard & Poor's Ratings Direct, New Business Profile Scores Assigned for U.S. Utility and Power Companies: Financial Guidelines Revised, June 2, 2004.

17 While an equity ratio of 38% to 48% may represent S&P's "target" for a BBB-rated utility with a business position of "4", it is important to recall that Duquesne Light was able to maintain its BBB rating with a 33% common equity ratio. Therefore, the S&P guidelines are just that—guidelines—not absolute boundaries outside of which certain bond ratings cannot be maintained.

Q. WHY IS IT OF CONCERN TO THIS COMMISSION THAT DQE HAS HIGHER BUSINESS RISK THAN DUQUESNE LIGHT, BUT A MORE HIGHLY LEVERAGED CAPITAL STRUCTURE THAN THAT REQUESTED BY THE COMPANY FOR RATESETTING PURPOSES?

A. There are two reasons. First, DQE's more highly leveraged capital structure imparts additional financial risk to the parent company. That additional financial risk could, in the event of some unforeseen negative event at the parent company level, be transferred to DLC and its ratepayers if DQE has to draw on DLC's relative financial strength for support. Also the potential for such an occurrence could restrain (i.e., lower) the bond rating that DLC might otherwise achieve, imparting additional debt cost that would be recovered from ratepayers.

Due to its large investment in utility distribution operations, DQE'S business risk is currently relatively low. However, the holding company, DQE, is an unregulated entity and there are no guarantees that, in the future, it will not expand its unregulated generation or energy merchant businesses and increase its operational risk relative to DLC. Rating agencies recognize that unregulated operations carry greater risk than regulated operations.

> In general, regulated utilities offer lenders some of the lowest business risks seen amongst corporate entities. However, many of the companies in question may also be active in unregulated businesses, such as speculative trading with exposure to unhedged commodity prices, which can be highly risky and may lead to serious financial difficulties despite the presence of a regulator.
>
> Moody's framework for rating regulated electric utilities is constructed around a number of credit risk factors rather than on any one particular metric such as a financial ratio.
>
> The *first step* is to assess the extent of a "regulated" company's exposure to unregulated businesses. The strongest position is enjoyed by those companies operating in a wholly regulated business. (Moody's Investors Service, Global Credit Research, Rating Methodology: Global Regulated Electric Utilities,

March 2005, pp. 1, 4, emphasis added, provided in Mr. Kilbride's Figure MK-16)

Second, a more highly leveraged capital structure at the parent company level, when the regulated subsidiary faces lower business risk, constitutes financial cross-subsidization of the unregulated parent (DQE) by the ratepayers of the regulated entity (DLC).

Q. PLEASE EXPLAIN WHAT YOU MEAN BY FINANCIAL CROSS-SUBSIDIZATION AND WHY THIS COMMISSION SHOULD BE CONCERNED.

A. Cross-subsidization of a parent company's unregulated operations by its regulated subsidiary operations can occur in many forms. For example, the unregulated firm could provide services to the utility at above-market rates or, conversely, the utility could provide services to its unregulated affiliates at rates below that which would prevail in an arms-length transaction.

Financial cross-subsidization occurs when the capital structure of the utility operation provides financial strength to the holding company, which, in turn, allows the parent to capitalize its consolidated operations with more debt and less equity (i.e., more cheaply) than they would otherwise be able to do. In other words, the utility (and, thereby, utility ratepayers) shoulders some of the financial risk of the unregulated affiliates by allowing the holding company to be capitalized in a manner that would not prevail in a stand-alone situation.

One way that DQE can maintain a stronger financial profile and offset the increased risks of its unregulated operations and lower equity ratios, is to set rates with a high common equity ratio for its regulated utility operations while simultaneously financing its unregulated operations with a lower equity ratio and a higher percentage of debt capital than would otherwise be possible. That is the essence of financial cross-subsidization. The tangible result of that action is

a common equity ratio for DQE that is substantially below that requested by the regulated subsidiary.

Q. COMPANY WITNESSES MOUL AND CANNEL INDICATE THAT THE BOND RATING OF DLC SHOULD BE IMPROVED AND RAISING THE COMMON EQUITY RATIO IS ONE WAY TO DO THAT. HOW DO YOU RESPOND TO THAT LOGIC?

A. First, the Company has made no showing that DLC's current bond rating ("BBB") is economically inefficient or that moving to a higher bond rating would be cost-effective. In fact, the average bond rating in the electric industry is in the "BBB"range. One thing is certain, however, setting rates with a 47% common equity ratio instead of the actual common equity ratio employed (until recently) by Duquesne Light would impart a substantial cost to ratepayers. I've shown on page 4 of Schedule 2 that using the Company's own data, that cost approximates $20 million per year.

Second, while there is no question that a substantially higher common equity ratio could (not would) have a positive impact on bond ratings, there are other means to achieve a higher bond rating than to increase the rate burden of captive ratepayers by raising the ratemaking common equity ratio. The Company's financial management is currently not separated in any significant manner from its parent, e.g., the Treasurer of Duquesne Light Holdings is also the Treasurer of Duquesne Light.

Moreover, when there is linkage between a regulated subsidiary and its unregulated parent holding company, the bond ratings of the two are also linked. As such, the bond ratings of the subsidiary are constrained by the risks attendant to the parent company. That is because the parent company can utilize the financial strength of its regulated subsidiaries to provide financial

support for its operations. There are many ways in which the parent company can obtain monies from its subsidiaries: dividends, loans, tax allocations, interest and the settlement of intercompany obligations (money pool arrangements, service company fees).

The ability of a parent company to utilize the financial strength of its regulated subsidiaries is recognized by bond rating agencies. Standard & Poor's, for example, is quite frank about the ability of parent companies, in complying with their fiduciary duty to the stockholders of the parent, to take advantage of the stronger finances of a subsidiary.

> Standard and Poor's takes the general position that the rating of an otherwise financial healthy, wholly owned subsidiary is constrained by the rating of its weaker parent. The basis for this position is that a weak parent has both the ability and the incentive to siphon assets out of its financially healthy subsidiary and to burden it with liabilities during times of financial stress. The weak parent might also have an economic incentive to filing the subsidiary into bankruptcy—if the parent itself were forced into bankruptcy—regardless of the subsidiary's "stand-alone" strength. Experience suggests that insolvent corporations will often jointly file with their subsidiaries—even those subsidiaries not themselves experiencing financial difficulty. (Standard & Poor's Ratings Direct, Ring-Fencing a Subsidiary, October 19, 1999, p. 1)

Q. ARE THERE STEPS THAT CAN BE TAKEN TO INSULATE A REGULATED SUBSIDIARY FROM THE FINANCIAL RISK IMPOSED BY A WEAKER PARENT COMPANY?

A. Yes. The methods used to protect the financial status of subsidiaries in the event of financial stress at the parent are, in today's terminology, called ring-fencing. It is important to understand that even though ring-fencing has proven to be effective in protecting regulated subsidiaries from financial problems at the parent company level, it is not a guarantee of financial separation:

> In Fitch's view, ring-fencing techniques rarely provide total insulation of a U.S. utility from problems relating to an insolvent

> parent. Furthermore, even if affiliates are segregated in numerous ways, the presence of a single important unifier, such as a large intercompany loan or an intercompany supply contract critical to continuing operations, may nullify all other ring-fencing efforts. (Fitch Ratings, Corporate Finance, Rating Linkage Within U.S. Utility Groups: Ring-Fencing Mechanisms, Utilities, Holding Companies and Affiliates, April 8, 2003, p. 1)

Q. WHAT ARE THE INTER-COMPANY ARRANGEMENTS THAT CONSTITUTE RING-FENCING?

A. The inter-company structures that work to separate the financial risks of affiliated firms include legal separation through the creation of a separate subsidiary with its own financial records, restriction of the ability of the parent to use the subsidiary's assets to collateralize any loans to other affiliates, restrictions on cash transfers from the subsidiary to the parent, and the creation of a "limited purpose entity" between the parent and subsidiary with an independent director to prevent the parent from forcing the subsidiary into bankruptcy without the consent of the independent director. Standard & Poor's makes clear that it considers the creation of a special purpose entity central in the separation of financial risk between holding company and subsidiary:

As noted above, parent/subsidiary linkage is prompted, in part, by two concerns:

- That a healthy subsidiary's assets may be consolidated with those of its insolvent parent: and
- That the parent will have the ability to cause the subsidiary to file itself into bankruptcy, despite the fact that the subsidiary is not itself experiencing financial difficulty. Ensuring that the subsidiary is a limited-purpose operating entity, somewhat similar to the "special purpose entity" (SPE) found in a securitization, may mitigate this bankruptcy risk.

- While the SPE is, strictly speaking, a creature of securitization, its operating asset analogues are found in the limited-purpose operating entities employed in industrial-based or project-financed transactions. In the context of a

'ring-fenced' transaction, Standard & Poor's expects that such limited-purpose entity will:

- Be 'single-purpose';
- Incur no additional debt (beyond that sized into the rating and necessary for routine business purposes. Such as trade debt and ordinary working-capital facilities to prestated levels);
- Not merge or consolidate with a lower-rated entity;
- Not dissolve; and
- Have an 'independent director.'

In the context of a 'ring-fenced' transactions, the operative feature is the independent director. (Standard & Poor's Ratings Direct, Ring-Fencing a Subsidiary, October 19, 1999, pp. 1, 2)

Q. HAS THE COMPANY MADE AN ATTEMPT TO RING-FENCE ITS UTILITY OPERATIONS?

A. My discussions with Company personnel (teleconference, June 16, 2006) indicate that there are some restrictions on cash flows between the subsidiary and the parent if the subsidiary common equity ratio falls to very low levels as well as some restrictions on the parent's ability to utilize unsecured debt, but the Company has not undertaken specific, corporate-structure ring-fencing measures. Nevertheless, the company has that option at its disposal for improving its bond rating position without shifting the financial risk burden from DQE to DLC's regulated ratepayers. However, it has not pursued that option and, instead, requests that its rates in this proceeding be based on a common equity ratio that is 1) substantially higher than the common equity ratio used by its parent company, 2) substantially higher than the common equity ratio with which it has been capitalized successfully for many years, and 3) higher than the average common equity ratio in use in the utility industry.

Q. WHAT CAPITAL STRUCTURE DO YOU RECOMMEND FOR RATEMAKING PURPOSES IN THIS PROCEEDING?

A. I am aware that this Commission prefers to set rates based on the projected capital structure of the applicant utility. However, in this instance, the evidence is clear that the Company has recently recapitalized its operations and dramatically increased its common equity ratio, resulting in a capital structure that is substantially more expensive than that with which it has been capitalized for many years. Following the practice of setting rates based on the regulated subsidiary company's projected book capital structure, in this instance, would impart substantial unnecessary cost to the Company's customers in Pennsylvania. Failure to recognize the Company's pre-rate case financial changes in setting rates in this proceeding may encourage utilities in this jurisdiction to affect the ratesetting procedure by de-leveraging prior to a rate case and re-leveraging following the decision. Relying exclusively on the subsidiary's capital structure also fails to recognize that the parent holding company can, with a simple accounting adjustment, substantially alter the booked capitalization of its subsidiaries without changing its own consolidated capital structure, just as Duquesne Light Holdings has done in this case. Therefore, I recommend that this Commission set rates based not on the subsidiary utility Company's projected book capital structure, but on a reasonable capital structure that more appropriately balances the interests of ratepayers and stockholders.

I recommend that rates be set using a 43% common equity, 9% preferred stock and 49% long-term debt capital structure. That capital structure has a common equity ratio that is similar to the average capital structure existing in the electric and gas utility industry, but because of the relatively large layer of preferred stock, has a debt-to-capital ratio that is well below the benchmarks published by Standard & Poor's for "BBB" bond ratings for companies with a business risk profile of "4." In addition, that capital structure provides additional support for the Company's financial position in that it provides a larger common equity layer than the Company has actually employed for many years prior to the third quarter of 2005. The capital structure I recommend also provides a better balance of the interests of ratepayers and stockholders than that requested by the Company, because it is a more economically efficient capitalization. That is, a

ratemaking capital structure based on 43% common equity would improve the Company's financial risk position and be less costly to ratepayers than the capital structure containing 47% common equity ratio requested by the Company.

Finally, the capital structure I recommend for ratemaking purposes fulfills the Hope and Bluefield requirements of providing an opportunity for the regulated entity to maintain its financial integrity because the debt-to-total capital ratio recommended (49%) is well within the guidelines for the Company's bond rating. As I noted above, for a company with a business risk of "4", like Duquesne Light, S&P recommends a debt-to-total capital ratio in the range of 52% to 62%. The ratemaking capital structure I recommend is sufficient for a single-A bond rating, again according to S&P. In addition, if the Company could prove that a higher bond rating is more cost-effective than its current BBB-rating (which it has not done at this point in this proceeding), there are other means to achieve an improvement in its bond rating. By changing its corporate structure to limit the ability of the parent company to access the cash flow of its regulated subsidiary in times of the parent's financial difficulty through explicit ring-fencing measures, the Company could improve its bond rating position. In that way, the Company could improve its financial position without imposing the costs of doing so on regulated ratepayers.

Page 7 of Schedule 2 attached to my testimony shows my recommended ratemaking capital structure and embedded cost rates. The debt cost rates are from the Direct Testimony of Company witnesses Moul, Exhibit PRM-1, Schedule 1. Those embedded cost rates are reasonably utilized with my recommended rate-making capital structure because the embedded cost rates were determined largely during the time period when the Company was capitalized with considerably greater financial risk.[18]

Q. DOES THIS CONCLUDE YOUR DISCUSSION OF CAPITAL STRUCTURE?

A. Yes, it does.

[18] 94% of Duquesne Light's projected year-end 2006 long-term debt was issued between 1999 and 2004.

IV. METHODS OF EQUITY COST EVALUATION

A. DISCOUNTED CASH FLOW MODEL

Q. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW (DCF) MODEL YOU USED TO ARRIVE AT AN ESTIMATE OF THE COST RATE OF COMMON EQUITY CAPITAL FOR THE DUQUESNE LIGHT COMPANY IN THIS PROCEEDING.

A. The DCF model relies on the equivalence of the market price of the stock (P) with the present value of the cash flows investors expect from the stock, providing the discount rate equals the cost of capital. The total return to the investor, which equals the required return according to this theory, is the sum of the dividend yield and the expected growth rate in the dividend.

The theory is represented by the equation,

$$k = D/P + g, \qquad (1)$$

where "k" is the equity capitalization rate (cost of equity, required return), "D/P" is the dividend yield (dividend divided by the stock price) and "g" is the expected sustainable growth rate.

Q. WHAT GROWTH RATE (g) DID YOU ADOPT IN DEVELOPING YOUR DCF COST OF COMMON EQUITY FOR THE COMPANY IN THIS PROCEEDING?

A. The growth rate variable in the traditional DCF model is quantified theoretically as the dividend growth rate investors expect to continue into the indefinite future. The DCF model is actually derived by 1) considering the dividend a growing perpetuity, that is, a payment to the stockholder which grows at a constant rate indefinitely, and 2) calculating the present value (the current stock price) of that perpetuity. The model also assumes that the company whose equity cost is to be measured exists in a steady state environment, i.e., the payout ratio and the expected

return are constant and the earnings, dividends, book value and stock price all grow at the same rate, forever. As with all mathematical models of real-world phenomena, the DCF theory does not exactly "track" reality. Payout ratios and expected equity returns do change over time. Therefore, in order to properly apply the DCF model to any real-world situation and, in this case, to find the long-term sustainable growth rate called for in the DCF theory, it is essential to understand the determinants of long-run expected dividend growth.

Q. CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THE DETERMINANTS OF LONG-RUN EXPECTED DIVIDEND GROWTH?

A. Yes, in Appendix B, I provide an example of the determinants of a sustainable growth rate on which to base a reliable DCF estimate. In addition, in Appendix B, I show how reliance on earnings or dividend growth rates alone, absent an examination of the underlying determinants of long-run dividend growth, can produce inaccurate DCF results.

Q. DID YOU USE A SUSTAINABLE GROWTH RATE APPROACH TO DEVELOP AN ESTIMATE OF THE EXPECTED GROWTH RATE FOR THE DCF MODEL?

A. Yes. I have calculated both the historical and projected sustainable growth rate for a sample of utility firms with similar-risk operations. However, I have not relied solely on that type of growth rate analysis. In addition to the sustainable growth rate analysis, I have also analyzed published data regarding both historical and projected growth rates in earnings, dividends, and book value for the sample group of utility companies. Through an examination of those data, which are available to and used by investors, I am able to estimate investors' long-term growth rate expectations. To that long-term growth rate estimate, I add any additional growth that is attributable to investors' expectations regarding the on-going sale of stock for each of the companies under review.

Q. WHY HAVE YOU USED THE TECHNIQUE OF ANALYZING THE MARKET DATA OF SEVERAL COMPANIES?

A. I have used the "similar sample group" approach to cost of capital analysis because it yields a more accurate determination of the cost of equity capital than does the analysis of the data of one individual company. Any form of analysis, in which the result is an estimate, such as growth in the DCF model, is subject to measurement error, i.e., error induced by the measurement of a particular parameter or by variations in the estimate of the technique chosen. When the technique is applied to only one observation (e.g., estimating the DCF growth rate for a single company) the estimate is referred to, statistically, as having "zero degrees of freedom." This means, simply, that there is no way of knowing if any observed change in the growth rate estimate is due to measurement error or to an actual change in the cost of capital. The degrees of freedom can be increased and exposure to measurement error reduced by applying any given estimation technique to a sample of companies rather than one single company. Therefore, by analyzing a group of firms with similar characteristics, the estimated value (the growth rate and the resultant cost of capital) is more likely to equal the "true" value for that type of operation.

Q. HOW WERE THE FIRMS SELECTED FOR YOUR ANALYSIS?

A. In determining the cost of capital for a transmission and distribution electric utility like DLC it would be ideal to rely on market data from publicly-traded companies that engage only in that type of activity. However, there are few electric companies that have only T&D operations. Most of those electric companies also have substantial unregulated operations that are much higher in risk and are unsuitable for determining the equity capital cost of a T&D operation like DLC.

Therefore, in selecting a sample of utility firms to analyze, I screened all the electric utilities followed by Value Line, because that investor service, in addition to providing a wealth of historical data, provides projected information, which is important in gauging investor expectations. I selected electric companies that had at least 70% of revenues from electric operations, did not have a large price increase due to a pending merger, did not have a recent

dividend cut, had stable book values and a bond rating between "A-" and "BBB-". I selected companies that had generation as well as those that did not. The inclusion of electric companies with generation would tend to make the sample group have somewhat more business risk than DLC, which does not have generation risk. The screening process for electric utilities is shown on Schedule 3 attached to my testimony. The Companies selected for analysis are: Central Vermont Public Service (CV), FirstEnergy Corp. (FE), Green Mountain Power (GMP), Progress Energy (PGN), Ameren Corp. (AEE), Cleco Corp. (CNL), DPL, Inc. (DPL), Empire District Electric (DPL), Entergy Corp. (ETR), Hawaiian Electric (HE), PNM Resources (PNM), Pinnacle West Capital Corp. (PNW), and Unisource Energy (UNS).[19]

I also elected to analyze a group of gas distribution utilities to estimate the cost of equity of DLC. When Standard & Poor's Corporation revamped its utility bond rating criteria in mid-year 2004[20], that bond rating agency awarded the lowest business risk scores to the "distribution" utilities: water, gas distribution and electric distribution. On a scale of 1 to 10, with "1" being the lowest risk, the distribution utilities were awarded business position scores of 1 to 4. In sum, the business risk of gas distribution operations is deemed by S&P to be similar to that of electric transmission and distribution utilities, which are also classified as utility distribution operations.

In selecting a sample of gas distribution firms to analyze, I screened all the gas distribution firms followed by Value Line. I selected companies from that group that had a continuous financial history and had at least 70% of revenues generated by gas distribution operations. In addition, I eliminated companies that were in the process of merging or being acquired and had realized an upward stock price shift due to that activity, or companies that had omitted dividends. The data for the sample group regarding the percent of revenues generated by gas distribution operations were obtained from A. G. Edwards Gas Utilities Quarterly Review, April 6, 2006, the Value Line Investment Survey, *Ratings and Reports*, March 17, 2006 and C.A. Turner's Utility Reports, April 2006.

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[19] In the Schedules accompanying this testimony, the sample group companies are referred to by their stock ticker symbols.

[20] Standard & Poor's Ratings Direct, "New Business Profile Scores Assigned to U.S. Utility and Power Companies: Financial Guidelines Revised, June 2, 2004.

The companies included in the similar-risk sample group in this proceeding are AGL Resources (ATG), Atmos Energy Corporation (ATO), Cascade Natural Gas Corporation (CGC), Laclede Group (LG), New Jersey Resources (NJR), Nicor, Inc. (GAS), Northwest Natural Gas (NWNG), Peoples Energy Corp. (PGL), Piedmont Natural Gas Company (PNY), and South Jersey Industries (SJI), Southwest Gas (SWX) and WGL Holdings (WGL).

Q. HOW HAVE YOU CALCULATED THE DCF GROWTH RATES FOR THE SAMPLE OF COMPARABLE COMPANIES?

A. Schedule 4 pages 1 through 9, shows the retention ratios, equity returns, sustainable growth rates, book values per share and number of shares outstanding for the comparable gas and electric companies for the past five years. Also included in the information presented in Schedule 4, are Value Line's projected 2006, 2007 and 2009-2011 values for equity return, retention ratio, book value growth rates and number of shares outstanding.

In evaluating these data, I first calculate the five-year average sustainable growth rate, which is the product of the earned return on equity (r) and the ratio of earnings retained within the firm (b). For example, Schedule 4, page 8, shows that the five-year average sustainable growth rate for Piedmont Natural Gas (PNY) is 2.96%. The simple five-year average sustainable growth value is used as a benchmark against which I measure the company's most recent growth rate trends. Recent growth rate trends are more investor-influencing than are simple historical averages. Continuing to focus on PNY, we see that sustainable growth in 2005 was about 3.5%—above the average growth for the five-year period. The historical data indicate an increasing growth rate trend. By the 2009-2011 period, Value Line projects PNY's sustainable growth will reach a level above the recent five-year average—about 4%. These forward-looking data indicate that investors expect PNY to grow at a rate in the future above the growth rate that has existed, on average, over the past five years.

At this point I should note that, while the five-year projections are given consideration in estimating a proper growth rate because they are available to and are used by investors, they are not given sole consideration. Without reviewing all the data available to investors, both projected

and historic, sole reliance on projected information may be misleading. Value Line readily acknowledges to its subscribers the subjectivity necessarily present in estimates of the future:

> "We have greater confidence in our year-ahead ranking system, which is based on proven price and earnings momentum, than in 3- to 5-year projections." (Value Line Investment Survey, Selection and Opinion, June 7, 1991, p.854).

Another factor to consider is that PNY's book value growth is expected to increase at a 3.5% level over the next five years, after increasing at a 6.5% rate historically. This information would tend to moderate growth rate expectations. Also, as shown on Schedule 5, page 4, that company's dividend growth rate, which was 5% historically, is expected to increase slightly to a 5.5% rate of growth in the future—higher than the sustainable growth rate projections. That information would tend to confirm investor expectations regarding higher growth in the future. Earnings growth rate data available from Value Line indicate that investors can expect a higher growth rate in the future (6%) than has existed over the past five years (5%). However, Reuters and Zack's (investor advisory services that poll institutional analysts for earnings growth rate projections) project earnings growth rate for PNY—4.87% and 5.2%, respectively—over the next five years.

PNY's projected sustainable growth, as well as Value Line's projected earnings growth indicates that investors can expect higher growth than has occurred, on average, in the past. Those projections are moderated by an expectation of stable dividend growth similar to the level of earnings growth projections. A long-term sustainable growth rate of 5.0% is a reasonable expectation for PNY.

Q. IS THE INTERNAL (b x r) GROWTH RATE THE FINAL GROWTH RATE YOU USE IN YOUR DCF ANALYSIS?

A. No. An investor's sustainable growth rate analysis does not end upon the determination of an internal growth rate from earnings retention. Investor expectations regarding growth from external sources (sales of stock) must also be considered and examined. For PNY, page 8 of

Schedule 4 shows that the number of outstanding shares increased at a 4.25% rate over the most recent five-year period. However, Value Line expects the number of shares outstanding to decline through the 2009-20011 period, bringing the share growth rate down to –0.45% rate by that time. An expectation of share growth of 0.5% is reasonable for this company. As shown on page 3 of Schedule 5, because PNY is currently trading at a market price that is slightly more than twice book value, issuing additional shares will increase investors' growth rate expectations. Multiplying the expected growth rate in shares outstanding (0.5%) by (1-(Book Value/Market Value)), increases the growth rate by 0.69%, and the combined internal and external DCF growth rate for PNY is 6.69%.

I have included the details of my growth rate analyses for PNY as an example of the methodology I use in determining the DCF growth rate for each company in both the electric and gas industry samples. A description of the growth rate analyses of each of the companies included in my sample groups is set out in Appendix C. Schedule 5, page 1 of Exhibit_(SGH-1) attached to this testimony shows the internal, external and resultant overall growth rates for the electric utility companies analyzed, and page 3 of Schedule 5 shows the same data for the gas distributors under study.

Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR GROWTH RATE ESTIMATES AGAINST OTHER, PUBLICLY AVAILABLE, GROWTH RATE DATA?

A. Yes. Pages 2 and 4 of Schedule 5 show the results of my DCF sustainable growth rate analysis as well as 5-year historic and projected earnings, dividend and book value growth rates from Value Line, earnings growth rate projections from Reuters, the average of Value Line and Reuters growth rates and the 5-year historical compound growth rates for earnings, dividends and book value for each company under study.

My DCF growth rate estimate for all the electric utility companies included in my analysis is 5.10%. This figure is higher than Value Line's projected average growth rate in earnings, dividends and book value for those same companies (4.28%) and is well above the five-year historical average earnings, dividend and book value growth rate reported by Value Line for

those companies (3.24%). My growth rate estimate for the electric companies under review is bracketed by the consensus analysts' growth rate projections—below Reuters and Zack's earnings growth projection for those companies, 5.43% and 6.3%, respectively; and above the projected average earnings growth for those companies published by Value Line, 4.81%. My growth rate estimate is above the projected dividend growth rate of the sample companies, 4.15%.

For the gas distribution sample group, Schedule 4 page 4 shows that my DCF growth rate estimate for those companies is 5.19%. That long-term growth rate estimate is higher than Value Line's projected average earnings, dividend and book value growth rate, 4.39% and higher than the historical average of those same parameters, 3.90%. In addition, my DCF growth rate estimate for the gas distributors is also higher than Reuters earnings growth rate projections (4.45%) and roughly equivalent to earnings growth projections by Zack's (4.97%), but below Value Line's average earnings projections of 5.50% for the group. My DCF growth rates for the gas distribution companies are reasonable when compared to available published information.

Q. DOES THIS CONCLUDE THE GROWTH RATE PORTION OF YOUR DCF ANALYSIS?

A. Yes, it does.

Q. HOW HAVE YOU CALCULATED THE DIVIDEND YIELDS?

A. I have estimated the next quarterly dividend payment of each firm analyzed and annualized them for use in determining the dividend yield. If the quarterly dividend of any company was expected to be raised in the next quarter (3rd quarter 2006), I increased the current quarterly dividend by (1+g). For the utility companies in the sample groups, a dividend adjustment was unnecessary for most of the companies under study because they either recently raised their dividend or were not projected to raise the dividend in 2006. A dividend adjustment was required only for South Jersey Industries and WGL Holdings.

The next quarter annualized dividends were divided by a recent daily closing average

stock price to obtain the DCF dividend yields. I use the most recent six-week period to determine an average stock price in a DCF cost of equity determination because I believe that period of time is long enough to avoid daily fluctuations and recent enough so that the stock price captured during the study period is representative of current investor expectations.

Schedule 6 contains the market prices, annualized dividends and dividend yields of the utility companies under study. Schedule 6, page 1, indicates that the average dividend yield for the sample group of electric companies is 4.25%. The year-ahead dividend yield projection for the electric utility sample group published by Value Line is 4.27% (Value Line, *Summary & Index*, May 5, 2006). By that measure, my dividend yield calculation is representative of investor expectations.

Page 2 of Schedule 5 shows that my DCF dividend yield calculation for the gas distribution companies is 4.25%. Again, Value Line's year-ahead dividend yield projection for the gas utility sample group, 4.28%, indicates my DCF dividend yield fairly represents investor expectations.

Q. WHAT IS YOUR COST OF EQUITY CAPITAL ESTIMATE FOR THE ELECTRIC AND GAS UTILITY COMPANIES, UTILIZING THE DCF MODEL?

A. Schedule 7 shows that the average DCF cost of equity capital for the group of electric utilities is 9.35% and for the gas utilities studied is 9.44%.

B. CORROBORATIVE EQUITY COST ESTIMATION METHODS

Q. IN ADDITION TO THE DCF, WHAT OTHER METHODS HAVE YOU USED TO ESTIMATE THE COST OF EQUITY CAPITAL FOR DUQUESNE LIGHT COMPANY?

A. To support and temper the results of my DCF analysis, I have used three additional econometric methods to estimate the cost of equity capital for a group of firms similar in investment risk to DLC. The three methodologies are: 1) the Capital Asset Pricing Model (CAPM), 2) the Modified Earnings-Price Ratio (MEPR) analysis, and 3) the Market-to-Book

Ratio (MTB) analysis. The similar risk sample group of firms analyzed with these three methods is the same as that selected for the DCF analysis, discussed previously. The theoretical details of each of those analyses are contained in Appendix D, attached to this testimony. The actual calculations and data supporting the results of each of these models are shown in the attached Schedules.

Schedule 8 attached to this testimony shows the detail regarding the CAPM analysis. Because the average beta coefficients for the electric utility and gas distribution sample groups were identical, 0.81, the CAPM results for both groups are the same. Schedule 8 shows a CAPM cost of capital for the electric and gas companies ranging from 8.95% to 10.25%.

Schedules 9 and 10 show the theoretical basis and the data and calculations regarding the Modified Earnings Price Ratio (MEPR) analysis, which indicates a current cost of equity capital for electric companies in a narrow range from 9.00% to 9.08%. For the gas sample group, the MEPR analysis shown on page 2 of Schedule 9 indicates a current cost of equity in a narrow range, from 8.94% to 9.29%. Finally, Schedule 11 attached to this testimony contains the supporting detail for the Market-to-Book Ratio (MTB) analysis, which indicates a current cost of equity capital for the electric utility companies of 9.40% (near-term) to 9.32% (long-term). For the gas utility sample group, pages 3 and 4 of Schedule 10 show a cost of equity ranging from 9.41% to 9.16%.

C. SUMMARY

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY CAPITAL COST ANALYSES FOR THE SAMPLE GROUPS OF SIMILAR-RISK UTILITY COMPANIES.

A. My analysis of the cost of common equity capital for the sample group of electric utility and gas distribution utility companies is summarized in the table below.

METHOD	Electric Utility Companies	Gas Distributors
DCF	9.35%	9.44%
CAPM	8.95%/10.25%	8.93%/10.23%
MEPR	9.00%/9.08%	8.94%/9.29%
MTB	9.40%/9.32%	9.41%/9.16%

For the electric utility sample group, the DCF result, 9.35%, is similar to that for the gas distributors, 9.44%. In addition, the corroborating cost of equity indications (MEPR, MTB, and CAPM) indicate that DCF result is reasonable. Averaging the lowest and highest results of all the corroborative analyses for the electric companies produces and equity cost range of 9.09% to 9.58%, with a mid-point of 9.33%, only 2 basis points below the DCF result.

The DCF result for the gas distributors is 9.44%. The corroborating methodologies indicate a cost of equity range for the gas distributors of 9.02%-9.65%. That range of equity costs brackets the DCF estimate for the gas distribution utility companies.

Therefore, weighing all the evidence presented herein, my best estimate of the cost of equity capital for a company facing similar risks as this group of electric utilities and gas distribution companies, ranges from 9.25% to 9.75%, with a mid-point of 9.50%.

Q. DOES THAT 9.50% EQUITY COST ESTIMATE INCLUDE AN INCREMENT FOR FLOTATION COSTS?

A. No, it does not.

Q. CAN YOU PLEASE EXPLAIN WHY AN EXPLICIT ADJUSTMENT TO THE COST OF EQUITY CAPITAL FOR FLOTATION COSTS IS UNNECESSARY?

A. An explicit adjustment to "account for" flotation costs is unnecessary for several reasons. First, it is often said that flotation costs associated with common stock issues are exactly like flotation costs associated with bonds. That is not a correct statement because bonds have a fixed cost and common stock does not. Moreover, even if it were true, the current relationship between

the electric utility sample group's stock price and its book value would indicate a flotation cost reduction to the market-based cost of equity, not an increase.

When a bond is issued at a price that exceeds its face (book) value, and that difference between market price and the book value is greater than the flotation costs incurred during the issuance, the embedded cost of that debt (the cost to the company) is *lower* than the coupon rate of that debt.

In the current economic environment for the electric utility common stocks studied to determine the cost of equity in this proceeding, those stocks are selling at a market price 66% above book value. (Exhibit__ (SGH-1), Schedule 4, p. 1) The difference between the market price of electric utility stock and book value dwarfs any issuance expense the companies might incur. Therefore, if common equity flotation costs were exactly like flotation costs with bonds, then, if an explicit adjustment to the cost of common equity were necessary, it should be downward, not upward.

Second, flotation cost adjustments are usually predicated on the prevention of the dilution of stockholder investment. However, the reduction of the book value of stockholder investment due to issuance expenses can occur only when the utility's stock is selling at a market price at to or below its book value. As noted, the companies under review are selling at a substantial premium to book value. Therefore, every time a new share of that stock is sold, existing shareholders realize an *increase* in the per share book value of their investment. No dilution occurs, even without any explicit flotation cost allowance.

Third, the vast majority of the issuance expenses incurred in any public stock offering are "underwriter's fees" or "discounts". Underwriter's discounts are not out-of-pocket expenses for the issuing company. On a per share basis, they represent only the difference between the price the underwriter receives from the public and the price the utility receives from the underwriter for its stock. As a result, underwriter's fees are not an expense incurred by the issuing utility and recovery of such "costs" should not be included in rates.

In addition, the amount of the underwriter's fees are prominently displayed on the front page of every stock offering prospectus and, as a result, the investors who participate in those

offerings (e.g., brokerage firms) are quite aware that a portion of the price they pay does not go to the company but goes, instead, to the underwriters. By electing to buy the stock with that understanding, those investors have effectively accounted for those issuance costs in their risk-return framework by paying the offering price. Therefore, they do not need any additional adjustments to the allowed return of the regulated firm to "account" for those costs.

Fourth, my DCF growth rate analysis includes an upward adjustment to equity capital costs which accounts for investor expectations regarding stock sales at market prices in excess of book value, and any further explicit adjustment for issuance expenses related to increases in stock outstanding is unnecessary.

Fifth, research has shown that a specific adjustment for issuance expenses is unnecessary[21]. There are other transaction costs which, when properly considered, eliminate the need for an explicit issuance expense adjustment to equity capital costs. The transaction cost that is improperly ignored by the advocates of issuance expense adjustments is brokerage fees. Issuance expenses occur with an initial issue of stock in a primary market offering. Brokerage fees occur in the much larger secondary market where pre-existing shares are traded daily. Brokerage fees tend to increase the price of the stock to the investor to levels above that reported in the Wall Street Journal, i.e., the market price analysts use in a DCF analysis. Therefore, if brokerage fees were included in a DCF cost of capital estimate they would raise the effective market price, lower the dividend yield and lower the investors' required return. If one considers transaction costs that, supposedly, raise the required return (issuance expenses), then a symmetrical treatment would require that costs that lower the required return (brokerage fees) should also be considered. As shown by the research noted above, those transaction costs essentially offset each other and no specific equity capital cost adjustment is warranted.

Q. ARE THERE OTHER FACTORS TO BE CONSIDERED BEFORE DETERMINING A POINT-ESTIMATE FOR DLC WITHIN A REASONABLE RANGE FOR SIMILAR-RISK FIRMS?

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21 "A Note on Transaction Costs and the Cost of Common Equity for a Public Utility," Habr, D., National Regulatory Research Institute Quarterly Bulletin, January 1988, pp. 95-103.

A. Yes. First, the electric sample group companies have higher operating risk than DLC—a pure T&D utility operation. The electric utilities have generation risk, which Duquesne Light does not have. However, DLC does have provider of last resort (POLR) risk, which is also common to the other companies in the gas and electric sample groups. The electric utilities studied have an average S&P business position ranking of 5.8 and the gas utilities have an average S&P business position of 3, while DLC's business position ranking is 4. Therefore, in my view, an equity cost rate of 9.50%—the mid-point of the range would be appropriate for Duquesne Light Company.

Q. COMPANY WITNESS CANNELL ALSO ADDRESSES THE INVESTORS' VIEW OF THE RISKS FACING DUQUESNE LIGHT COMPANY. ARE THERE ISSUES DISCUSSED BY MS. CANNELL THAT INDICATE YOUR RECOMMENDED RETURN SHOULD BE ADJUSTED IN SOME FASHION?

A. No. Ms. Cannell discusses several topics that are related to what she perceives as the risks of investing in Duquesne Light. However, her comments regarding what investors believe to be a "reasonable" return are not supported by any objective analysis on her part. In addition, Ms. Cannel cites negative comments by bond rating agencies while ignoring positive comments by those same agencies, incorrectly attributes the risks of the parent holding company to the regulated subsidiary and provides a risk analysis of T&D utilities that is, in fact, in conflict with published information by rating agencies she claims is "critically important" to equity investors. In my view, Ms. Cannell's testimony offers nothing useful with regard to the cost of capital that should be used to determine rates in this proceeding.

Q. CAN YOU ELABORATE ON THE REASONS WHY MS. CANNELL'S TESTIMONY IS NOT ON POINT?

A. First, while Ms. Cannell testifies that she believes that investors would find the Company's 11.75% equity return request to be "reasonable," she also testifies, at page 6 of her Direct that investors' "typically want the highest possible returns." The salient point here is that

this Commission does not need the opinion of a utility advisory service (Ms. Cannell) to indicate a reasonable cost of equity capital. That information is found in collective wisdom of the capital market in the prices investors are willing to provide for similar-risk utility operations. Through careful application of reliable econometric models (which are absent from Ms. Cannell's testimony) we are able to discern the return investors require for T&D utility investment similar in risk to DLC. As I have shown in detail above, that return in today's market is 9.50%. I will also demonstrate subsequently that the Company's requested return of 11.75% is substantially overstated for many reasons. Therefore, whether or not, in Ms. Cannell's subjective opinion, a return of 10%, 11.75% or 20% would be "reasonable" to investors who want the highest returns they can get is not a factor that should be considered in setting rates in this case.

Second, at pages 23 and 24 of her Direct, Ms. Cannell cites the "BBB-" bond rating awarded Duquesne Light Holdings for a recent $320 million unsecured debt issuance and quotes Standard and Poor's as stating: "However in its outlook on the Company, S&P cautioned that 'the negative outlook reflects multiple challenges confronting DLH could result in lower ratings.'" Ms. Cannell goes on in her testimony to offer Allegheny Energy as an example of what can happen when investment-grade bond ratings fall to junk status. There are several points regarding the nature of Ms. Cannell's testimony to be made here:

- Duquesne Light Company (the Company seeking rate relief in this proceeding) is not DLH (Duquesne Light Holdings). As noted previously in my Testimony, the parent company contains several business platforms that have greater operating risk than Duquesne Light. Also, the parent company's risk position improves as it relies more and more on the operations of its low-risk T&D utility operation (DLC). Ms. Cannell's reference to DLH as the "Company" in this proceeding unnecessarily mixes the parent's operation risks with that of the subsidiary and overstates the latter.
- The Company's bond rating is not "BBB-", as Ms. Cannell implies. In Attachment III-F-4-B, page 1 of 1, included in its filing in this proceeding, Duquesne Light reports that its senior secured debt rating from Moody's is "Baa1", from Standard & Poor's is "BBB+", and from Fitch is "BBB+". While the Company's senior unsecured debt (bank loan debt),

which is junior to its senior debt, is rated low- or mid-BBB by the rating agencies, by no means is the Company only one ratings notch away from junk bond status. Ms. Cannell's testimony incorrectly implies something very different.

- The bond rating decline of Allegheny Energy was engendered entirely by that company's unregulated energy trading operations and had nothing at all to do with its fully-integrated utility operations. This fact underscores Ms. Cannell's failure to differentiate the risks attendant to DLH and its unregulated operations from that of the low-risk regulated T&D Company, DLC. The bond rating decline of Allegheny Energy also underscores the dangers of unregulated parent company operations and the impact they can have on the financial health of the regulated utility and calls for improved ring-fencing measures at Duquesne Light Holdings.

Third, Ms. Cannell's reporting of the opinions of bond rating agencies and their analysis of investment risks elects to focus only on the importance of this rate proceeding. However, the bond rating agencies focus is actually much broader than that and includes many risks that pertain only to the parent company:

> "CONTINUED DRAG FROM RESIDUAL NON-UTILITY INVESTMENTS
> *Portfolio of prior financial and synthetic fuel related investments continue to pressure the company's overall financial flexibility.* The company's synfuel and leveraged lease portfolios have been subject to various tax and regulatory scrutiny over the last several years. While DLH has settled its dispute with the Internal Revenue Service over its leveraged lease transactions, the company continues to face uncertainty with respect to the application of proposed new accounting rules relating to leveraged leases. Additionally, ongoing IRS field audits with respect to the in-service date of DLH's synfuel facilities could also expose the company to additional charges to earnings.
>
> PHASE OUT RISK OF SECTION 29 TAX CREDITS
> DLH earns Section 29 tax credits from DQE Financial's landfill gas operations and the company's remaining synthetic fuel partnership. DLH's subsidiary Duquesne Energy Solutions also derives O&M fees from operating a number of synthetic fuel facilities for a third party owner. Section 29 tax credits are subject to phase out provisions based upon the average annual wellhead price per barrel of domestic crude oil. ... DLH has not hedged its

> exposure to rising crude oil prices, and hence Moody's expects that DLH's earnings and cash flow exposure related to Section 29 tax credits in 2004 was $40 million, with $22 million represented by O&M Fees to Duquesne Energy Solutions and $17 million attributable to landfill gas and synthetic fuel tax credits. The total exposure represented 20% of 2004 consolidated FFO of approximately $190 million.
>
> UNRESOLVED STATE OF PENNSYLVANIA INCOME TAX ISSUES THAT MAY IMPACT NEAR TERM CASH FLOW
> Duquesne Light has an ongoing tax dispute with the Pennsylvania Department of Revenue with regard to a tax assessment to include income from an out of state subsidiary during the period 1999 to 2002. The assessment could potentially result in an exposure of up to $96 million. Although, the company has established reserves for a portion of this exposure, the ultimate settlement amount may place pressure on DLH's cash flow in the near term." (Moody's Investors Service, Duquesne Light Holdings, August 2005, p. 3, *Filing Attachment III-F-4-C*)

The above-cited Moody's credit report also indicates bond rating strengths for DLH include 1) DLH's efforts to scale back its non-regulated businesses and reposition its operations around its T&D utility, which will result in a reduction of overall business risk, and 2) an expectation that DLC will be able to recover anticipated capital expenditures that are related primarily to transmission and distribution system upgrades. This rating agency information, provided by the Company in its filing, indicates that Ms. Cannell has selectively reported bond rating agency opinion, focusing only on the outcome of this rate proceeding, when the actual bond rating is based on a much broader set of factors which include the risks of unregulated parent company operations and the relatively lower risk operations of the regulated utility subsidiary.

Fourth, Ms. Cannell, at pages 9 through 12 of her Direct Testimony, provides support for her belief that a T&D utility operation, due to its lack of diversity (single line of business), has greater risk than fully-integrated utilities. Ms. Cannell's position, which is based on a theoretical portfolio-risk concept, is without merit. As I have discussed previously in my testimony, Standard & Poor's has recently re-classified the energy industry on the basis of business risk. Transmission and distribution utilities, such as DHL, are at the bottom end of the spectrum of

business risk. Fully integrated companies (those that include both generation and distribution) have greater business risk due to the high risk related to generation assets. Ms. Cannell's theoretical position that a single-line-of-business firm has more risk is in direct conflict with the published opinions of Standard & Poor's. According to Ms. Cannell's own testimony at pages 19 and 20 the opinions of credit rating agencies are "critically important" to investors. In this instance, Mr. Cannell's position with regard to the relative risk of the T&D operations of DLC is at odds with that of Standard & Poor's. It is reasonable to believe that investors would rely on the latter.

Fifth, Ms. Cannell discusses how institutional traders and hedge funds might trade the stock of the parent company, DLH. Because those investors are free to trade any type of stock, and presumably do so, the manner in which they may or may not trade DLH stock is not germane to the return investors require. As I noted in the first point above, that cost rate is embodied in the market price those and other investors are willing to provide for similar-risk utility companies. I have taken the market opinion into account in my testimony, Ms. Cannell has not.

Finally, although I do not believe that Ms. Cannell's testimony provides any evidence that would cause me to adjust the 9.50% cost of common equity capital in this case, she does make one point with which I unequivocally agree. At page 6 of her Direct Testimony, Ms. Cannell is asked, "Are you suggesting that the Pennsylvania Public Utility Commission should cater to the desires of investors, who typically want the highest returns?" She answers, "No. I realize that the Pennsylvania Public Utility Commission ('PUC' or "Commission') has to balance the interests of both investors, who want higher returns, and ratepayers, who want lower rates." On that point, we are in agreement.

Q. WHAT IS THE OVERALL COST OF CAPITAL FOR DLC's T&D UTILITY OPERATIONS, BASED ON AN ALLOWED EQUITY RETURN OF 9.50%?

A. Schedule 12 attached to my testimony shows that an equity return of 9.50%, operating through an appropriate ratemaking capital structure and the Company's requested embedded capital cost rates, produces an overall return of 7.85% for DLC. Schedule 12 also shows that a

7.85% overall cost of capital affords the Company an opportunity to achieve a pre-tax interest coverage level of 3.21 times.

According to DLC's 2005 S.E.C. Form 10-K (Exhibit 12), the pre-tax interest coverage over the past five years has averaged 2.93x and has ranged from 2.11x to 3.37x. Also, Company witness Moul's PRM-1, Schedules 3 and 4 show that the average pre-tax interest coverage for his similar-risk sample group and the S&P's Public Utilities have averaged 2.66x and 2.60x over the past five years. The return I recommend would allow the Company the opportunity to improve their historical average interest coverage and achieve a level of pre-tax interest coverage that exceeds the average interest coverage of similar risk sample groups. Therefore, the equity return I recommend fulfills the legal requirement of Hope and Bluefield of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation and serves to support and maintain the Company's ability to attract capital.

V. COMPANY COST OF CAPITAL TESTIMONY

Q. IN HIS TESTIMONY IN THIS PROCEEDING, COMPANY WITNESS MOUL INDICATES THAT WHEN UTILITY MARKET PRICES EXCEED BOOK VALUES, MARKET-BASED COST OF EQUITY ESTIMATES SHOULD BE ADJUSTED UPWARD. IS THAT CORRECT?

A. No, it is not correct. As I will demonstrate below, Mr. Moul's upward adjustments to the market-based cost of equity for what he characterizes as leverage differences created by market prices above book value are without theoretical foundation. There is no support in the literature of financial economics for comparing leverage differences between market-value and book-value capital structures. The only regulatory reference Mr. Moul does cite for the formulas used in his leverage adjustment, does not support his position, indicates that the focus of financial risk in regulation should be on book values not market values, and states that the use of market-value capital structure can lead to "distorted" equity cost estimates.

There is no difference in financial risk when the market-value capital structure of a firm is different from the book-value capital structure. Financial risk is a function of the interest payments on the debt issued by the firm. Whether the capital structure is measured with market values or book values, interest payments do not change and, for that reason, the financial risk is not different under the two methods of measuring capital structure. As a result, market-value capital structures are useful as indicators of financial risk only when compared with other market-value capital structures. There simply is no economic or financial meaning in comparing market-value capitalization with book-value capitalization.

In addition, Mr. Moul's "leverage" adder is based on fair values (market values of debt and equity) drawn from the annual reports of each of the companies. Pennsylvania is an original cost ratemaking jurisdiction, and bases its regulatory returns on depreciated original costs, not fair value.[22] Therefore, Mr. Moul's use of fair value capital structures in determining the return to be allowed could violate the Pennsylvania statue that requires rates be based on original cost. Finally, Mr. Moul has testified on cost of capital issues for many years and has continually sought to "adjust" the DCF result upward. While the rationale has differed over the years, his adjustments to the DCF have always been in one direction—upward. Mr. Moul's "leverage" adjustment is of the same type.

Equity cost estimation methods based on the current financial market data (such as the DCF) provide the most accurate representation of investors' return expectations. The cost of equity capital—the return that should be allowed utility operations such as Duquesne Light—is equivalent to investors' return expectations and it is that parameter that should be applied to a book value rate base. Current market-based equity cost estimates need no artificial adjustment of the sort recommended by Mr. Moul in this proceeding.

[22] 66 Pa.C.S. Sec. 1311

Q. JUST TO BE CLEAR, WHEN YOU USE THE TERMS "BOOK VALUE CAPITAL STRUCTURES" AND "MARKET VALUE CAPITAL STRUCTURES," WHAT DO YOU MEAN?

A. Book value capital structures represent the actual mix of capital used by the firm and are calculated based on the dollar amount of each form of capital (common equity, preferred stock, and long-term) appearing on the books (balance sheet) of the firm. The market value capital structure is the mix of capital used by a firm in which the amounts of capital are measured based on their market value, or "fair value" according to Mr. Moul.[23]

For common equity capital, the total dollar amount of equity, measured on a market basis, is the number of shares outstanding times the current market price. The market value of debt is obtained from a portion of each company's S.E.C. Form 10-K in which it is required to report the "fair value" (market value) of its financial assets. Unless current interest rates are very different from embedded debt costs (which is not the case in today's economy), the fair value of a firm's debt will closely approximate its book value. That is the case with Mr. Moul's firms—the market value of the common equity substantially exceeds the book value but the market value of debt is very similar to the book value for each company in his sample group.

Q. WHERE IN HIS TESTIMONY DOES MR. MOUL PROVIDE THE BASIS FOR HIS BELIEF THAT A UTILITY MARKET-TO-BOOK RATIO ABOVE ONE INDICATES THAT A DCF COST OF EQUITY UNDERSTATES THE COST OF EQUITY?

A. In his Appendix E, pages 4 and 5, Company witness Moul sets out his rationale which purportedly shows that, when market prices are above book value, a DCF "misspecifie[s]" [the] cost of equity when those results are applied to book value." Mr. Moul concludes that regulators that use an "unadjusted" DCF result would not provide investors with the returns they require. Also, Mr. Moul adds, "the utility would not be able to withstand these [unadjusted] DCF results applied in a rate case and also sustain its financial integrity."

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23 Moul Direct, Appendix E, pp. 13, 14.

What the Company witness means is that if regulators set rates using unadjusted market-based cost of equity estimates when market prices are above book value, investors would to be able to earn their required return and, therefore, utilities would not be able to raise the capital necessary to meet their obligation to provide necessary services required by consumers. As I show below, evidence readily available in the marketplace shows that the thesis on which Mr. Moul's upward adjustment to the cost of equity is based, is incorrect.

Q. DOES MR. MOUL'S APPENDIX E EXAMPLE SUPPORT HIS POSITION THAT MARKET-BASED EQUITY COST MODELS LIKE THE DCF UNDERSTATE INVESTOR-REQUIRED RETURNS WHEN UTILITY MARKET PRICES ARE ABOVE BOOK VALUE?

A. No, it does not. Mr. Moul's Appendix E example is flawed. It is important to understand that Mr. Moul's Appendix E example provides the basis of his belief that the DCF provides an inaccurate estimate of the cost of equity capital when market prices are above book value. As I show below, his example does not hold up under scrutiny. Moreover, his Appendix E example provides the rationale for the market value/book value capital structure adjustment Mr. Moul subsequently makes in his testimony. If his Appendix E example is incorrect, then so is his market value/book value equity cost adjustment.

Q. PLEASE EXPLAIN WHY MR. MOUL'S APPENDIX E NUMERICAL EXAMPLE IS FLAWED.

A. In the numerical example on pages 4 and 5 of Appendix E to his Direct Testimony in this proceeding, Mr. Moul posits a utility with a certain market price ($12), book value ($8), allowed return (12.5%)[24] and payout ratio (75%). From that data he derives a DCF-type cost of equity of 9.375%. Thus far in Mr. Moul's example, there is no problem.

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24 Mr. Moul's example is not well defined. At the outset he assumes that 12.5% is the "return investors require on their common stock investment value (i.e., the market price per share)," which is the definition of the cost of equity. If, according to his example investors required a return on the market price of 12.5% and were providing a market price 150% above an $8 per share book value, the actual allowed return would have to be 18.75% [$12 x 12.5% = $1.50/$8 = 18.75%]. However, Mr. Moul's analysis subsequently appears to be based on the assumption that the cost of equity capital is 9.375%. The cost of equity cannot be both values and Mr. Moul's hypothetical example appears ill-defined. For purposes of discussion here, I have assumed that the allowed return = 12.5% and the DCF cost of equity = 9.375%.

At this point, however, Mr. Moul's example goes awry. He supposes a situation that cannot exist. Namely, Mr. Moul posits that if the DCF/market-based cost of equity becomes the allowed return the market price would not change. Here, Mr. Moul's example diverges from a most basic tenet of modern finance: for a given security risk-level, price and return are directly related—higher risk requires a higher return and vice versa. That is, utility investors, realizing that the utility will be allowed a lower return, would lower the price they are willing to provide for that stock. Mr. Moul has it wrong when he assumes otherwise.

By making the illogical assumption that market price would remain unchanged with a lower allowed return, Mr. Moul is able to claim (incorrectly) that the DCF does not provide a return sufficient to meet investor expectations. He further incorrectly concludes that a DCF equity cost estimate for a utility with a market price above book value will create an ever-downward spiral of earned returns and, ultimately, that utility could not maintain financial integrity under such a scenario. That conclusion is incorrect.

Mr. Moul's example does not support his thesis that a market-based DCF analysis will not provide utility investors the return they require when those returns are applied to rate base. What he has demonstrated is that when allowed/expected returns on book value substantially exceed the cost of equity capital (investors required market returns) the market price of utility stocks will substantially exceed book value, a premise with which I concur.

Q. MR. MOUL CLAIMS THAT WHEN MARKET PRICES ARE ABOVE BOOK VALUE AND RATES ARE SET WITH MARKET-BASED (i.e., UNADJUSTED) EQUITY COST ESTIMATES, UTILITIES CANNOT EARN THEIR COST OF CAPITAL, DOES HE NOT?

A. Yes, that is his claim. Mr. Moul states at page 4 of his Appendix E that "a utility cannot withstand" market-based equity cost estimates applied to book value when market prices are above book value. His Appendix E example purports to show that when market prices are above book value, investors cannot earn the return they require. However, as I've shown above, that example does not withstand scrutiny.

Q. WHAT WOULD BE THE CONSEQUENCE OF INVESTORS BEING UNABLE TO EARN THEIR REQUIRED RETURNS?

A. If investors did not have an expectation of being able to earn the returns they require, utilities would not be able to attract capital.

Q. IS THE APPLICATION OF MARKET-BASED COST OF EQUITY ESTIMATES TO A BOOK VALUE CAPITAL STRUCTURE (AND RATE BASE) STANDARD REGULATORY PRACTICE IN THE UNITED STATES?

A. Yes. That has certainly been my experience over my 25 years as an expert witness. Moreover, that opinion is echoed by an author on whom Mr. Moul has often relied for authority:

> "In the context of rate making for regulated utilities, it is almost universal practice to employ a hybrid computation consisting of embedded cost of debt and a market-based cost of equity, with costs of debt and equity both weighted at their respective book values in the determination of the WACC [weighted-average cost of capital]. (Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, 1994, p. 411)

Moreover, Pennsylvania is the only regulatory jurisdiction that has accepted Mr. Moul's "leverage" adjustment, even though he has been using it since 1997, and has testified in twenty jurisdictions since that time.[25]

Q. IN OTHER WORDS, THE RATEMAKING PROCEDURE THAT MR. MOUL RECOMMENDS AGAINST—APPLYING MARKET-BASED EQUITY COST ESTIMATES (WITHOUT ADJUSTMENT) DIRECTLY TO BOOK VALUE CAPITAL STRUCTURES—IS UNIVERSAL REGULATORY PRACTICE?

A. Yes; and according to Mr. Moul, when market prices are significantly above book value that universal practice will result in investors being unable to earn their required returns. He also warns that when investors are unable to earn their required returns, utilities will not be able to attract capital.

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25 *Company response to OCA-X-R1.*

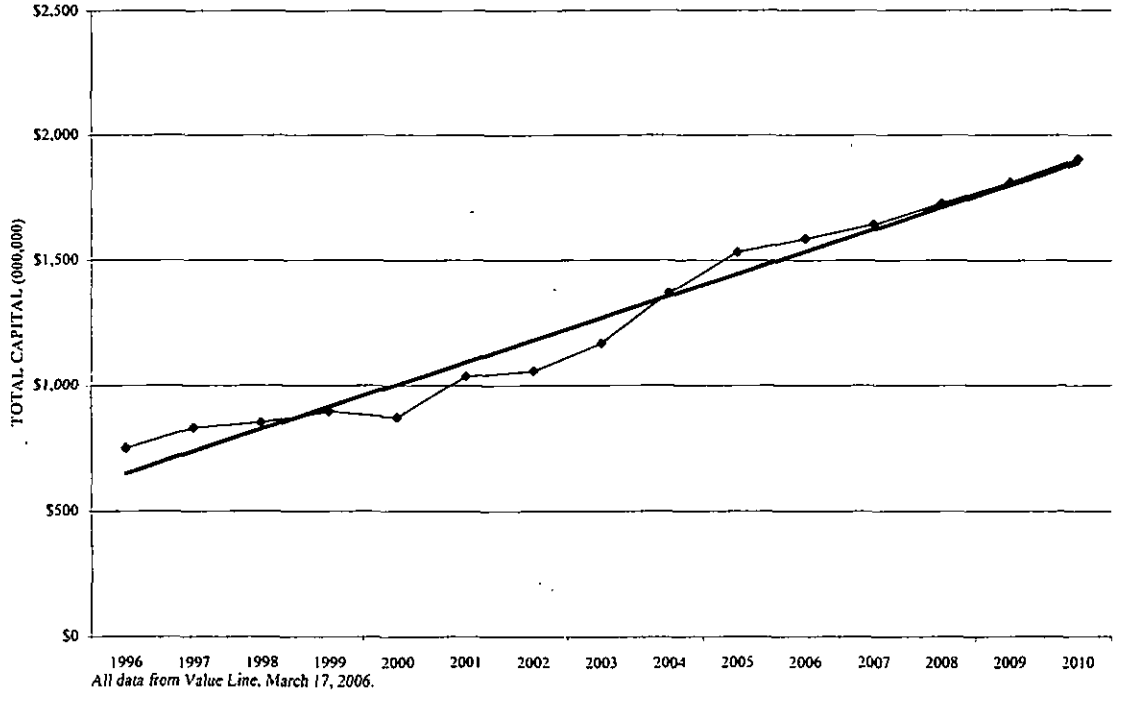
Q. UTILITY MARKET PRICES HAVE BEEN ABOVE BOOK VALUE FOR MANY YEARS HAVE THEY NOT?

A. Yes. Utility market prices have been above book value, generally, since the mid-1980s when the very, very high interest and inflation rates that existed during that time period began to decline.

Q. SINCE UTILITY MARKET PRICES HAVE BEEN ABOVE BOOK VALUE FOR SOME TIME AND MARKET-BASED EQUITY COSTS ARE UNIVERSALLY APPLIED TO BOOK VALUE CAPITAL STRUCTURE (AND RATE BASE), MR. MOUL'S LOGIC INDICATES THAT UTILITIES WOULD NOT HAVE BEEN ABLE TO ATTRACT CAPITAL FOR MANY YEARS, CORRECT?

A. Yes, that would be the logical conclusion of Mr. Moul's position. However, utilities have been able to attract capital. As shown in the graph below, the average total capital of my sample of gas distributors has increased steadily over the past decade and is projected to continue to increase at a stable rate.

GAS UTILITY CAPITAL FORMATION



All data from Value Line, March 17, 2006.

This chart shows that the gas distribution industry over the past ten years has, on average, added capital at a very strong and steady rate and is expected to continue to do so in the future. In 1995, the average amount of total capital per company in the utility industry was about $750 Million. In 2005, that figure was about $1.5 Billion per company, double the amount ten years earlier; and by 2010 (the mid-point of Value Line's 2009-2011 projection period), the average gas distribution company is expected to have about $1.9 Billion of total capital.

Therefore, Mr. Moul's contention that unless there is some sort of "leverage" adjustment to the market-based cost of equity capital, investors will not be able to earn their required return cannot be correct. Obviously, from the above graph, utilities have had no problem attracting capital, and, since investors would not supply capital if they were not earning their required return, we must conclude that they have been doing so. Investors' ability to earn their required return is clearly not predicated on the use of an artificial "leverage" adjustment to the market-based cost of equity capital. No other regulatory jurisdiction uses it, except Pennsylvania.

Q. ARE THERE ANY SIGNIFICANT FINANCIAL RISK DIFFERENCES BETWEEN THE COMPANIES IN MR. MOUL'S SAMPLE GROUP AND DUQUESNE LIGHT COMPANY?

A. There are minor financial risk differences between the capital structure requested by Duquesne Light in this proceeding and Mr. Moul's sample group of electric companies. However, those differences indicate that Duquesne Light's requested ratemaking capital structure has less risk than the capital structure of Mr. Moul's sample companies. As a result, if there is any "adjustment" to the market based cost of equity of Mr. Moul's sample group of electric companies, it should be downward to recognize the lower risk, not upward as he suggests. Table II, below shows the actual capital structure data contained in Mr. Moul's Testimony.

Table II.

Book Value Capital Structure of Mr. Moul's Sample Companies

ELECTRIC GROUP	Common Equity	Preferred Stock	Long-term Debt	Total Capital
Percentage	**45.2%**	2.4%	52.5%	100.00%

PRM-1, Schedule 3.

DUQUESNE LIGHT	Common Equity	Preferred Stock	Long-term Debt	Total Capital
Percentage	**47.93%**	9.04%	43.03%	100.00%

PRM-1, Schedule 1.

Mr. Moul's own data show that the book value capital structure of his sample of electric companies exhibits an average common equity ratio of 45.2% at year end 2004.[26] Duquesne Light's requested ratemaking common equity ratio is 47.93%. Mr. Moul's sample group has a lower common equity ratio than that requested by the Company for ratemaking purposes in this proceeding. Therefore, if there is any impact on the cost of capital due to capital structure differences that impact would be downward because Duquesne Light's requested ratemaking common equity ratio is greater than that of Mr. Moul's sample group. Based on capital structure differences, there is certainly no reason for any upward adjustment to the cost of equity to account for financial risk.

Q. WHY, THEN, DOES THE COMPANY CLAIM THAT THERE ARE FINANCIAL RISK DIFFERENCES THAT INCREASE THE REQUIRED RETURN ON EQUITY?

A. The Company is making an improper comparison between market value capital structures and book value capital structures in order to claim that a financial risk difference exists. When utility common equity market prices are above book value, the capital structure measured with market values will have a higher equity percentage and a lower debt percentage than the capital

26 The average common equity ratio of Mr. Moul's sample group in 2006 is also 45% of total capital, according to the April 2006 edition of AUS Utility Reports.

structure measured with book value. That does not mean, as the Company claims, that those different capital structure measures signify any difference whatsoever in financial risk.

Q. PLEASE EXPLAIN WHY MR. MOUL'S "LEVERAGE" ADJUSTMENT IS WITHOUT THEORETICAL MERIT.

A. The authority cited in Mr. Moul's testimony for the upward adjustment to the cost of capital—prior theoretical work in the field of financial economics by Miller and Modigliani (MM)[27]—does not support the leverage adjustment Mr. Moul applies to the cost of equity. Simply stated, MM's theoretical financial work, which measures risk differences between different firms imparted by leverage (the use of debt), is based only on market values and makes no reference whatsoever to book value capital structures. In fact, the formulas created in those studies, and extracted by Mr. Moul for his purposes here, cannot be derived through the use of accounting-based or book value capital structures and, thus, have no meaning in reference to book value capital structures.

Book values of equity and debt are never mentioned in the MM treatise. Other financial texts confirm that the capital structure ratios which should be used in the MM leverage adjustment equations are market-based capital structure ratios, not book value-based capital structure ratios (e.g., Brigham, E. F., Intermediate Financial Management, 5th Ed, 1996, Dryden Press, Fort Worth TX, pp. 364-374).

The theoretical formulas which Mr. Moul uses are designed to compare only market-value leverage/risk differences between one firm and another firm (or group of firms), or leverage differences between capital structures of the same firm at different points in time. Financial theory very clearly requires that those leverage comparisons be made on the same basis—market value capital structure.

Mr. Moul's analysis, on the other hand, is applied to differences that happen to exist between the market value capital structure and the book value capital structure of utility

27 Moul Direct, p. 40.

companies. In making that comparison, Mr. Moul effectively assumes that one firm or group of firms can, at one point in time, have two levels of financial risk. That is an impossibility.

Q. WHY IS IT IMPOSSIBLE FOR ONE COMPANY TO HAVE TWO LEVELS OF FINANCIAL RISK?

A. There can be no "difference" in financial risk for one company at one point in time, regardless of the relationship between market price and book value. Yet, that is the crux of the Company's "leverage" adjustment. Financial risk is created by the impact of interest payments on the volatility of a firm's income stream. As the amount of interest expense increases relative to the operating income available to pay that debt service, the volatility of the income available to stockholders (a residual that flows to stockholders after interest payments are met) increases, thus creating more risk for the stockholders.

In response to data requests in recent rate proceedings in this jurisdiction, Mr. Moul has cited Roger Morin as the authority on which he relies for the source of his leverage adjustment formulas that appear in his Appendix E (e.g., Moul response to OCA-III-R13, in Pa.P.U.C. Docket No. R-00051030, Aqua Pennsylvania). However, as Roger Morin notes in his text Regulatory Finance:

> "Financial risk stems from the method used by the firm to finance its investments and is reflected in its capital structure. It refers to the additional variability imparted to income available to common shareholders by the employment of fixed-cost financing, that is, debt and preferred stock capital. Although the use of fixed-cost capital can offer financial advantages through the possibility of leverage of earnings (financial leverage), it creates additional risk due to the fixed contractual obligations associated with such capital. Debt and preferred stock carry fixed charge burdens that must be supported by the company's earnings before any return can be made available to the common shareholder. *The greater the percentage of fixed charges to the total income of the company, the greater the financial risk.*" (Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, 1994, pp. 40-42, emphasis added)

Mr. Moul, himself, provides a similar definition of financial risk in his testimony:

> "Financial risk results from a firm's use of borrowed funds (or *similar sources or capital with fixed payments*) *in the capital* structure, i.e., financial leverage."(Moul Appendix C, p. C-2, ll. 1-3)

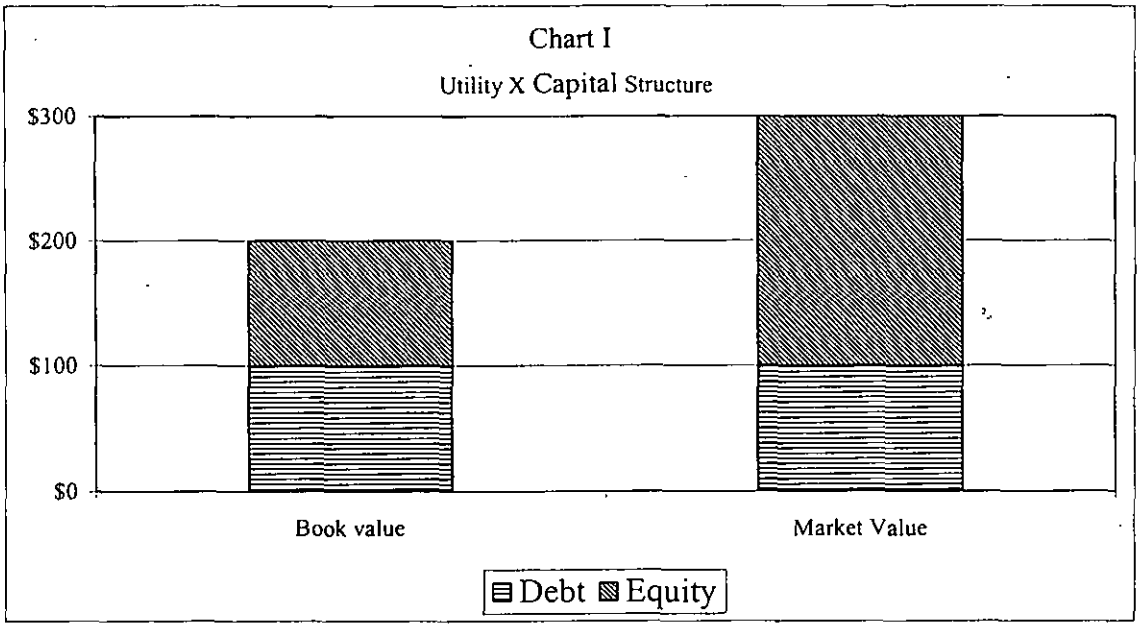
As both quotes confirm, financial risk is a function of the amount of fixed charges or debt expense incurred by the firm and the impact of those fixed charges on the variability of the income available to the stockholder. Therefore, unless the actual amount of borrowed funds increases, causing the dollar amount of "fixed charges to the total income of the company" to increase, financial risk cannot increase. Because of that fact, one company (or group of companies) at one point in time cannot have two levels of financial risk because the amount of fixed charges (the debt costs) are the same—no matter how the capital structure ratios are measured.

Market value capital structure and book value capital structure are merely different ways to measure the capitalization of a company, they do not represent differences in the level of fixed charges incurred. Most importantly, differences in market-value and book-value capital structure cannot, therefore, reflect differences in financial risk for one company or group of companies at any one point in time.

Q. CAN YOU PROVIDE AN EXAMPLE TO SHOW THAT THE FINANCIAL RISK DOES NOT CHANGE WHEN THERE IS A DIFFERENCE BETWEEN MARKET PRICE AND BOOK VALUE?

A. Yes. For example, assume that Utility X has $100 of debt that has a 6% cost rate, and $100 of equity on its books. Its book value capital structure is 50% equity/50% debt. Assume further that Utility X's market price is double its book value. The market valuation would then be $200 equity and $100 debt (we assume here for simplicity that the market value of debt is equal to book value). The market value capital structure is 67% equity and 33% debt. There is no difference in financial risk here because, no matter how one measures the capital structure, the company has the same fixed charges to pay—6% of $100 of debt capital. The fixed cost of the

debt is what creates the financial risk and that factor, for one company at one point in time, *cannot* be different. Thus, it is not logical to assume that one company at one point in time has two levels of financial risk. Yet, that is the crux of Mr. Moul's "leverage/risk" adjustment.



Mr. Moul's position on the measurement of a firm's capital structure is tantamount to saying that 16 ounces weighs more than one pound because 16 is a larger number than 1. However, there is no difference in the factor being measured—one pound weighs the same no matter what units are used to measure it—ounces, grams, or tons. Similarly, there is one level of financial risk inherent in the capital structure of any firm at one point in time, no matter how that capital structure it is measured.

A Hearing Examiner in the Virginia Corporation Commission recognized that differences between market value capital structures and book value capital structures do not connote difference in financial risk. In a Virginia-American Water rate proceeding (Case No. PUE-2002-00375), the Virginia Hearing Examiner opined regarding Mr. Moul's "leverage" adjustment, "[t]he underlying risk of a utility does not vary when viewed from the perspective of market valuation or the perspective or book valuation. All that changes is the perspective."[28] The

28 Response to OCA-III-R36, p. 26.

Virginia Hearing Examiner is correct on that point; Mr. Moul's claim that financial risk differences exist because of market-to-book ratio differences is not correct.

Q. YOU NOTED THAT MR. MOUL, IN A RECENT PROCEEDING IN THIS JURISDICTION, CITED MORIN AS THE SOURCE OF THE FORMULAS HE USED IN HIS LEVERAGE ADJUSTMENT. DOES THE MORIN TEXT SUPPORT MR. MOUL'S ANALYSIS?

A. No. Once again, there is nothing in the Morin text cited by Mr. Moul that supports Mr. Moul's comparison of market-value and book-value capital structures. Dr. Morin points out that financial theory calls for the use of market-value capital structures in the measure of capital structure differences (not the mix of market and book capital structures that Mr. Moul uses). Therefore, there is no support for Mr. Moul's analysis to be found in the Morin text.

Moreover, Morin states quite clearly that if market-value capital structures are used in ratesetting in a situation where market-value capital structures are different from book value capital structures, as in Mr. Moul's so-called leverage analysis, the cost of equity estimates will be "distorted."

> "Second, while both equations 17-7 and 17-3 [the Miller/Modigliani equations] require the use of market value capital structure, the use of book values is preferable because the equity return obtained is in fact applied to the book value of the equity by the regulator. If the stock is trading at or near book value, no problem arises. But if the stock is trading away from book value, *the use of market values will lead to distorted cost of equity estimates*." (Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, 1994, p. 437, emphasis added)

Q. YOU NOTED AT THE OUTSET OF THIS DISCUSSION THAT MR. MOUL'S "LEVERAGE" ADJUSTMENT MAY BE IN VIOLATION OF PENNSYLVANIA STATUTORY STANDARDS. WHY IS THAT THE CASE?

A. Pennsylvania is an "original cost" regulatory jurisdiction. That is, according to statute, regulated utility rates in this state are to be based on the depreciated original cost of utility plant.

At one time in the early part of the 20th Century, there was great controversy over whether rates should be based on the original cost or "fair value"(also known as replacement cost or market value) of the utility plant. Ultimately, the determination of "fair value" proved too difficult a task, and the regulatory community in the U.S. settled on depreciated original cost as a reasonable basis for ratemaking. That has been the paradigm for many years now, and the capital structure that best represents the original cost rate base is the book value capital structure—the actual proportions of capital that were used to invest in the plant on which the utility is allowed to earn a return.

Mr. Moul's unsupported leverage adjustment uses "fair value" or market value capital structures that are not related to the original cost rate base. From an economic point of view, a market-value capital structure is more closely related to a replacement cost or fair value rate base. A market value capital structure is, by definition, the value the market puts on the capital invested in the firm, based on current market conditions and expectations. In that way, it can be said to represent the "fair value" of the company's utility investments in today's marketplace.

However, basing rates on "fair value" or replacement cost is not allowed in Pennsylvania. Rates in this state are restricted to depreciated original cost and Mr. Moul's attempt to inject market values into the ratemaking process violates that original cost standard.

The West Virginia Public Service Commission, in its January 2, 2004 decision in a West Virginia-American Water Company rate proceeding, strongly rejected Mr. Moul's "leverage" analysis. That Commission correctly saw Mr. Moul's adjustment to the cost of equity based on market values as an attempt to supplant original cost rate base regulation with fair value regulation.

> "Additional examples of the Company witness raising his sights above what a reasonable analysis produces can be found in the market value adjustments that he makes. His water group DCF analysis would be only 8.98%; however, he leverages this number up by 54 basis points, or .54%, to reflect the fact that stockholders pay market prices for stock and those market prices may exceed the book value of a utility's rate base. Thus, the Company asks us to effectively depart from our long-standing use of an original cost rate base. We could do this by simply applying the derived rate of

> return, before market price leveraging, to an inflated rate base that exceeds book value or, in the alternative chosen by the Company, we can continue to use original cost rate base and apply an inflated rate of return to that rate base." (W.V.P.S.C. Case No. 03-0353-W-42T, West Virginia-American Water Works, January 2, 2004, p. 18.)[29]

Mr. Moul's use of a market-based capital structure to produce a ratemaking cost of equity, as noted by the West Virginia Commission, effectively requires this Commission to set rates on something other than original cost.

Q. YOU MENTIONED EARLIER IN YOUR DISCUSSION OF MR. MOUL'S ADJUSTMENT TO THE DCF, THAT HE HAS CONSISTENTLY ADJUSTED THE DCF FOR ONE REASON OR ANOTHER—AND THOSE ADJUSTMENTS HAVE BEEN UNIFORMLY UPWARD, NO MATTER WHAT THE RELATIONSHIP BETWEEN MARKET PRICE AND BOOK VALUE. CAN YOU ELABORATE?

A. Yes. Mr. Moul adjusts the DCF upward or discounts its results in favor of other cost of equity methods that produce higher results. His "leverage" adjustment is the latest permutation in attempting to increase the results of a DCF analysis.

Mr. Moul's leverage adjustment has the effect of increasing the cost of equity estimate when market prices are above book value. The mathematics of his leverage adjustment also indicate that when market prices are *below* book value, market-based cost of equity estimates should be adjusted *downward*. However, when Mr. Moul actually testified for companies that had market prices below book value, he recommended an upward, not a downward adjustment to the market-based cost of equity capital. As this Commission noted in 1982:

> "We find that market-book ratios in the area of one to one are most suitable for public utilities. It was Blue Mountain witness Moul's contention that earnings should be sufficient to drive market price to a value 25 per cent greater than the value of book assets

[29] This West Virginia decision was appealed, but the appeal was dropped by the Company following the settlement of a subsequent case.

> represented by each share (M/BV-1.25). In some circumstances, Mr. Moul recommended an increment of 35 per cent over book value (N.T. 206). That recommendation had the effect of inflating Mr. Moul's ultimate recommendation by perhaps as much as 150 basis points (see N.T. 201). There is no convincing logic for such a position." (Pennsylvania Public Utility Commission, Docket No. R-78100686, Blue Mountain Water Company, January 14, 1982, 1982 Pa. PUC LEXIS 160; 55 Pa. PUC 502)

In Pa.P.U.C. Docket No. R-822145, testifying on behalf of Pennsylvania Division of the National Fuel Gas Distribution Corporation, Mr. Moul, discussed the fact that the company's stock price was <u>below</u> book value, and how that showed that investors expected <u>higher</u> authorized returns in the future.

> "I should emphasize that the actual 1982 growth rates for NFG of 6.9% in earnings per share, 7.8% in dividends per share, and 7.0% in book value per share and as an internal growth rate were inadequate to fulfill investors' growth requirements, in that the market-to-book ratio for fiscal 1982 was only 61.2%. Even considering the stock market performance since August 13, 1982, the current NFG stock price of $31.00 per share at January 8, 1983 provides a market-to-book ratio of only 63.6% ($31.00 ÷ $48.77). This clearly demonstrates that the investor required growth is higher than the 7% growth rate actually experienced in NFG's book value.
>
> Regulated public utilities require higher authorized and achieved rates of return on book common equity to satisfy the growth rate expectations of investors, such that the market price for common stock equity will at least equal book value." (Moul Direct, Pa.P.U.C. Docket No. R-822145, pp. 24, 25)

If Mr. Moul were consistent in his DCF theory, the fact that Duquesne's market price is currently about two times book value would mean that investors expected lower growth and lower allowed returns so that the market-to-book ratio would be closer to 1.0. Moreover, if he were consistent, he would opine that a market-to-book ratio of 2.0 indicates that the return on book value earned by the company substantially exceeds the market-based cost of capital. The economic theory underlying the DCF has not changed in the ensuing years. Also, it is most

important to understand that the financial theory on which Mr. Moul bases his "new" theoretical position (his leverage adjustment), the Miller/Modigliani research pre-dated the 1982 testimony cited above and was widely known. Nevertheless, Mr. Moul now testifies that a company like Duquesne, which has a market-to-book ratio of 2.0, needs a 43 basis point increase in the market-based DCF result in order that investors can achieve their required return. Mr. Moul's theoretical flip-flop on the meaning of market-to-book ratios and the cost of capital is significant and cannot be overlooked in the determination of the validity of his current position.

Q. ARE THERE OTHER POSITIONS TAKEN IN PRIOR TESTIMONY BY MR. MOUL OF WHICH THIS COMMISSION SHOULD BE AWARE?

A. Yes. As the very high interest rates of the early 1980s began to recede, capital costs (including DCF equity cost estimates) began to fall and utility market-to-book ratios began to rise. In a 1987 Western Pennsylvania Water rate proceeding (Pa.P.U.C. Docket No. R-00870825), Mr. Moul testified that the DCF was less reliable because of "significant investor optimism which is prevalent at this time." (Pa.P.U.C. Docket No. R-00870825, Moul Direct, p. 48)

About the same time, Mr. Moul, along with Joseph R. Brennan undertook a research project, funded by a consortium of 60 utilities, to "test" the underlying assumptions of the DCF. That research was published in the *Public Utilities Fortnightly*, under the title "Does the Constant Growth Discounted Cash Flow Model Portray Reality?" The premise of the article was: because the assumptions on which the DCF was based do not precisely mirror reality, the model is not reliable. Of course, that can be said of any equity cost estimation methodology and does not prove in any fashion that the DCF is not reliable. I have attached as Schedule 13, that article by Mr. Moul along with my reply to the article, which was also published by the *Public Utilities Fortnightly*. As I point out in my reply letter, Mr. Moul's article was merely an attempt to discredit the DCF, which was then and remains today, the pre-eminent cost of capital estimation methodology, and which was beginning to produce lower equity cost estimates as capital costs

fell through the 1980s. Moreover, this article serves a pattern for Mr. Moul's subsequent testimony: the DCF provides inaccurate estimates of the cost of equity.

For example, in a 1989 Pennsylvania American Water rate proceeding (Pa.P.U.C. Docket No. R-891208), Mr. Moul testifies that the DCF "provides results which understate the fair rate of return on common equity. This is because of undue investor optimism which has resulted in above normal stock market prices."(Pa.P.U.C. Docket No. R-891208, Moul Direct, p. 53) Mr. Moul elected to add 25 basis points to his DCF result in that case.

In 1992, in a Philadelphia Suburban water rate proceeding (Pa.P.U.C. Docket No. R-922476), Mr. Moul began a period in which he tried to downplay the usefulness of the DCF through reference to an article based on a Goldman Sachs study published in *The Wall Street Journal*. That study found that the stock price movements during the 1980s were only partially related to earnings and interest rates. Mr. Moul opined (in similar fashion to his *Fortnightly* article) that the study showed the DCF's assumptions are not representative of the market, and the DCF was not reliable.

Then, in 1994, Mr. Moul began to use the when-market-prices-exceed-book-value-the-DCF-understates-the-cost-of-equity logic that he uses today. I have discussed the flaws in that logic previously, and have shown why Mr. Moul's conclusion that market prices above book value do not affect the accuracy of a standard DCF equity cost estimate. When he first began to use his market-to-book rationale, Mr. Moul simply used it as a means to discount the DCF results in favor of other methods which produce higher results. It was also about this time that Mr. Moul added the "Comparable Earnings" analysis to his equity cost testimony (previously, he had relied on only the DCF and Risk Premium).

In a 1997 Pennsylvania-American Water Company case (Docket No. R-00016339), Mr. Moul provides his standard "problems with the DCF when market prices are above book value" and adds 50 basis points to his DCF growth rate due to "market wide factors." He does not, however, make any adjustment in that case for differences in "leverage" due to market prices exceeding book value.

Mr. Moul's latest upward adjustment to the DCF—his "leverage" adjustment—began to appear in his testimony after 1997. A review of Mr. Moul's testimonial history reveals that his latest upward adjustment to the DCF contradicts testimony he provided when market prices were below book value and, since that time, is simply another of many methods through which Mr. Moul has provided higher DCF equity cost estimates. As I have shown above, his "leverage" adjustment has no theoretical support in finance or economics; Mr. Moul, alone, pioneered this adjustment. In my view, with its focus on "fair value," it violates original cost ratemaking standards in Pennsylvania. It has been presented in 20 regulatory jurisdictions since Mr. Moul created it and accepted in only one—Pennsylvania. This Commission should reject Mr. Moul's unwarranted and unnecessary "leverage" adjustment to the market-based cost of equity capital.

Q. DOES THIS CONCLUDE YOUR COMMENTS REGARDING MR. MOUL'S "LEVERAGE ADJUSTMENT"?

A. Yes, it does.

Q. WHAT METHODS HAS COMPANY WITNESS MOUL USED TO DETERMINE EQUITY CAPITAL COSTS IN THIS PROCEEDING?

A. Mr. Moul has based his equity return recommendation for Duquesne Light's electric utility operations on a Discounted Cash Flow Analysis (DCF) analysis of a sample of electric companies. In addition, Mr. Moul presents the results of Risk Premium, CAPM and Comparable Earnings analyses as support for his recommendation that the Company be allowed to earn a return on equity capital of 11.75%.

Q. DO YOU HAVE CONCERNS REGARDING MR. MOUL'S APPLICATION OF EACH OF THE FOUR METHODOLOGIES HE USES TO ESTIMATE THE COST OF EQUITY CAPITAL FOR DLC?

A. Yes. There are deficiencies in each of Mr. Moul's equity cost estimation techniques. Mr. Moul's unadjusted DCF results for his electric sample group (9.66%) are only slightly higher

than my own. However, in addition to an unnecessary leverage adjustment, Mr. Moul also adds a 31 basis point upward adjustment for Duquesne's "small size." That adjustment is unnecessary for a Company that has approximately $1.5 Billion of total capital, as I will demonstrate below. Also, this adjustment is inconsistent with testimony filed by Mr. Moul in this jurisdiction. When Mr. Moul testified recently on behalf of Aqua Pennsylvania (Pa.P.U.C. Docket No. R-00051030), a company with a capitalization of $1.1 Billion (smaller than Duquesne Light), he added no additional increment to his DCF estimate for "size."

The Company witness' heavy reliance on risk premium-type methodologies (Mr. Moul gives both a Risk Premium and a CAPM analysis equal consideration with his DCF results) is also unwarranted and skews upward his recommendation. Even if one accepts the premise that long-term historical differences between stock and bond earned returns are representative of investors' current expectations, Mr. Moul's Risk Premium analysis produces results which are not representative of the long-term historical return difference between utility stocks and bonds.

With regard to the Company's CAPM analysis, Mr. Moul has used beta coefficients that are not published and, therefore, not representative of investor expectations. Also, those beta coefficients are unnecessarily biased upward. Mr. Moul's reliance on Comparable Earnings is misplaced because he assumes that the accounting returns of a sample of unregulated firms are equivalent to investors' current return requirements for electric utility expectations, and the Comparable Earnings equity return estimate is not representative of DLC's cost of equity capital.

Q. WHAT ARE YOUR COMMENTS REGARDING COMPANY WITNESS MOUL'S DCF ANALYSIS?

A. Mr. Moul's DCF analysis, without his unsupported "leverage" and "size" adjustments, produces cost of equity estimate of 9.66% for the electric company sample group (Moul Direct, p. 42).

Mr. Moul's upward "leverage" adjustment for financial risk differences that do not really exist is unjustified for many reasons. I have explained the flaws in that logic previously.

Mr. Moul's position regarding the size of Duquesne Light conflicts with testimony he has recently filed in Pennsylvania. In Docket No. R-00051030, testifying on behalf of Aqua Pennsylvania, Mr. Moul made no "size" adjustment to the market-based DCF results for that company. Yet, Aqua Pennsylvania is a smaller company than Duquesne Light. Also, Mr. Moul's "size" adjustment for DLC is not based on size, but on the difference in bond yields between single-A and triple-B utility bonds. However, Mr. Moul's electric utility sample group has similar bond ratings to DLH and no addition to the DCF cost of equity for bond rating differences is warranted.

Q. ARE THERE ADDITIONAL REASONS WHY A SIZE PREMIUM IS NOT APPROPRIATE IN REGULATED RATESETTING?

A. Yes there are. A size effect premium to the cost of equity in regulated rate proceedings is unwarranted for both theoretical and practical reasons. First, the evidence on which the "size effect" logic is based—the historical returns of large and small companies—suffers from "survivor bias." The studies that posit the existence of a consistently higher return for small companies (e.g., Ibbotson Associates data), are based on broad market indices such as the New York Stock Exchange (NYSE) Index. In order for a small company to break into a national stock index like the NYSE it has to be extremely successful. Therefore, it is reasonable to believe that the returns of the small companies being measured—the ones that ultimately get to be listed—are considerably higher than those of the many small firms that don't rise to a level high enough to be listed or that have failed altogether. There are many firms that succeed but don't make it to the "big board" as well as many firms that fail and go out of business. The returns of those less successful companies are not measured in the data set that forms the basis of the size premium theory, but surely must be considered possible outcomes for investors. Therefore, simply measuring a subset of the actual returns—the returns of the very successful small companies—does not accurately portray investor expectations with regard to all small companies.

Second, the "size effect" is also called the "January effect" because virtually all (about 90%) of the small stock effect occurs only in the month of January. This is a truly puzzling

phenomenon, which to my knowledge, has escaped theoretical explanation. Therefore, the "excess" returns that "size risk" proponents claim are attributable only to firms' size are also equally attributable to the month of January. If those data support regulatory action, then a return premium for a "small" firm would only be appropriate one month of the year—January. Of course, that would be neither a reasonable nor manageable course of action.

Third, the "size effect" has been extremely variable over the past 70 years, occurring in one period and not occurring in the next and more importantly, has disappeared over the past twenty years. On page 157 of its 2005 Valuation Edition of Stock, Bonds, Bills and Inflation, Ibbotson Associates indicates that over several of the most recent 20-year rolling periods, "small capitalization stocks have not outperformed large-capitalization stocks." In other words, in the most recent economic environment large company stocks have earned higher returns than small company stocks. Therefore, for more than the past 20 years the "size effect" has apparently been on hiatus.

Or, if one elects to subscribe to the size effect theory, then the most recent 20 to 25 years' experience indicates that large companies have earned higher returns and have higher risk than small companies. Following that more recent theory, since we are applying a rate of return to a "small" company (by Mr. Moul's assessment), a discount to the cost of capital must be applied to match investor expectations.

The unreliability of the "size effect" (also called the small-firm effect) is also confirmed in the financial literature:

> "This response to the small-firm effect is of particular interest because the small-firm effect has been called too time-period specific and overly dependent on the month of January for high returns. As an example of the time-period specificity, research has found that between 1975 and 1983, small-capitalization stocks averaged a 35.3 percent annual return, more than twice the 15.7 percent return of large-cap stocks. During the same time period, compounded total returns on small-cap stocks exceeded 1,400 percent [footnote omitted]. However, from 1984 to 1997, small-cap stocks (as defined by Ibbotson and Associates 1998) increased by 526.9 percent while large-cap stocks (S&P 500) were up 902.8 percent. When one strips the 1975-83 period out of the Ibbotson

and Associates data, small-cap stocks *fell* one-third below large-cap stocks from 1926 through 1997." (Block, S. B. "A Study of Financial Analysts: Practice and Theory," Association for Investment Management and Research, July/August 1999, pp. 86-92)

Fourth, the types of analyses performed by scholars that study the "size effect" examine market aggregates without regard to whether or not the companies included are from regulated or competitive industries. Even if one assumes the "size effect" is a valid theory, research has shown that it does not apply to regulated utility operations (Wong, A., "Utility Stocks and the Size Effect: An Empirical Analysis," Journal of the Midwest Finance Association, 1993, pp. 95-101).

In summary, the historical data on which the so-called size effect is based suffers from survivor bias that would cause the realized returns of small firms to be overstated. Also, that phenomenon where even very successful small firms earn higher returns than large firms has not existed for the last 20 years. The most recent investor experience then, is a time period in which large firms have out-earned small ones. Also, studies that have analyzed the historical return data of large and small *utility* operations have found no statistical differences in their returns, indicating that if a small firm effect does exist for other types of companies (a questionable premise in my view) it does not exist for utilities. No size risk premium is warranted.

Q. DOES THAT CONCLUDE YOUR COMMENTS REGARDING MR. MOUL'S DCF ANALYSIS?

A. Yes, it does.

Q. WHAT ARE YOUR COMMENTS ON THE MECHANICS OF THE RISK PREMIUM METHODOLOGY?

A. A fundamental precept on which the risk premium methodology is based holds that the higher risk of stocks over bonds requires an incrementally higher return for those stocks in order for investors to be compensated for assuming the higher risk (e.g., see Moul Direct, Appendix G,

p. G-1). Although that is generally true, it is most important to realize that, given a current bond yield of 6.5% for BBB-rated utilities, an equity return of 7%, 9% or even 15% would fulfill the requirement of providing "a premium" over debt costs. The real issue with a risk premium analysis is determining the premium with any precision. It is not a directly observable phenomenon and must be estimated.

There are two other fundamental tenets on which risk premium-type analyses are grounded which, when examined, indicate that this equity cost estimation methodology should not be given primary consideration in setting allowed rates of return. First, since risk premium analyses look backward in time, they assume "past is prologue." In other words, the investors' expectations for the future are assumed to mirror the average results they have experienced in the past. Second, implicit in the use of an average historical return premium of equities over debt is the assumption that the risk premium is constant over time. Neither of these assumptions on which the risk premium analysis rests is true.

Over time, risk premiums (the differences in historical returns between stock and bonds) vary greatly from period to period. The practical impact of the volatility of historical risk premium data is that with the selection of any particular period over which to average the historical data, virtually any risk premium result can be produced. The extreme volatility of the data that forms the basis of Mr. Moul's risk premium analysis is shown on his Schedule 12, page 1. Mr. Moul's Schedule 12 depicts the yearly return of the S&P Utility Index and the yearly return on the S&P Utility Bond Index from 1928 through 2005. The annual earnings for the S&P Utilities that fluctuate between +76% and –37% and annual returns for the Utility Bond Index that fluctuate between +33% and –11%.

In addition, the use of historical earned return data to estimate current equity capital costs has been questioned in the financial literature:

> "There are both conceptual and measurement problems with using I&S [historical return data] data for purposes of estimating the cost of capital. Conceptually, there is no compelling reason to think that investors expect the same relative returns that were earned in the past. Indeed, evidence presented in the following sections indicates that relative expected returns should,

> and do, vary significantly over time. Empirically, the measured historic premium is sensitive both to the choice of estimation horizon and to the end points. These choices are essentially arbitrary, yet they can result in significant differences in the final outcome." ("The Risk Premium Approach to Measuring a Utility's Cost of Equity," Brigham, Shome and Vinson, Financial Management, Spring 1985, p. 34)

It is important to note here that the type of data referenced in the quote above forms the basis of Mr. Moul's Risk Premium methodology.

Q. DO YOU HAVE ANY COMMENTS REGARDING MR. MOUL'S PARTICULAR APPLICATION OF THE RISK PREMIUM ANALYSIS?

A. Yes. In reaching his Risk Premium estimate, Mr. Moul adds the 77-year return difference between utility stocks and bonds to projected utility bond yields. To his credit, Mr. Moul has considered both arithmetic and geometric return differentials. However, Mr. Moul also considers what he calls "median" or middle-value return information, which is improper and leads to an overstatement of his risk premium.

The reason that Mr. Moul's "median" risk premium estimates should not be included in his analysis is that the "median" values come from different years—different eras, in fact—and cannot be said to be representative of any risk premium which might have existed in a cohesive economic environment. For example, the S&P Public Utility Index return median return is the average of returns that occurred in 1955 and 1981, while the Utility Bond return median is the average of returns that occurred in 1940 and 1961. Clearly, the difference between those two average values from four different years does not represent a meaningful or usable risk premium. Nevertheless, Mr. Moul averages that number in with his average risk premiums and, in so doing, overstates his result. Mr. Moul's data presented on page 2 of his Schedule 12 indicate that over the long-term, the return on the S&P Utilities exceeded bond returns by 4.2% (the average of the geometric and arithmetic means).

Q. DO YOU BELIEVE, THEN, THAT INVESTORS REQUIRE A 4.2% PREMIUM ABOVE UTILITY DEBT COSTS IN ORDER TO INVEST IN UTILITY EQUITIES?

A. No. There are several reasons to be cautious with regard to the direct application of historical average differences in earned returns for stocks and bonds as representative of investors' current expectations. First, earned returns do not represent expectations and expectations are the engine of the cost of capital.

Second, as I noted above, the historical record is quite volatile and the average risk premiums taken from that data should be used with caution. For example, the average earned return of the S&P Utilities shown on Mr. Moul's Schedule 11 is 11.02%, with a standard deviation of 22.67%. If we develop a standard two-standard-deviation confidence interval around that historical average return, according to a statistical view of the historical record, we can be 95% sure that the return on utility stocks will fall somewhere between –34.32% and +79.51% [11.02% ± 2 x 22.67%]. This Commission should not place much confidence in such a wide range of possibilities.

Third, a widely used source of historical return data, Ibbotson Associates notes that historical earned bond returns understate investor expectations. Because there has been an unanticipated capital loss over the historical period and because there is no apparent current premium to adjust for that occurrence, Ibbotson Associates warns that historical bond returns are biased downward as indicators of future expectations. Mr. Moul's risk premium analysis relies on historical bond returns, a parameter that understates investor expectations and, therefore, overstates the resultant risk premium.

Fourth, as I discussed in some detail in Section I of this testimony, there is additional evidence published relatively recently that shows that the risk premiums obtained from the time period studied by Mr. Moul are exaggerated. Moreover, those studies show that a more normal risk premium between stocks and bonds ranges from 2% to 3% (Siegel, J., Stocks for the Long Run, 1994, Irwin, Chicago IL, p. 20). In that regard, a risk premium at lower end of that range, 2%, which would be appropriate for less-risky utilities, added to Mr. Moul's projected 6.5%

utility bond yield would produce a cost of equity estimate of 8.5%—well below the lower end of my range of equity cost estimates for DLC.

Q. WHAT ARE YOU COMMENTS REGARDING MR. MOUL'S CAPM ANALYSIS?

A. In his CAPM analysis Mr. Moul used betas that are adjusted for differences in leverage between market capital structures and book value capital structures. As I described in detail above, that "adjustment" is theoretically unsound and serves, here, to unnecessarily inflate the CAPM result.

Second, it is important to recall that beta is a relatively poor measure of risk. Mr. Moul has admitted that fact in prior testimony:

> "Merrill Lynch also provides the coefficient of determination (R^2) which indicates the percent of price fluctuation in the stock which can be attributed to the fluctuation in the S&P Composite Index. Since the coefficients of determination are low [for the utilities studied], it is apparent that the vast majority of the investment risk is unsystematic and hence not explained by beta." (Moul Direct Testimony on behalf of Hope Gas, W.V.P.S.C. Case No. 98-0001-G-42T, p. 20)

As I note in my testimony, the failings of beta are well documented in the financial literature, and CAPM cost of equity estimates should be used with caution.

Third, unlike his Risk Premium analysis noted above, Mr. Moul has failed to consider geometric average historical risk premiums and, because of that fact, has overstated that parameter as well. As shown in Mr. Moul's Schedule 13, page 6, Ibbotson Associates publishes the geometric averages right next to the arithmetic averages, and both should be considered in this analysis. Mr. Moul uses only the 6.5% arithmetic average and ignores the 5.1% geometric average market risk premium also published by Ibbotson, thereby overstating his resulting CAPM cost of equity estimate.[30] Averaging those two measures of historical risk premium produces a risk premium of 5.8%. Multiplying that market risk premium by Mr. Moul's actual

[30] Recall that in his Risk Premium analysis, Mr. Moul does average the geometric risk premium average with his arithmetic average, but he fails to do so in his CAPM analysis.

electric sample group beta published by Value Line (0.74) and adding his selected risk-free rate (5.5%) to that product, produces a CAPM estimate of the cost of equity capital of 9.8% [5.5% + 0.74(5.8%) = 9.79%]. That result is close to the upper end of a reasonable range of equity cost for electric and gas companies as determined in Section III of this testimony.

Fourth, according substantial current research in the field of financial economics, the Ibbotson historical market risk premium data used by Mr. Moul (and myself) in the CAPM analysis are likely to overstate investors' current expectations. Even Ibbotson's most recent publication on the subject (previously cited) indicates an expected return on the broad stock market of 9.37%. Those data indicate that even Mr. Moul's corrected CAPM result, cited above (9.79%) for a T&D utility operation, is too high.

Finally, Mr. Moul also uses Value Line's current dividend yield and appreciation potential projection for the stock market to project a DCF-type total return for stocks. From that he subtracts the risk-free rate of return to provide another estimate of the market risk premium for use in his CAPM analysis. At the time he prepared his testimony Value Line projected a 45% price appreciation potential for the stock market. Value Line's current projections are for a price appreciation of 40%[31]. Using that number, along with Value Line's current dividend yield of 1.6% for those same stocks, the total market return (calculated in the same manner as shown in Mr. Moul's Appendix H) is 10.38%. That current total market return less Mr. Moul's projected risk free rate of 5.5%, produces a market risk premium of 4.88%. In turn, that market risk premium produces a current CAPM result of 9.1%, using Mr. Moul's own methodology and recent projections from Value Line.

Q. DOES THIS CONCLUDE YOUR COMMENTS ON MR. MOUL'S CAPM ANALYSIS?

A. Yes, it does.

31 Value Line, *Summary & Index*, May 5, 2006.

Q. WHAT ARE YOUR COMMENTS ON COMPANY WITNESS MOUL'S COMPARABLE EARNINGS ANALYSIS?

A. Witness Moul's Comparable Earnings analysis suffers from a fundamental flaw: the accounting or book returns on common equity of a firm do not represent the cost of equity capital to that firm. Accounting returns are not based on opportunity costs. In other words, they do not represent what investors could earn in the marketplace on investments of similar risk. If rates are to be cost based, then the allowed profit levels (the return allowed on equity capital) must represent the cost to the company of that type of capital. Accounting returns, or the returns on book value, do not measure the forward-looking cost of capital to the utility.

Also, Mr. Moul's suggestion that this Commission allow the Company to earn a return on equity which is based on expected accounting returns ignores the past twenty-five years of regulation in which accounting-based equity cost estimation techniques (comparable earnings) were supplanted by market-based methods. The latter (particularly the DCF) came into widespread use because they simply work better than accounting-based methods and more accurately identify the cost of equity capital.

Moreover, a comparable earnings standard of ratesetting actively ignores the actions of capital markets and the information that may be gleaned from those markets in estimating the cost of capital. If interest rates rise or fall by substantial amounts, the opportunity cost of capital and the allowed profitability of utilities should also change, generally, in the same direction. However, if the focus of allowed returns becomes accounting returns, no particular change would be warranted by a shift in interest rate levels. For example, if interest rates jumped up by 2%, capital costs for the utility would rise and, with higher costs the utility's profitability would be impaired—the return on book value would fall. If, in that situation, regulators set equity returns by considering future accounting returns, they would recommend that the utility's profit levels be lowered as a result of an increase in interest rates. Clearly, such a situation based on regulation, which is dependent on accounting returns, would be economically inefficient, would send the wrong signals to both management and stockholders and fail to ensure financial integrity for the

utility over the long term. Setting allowed rates of return by relying on either actual or projected accounting returns (returns on book value) is not a reasonable ratemaking strategy.

Finally, the companies Mr. Moul used in his Comparable Earnings (CE) analysis are not regulated utility companies and, thus are exposed to competitive risks to which the electric utility operations of DLC are not. Some of Mr. Moul's "similar risk" companies are Anheuser Busch, Chevron, Coca-Cola, General Dynamics and NIKE, Inc. While the Company witness has selected his CE sample group based on some risk parameters, one important risk parameter excluded from consideration in that selection process was market share. It is reasonable to believe, therefore, that the sample group on which Mr. Moul's CE results are based has a risk profile that is greater than that of DLC's electric utility T&D operations, and the results of that analysis substantially overstate the Company's actual cost of equity.

Q. DOES THIS CONCLUDE YOUR COMMENTS ON THE PRE-FILED DIRECT TESTIMONY OF COMPANY WITNESS MOUL?

A. Yes, it does.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY, MR. HILL?

A. Yes, it does.

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BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITIES COMMISSION

v.

DUQUESNE LIGHT COMPANY

DOCKET NO. R-00061346

APPENDICES AND SCHEDULES
TO THE
DIRECT TESTIMONY
OF
STEPHEN G. HILL

ON BEHALF OF

THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

JULY 7, 2006

APPENDIX A

EDUCATION AND EMPLOYMENT HISTORY
OF
STEPHEN G. HILL

EDUCATION

Auburn University - Auburn, Alabama - Bachelor of Science in Chemical Engineering (1971); Honors - member Tau Beta Pi national engineering honorary society, Dean's list, candidate for outstanding engineering graduate; Organizations - Engineering Council, American Institute of Chemical Engineers

Tulane University - New Orleans, Louisiana - Masters in Business Administration (1973); concentration: Finance; awarded scholarship; Organizations - member MBA curriculum committee, Vice-President of student body, academic affairs

Continuing Education - NARUC Regulatory Studies Program at Michigan State University

EMPLOYMENT

West Virginia Air Pollution Control Commission (1975)
Position: Engineer ; Responsibility: Overseeing the compliance of all chemical companies in the State with the pollution guidelines set forth in the Clean Air Act.

West Virginia Public Service Commission-Consumer Advocate (1982)
Position: Rate of Return Analyst ; Responsibility: All rate of return research and testimony promulgated by the Consumer Advocate; also, testimony on engineering issues, when necessary.

Hill Associates (1989)
Position: Principal; Responsibility: Expert testimony regarding financial and economic issue in regulated industries.

PUBLICATIONS

"The Market Risk Premium and the Proper Interpretation of Historical Data," Proceedings of the Fourth NARUC Biennial Regulatory Information Conference, Volume I, pp. 245-255.
"Use of the Discounted Cash Flow Has Not Been Invalidated," Public Utilities Fortnightly, March 31, 1988, pp. 35-38.

MEMBERSHIPS

American Institute of Chemical Engineers; Society of Utility and Regulatory Financial Analysts (Certified Rate of Return Analyst, Member of the Board of Directors)

APPENDIX B

Q. PLEASE PROVIDE AN EXAMPLE WHICH DESCRIBES THE DETERMINANTS OF LONG-TERM SUSTAINABLE GROWTH.

A. Assume that a hypothetical regulated firm had a first period common equity or book value per share of $10, the investor-expected return on that equity was 10% and the stated company policy was to pay out 60% of earnings in dividends. The first period earnings per share are expected to be $1.00 ($10/share book equity x 10% equity return) and the expected dividend is $0.60. The amount of earnings not paid out to shareholders ($0.40), the retained earnings, raises the book value of the equity to $10.40 in the second period. The table below continues the hypothetical for a five year period and illustrates the underlying determinants of growth.

TABLE A.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.25	$11.70	4.00%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	$1.00	$1.040	$1.082	$1.125	$1.170	4.00%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH.	$0.60	$0.624	$0.649	$0.675	$0.702	4.00%

We see that under steady-state conditions, the earnings, dividends and book value all grow at the same rate. Moreover, the key to this growth is the amount of earnings retained or reinvested in the firm and the return on that new portion of equity. If we let "b" equal the retention ratio of the firm (1 – the payout ratio) and let "r" equal the firm's expected return on equity, the DCF growth rate "g" (also referred to as the internal or sustainable growth rate) is equal to their product, or

$$g = br. \qquad (i)$$

Professor Myron Gordon, who developed the Discounted Cash Flow technique and first

introduced it into the regulatory arena, has determined that Equation (i) embodies the underlying fundamentals of growth and, therefore, is a primary measure of growth to be used in the DCF model. Professor Gordon's research also indicates that analysts' growth rate projections are useful in estimating investors' expected sustainable growth.

I should note here that the above hypothetical does not allow for the existence of external sources of equity financing, i.e., sales of common stock. Stock financing will cause investors to expect additional growth if the company is expected to issue new shares at a market price that exceeds book value. The excess of market over book would inure to current shareholders, increasing their per share equity value. Therefore, if the company is expected to continue to issue stock at a price that exceeds book value, the shareholders would continue to expect their book value to increase and would add that growth expectation to that stemming from earnings retention or internal growth. Conversely, if a company were expected to issue new equity at a price below book value, that would have a negative effect on shareholder's current growth rate expectations. In such a situation, shareholders would perceive an overall growth rate less than that produced by internal sources (retained earnings). Finally, with little or no expected equity financing or a market-to-book ratio near unity, investors would expect the sustainable growth rate for the company to equal that derived from Equation (i), "g = br." Dr. Gordon[1] identifies the growth rate which includes both expected internal and external financing as:

$$g = br + vs, \qquad \text{(ii)}$$

where,

g = DCF expected growth rate,
r = return on equity,
b = retention ratio,
v = fraction of new common stock sold that accrues to the current shareholder,
s = funds raised from the sale of stock

[1]Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, 1974, pp., 30–33.

as a fraction of existing equity.

Additionally,

$$v = 1 - BV/MP, \qquad \text{(iii)}$$

where,

MP = market price,
BV = book value.

I have used Equation (iii) as the basis for my examination of the investor expected long-term growth rate (g) in this proceeding.

Q. IN YOUR PREVIOUS EXAMPLE, EARNINGS AND DIVIDENDS GREW AT THE SAME RATE (br) AS DID BOOK VALUE. WOULD THE GROWTH RATE IN EARNINGS OR DIVIDENDS, THEREFORE, BE SUITABLE FOR DETERMINING THE DCF GROWTH RATE ?

A. No, not necessarily. Rates of growth derived from earnings or dividends alone can be unreliable due to extraneous influences on those parameters such as changes in the expected rate of return on common equity or changes in the payout ratio. That is why it is necessary to examine the underlying determinants of growth through the use of a sustainable growth rate analysis.

If we take the hypothetical example previously stated and assume that, in year three, the expected return on equity rises to 15%, the resultant growth rate for earnings and dividends far exceeds that which the company could sustain indefinitely. The potential error in using those growth rates to estimate "g" is illustrated in the following table.

TABLE B.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.47	$12.157	5.00%
EQUITY RETURN	10%	10%	15%	15%	15%	10.67%
EARNINGS/SH.	$1.00	$1.040	$1.623	$1.720	$1.824	16.20%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH.	$0.60	$0.624	$0.974	$1.032	$1.094	16.20%

What has happened is a shift in steady-state growth paths. For years one and two, the sustainable rate of growth (g=br) is 4.00%, just as in the previous hypothetical. Then, in the last three years, the sustainable growth rate increases to 6.00% (g=br = 0.4x15%). If the regulated firm were expected to continue to earn a 15% return on equity and retain 40% of its earnings, then a growth rate of 6.0% would be a reasonable estimate of the long-term sustainable growth rate. However, the compound annual growth rate for dividends and earnings exceeds 16% which is the result only of an increased equity return rather than the intrinsic ability of the firm to grow continuously at a 16% annual rate. Clearly, this type of estimate of future growth cannot be used with any reliability at all. In the case of the hypothetical, to utilize a 16% growth rate in a DCF model would be to expect the company's return on common equity to increase by 50% every five years into the indefinite future. This would be a ridiculous forecast for any regulated firm and underscores the importance of utilizing the underlying fundamentals of growth in the DCF model.

It can also be demonstrated that a change in our hypothetical regulated firm's payout ratio makes the past rate of growth in dividends an unreliable basis for predicting "g". If we assume our regulated firm consistently earns its expected equity return (10%) but in the third year, changes its payout ratio from 60% to 80% of earnings, the results are shown in the table below.

TABLE C.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.036	$11.26	3.01%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	$1.00	$1.040	$1.082	$1.104	$1.126	3.01%
PAYOUT RATIO	0.60	0.60	0.80	0.80	0.80	7.46%
DIVIDENDS/SH.	$0.60	$0.624	$0.866	$0.833	$0.900	10.67%

What we see here is that, although the company has registered a high dividend growth rate (10.67%), it is, again, not at all representative of the growth that could be sustained indefinitely, as called for in the DCF model. In actuality, the sustainable growth rate has declined from 4.0% the first two years to only 2.0% (g=br = 0.2x10%) during the last three years due to the increased payout ratio. To utilize a 10% growth rate in a DCF analysis of this hypothetical regulated firm would 1) assume the payout ratio of the firm would continue to increase 33% every five years into the indefinite future, 2) lead to the highly implausible result that the firm intends to consistently pay out more in dividends than it earns and 3) grossly overstate the cost of equity capital.

APPENDIX C
SAMPLE COMPANY GROWTH RATE ANALYSES

ELECTRIC UTILITIES

CV – Central Vermont Public Service - CV's sustainable growth rate has averaged 2.28% over the most recent five year period (2001-2005), including a set-back with low growth in 2001. Value Line expects CV's sustainable growth to rise above that historical growth rate level and reach 5.8% by the 2009-2011 period. CV's book value growth rate is expected to be "nmf" (not meaningful) over the next five years, due to write offs. The per share book value in 2009-2011 is expected to approximate the book value in 2005. Book value increased at a 3% rate of growth over the past five years. CV's earnings per share are projected to increase at a 5.0% (Value Line) rate (Reuters and Zack's do not publish growth rate expectations for this company). Over the past five years, CV's earnings growth was 8.5% but its dividends increased at only a 0.5% rate. Investors can reasonably expect long-term sustainable growth rate in the future to be higher than the past but not as high as the company's current internal (b x r) growth projections; a growth rate of **4.0%** is reasonable for CV.

Regarding share growth, CV's shares outstanding increased at a 1.45% rate over the past five years. The growth in the number of shares is projected by Value Line to decline dramatically through the 2009-11 period due to a stock buy-back program initiated in 2006 and financed by the sale of one of the company's unregulated subsidiaries. An expectation of share growth of **0%** for this company is reasonable.

FE – FirstEnergy Corp. - FE's sustainable growth rate averaged 3.16% over the five-year historical period, with negative results in 2003. Absent those recent results, the company's historical sustainable growth was 4%. Value Line projects that the internal growth will increase through 2009-11, which will bring sustainable growth to 4.95%. FE's book value, which increased at a 6% rate during the most recent five years, however, is expected to decline slightly to a 5.5% rate in the future. FE's earnings per share are projected to increase at 8.5% (Value Line) to 4.38% (Reuters), and 4.8% (Zack's) rates, indicating the variability of that growth rate measure. Value Line's projections are largely a function of it's three-year averaging technique, which includes FE's 2003 results in which it paid out more in dividends that it took in earnings, thereby depressing the base year average and causing the projected earnings to overstate long-term expectations. FE's dividends are expected to grow at a 4.5% rate, moderating long-term growth expectations to some extent. Historically FE's earnings grew at a 1% rate, according to Value Line, and its dividends showed 2% growth over the past five years. On a compound growth rate basis using 2005 projections as the final year, FE's earnings grew at about a 4% rate historically. The projected sustainable growth, earnings and book value growth rate data indicate that investors can expect the growth from FE in the future to be higher than that which has existed in the past. Investors can reasonably expect a sustainable growth rate of **5.00%** for FE.

Regarding share growth, FE's shares outstanding showed a 2.6% increase over the past five years. However, FE's growth rate in shares outstanding is expected to fall to a 0% rate of increase through 2009-11. Those projections indicate that future share growth will be below past averages. An expectation of share growth of **0.5%** for this company is reasonable.

GMP – Green Mountain Power – GMP's sustainable growth rate has averaged 6.67% over the most recent five-year period. Value Line expects GMP's sustainable growth to decline to approximately 4.2% by the 2009-2011 period. GMP's book value growth rate is expected to be 3% over the next five years, up from the -0.5% rate of growth experienced over the past five years, but below sustainable growth projections. Also, GMP's earnings per share are projected to increase at 3.5% according to Value Line. That investor service projects an 11% growth in dividends, following a 6% decline for the previous five years. Also Value Line shows an historical earnings growth of 37% due to the inclusion of negative earnings in 1998 in the base-year calculation. The 5-year compound rate of earnings growth for this company is 3.2%. Investors can reasonably expect a lower sustainable growth rate in the future — **5%** for GMP is reasonable.

Regarding share growth, GMP's shares outstanding declined at approximately a 2% rate over the past five years. The number of shares is expected to grow at a 1.1% rate through 2009-11. An expectation of share growth of **0%** for this company is reasonable.

PGN- Progress Energy- PGN's sustainable growth rate has averaged 3.60% over the most recent five-year period. Value Line expects PGN's sustainable growth to decline to a growth rate level of 2.5% by the 2009-2011 period. PGN's book value growth rate is also expected to decline to 2.5% over the next five years, well below the 8.5% rate of growth experienced over the past five years, pointing to lower growth. Also, PGN's earnings per share are projected to increase at 0% (Value Line) to 3.14% (Reuters), to 3.8% (Zack's) rate—bracketing the indicated projected internal growth rate. Also, PGN's dividends are expected to grow at 2%, above earnings growth rate expectations and below historical dividend growth of 3%. Investors can reasonably expect a sustainable growth rate in the future of **3.0%** for PGN.

Regarding share growth, PGN's shares outstanding increased at approximately a 3.6% rate over the past five years. The number of shares outstanding in 2009-2011 is expected to show about a 0.7% increase from 2004 levels. That increase will leave the total number of shares at a lower level than existed in 2000. An expectation of share growth of **1.5%** for this company is reasonable.

AEE – Ameren Corp. - AEE's sustainable growth rate has averaged 1.8% over the most recent five year period (2001-2005), with a clear declining trend. Value Line expects AEE's sustainable growth to improve a bit over recent low growth rate levels and reach 2.5% by the 2009-2011 period. AEE's book value growth rate shows stability and is expected to be 4.5% over the next five years, just above the 4% rate of growth experienced over the past five years, but well above internal growth projections. Also, AEE's earnings per share are projected to increase at a 2.5% (Value Line) rate. Reuters and Zacks project 5.17% and 6% earnings growth for AEE, respectively. AEE's dividends are expected to show no growth over the next five years, after growing at a 0% rate the previous five years, according to Value Line. Over the past five years, AEE's earnings growth was 1.5%. Based on projected earnings and book value growth, investors can reasonably expect long-term sustainable growth rate in the future to be higher than the internal growth projections published by Value Line; a growth rate of **3.75%** is reasonable for AEE.

Regarding share growth, AEE's shares outstanding increased at a 10.4% rate over the past five years due to a series of equity issuances. The growth in the number of shares is projected by Value Line to increase at about a 1.1% rate between 2004 and the 2009-11 period. An expectation of share growth of **2.5%** for this company is reasonable.

CNL – Cleco Corp. - CNL's sustainable growth rate averaged 4.56% for the five-year period, with the results in the most recent years below that average. Value Line expects sustainable growth to continue at about a 4% level through the 2009-11 period. CNL's book value growth is expected to increase at a 8% rate, above the historical level of 4%, due to the building of a new power plant. CNL's earnings per share is projected to show 4.5% growth over the next five years, and its dividends are expected to show 2% growth, according to Value Line (Reuters & Zacks project 8% earnings growth). Historically CNL's earnings increased at a 1% rate and its dividends increased at a 2% rate of growth, according to Value Line. These data indicate that future growth will be above prior growth rate averages. Investors can reasonably expect sustainable growth from CNL to be below past averages; a sustainable internal growth rate of **5.0%** is reasonable for this company.

Regarding share growth, CNL's shares outstanding grew at approximately a 2.7% rate over the past five years. The growth in the number of shares is expected by Value Line to be 6.3% through 2009-11. An expectation of share growth of **4%** for this company is reasonable.

DPL – DPL, Inc.- DPL's sustainable growth rate has averaged 4.34% over the most recent five-year period. Value Line expects DPL's sustainable growth to increase to approximately 7% by the 2009-2011 period. DPL's book value growth rate is expected to be 2% over the next five years, up substantially from the -3% rate of growth experienced over the past five years. Also, DPL's earnings per share are projected to increase at a rate of from 5.5% (Reuters and Value Line), to 7% (Zack's). Over the past five years, DPL's earnings growth was -1% according to Value Line. Historically, dividends grew at only a 0.5% rate, and Value Line expects that rate to increase to 3% over the next five years. Investors can reasonably expect a higher sustainable growth over the long term – **6.5%** for DPL is reasonable.

Regarding share growth, DPL's shares outstanding increased at a 0.3% rate over the past five years. The number of shares is expected to decline at a 2.1% rate through 2009-11. An expectation of share growth of **0%** for this company is reasonable.

EDE – Empire District Electric - EDE's sustainable internal growth rate averaged –2% over the five-year historical period, with several negative growth years. Value Line projects EDE's sustainable growth to rise to a level of only 1.4% through 2009-11—a substantial improvement over historical results. EDE's book value growth rate is expected to continue in the future at 1.5%, similar to the historical level of 2%. However, EDE's earnings per share are projected to increase at 5.5% according to Value Line, while the analysts' surveyed by Reuters project earnings growth at 2%, a wide differential. EDE's dividends are expected to remain at a constant level over the next five years (i.e., showing 0% growth), and moderating long-term growth expectations. Sustainable growth has been relatively inconsistent for this company, historically and is expected to trend upward in the future. Dividend growth has been non-existent, but the company has continued to pay its dividend. Also, Value Line's earnings growth projection is skewed upward by their inclusion of the company's poor 2004 earnings in its "base" three-year period. From 2003 through the mid-point of the 2009-2011 period, Value Line's projected earnings per share indicate a 5% growth rate. Investors can reasonably expect a sustainable growth rate of **3.5%** from EDE.

Regarding share growth, EDE's shares outstanding grew at about a 7% rate over the past five years, due primarily to a large equity issuance in 2002. The level of share growth is expected by Value Line to drop to 2.8% through 2009-11. An expectation of share growth of **4%** for this company is reasonable.

ETR – Entergy Corp. - ETR's internal sustainable growth rate has averaged 5.79% over the most recent five year period (2001-2005). Sustainable growth is expected to decline to about 5% by the 2009-2011 period. Also, ETR's book value growth rate is expected to be 4.5% over the next five years—a decrease from the 5.5% rate of growth experienced over the past five years—pointing to somewhat lower growth expectations for the future. ETR's earnings per share are projected to increase at a rate of from about 5% (Value Line) to 7.4% (Zack's) to 6.8% (Reuters). After showing low growth historically ETR's dividends are expected to grow at a high 8% rate, supporting higher sustainable growth expectations. Over the past five years, ETR's earnings grew at a 11% rate according to Value Line (8% on a compound growth basis) while its dividends showed 1.5% growth. These data indicate that investors can reasonably expect a sustainable growth rate in the future below past averages; however, the earnings growth projections are above historical sustainable growth. Therefore, **6.0%** is a reasonable long-term growth expectation for ETR.

Regarding share growth, ETR's shares outstanding grew at a –1.7% rate over the past five years. The number of shares outstanding is projected by Value Line to continue to decline at approximately a 0.2% rate through 2009-11. An expectation of share growth of **–0.25%** for this company is reasonable.

HE – Hawaiian Electric - HE's sustainable growth rate has averaged 1.97% over the most recent five year period (2001-2005), with lower growth in the most recent year, indicating a decreasing trend. However, Value Line expects HE's sustainable growth to increase from that historical growth rate level to reach 3% by the 2009-2011 period. Also, HE's book value growth rate is expected to be 2.5% over the next five years, down from the 3% rate of growth experienced over the past five years. HE's earnings per share are projected to increase at a 3% (Value Line) to 5.2% (Zack's) to 2.9% (Reuters) rate. The company's dividends are expected to show 0% growth over the next five years. Over the past five years, HE's earnings grew at a 1% rate while its dividends showed no increase. Investors can reasonably expect a sustainable growth rate in the future of **3.5%** for HE.

Regarding share growth, HE's shares outstanding grew at a 3.27% rate over the past five years. The number of shares is projected by Value Line to show a 0.25% rate of increase through the 2009-11 period. An expectation of share growth of **1%** for this company is reasonable.

PNM Resources – PNM - PNM's sustainable growth rate has averaged 5.37% over the most recent five year period with a declining trend. Value Line expects PNM's sustainable growth to fall below that historical average growth rate level to about 3.5% by the 2009-2011 period. PNM's book value growth rate is expected to be 4% over the next five years, similar to the 4.5% rate of growth experienced over the past five years. Those data indicate stable growth. Also, PNM's earnings per share are projected to increase at a 5.5% (Value Line) to 8.3% (Zacks) to 10.3% (Reuters) rate. Its dividends are expected to grow at 8.5%, increasing long-term growth rate expectations. Over the past five years, PNM's earnings growth was -1% while its dividends increased at a 5% rate. Investors can reasonably expect a sustainable growth rate in the future of **5.75%** for PNM.

Regarding share growth, PNM's shares outstanding increased at a 4% rate over the past five years. The number of shares outstanding in 2009-2011 is expected to increase at about a 1.5% rate from 2005 levels. An expectation of share growth of **2%** for this company is reasonable.

Pinnacle West – PNW - PNW's sustainable growth rate has averaged 3.22% over the most recent five-year period with a downward trend. Value Line expects PNW's sustainable growth to fall below that historical average growth rate level to 2.84% by the 2009-2011 period. PNW's book value growth rate is expected to be 3.5% over the next five years, just below the 4% rate of growth experienced over the past five years, indicating relatively stable growth expectations for this firm. PNW's earnings per share is projected to increase at a 6% (Value Line and Reuters) to 6.8% (Zack's) rate—all well above the indicated internal growth rate. PNW's dividends are expected to grow at a 5% rate, supporting higher long-term growth rate expectations. Over the past five years, PNW's earnings growth was –4.5% while its dividends increased at a 6.5% rate. Investors can reasonably expect a sustainable growth rate in the future of **5.0%** for PNW.

Regarding share growth, PNW's shares outstanding increased at approximately a 4% rate over the past five years due to a share issuance in 2002. The number of shares outstanding in 2009-2011 is expected to show a 0% increase from 2005 levels. An expectation of share growth of **1%** for this company is reasonable.

UNS – Unisource Energy - UNS's sustainable growth rate has averaged 5.29% over the most recent five year period. Value Line expects UNS's sustainable growth to decline below that historical growth rate level, to about 3.5%, by the 2009-2011 period. UNS's book value growth rate is expected to be 5% over the next five years, below the very high 12% rate of growth experienced over the past five years. UNS's earnings per share are projected to increase at a rate of 7% (Value Line). Zack's and Reuters do not report projected earnings growth for this company. Its dividends are expected to grow more rapidly, at a 9.5% rate—catching up from an historical growth rate of 0%. Over the past five years, UNS's earnings growth was 5%. Investors can reasonably expect a sustainable growth rate in the future to be similar to that of the past and **5.0%** is reasonable for UNS.

Regarding share growth, UNS's shares outstanding increased at approximately a 1% rate over the past five years. That rate of increase is expected to decline in the future to a 1.2% rate through 2009-2011. An expectation of share growth of **1%** for this company is reasonable.

GAS DISTRIBUTORS

ATG - AGL Resources - ATG's sustainable growth rate has averaged 5.49% over the most recent five year period (2001-2005). Value Line expects ATG's sustainable growth to fall below that historical growth rate level and to reach 4.75% by the 2009-2011 period. ATG's book value growth rate is expected to be 6% over the next five years, a decrease from the 6% rate of growth experienced over the past five years. Also, ATG's earnings per share are projected to increase at a 4.57% (Reuters), 4.5% (Zack's) to 4% (Value Line) rate— below historical growth and similar to the projected sustainable growth rate—and its dividends are expected to show 6.5% annual growth over the next five years. Over the past five years, ATG's earnings showed 13.50% growth (as the company acquired other large distribution operations and expanded its energy trading business), while its dividends increased at only a 2% rate. Investors can reasonably expect a sustainable growth rate in the future of **5.0%** for ATG.

Regarding share growth, ATG's shares outstanding increased at approximately a 9% rate over the past five years, due to merger activity. The number of shares is projected by Value Line to increase at about a 0.1% rate between 2005

and the 2009-11 period. An expectation of share growth of **1%** for this company is reasonable.

ATO – Atmos Energy Corp - ATO's sustainable growth rate averaged only about 2.2% for the five-year historical period. Value Line projects increasing growth in 2006 and 2007, and then a rise by the 2009-11 period to a level near 4.8%, through an increasing ROE and earnings retention. However, ATO's book value growth during the most recent five years (8.5%) is expected to moderate to a 5% rate in the future. ATO's earnings per share are projected to increase at a 7% (Value Line) to 4.8% (Reuters) to 5.5% (Zack's) rate, but its dividends are expected to grow at only a 2% rate, moderating long-term growth expectations. Value Line's earnings growth rate expectation is due, largely, to the inclusion of 2004's poor results in the "base period" earnings measurement and, as a result, would not represent investors' expectations for a sustainable growth rate. Historically ATO's earnings have shown 6.5% growth, while its dividends increased at a 2.0% rate. Investors can reasonably expect a sustainable growth rate higher than that established historically, but not as high as the earnings growth projected by Value Line; **4.25%** is a reasonable expectation for this company.

Regarding share growth, ATO's shares outstanding grew at approximately an 18% rate over the past five years due to merger activity. The number of shares is expected to grow at approximately a 4.5% rate through 2009-11. An expectation of share growth of **5%** for this company is reasonable.

CGC - Cascade Natural Gas Company - CGC's sustainable growth rate averaged 1.2% over the five-year historical period with the company paying out more in dividends that it had in earnings in 2003 and 2005. By 2009-11, sustainable growth is projected to approximate 3%. However, CGC's book value, which showed no increase during the most recent five years, is expected to increase at a 10.5% rate in the future, well above the sustainable growth projection. CGC's earnings per share are projected to increase at a 8.5% (Value Line) and 3.5% (Reuters) rate, but its dividends are expected to grow at only a 0.5% rate. Historically CGC's earnings declined at a 3.5% rate, according to Value Line and its dividends showed 0% growth. The projected sustainable growth indicates declining growth for this company, however earnings and book value growth rate data indicate that investors can expect the growth from CGC to be higher in the future than has existed in the past. Investors can reasonably expect a sustainable growth rate of **4%** for CGC.

Regarding share growth, CGC's shares outstanding showed a 0.8% increase over the past five years. CGC's growth rate in shares outstanding is expected to rise at about a 1.8% rate of increase through 2009-11. Those projections indicate that future share growth will be above past averages. An expectation of share growth of **1%** for this company is reasonable.

LG – Laclede Group - LG's sustainable growth rate has averaged 1.8% over the most recent five year period, with much higher growth in the most recent year—indicating an upward trend. Value Line expects LG's sustainable growth to rise above that historical growth rate level and reach 6% by the 2009-2011 period. LG's book value growth rate is expected to be 5% over the next five years, up from the 2.5% rate of growth experienced over the past five years. Also, LG's earnings per share are projected to increase at a 4.0% (Reuters) to 7% (Value Line) rate—bracketing the indicated sustainable growth rate. However, its dividends are expected to grow at 2%. Over the past five years, LG's earnings growth was 4.5%

while its dividends increased at a 0.5% rate. Investors can reasonably expect a sustainable growth rate in the future of **4.5%** for LG.

Regarding share growth, LG's shares outstanding increased at approximately a 2.9% rate over the past five years, with equity issuances recently. The number of shares outstanding in 2009-2011 is expected to have increased at a rate of 2.5% from 2005 levels. An expectation of share growth of **2.5%** for this company is reasonable.

NJR - New Jersey Resources - NJR's sustainable growth rate averaged 7.18% over the most recent five-year period, with an increasing trend. Value Line projects, by the 2009-11 period, sustainable growth will approximate 7%. NJR's projected book value also indicates stability -- book value grew at a 7% rate during the most recent five years and is expected to rise at an 8% rate in the future, according to Value Line. Value Line projects a rate of earnings increase for NJR of 4.5%, while Reuters projects 5.2% and Zack's projects 6.0%--all of those estimates are below sustainable growth projections. Dividends are expected to grow at a 4.5% rate, moderating long-term growth expectations slightly. Historically NJR's earnings grew at an 8.5% rate while its dividends increased at a 3% rate. Therefore, like many other gas distributors, NJR's earnings can not be expected to support dividend increases at the same rate. Investors can reasonably expect a long-term sustainable growth rate of **6.5%.**

Regarding share growth, NJR's shares outstanding grew at a 0.8% rate over the past five years. The five-year average level of share growth is expected to decrease at approximately 1% annually through 2009-11. An expectation of share growth of **0%** for this company is reasonable.

GAS – Nicor, Inc. - GAS's sustainable growth rate averaged 3.98% over the five-year historical period with a decreasing trend. Value Line projects sustainable growth through 2009-11 near historical averages, 3.6%. GAS's book value, which increased at a 1% rate during the most recent five years, is expected to increase to a 3.5% rate in the future, above historic rates and near the sustainable growth projection. GAS's earnings per share are projected to increase at 4% (Value Line) 3.1% (Reuters) rate and 3.5% (Zack's). Its dividends are expected to grow at a 1.5% rate, moderating long-term growth expectations. Historically GAS's earnings grew at a –0.5% rate, according to Value Line and its dividends showed 4.5% growth. The projected sustainable growth, earnings and book value growth rate data indicate that investors can expect the growth from GAS to be lower in the future than has existed in the past. Investors can reasonably expect a sustainable growth rate of **3.75%** for GAS.

Regarding share growth, GAS's shares outstanding showed a –0.1% increase over the past five years. Further, GAS's growth rate in shares outstanding is expected to rise at about a 0.2% rate of increase through 2009-11. An expectation of share growth of **0%** for this company is reasonable.

NWN - Northwest Natural Gas - NWN's sustainable growth rate averaged 2.85% for the five-year period, with the results in the most recent year exceeding the average. Value Line expects sustainable growth to rise to about a 4.25% level through the 2009-11 period. NWN's book value growth is expected to continue to increase at a 3.5%, equal to the historical level of 3.5%. NWN's earnings per share growth is projected to increase at 7% (Value Line) to 5.2% (Reuters) to 5.3% (Zack's). Value Line projects its dividends are expected to grow at a 4.0% rate. Historically NWN's earnings and dividends increased at 3% and 1% rates, respectively, according to Value Line. Investors can reasonably expect sustainable

growth from NWN to exceed past averages; a sustainable internal growth rate of **4.5%** is reasonable for this company.

Regarding share growth, NWN's shares outstanding grew at a 2.2% rate over the past five years. The growth in the number of shares is expected by Value Line to be 0.3% through 2009-11. An expectation of share growth of **1.0%** for this company is reasonable.

PGL – Peoples Energy - PGL's sustainable growth rate has averaged 2.36% over the most recent five year period, with sub-par results in the most recent two years. Value Line expects PGL's sustainable growth to be 2.3% by the 2009-2011 period. PGL's book value growth rate is expected to be –1.5% over the next five years, below the 2.0% rate of growth experienced over the past five years. Also, PGL's earnings per share are projected to increase at 0.5% (Value Line), 4.38% (Reuters) and 4.0% (Zack's). Dividends are expected to grow at only 1.0%. Over the past five years, PGL's earnings growth was 1% while its dividends increased at a 2% rate. Investors can reasonably expect a sustainable growth rate in the future of **3.0%** for PGL.

Regarding share growth, PGL's shares outstanding increased at approximately a 1.9% rate over the past five years. The number of shares outstanding in 2009-2011 is expected to increase at a 1.9% rate. An expectation of share growth of **2%** for this company is reasonable.

PNY - Piedmont Natural Gas - PNY's sustainable internal growth rate averaged 2.96% over the five-year historical period, but was above that level in the two most recent years, indicating an increasing trend. Value Line projects PNY's sustainable growth to rise to a level of approximately 4.1% through 2009-11. Also, PNY's book value growth rate is expected to continue in the future at 3.5%, below the historical level of 6.5%, pointing to moderating growth for this company. PNY's earnings per share are projected to increase at 6% (Value Line) to 5.2% (Zack's), to 4.87% (Reuters), while its dividends are expected to grow at a 5.5% rate, approximating to the historical rate. Sustainable growth has been relatively consistent for this company and is expected to trend upward somewhat in the future to above the 4% level. Dividend growth has been consistent at 5%; therefore, investors can reasonably expect a sustainable growth rate of **5%**, from PNY.

Regarding share growth, PNY's shares outstanding grew at about a 4.25% rate over the past five years, due to a large equity issuance in 2004. Prior to that time share growth was about 1.7% annually. The level of share growth is expected by Value Line to decline at a 0.4% rate through 2009-11. An expectation of share growth of **0.5%** for this company is reasonable.

SJI – South Jersey Industries - SJI's internal sustainable growth rate has averaged 5.31% over the most recent five-year period (2001-2005), with results in 2005 above the historical growth rate level, indicating an increasing trend. That higher level of growth is expected to be maintained and to reach 6.5% by the 2009-2011 period. SJI's book value growth rate is expected to be 6% over the next five years—down from the 13% rate of growth experienced over the past five years (the product of acquisitions). SJI's earnings per share are projected to increase at 7% to 5.67% (Value Line & Reuters, respectively) and 5.7% (Zack's), while its dividends are also expected to grow at 6%. Over the past five years, SJI's earnings grew at a 11.5% rate while its dividends showed a 2.5% increase. Investors can reasonably expect a sustainable growth rate in the future to be higher than past averages, **6%** is reasonable for for SJI.

Regarding share growth, SJI's shares outstanding grew at a 5% rate over the past five years. The number of shares outstanding is projected by Value Line to rise

at approximately a 1.3% rate through 2009-11. An expectation of share growth of **1.5%** for this company is reasonable.

SWX – Southwest Gas - SWX's sustainable growth rate averaged 2.37% over the five-year historical period with an increasing trend. Value Line projects that the retention ratio and ROE will rise through 2009-11, bringing sustainable growth near 6.75%. SWX's book value, which increased at a 4% rate during the most recent five years, is expected to decline slightly to a 3% rate in the future, below the sustainable growth projection. SWX's earnings per share are projected to increase at a 8.5% (Value Line) 4.33% (Reuters) and 6% (Zack's). Its dividends are expected to grow at a 0% rate, moderating long-term growth expectations. Historically SWX's earnings grew at a 1.5% rate, according to Value Line and its dividends showed 0% growth. The projected sustainable growth and earnings growth rate data indicate that investors can expect the growth from SWX to be higher in the future than has existed in the past, however those expectations are moderated by the decline in book value growth and the stagnant dividend. Investors can reasonably expect a sustainable growth rate of **5.5%** for SWX.

Regarding share growth, SWX's shares outstanding showed a 4.8% increase over the past five years. Further, SWX's growth rate in shares outstanding is expected to rise at about a 2.8% rate of increase through 2009-11. An expectation of share growth of **3%** for this company is reasonable.

WGL – WGL Holdings - WGL's sustainable growth rate has averaged 3.52% over the most recent five year period, with an increasing trend. Value Line expects WGL's sustainable growth to rise above that historical growth rate level to 4.35% by the 2009-2011 period. WGL's book value growth rate is expected to be 4% over the next five years, above the 3% rate of growth experienced over the past five years. WGL's earnings per share are projected to increase at a 2% (Value Line) 3.73% (Reuters) to 4.0% (Zack's). However, like the other gas distributors, its dividends are expected to grow at only 2%. Over the past five years, WGL's earnings growth was 6% while its dividends increased at a 1.5% rate. Investors can reasonably expect a sustainable growth rate in the future of **4.0%** for WGL.

Regarding share growth, WGL's shares outstanding increased at approximately a 0.5% rate over the past five years. That rate of increase is expected to be maintained in the future while the number of shares outstanding in 2009-2011 is expected to grow at a similar rate. An expectation of share growth of **0.5%** for this company is reasonable.

APPENDIX D

CORROBORATIVE EQUITY CAPITAL COST ESTIMATION METHODS

CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPITAL ASSET PRICING MODEL (CAPM) YOU USED TO ARRIVE AT AN ESTIMATE FOR THE COST RATE OF THE COMPANY'S EQUITY CAPITAL.

A. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium which is proportional to the non-diversifiable (systematic) risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy (the economic "system") and, thus, cannot be *eliminated through diversification by holding a portfolio of securities.* The beta coefficient (β) is a statistical measure that attempts to quantify the non-diversifiable risk of the return on a particular security against the returns inherent in general stock market fluctuations. The formula is expressed as follows:

$$k = r_f + \beta(r_m - r_f), \qquad \text{(i)}$$

where "k" is the cost of equity capital of an individual security, "r_f" is the risk-free rate of return, "β" is the beta coefficient, "r_m" is the average market return and "$r_m - r_f$" is the market risk premium. The CAPM is used in my analysis, not as a primary cost of equity analysis, but as a check of the DCF cost of equity estimate. Although I believe the CAPM can be useful in testing the reasonableness of a cost of capital estimate, certain theoretical shortcomings of this model (when applied in cost of capital analysis) reduce its usefulness.

Q. CAN YOU EXPLAIN WHY YOU APPLY THE CAPM ANALYSIS WITH CAUTION?

A. Yes. The reasons why the CAPM should be used in cost of capital analysis with caution are set out below. It is important to understand that my caution with regard to the use of the CAPM in a cost of equity capital analysis does not indicate that the model is not a useful description of the capital markets. Rather, it recognizes that in the practical application of the CAPM to cost of capital analysis there are problems that can cause the results of that type of analysis to be less reliable than other, more widely accepted models such as the DCF.

The CAPM was originally designed as a point-in-time tool for selecting stock portfolios that matched a particular investor's risk/return preference. Its use in rate of return analysis to estimate multi-period return expectations for one stock or one type of stock, rather than a diversified portfolio of stocks, takes the model out of the context for which it was intended. Also, questions regarding the fundamental applicability of the CAPM theory and the accuracy of beta have arisen recently in the financial literature.

Over the past few years there has been much comment in the financial literature over the strength of the assumptions that underlie the CAPM and the inability to substantiate those assumptions through empirical analysis. Also, there are problems with the key CAPM risk measure that indicate that the CAPM analysis is not a reliable primary indicator of equity capital costs.

Cost of capital analysis is a decidedly forward-looking, or *ex-ante*, concept. Beta is not. The measurement of beta is derived with historical, or *ex-post*, information. Therefore, the beta of a particular company, because it is usually derived with five years of historical data, is slow to change to current (i.e., forward-looking) conditions, and some price abnormality that may have happened four years ago could substantially affect beta while, currently, being of little actual concern to investors. Moreover, this same shortcoming which assumes that past results mirror investor expectations for the future plagues the market risk premium in an ex-post, or historically-oriented CAPM.

Also, an important study performed for the Center for Research in Security Prices at the University of Chicago Graduate School of Business shows that the assumed linear relationship between beta, risk and return (i.e., beta varies directly with risk and return)

simply does not appear to exist in the marketplace. As Value Line reported in its Industry Review published in March of 1992:

> Two of the most prestigious researchers in the financial community, Professors Eugene F. Fama and Kenneth R. French from the University of Chicago have challenged the traditional relationship between Beta and return in a recent paper published by the Center for Research in Security Prices. In this study, the duo traced the performance of thousands of stocks over 50 years, but found no statistical support for the hypothesis that the relationship between volatility and return is significantly different from random. (Value Line Industry Review, March 13, 1992, p. 1-8.)

Fama and French have continued their investigation of the CAPM since their 1992 article and have postulated that a more accurate CAPM would use two additional risk measures in addition to beta. However, it is important to note that while those authors tout the superiority of their three-factor CAPM to the single-beta CAPM on theoretical grounds, they recognize that there are significant problems with any type of asset pricing model when it comes to using the model to estimate the cost of equity capital. Just last year, Fama and French noted regarding the CAPM:

> The attraction of the CAPM is that is offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is *poor—poor enough to invalidate the way it is used in* applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model....In the end, we argue that whether the model's problems reflect weaknesses in the theory or in its empirical implementation, the failure of the CAPM in empirical tests implies that most applications of the model are invalid. (Fama, E., French, K., "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004, pp. 25-46)

While the recently published conclusions as to the imprecision of equity cost estimates produced by CAPM-type models does not necessarily negate the risk/return basis of asset pricing, it does call for more accurate measures with which asset returns can be more reliably indexed. However, unless and until such indices are published and widely accepted in the marketplace, CAPM cost of equity capital estimates should be relegated to a supporting role or informational status. Therefore, I use the CAPM for informational purposes and do not rely on that methodology as a primary equity capital cost estimation technique.

Q. WHAT VALUE HAVE YOU CHOSEN FOR A RISK-FREE RATE OF RETURN IN YOUR CAPM ANALYSIS?

A. As the CAPM is designed, the risk-free rate is that rate of return investors can realize with certainty. The nearest analog in the investment spectrum is the 13-week U. S. Treasury Bill. However, T-Bills can be heavily influenced by Federal Reserve policy, as they have been over the past three years. While longer-term Treasury bonds have equivalent default risk to T-Bills, those longer-term government securities carry maturity risk that the T-Bills do not have. When investors tie up their money for longer periods of time, as they do when purchasing a long-term Treasury, they must be compensated for future investment opportunities forgone as well as the potential for future changes in inflation. Investors are compensated for this increased investment risk by receiving a higher yield on T-Bonds. However, when T-Bills and T-Bonds exhibit a "normal" (historical average) spread of about 1.5% to 2%, the results of a CAPM analysis that matches a higher market risk premium with lower T-Bill yields or a lower market risk premium with higher T-Bond yields, are very similar.

As I noted in my previous discussion of the macro-economy, the Fed has acted vigorously during the past year or so to raise short-term interest rates. Over the most recent six-week period, T-Bills have produced an average yield of 4.69% and Treasury Bonds have yielded 4.97% (data from Value Line *Selection & Opinion*, six most recent

weekly editions[1]).

Q. DO YOU BELIEVE THE USE OF A LONG-TERM TREASURY BOND RATE IS APPROPRIATE IN THE CAPM?

A. In the current economic environment, the use of a long-term Treasury bond produces a more accurate estimate of investors' cost of equity. Although the selection of a long- or short-term Treasury security as the risk free rate of return to be used in the CAPM is one of the areas of contention in applying the model in cost of capital analysis, the use of a normalized short-term T-Bill rate is the more prevalent in the literature. However, the T-Bill yield can be influenced by Federal Reserve policy, and, produce inaccurate indications of the cost of equity, especially if the yield differential between T-Bonds and T-Bills is different from long-term averages.

For example, in 2004 when the Fed had pushed T-Bill rates below 2%, the results of a T-Bill-based CAPM for utilities were below bond yields and were not reliable. Recently, with the Fed pushing up short-term T-Bill yields resulting through credit tightening, combined with stable long-term yields, the yield differential between T-Bonds and T-Bills has shrunk to about 0.4%, which is well below long-term averages of about 1.5% to 2%. Therefore, the short-term CAPM will overstate the cost of equity. For purposes of analysis in this proceeding I will rely on the long-term Treasury bond yields for the risk-free rate in the CAPM. Also, along with those measures of the risk-free rate I use the corresponding measures of market risk premiums.

Q. WHAT HAVE YOU CHOSEN AS THE MARKET RISK PREMIUM FOR THE CAPM ANALYSIS?

A. In their 2006 edition of Stocks, Bonds, Bills and Inflation, R.G. Ibbotson Associates indicates that the average market risk premium between stocks and T-Bills over the 1926–2005 time period is 6.5% (based on an arithmetic average), and 4.9% (based on a geometric average). For short-term Treasuries, the market risk premiums are 8.6% (based

[1] Current T-Bill yield, six-week average yield from Value Line Selection & Opinion (3/31/06-5/5/06).

on an arithmetic average) and 6.7% (based on a geometric average). I have used these values to estimate the market risk premium in the CAPM analysis. The geometric mean is based on compound returns over time and the arithmetic mean is based on the average of single-period returns.

It is also important to note that, as I point out in Section I of my testimony, recent research in the field of financial economics has shown that the market risk premium data published by Ibbotson Associates—the earned return differentials that existed in the U.S. between 1926 and 2003—overstates investor-expected market risk premiums. The most recent research indicates that the return investors require over the risk-free rate ranges from 2.5% to 4.5% as opposed to the 4.9% to 6.5% estimate published by Ibbotson. Also Ibbotson, himself, has published a recent paper that indicates the forward-looking risk premium expectation ranges between 4% and 6%.[2] Therefore, the upper end of the CAPM cost of equity estimates, based on the historical Ibbotson data, should be considered to be higher than the current cost of common equity capital.

Q. IF THE IBBOTSON HISTORICAL DATA OVERSTATE THE EXPECTED MARKET RISK PREMIUM, WHY DO YOU USE THOSE DATA IN YOUR CAPM ESTIMATE OF THE COST OF COMMON EQUITY CAPITAL?

A. I continue to utilize the historical Ibbotson data in my CAPM analysis in order to be consistent with the manner in which I have traditionally used those data. I have been testifying on the subject of the cost of equity capital for more than twenty years and have consistently used the Ibbotson historical data in my CAPM analyses, and choose not to deviate from that practice at this time. However, the new research on the market risk premium (including a paper from Ibbotson, himself) indicates that the market risk premium expected by investors is considerably lower than the risk premium contained in the historical data. While that information does not cause me to change my long-standing CAPM methodology of relying on the Ibbotson historical risk premium data, the current research on the topic of the market risk premium is important, deserves consideration and

[2] Ibbotson, R, Chen, P., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts Journal*, January/February 2003, pp. 88-89.

causes me to put considerably less weight on the higher end of the CAPM estimates.

Q. WHAT VALUES HAVE YOU CHOSEN FOR THE BETA COEFFICIENTS IN THE CAPM ANALYSIS?

A. Value Line reports beta coefficients for all the stocks it follows. Value Line's beta is derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. The average beta coefficient of the sample groups of electric companies and gas distribution companies happens to be the same in this instance—0.81.

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY CAPITAL FOR THE SAMPLE OF GAS AND ELECTRIC COMPANIES USING THE CAPITAL ASSET PRICING MODEL ANALYSIS?

A. Schedule 8 shows that the average Value Line beta coefficient for the group of electric companies under study, rounded to two decimal places, is 0.81. The overall arithmetic average market risk premium of 6.5% would, upon the adoption of a 0.80 beta, become a sample group premium of 5.27% (0.81 x 6.5%). That non-specific risk premium added to the risk-free T-Bond rate of 4.97%, previously derived, yields a common equity cost rate estimate of 10.25%. Using the geometric market risk premium of 4.90% with the current T-Bond yield produces a CAPM estimate of 8.95%. As noted above, that upper-end estimate of the CAPM is likely to exceed the current cost of equity capital. It is also important to note that both of those results are predicated on Ibbotson's long-term historical market risk premiums, which current research indicates overstate actual investor expectations. However, those CAPM results bracket the DCF results derived previously, supporting the reasonableness of those results.

MODIFIED EARNINGS-PRICE RATIO ANALYSIS

Q. PLEASE DESCRIBE THE MODIFIED EARNINGS-PRICE RATIO (MEPR) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL.

A. The earnings-price ratio is calculated simply as the expected earnings per share divided by the current market price. In cost of capital analysis, the earnings-price ratio (which is one portion of this analysis) can be useful in a corroborative sense, since it can be a good indicator of the proper range of equity costs when the market price of a stock is near its book value. When the market price of a stock is *above* its book value, the earnings-price ratio *understates* the cost of equity capital. Schedule 9 contains mathematical proof for this concept. The opposite is also true, i.e.; the earnings-price ratio *overstates* the cost of equity capital when the market price of a stock is *below* book value.

Under current market conditions, the utilities under study have an average market-to-book ratio of 1.79 (gas) and 1.69 (electric) and, therefore, the average earnings-price ratio alone would understate the cost of equity for the sample groups. However, I do not use the earnings-price ratio alone as an indicator of equity capital cost rates. Because of the relationship among the earnings-price ratio, the market-to-book ratio and the investor-expected return on equity described in Schedule 9, I have modified the standard earnings-price ratio analysis by including expected returns on equity for the companies under study. It is that modified analysis that I will use to assist in estimating an appropriate range of equity capital costs in this proceeding.

Q. PLEASE EXPLAIN THE RELATIONSHIP AMONG THE EARNINGS-PRICE RATIO, THE EXPECTED RETURN ON EQUITY, AND THE MARKET-TO-BOOK RATIO.

A. When the expected return (ROE) approximates the cost of equity, the market price of the utility approximates its book value and the earnings-price ratio provides an unbiased estimate of the cost of equity. When the investor-expected return on equity for a utility (ROE) exceeds the investor-required return (the cost of equity capital), the market price

of the firm will tend to exceed its book value. As explained above, when the market price exceeds book value, the earnings-price ratio understates the cost of equity capital. Therefore, when the expected equity return (ROE) exceeds the cost of equity capital, the earnings-price ratio will understate that cost rate.

Also, in situations where the expected equity return is below what investors require for that type of investment, market prices fall below book value. Further, when market-to-book ratios are below 1.0, the earnings-price ratio overstates the cost of equity capital. Thus, the expected rate of return on equity and the earnings-price ratio tend to move in a countervailing fashion around the cost of equity capital.

When market-to-book ratios are above one, the expected equity return exceeds the cost of equity capital. Also, earnings-price ratios understate the cost of equity capital when market prices are above book value. When market-to-book ratios are below one, the expected equity return understates and the earnings-price ratio exceeds the cost of equity capital. Further, as market-to-book ratios approach unity, the expected return and the earnings price ratio approach the cost of equity capital. Therefore, the average of the expected book return and the earnings price ratio provides a reasonable estimate of the cost of equity capital.

These relationships represent general rather than precisely quantifiable tendencies but are useful in corroborating other cost of capital methodologies. The Federal Energy Regulatory Commission, in its generic rate of return hearings, found this technique useful and indicated that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the expected equity return and below by the earnings-price ratio (e.g., 50 Fed Reg, 1985, p. 21822; 51 Fed Reg, 1986, pp. 361, 362; 37 FERC ¶ 61,287). The mid-point of these two parameters, therefore, produces an estimate of the cost of equity capital which, when market-to-book ratios are different from unity, is far more accurate than the earnings-price ratio alone.

Q. WHAT ARE THE RESULTS OF YOUR EARNINGS-PRICE RATIO ANALYSIS OF THE COST OF EQUITY FOR THE SAMPLE GROUP?

A. Schedule 10 shows the Reuters projected 2007 per share earnings for each of the firms in the sample groups. Recent average market prices (the same market prices used in my DCF analysis), Value Line's projected return on equity for 2007 and 2009-2011 for each of the companies are also shown.

The average earnings-price ratio for the electric sample group, 7.39%, is below the cost of equity for those companies due to the fact that their average market-to-book ratio is currently above unity (average electric utility M/B = 1.69). The sample electric companies' 2007 expected book equity return averages 10.77%. For the electric sample group, then, the mid-point of the earnings-price ratio and the current equity return is 9.08%.

Schedule 10 also shows that the average expected book equity return for the water utilities over the next three- to five-year period declines slightly to 10.62%, indicating consistent return expectations. The midpoint of these two boundaries of equity capital cost for the whole group, i.e., the long-term projected return on book equity (10.62%) and the current earnings-price ratio (7.39%) is 9.00%, which provides another forward-looking estimate of the equity capital cost rate of electric utility firms.

For the gas distributors, the MEPR analysis, shown on page 2 of Schedule 10, indicates a cost of equity range of 8.94% to 9.29%. The results of this MEPR analysis indicate that the DCF equity cost estimate previously derived may be overstated (i.e., too high).

MARKET-TO-BOOK RATIO ANALYSIS

Q. PLEASE DESCRIBE YOUR MARKET-TO-BOOK (MTB) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL FOR THE SAMPLE GROUPS.

A. This technique of analysis is a derivative of the DCF model that attempts to adjust the capital cost derived with regard to inequalities that might exist in the market-to-book ratio. This method is derived algebraically from the DCF model and, therefore, cannot be considered a strictly independent check of that method. However, the MTB analysis is

useful in a corroborative sense. The MTB seeks to determine the cost of equity using market-determined parameters in a format different from that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to identify investors' long-term sustainable expectations. The MTB analysis, while based on the DCF theory, relies instead on point-in-time data projected one year and five years into the future and, thus, offers a practical corroborative check on the traditional DCF. The MTB formula is derived as follows:

Solving for "P" from Equation (1), the standard DCF model, we have

$$P = D/(k-g). \qquad \text{(ii)}$$

But the dividend (D) is equal to the earnings (E) times the earnings payout ratio, or one minus the retention ratio (b), or

$$D = E(1-b). \qquad \text{(iii)}$$

Substituting Equation (iii) into Equation (ii), we have

$$P = \frac{E(1-b)}{k-g}. \qquad \text{(iv)}$$

The earnings (E) are equal to the return on equity (r) times the book value of that equity (B). Making that substitution into Equation (iv), we have

$$P = \frac{rB(1-b)}{k-g}. \qquad \text{(v)}$$

Dividing both sides of Equation (v) by the book value (B) and noting from Equation (iii) in Appendix B that g = br+sv,

$$\frac{P}{B} = \frac{r(1-b)}{k-br-sv} \quad \text{(vi)}$$

Finally, solving Equation (vi) for the cost of equity capital (k) yields the MTB formula:

$$k = \frac{r(1-b)}{P/B} + br + sv. \quad \text{(vii)}$$

Equation (vii) indicates that the cost of equity capital equals the expected return on equity multiplied by the payout ratio, divided by the market-to-book ratio plus growth. Schedule 11 shows the results of applying Equation (vii) to the defined parameters for the water utility firms in the comparable sample. For the electric utility sample group, page 1 of Schedule 11 utilizes current year (2006) data for the MTB analysis while page 2 utilizes Value Line's 2009-2011 projections.

The MTB cost of equity for the sample of electric utility firms, recognizing a current average market-to-book ratio of 1.69 is 9.40% using the current year data and 9.32% using projected three- to five-year data. For the gas distributor sample group, pages 3 and 4 of Schedule 11 show the current and projected MTB equity cost estimate, respectively. Page 3 of Schedule 10 indicates that the cost of equity based on current data for the gas distributor sample group is 9.41% and page 4 indicates that, based on projected 3- to 5-year data, the MTB equity cost estimate is 9.16%. Those point-in-time estimates tend to confirm my DCF equity cost estimate.

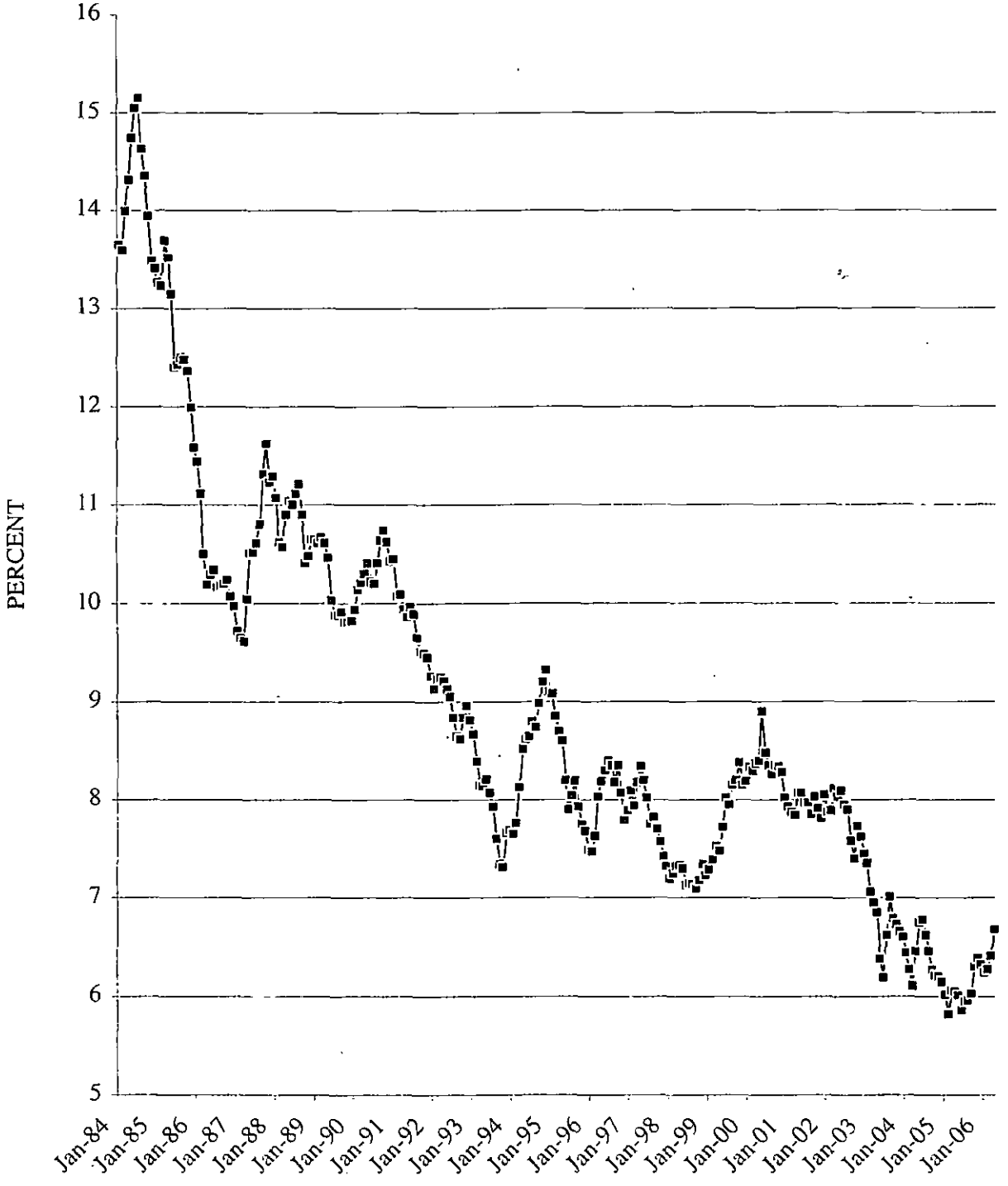
Q. DOES THIS CONCLUDE YOUR DISCUSSION OF YOUR CORROBORATIVE EQUITY COST ESTIMATION ANALYSES?

A. Yes.

DUQUESNE LIGHT COMPANY

MOODY'S BAA BOND YIELDS

1984-2006

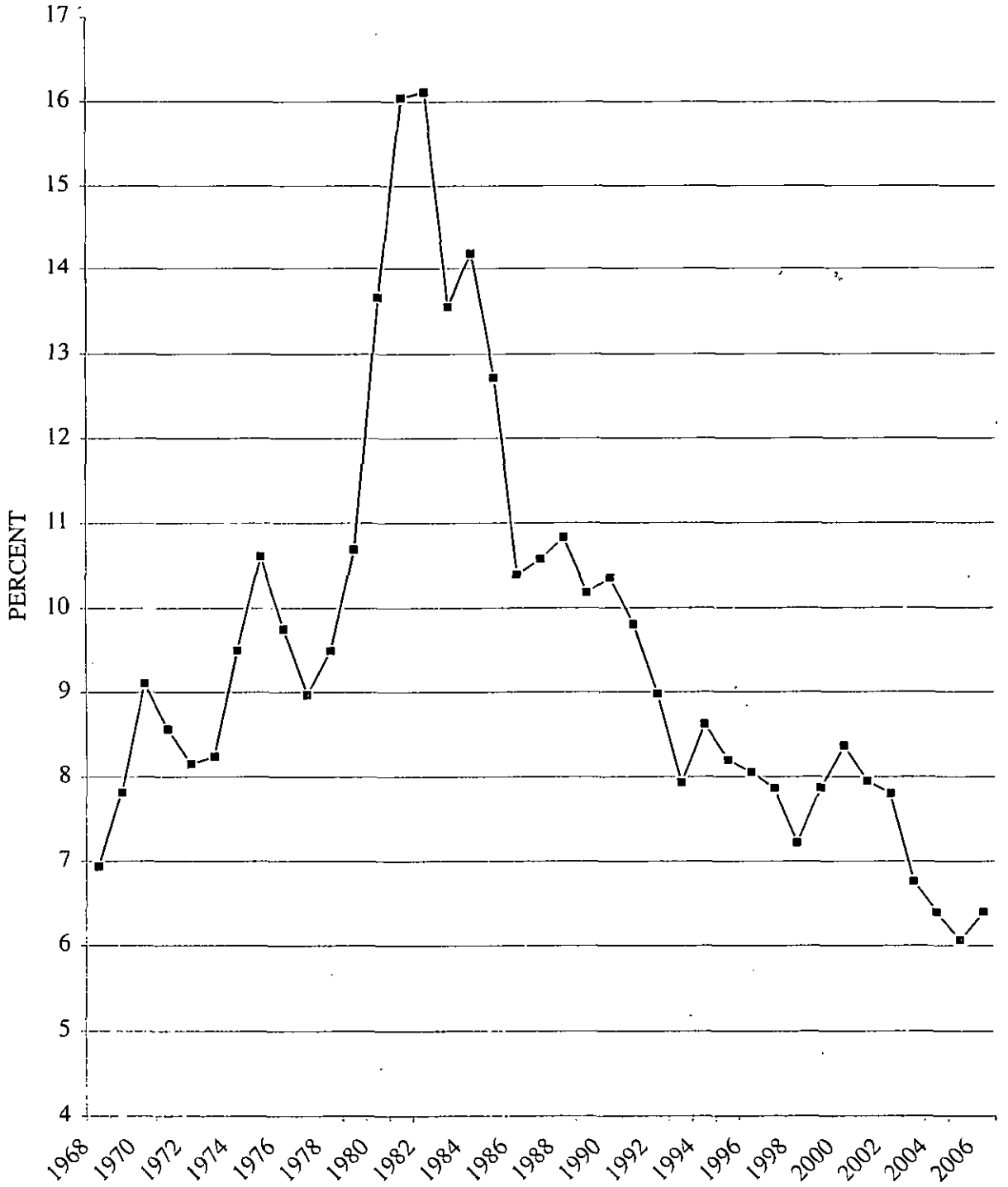


Data from Federal Reserve Release H.15.

DUQUESNE LIGHT COMPANY

MOODY'S BAA BOND YIELDS

1968-2005



Data from Federal Reserve Release H.15.

DUQUESNE LIGHT COMPANY
HISTORICAL CAPITAL STRUCTURE

AMOUNT (000,000)

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	Average
Common Equity	537.7	551.6	584.3	630.6	664.7	**$594**
Preferred Stock	146.1	146.3	146.6	146.5	146.9	**$146**
Long-term Debt	956.4	956.5	636.5	636.5	636.5	**$764**
TOTAL	1,640.2	1,654.4	1,367.4	1,413.6	1,448.1	**$1,505**

PERCENTAGE INCLUDING SHORT-TERM DEBT

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	5 Quarter Average
Common Equity	32.78%	33.34%	42.73%	44.61%	45.90%	**39.46%**
Preferred Stock	8.91%	8.84%	10.72%	10.36%	10.14%	**9.73%**
Long-term Debt	58.31%	57.82%	46.55%	45.03%	43.95%	**50.80%**
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	**60.54%**

Data from Company response to OCA-1-1.

DUQUESNE LIGHT COMPANY
DUQUESNE LIGHT HOLDING, INC.
PARENT-ONLY CAPITAL STRUCTURE

AMOUNT (000,000)

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	**Average**
Common Equity	$610.4	$638.2	$681.6	$655.9	$652.2	**$648**
Preferred Stock	$0.0	$0.0	$0.0	$0.0	$0.0	**$0**
Long-term Debt	$0.0	$0.0	$320.0	$320.0	$320.0	**$192**
Short-term Debt	$0.0	$0.0	$0.0	$40.0	$88.0	**$26**
TOTAL	$610.4	$638.2	$1,001.6	$1,015.9	$1,060.2	**$865**

PERCENTAGE

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	**5 Quarter Average**
Common Equity	100.00%	100.00%	68.05%	64.56%	61.52%	**74.85%**
Preferred Stock	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
Long-term Debt	0.00%	0.00%	31.95%	31.50%	30.18%	**22.19%**
Short-term Debt	0.00%	0.00%	0.00%	3.94%	8.30%	**2.96%**
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	**100.00%**

Data from Company response to OCA-I-1.

DUQUESNE LIGHT COMPANY
DUQUESNE LIGHT HOLDING, INC.
CONSOLIDATED CAPITAL STRUCTURE

AMOUNT (000,000)

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	**Average**
Common Equity	$633.8	$638.2	$681.6	$655.9	$652.2	**$652**
Preferred Stock	$147.1	$147.3	$147.6	$147.5	$147.9	**$147**
Long-term Debt	$958.1	$958.1	$958.0	$958.1	$958.1	**$958**
Short-term Debt	$5.0	$0.0	$0.0	$40.0	$88.0	**$27**
TOTAL	$1,744.0	$1,743.6	$1,787.2	$1,801.5	$1,846.2	**$1,785**

PERCENTAGE

Type of Capital	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	**5 Quarter Average**
Common Equity	36.34%	36.60%	38.14%	36.41%	35.33%	**36.56%**
Preferred Stock	8.43%	8.45%	8.26%	8.19%	8.01%	**8.26%**
Long-term Debt	54.94%	54.95%	53.60%	53.18%	51.90%	**53.69%**
Short-term Debt	0.29%	0.00%	0.00%	2.22%	4.77%	**1.49%**
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	**100.00%**

Data from Company response to OCA-1-1.

DUQUESNE LIGHT COMPANY
ANNUAL COST OF RECAPITALIZATION

RATE CASE CAPITAL STRUCTURE

Type of Capital	Percent	Cost Rate	Wt. Average Cost Rate	Pre-tax Wt. Av. Cost Rate
Common Equity	47.93%	11.75%	5.63%	9.39%
Preferred Stock	9.04%	5.37%	0.49%	0.81%
Long-term Debt	43.03%	6.90%	2.97%	2.97%
	100.00%			**13.16%**

HISTORICAL CAPITAL STRUCTURE

Type of Capital	Percent	Cost Rate	Wt. Average Cost Rate	Pre-tax Wt. Av. Cost Rate
Common Equity	31.30%	12.50%	3.91%	6.52%
Preferred Stock	5.10%	5.37%	0.27%	0.46%
Long-term Debt	63.50%	6.90%	4.38%	4.38%
	100.00%			**11.36%**

OVERALL COST OF CAPITAL DIFFERENCE =	**1.81%**
COMPANY REQUESTED RATE BASE =	**$1.143 Bill.**
ANNUAL RATE IMPACT OF CAPITAL STRUCTURE SHIFT =	**$20,646,074**

DUQUESNE LIGHT COMPANY
ELECTRIC UTILITY INDUSTRY COMMON EQUITY RATIOS

ELECTRIC COMPANIES	EQUITY RATIO
Allegheny Energy	29%
ALLETE	60%
American Electric Power	42%
Central Vermont P.S.	58%
Cleco Corporation	51%
DPL, Inc.	38%
Duquesne Light Holdings	36%
Edison International	38%
El Paso Electric Co.	47%
Empire District Electric	47%
FirstEnergy Corp.	45%
FPL Group	44%
Great Plains Energy	50%
Green Mountain Power	55%
Hawaiian Electric Industries	38%
IDACORP	48%
Maine & Maritimes Corp.	51%
OGE Energy	50%
Otter Tail Power	61%
Pinnacle West Capital Corp.	53%
Progerss Energy	41%
Southern Co.	44%
TXU Corp.	nmf
UIL Holdings	51%
Westar Energy	46%
INDUSTRYAVERAGE	**44%**

COMBINATION GAS & ELECTRIC COMPANIES	EQUITY RATIO
AES Corp.	nmf
Alliant Energy	48%
Ameren Corp.	52%
Aquilla	40%
Avista Corp.	41%
Black Hills Corporation	50%
CenterPoint Energy	13%
CH Energy Group	56%
CINergy Crop.	42%
CMS Energy Corp.	22%
Consolidated Edison	47%
Constellation Energy	49%
Dominion Resources	36%
DTE Energy Company	40%
Duke Energy	49%
Energy East Corp.	41%
Entergy Corp.	45%
Excelon Corp.	39%
Florida Pub. Utilities	46%
MDU Resources	61%
MGE Resources	53%
NiSource Inc.	42%
Northeast Utilities	43%
Northwestern Corp.	50%
NSTAR	34%
Pepco Holdings	39%
PG&E Corp.	40%
PNM Resources	38%
PPL Corp.	37%
Public Service Ent. Group	29%
Puget Energy	43%
SCANA Corp.	42%
SEMPRA Energy	49%
Sierra Pacific Resources	34%
TECO Energy	30%
UniSource Energy	33%
Unitil Corp.	40%
Vectren Corp.	42%
Wisconsin Energy Corp.	40%
WPS Resources	52%
Xcel Energy Inc.	42%

Data from C.A. Turners Utility Reports, Aprial 2006.

DUQUESNE LIGHT COMPANY
GAS INDUSTRY COMMON EQUITY RATIOS

	COMPANY	COMMON EQUITY RATIO
		AUS Utilities Reports
1	AGL Resources	41%
2	Atmos Energy	38%
3	Cascade Natural Gas	39%
4	Chesapeake Utilities	46%
5	Delta Natural Gas	37%
6	El Paso Corporation	16%
7	Energen Corporation	56%
8	Energy West Incorporated	37%
9	EnergySourth, Inc.	55%
10	Equitable Resources	24%
11	KeySpan Corp.	47%
12	Kinder Morgan, Inc.	31%
13	Laclede Group, Inc.	38%
14	National Fuel Gas	52%
15	New Jersey Resources	43%
16	NICOR, Inc.	42%
17	Northwest Natural Gas	47%
18	ONEOK, Inc.	54%
19	Peoples Energy Corporation	43%
20	Piedmont Natural Gas	48%
21	Questar Corporation	59%
22	RGC Resources, Inc.	42%
23	SEMCO Energy, Inc.	25%
24	South Jersey Industries	45%
25	Southern Union Company	40%
26	Southwest Gas Corporaiton	36%
27	Southwestern Energy	81%
28	UGI Corporation	33%
29	WGL Holdings	58%
30	Williams Companies	41%
	INDUSTRY AVERAGE	**43%**

AUS Utility Reports, APRIL 2006, pp. 15, 16.

DUQUESNE LIGHT COMPANY
RATEMAKNG CAPITAL STRUCTURE

Type of Capital	PERCENT	COST RATE*	WT. AVG. COST RATE
Common Equity	42.00%	-	-
Preferred Stock	9.00%	5.37%	0.48%
Long-term Debt	49.00%	6.90%	3.38%
Totals	100.00%		

*Cost rate from Exhibit PRM-1, Schedule 1.

Exhibit__(SGH-1)
Schedule 3

DUQUESNE LIGHT COMPANY
ELECTRIC UTILITY SAMPLE GROUP SELECTION

	Company Name	Revenues % Electric	Pending Merger?	Recent Div. Cut?	Generation Assets?	Stable Book Value?	Bond Rating S&P	Bond Rating Moody's	Selected
	SCREEN	≥70%	no	no	yes/no	yes	A- to BBB-		
EAST									
e	Allegheny Energy	88	no	yes	yes	no	BB+	Baa3	
e+g	CH Energy	54	no	no	yes	yes	BBB	Baa2	
e	Central Vermont P. S.	78	no	no	yes	yes	BBB	-	√
e+g	Consolidated Edison	65	no	no	no	yes	A	A1	
e+g	Constellation Energy	12	yes	no	yes	yes	A	A2	
e	Duquesne Light Holdings	79	no	yes	no	no	BBB+	Baa1	
e+g	Dominion Resources	31	no	no	yes	yes	A-	A2	
e+g	Duke Energy	31	yes	no	yes	yes	BBB	Baa2	
e+g	Energy East Corp.	56	no	no	yes	yes	BBB+	A3	
e+g	Excelon Corp.	67	yes	no	yes	yes	BBB+	A3	
e	FPL Group	80	yes	no	yes	yes	A	Aa3	
e	FirstEnergy Corp.	79	no	no	yes	yes	BBB	Baa1	√
e	Green Mountain Power	100	no	no	yes	yes	BBB	Baa1	√
e+g	Northeast Utilities	65	no	no	yes	yes	BBB	Baa1	
e+g	NSTAR	78	no	no	no	yes	A	A1	
e+g	PPL Corporation	70	no	no	yes	no	A-	Baa1	
e+g	Pepco Holdings, Inc.	55	no	no	no	no	A-	A3	
e	Progress Energy	78	no	no	yes	yes	BBB	A2	√
e+g	Public Service Ent. Gp.	61	yes	no	yes	yes	A-	A3	
e+g	SCANA Corp.	40	no	no	yes	yes	A-	A1	
e	Southern Company	97	no	no	yes	yes	A+	A1	
e+g	TECO Energy	58	no	yes	yes	no	BBB-	Baa2	
e	UIL Holdings Corp.	67	no	no	no	yes	-	Baa2	
CENTRAL									
e	ALLETE	74	no	no	yes	no	A	Baa1	
e+g	Alliant Energy	70	no	no	yes	yes	A-	A2	
e+g	Ameren Corp.	80	no	no	yes	yes	A-	A3	√
e	American Eelectric Power	93	no	yes	yes	no	BBB	Baa1	
e+g	Aquila, Inc.	52	no	yes	yes	yes	B	B2	
e+g	CMS Energy Corp.	43	no	yes	yes	no	BBB-	Baa3	
e+g	CenterPoint Energy	16	no	no	no	no	BBB	Baa2	
e+g	Cinergy Corp.	77	yes	no	yes	yes	BBB-	Baa3	
e	Cleco Corporation	95	no	no	yes	yes	BBB	Baa1	√
e	DPL Inc.	100	no	no	yes	yes	BBB-	Baa1	√
e+g	DTE Energy	49	no	no	yes	yes	BBB+	A3	
e	Empire District Electric	93	no	no	yes	yes	A-	Baa1	√
e+g	Entergy Corp.	78	no	no	yes	yes	BBB-	Baa2	√
e	Great Plains Energy	43	no	no	yes	yes	BBB	A2	
e+g	MGE Energy	61	no	no	yes	yes	AA	Aa3	
e+g	NiSource Inc.	16	no	yes	yes	yes	BBB	Baa2	
e	OGE Energy Corp.	29	no	no	yes	yes	BBB+	Baa2	
e	Otter Tail Corp.	29	no	no	yes	yes	BBB+	A3	
e	TXU Corp.	23	no	yes	no	no	BBB-	Baa2	
e+g	Vectren Corp.	21	no	no	yes	yes	A	A3	
e+g	WPS Resources	15	no	no	yes	yes	A+	Aa2	
e	Westar Energy	70	no	yes	yes	no	BBB	Baa3	
e+g	Wisconsin Energy	61	no	no	yes	yes	A-	A1	
WEST									
e+g	Avista Corp.	51	no	no	yes	yes	BBB-	Baa3	
e+g	Black Hills Corp.	32	no	no	yes	yes	BBB	Baa1	
e	Edison International	80	no	yes	yes	no	BBB+	Baa1	
e	El Paso Electric	98	no	yes	yes	yes	BBB	Baa2	
e	Hawaiian Electric	82	no	no	yes	yes	BBB+	Baa2	√
e	IDACORP, Inc.	97	no	yes	yes	yes	A-	A3	
e+g	MDU Resources Group	5	no	no	yes	yes	A-	A2	
e+g	PG&E Corp.	68	no	yes	yes	no	BBB	Baa1	
e+g	PNM Resources	75	no	no	yes	yes	BBB	Baa2	√
e	Pinnacle West Capital	74	no	no	yes	yes	BBB-	Baa1	√
e+g	Puget Energy, Inc.	63	no	no	yes	yes	BBB	Baa2	
e+g	Sempra Energy	45	no	no	yes	yes	A+	A1	
e+g	Sierra Pacific Resources	94	no	yes	yes	no	BB	Ba1	
e+g	UniSource Energy	87	yes	no	yes	yes	BBB-	Baa3	√
e+g	Xcel Energy, Inc.	75	no	yes	yes	no	A-	A3	

e= electric company; e+g=combination electric and gas company

Data from Value Line Ratings and Reports, March 3, March 31 and May 12, 2006 ; AUS Utility Reports, April 2006.

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CV	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.0538	05.8%	0.31%	15.81	11.61	
2002	0.4286	09.3%	3.99%	16.83	11.74	
2003	0.3759	08.1%	3.04%	17.89	11.81	
2004	0.2640	06.8%	1.80%	18.49	12.19	
2005	19.4000	nmf	nmf	17.45	12.30	
AVERAGE GROWTH			2.28%	2.00%		1.45%
2006	0.2923	08.5%	2.48%		10.00	-18.70%
2007	0.4065	09.0%	3.66%		10.25	-0.50%
2009-2011	0.5282	11.0%	5.81%	nmf	11.00	-2.21%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
FE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.4718	08.9%	4.20%	24.86	297.64	
2002	0.4094	10.5%	4.30%	23.92	297.64	
2003	-0.0204	05.4%	-0.11%	25.13	329.84	
2004	0.3105	10.6%	3.29%	26.04	329.84	
2005	0.4021	10.3%	4.14%	27.85	329.84	
AVERAGE GROWTH			3.16%	6.00%		2.60%
2006	0.4800	12.0%	5.76%		329.84	0.00%
2007	0.4865	12.0%	5.84%		329.84	0.00%
2009-2011	0.4500	11.0%	4.95%	5.50%	329.84	0.00%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
GMP	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.7074	10.7%	7.57%	17.81	5.69	
2002	0.6939	12.3%	8.53%	18.51	4.95	
2003	0.6219	10.3%	6.41%	19.85	5.03	
2004	0.5810	10.1%	5.87%	21.32	5.14	
2005	0.5215	09.5%	4.95%	22.50	5.20	
AVERAGE GROWTH			6.67%	-0.50%		-2.23%
2006	0.4909	09.5%	4.66%		5.30	1.92%
2007	0.4609	10.0%	4.61%		5.35	1.43%
2009-2011	0.3961	10.5%	4.16%	3.00%	5.50	1.13%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PGN	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3761	11.5%	nmf	27.45	218.73	
2002	0.4323	12.1%	5.23%	28.73	232.43	
2003	0.3372	10.9%	3.68%	30.26	246.00	
2004	0.2516	09.9%	2.49%	30.9	247.00	
2005	0.2853	10.5%	3.00%	31.55	252.00	
AVERAGE GROWTH			3.60%	8.50%		3.60%
2006	0.2492	10.0%	2.49%		254.00	0.79%
2007	0.2537	10.0%	2.54%		256.00	0.79%
2009-2011	0.2514	10.0%	2.51%	2.50%	261.00	0.70%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
AEE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2551	14.0%	3.57%	24.26	138.05	
2002	0.0451	09.9%	0.45%	24.93	154.10	
2003	0.1911	11.6%	2.22%	26.73	162.90	
2004	0.0993	09.1%	0.90%	29.71	195.20	
2005	0.1885	10.0%	1.88%	31.35	205.00	
AVERAGE GROWTH			1.80%	4.00%		10.39%
2006	0.1937	09.5%	1.84%		207.40	1.17%
2007	0.2418	10.0%	2.42%		209.80	1.16%
2009-2011	0.2638	09.5%	2.51%	4.50%	216.80	1.13%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CNL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.4238	14.6%	6.19%	10.69	44.96	
2002	0.4079	13.1%	5.34%	11.77	47.04	
2003	0.2857	12.5%	3.57%	10.09	47.18	
2004	0.3182	11.9%	3.79%	10.83	49.62	
2005	0.3662	10.7%	3.92%	13.69	49.99	
AVERAGE GROWTH			4.56%	4.00%		2.69%
2006	0.2800	08.0%	2.24%		54.25	8.52%
2007	0.3333	08.0%	2.67%		60.50	10.01%
2009-2011	0.4286	09.0%	3.86%	8.00%	68.00	6.35%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
DPL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.4598	27.8%	12.78%	6.31	126.50	
2002	-0.3056	10.8%	-3.30%	6.38	126.50	
2003	0.1376	14.6%	2.01%	7.13	126.50	
2004	0.4696	20.7%	9.72%	8.25	126.50	
2005	0.0400	12.0%	0.48%	8.20	128.00	
AVERAGE GROWTH			4.34%	-3.50%		0.30%
2006	0.2857	24.5%	7.00%		115.00	-10.16%
2007	0.3697	24.5%	9.06%		115.00	-5.21%
2009-2011	0.3371	21.0%	7.08%	2.00%	115.00	-2.12%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
EDE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	-1.1695	03.9%	-4.56%	13.58	19.76	
2002	-0.0756	07.8%	-0.59%	14.59	22.57	
2003	0.0078	07.8%	0.06%	15.17	24.98	
2004	-0.4884	05.8%	-2.83%	14.76	25.70	
2005	-0.3913	06.0%	-2.35%	15.08	26.08	
AVERAGE GROWTH			-2.05%	2.00%		7.18%
2006	-0.2190	06.5%	-1.42%		27.15	4.10%
2007	0.0857	08.5%	0.73%		28.20	3.99%
2009-2011	0.1467	09.5%	1.39%	1.50%	30.00	2.84%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
ETR	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.5844	09.3%	5.44%	33.78	220.73	
2002	0.6359	10.9%	6.93%	35.24	222.42	
2003	0.5664	09.8%	5.55%	38.02	228.90	
2004	0.5191	11.0%	5.71%	38.26	216.83	
2005	0.4857	11.0%	5.34%	38.45	205.50	
AVERAGE GROWTH			5.79%	5.50%		-1.77%
2006	0.5304	11.5%	6.10%		204.00	-0.73%
2007	0.5167	11.0%	5.68%		204.00	-0.37%
2009-2011	0.4717	10.5%	4.95%	4.50%	204.00	-0.15%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
HE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2250	11.6%	2.61%	13.06	71.20	
2002	0.2346	11.3%	2.65%	14.21	73.62	
2003	0.2152	10.8%	2.32%	14.36	75.84	
2004	0.0882	08.9%	0.79%	15.01	80.69	
2005	0.1507	09.7%	1.46%	15.02	80.98	
AVERAGE GROWTH			1.97%	3.00%		3.27%
2006	0.1733	10.0%	1.73%		81.20	0.27%
2007	0.2000	10.0%	2.00%		81.40	0.26%
2009-2011	0.2914	10.0%	2.91%	2.50%	82.00	0.25%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PNM	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.7969	15.4%	12.27%	17.25	58.68	
2002	0.4673	06.5%	3.04%	16.60	58.68	
2003	0.4696	06.3%	2.96%	17.84	60.39	
2004	0.5594	08.0%	4.48%	18.19	60.46	
2005	0.5031	08.2%	4.13%	18.70	68.79	
AVERAGE GROWTH			5.37%	4.50%		4.05%
2006	0.4788	08.5%	4.07%		68.80	0.01%
2007	0.4743	08.5%	4.03%		70.80	1.45%
2009-2011	0.4211	08.5%	3.58%	4.00%	74.00	1.47%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PNW	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.5842	12.5%	7.30%	29.46	84.83	
2002	0.3557	08.0%	2.85%	29.44	91.26	
2003	0.3135	08.1%	2.54%	31.00	91.29	
2004	0.2907	08.0%	2.33%	32.14	91.79	
2005	0.1645	06.5%	1.07%	34.57	99.08	
AVERAGE GROWTH			3.22%	4.00%		3.96%
2006	0.3233	08.5%	2.75%		99.10	0.02%
2007	0.3735	09.0%	3.36%		99.10	0.01%
2009-2011	0.3155	09.0%	2.84%	3.50%	99.10	0.00%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
UNS	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.7765	14.3%	11.10%	12.68	33.50	
2002	0.4845	07.6%	3.68%	13.05	33.58	
2003	0.5385	08.4%	4.52%	15.97	33.79	
2004	0.5115	07.9%	4.04%	16.95	34.26	
2005	0.4154	07.5%	3.12%	17.68	34.87	
AVERAGE GROWTH			5.29%	12.00%		1.01%
2006	0.5333	09.5%	5.07%		35.30	1.23%
2007	0.5027	09.5%	4.78%		35.70	1.18%
2009-2011	0.4051	08.5%	3.44%	5.00%	36.90	1.14%

Data from Value Line Ratings & Reports March 3, March 31 and May 12, 2006.

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
GAS DISTRIBUTORS

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
ATG	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2800	12.3%	3.44%	12.19	55.10	
2002	0.4066	14.5%	5.90%	12.52	56.70	
2003	0.4663	14.0%	6.53%	14.66	64.50	
2004	0.4956	11.0%	5.45%	18.06	76.70	
2005	0.4758	12.9%	6.14%	19.29	77.70	
AVERAGE GROWTH			5.49%	8.50%		8.97%
2006	0.4118	12.5%	5.15%		77.80	0.13%
2007	0.3923	12.0%	4.71%		77.80	-0.50%
2009-2011	0.3966	12.0%	4.76%	6.00%	78.00	0.08%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
ATO	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2109	09.6%	2.02%	14.31	40.79	
2002	0.1862	10.4%	1.94%	13.75	41.68	
2003	0.2982	09.3%	2.77%	16.66	51.48	
2004	0.2278	07.6%	1.73%	18.05	62.80	
2005	0.2791	08.5%	2.37%	19.90	80.54	
AVERAGE GROWTH			2.17%	8.50%		18.54%
2006	0.3189	09.0%	2.87%		82.00	1.81%
2007	0.3600	09.5%	3.42%		84.00	2.13%
2009-2011	0.4600	10.5%	4.83%	5.00%	100.00	4.42%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CGC	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3469	13.3%	4.61%	11.01	11.05	
2002	0.1504	10.9%	1.64%	10.34	11.05	
2003	-0.1034	08.6%	-0.89%	10.11	11.13	
2004	0.1933	11.2%	2.16%	10.52	11.27	
2005	-0.1707	07.8%	-1.33%	10.39	11.41	
AVERAGE GROWTH			1.24%	0.00%		0.80%
2006	0.0400	08.0%	0.32%		11.50	0.79%
2007	0.1652	08.0%	1.32%		11.50	0.39%
2009-2011	0.3677	08.5%	3.13%	10.50%	12.50	1.84%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
GAS DISTRIBUTORS

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
LG	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.1677	10.5%	1.76%	15.26	18.88	
2002	-0.1356	07.8%	-1.06%	15.07	18.96	
2003	0.2637	11.6%	3.06%	15.65	19.11	
2004	0.2582	10.1%	2.61%	16.96	20.98	
2005	0.2789	10.9%	3.04%	17.31	21.17	
AVERAGE GROWTH			1.88%	2.50%		2.90%
2006	0.4043	13.0%	5.26%		21.50	1.56%
2007	0.4083	13.0%	5.31%		21.50	0.78%
2009-2011	0.4643	13.0%	6.04%	5.00%	24.00	2.54%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
NJR	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.4000	14.9%	5.96%	13.2	26.66	
2002	0.4258	15.7%	6.69%	13.06	27.67	
2003	0.4790	15.6%	7.47%	15.38	27.23	
2004	0.4902	15.3%	7.50%	16.87	27.74	
2005	0.4868	17.0%	8.28%	15.9	27.55	
AVERAGE GROWTH			7.18%	7.00%		0.82%
2006	0.4786	16.5%	7.90%		27.25	-1.09%
2007	0.4759	15.5%	7.38%		27.00	-1.00%
2009-2011	0.4848	14.5%	7.03%	8.00%	26.00	-1.15%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
GAS	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.4153	18.7%	7.77%	16.39	44.40	
2002	0.3611	17.5%	6.32%	16.55	44.01	
2003	0.1185	12.3%	1.46%	17.13	44.04	
2004	0.1622	13.1%	2.12%	16.99	44.10	
2005	0.1806	12.5%	2.26%	18.36	44.18	
AVERAGE GROWTH			3.98%	1.00%		-0.12%
2006	0.2250	12.5%	2.81%		44.20	0.05%
2007	0.2627	13.5%	3.55%		44.30	0.14%
2009-2011	0.2786	13.0%	3.62%	3.50%	44.60	0.19%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
GAS DISTRIBUTORS

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
NWN	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3351	10.2%	3.42%	18.56	25.23	
2002	0.2222	08.5%	1.89%	18.88	25.59	
2003	0.2784	09.0%	2.51%	19.52	25.94	
2004	0.3011	08.9%	2.68%	20.64	27.55	
2005	0.3744	10.0%	3.74%	21.27	27.58	
AVERAGE GROWTH			2.85%	3.50%		2.25%
2006	0.3867	10.0%	3.87%		27.75	0.62%
2007	0.4083	10.5%	4.29%		27.80	0.40%
2009-2011	0.4035	10.5%	4.24%	3.50%	28.00	0.30%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PGL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3544	13.9%	4.93%	22.76	35.40	
2002	0.2607	12.3%	3.21%	22.74	35.46	
2003	0.2613	12.3%	3.21%	23.11	36.69	
2004	0.0092	09.4%	0.09%	23.06	36.69	
2005	0.0354	10.8%	0.38%	20.95	38.16	
AVERAGE GROWTH			2.36%	2.00%		1.89%
2006	0.0311	11.0%	0.34%		39.00	2.20%
2007	0.0917	11.5%	1.05%		40.00	2.38%
2009-2011	0.1704	13.5%	2.30%	-1.50%	42.00	1.94%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PNY	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2475	11.7%	2.90%	8.63	64.93	
2002	0.1579	10.6%	1.67%	8.91	66.18	
2003	0.2613	11.8%	3.08%	9.36	67.31	
2004	0.3228	11.1%	3.58%	11.15	76.67	
2005	0.3106	11.5%	3.57%	11.53	76.70	
AVERAGE GROWTH			2.96%	6.50%		4.25%
2006	0.2615	11.0%	2.88%		76.50	-0.26%
2007	0.2857	11.5%	3.29%		76.00	-0.46%
2009-2011	0.3314	12.5%	4.14%	3.50%	75.00	-0.45%

DUQUESNE LIGHT COMPANY
DCF GROWTH RATE PARAMETERS
GAS DISTRIBUTORS

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
SJI	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3565	12.8%	4.56%	7.81	23.72	
2002	0.3852	12.5%	4.82%	9.67	24.41	
2003	0.4307	11.6%	5.00%	11.26	26.46	
2004	0.4810	12.5%	6.01%	12.41	27.76	
2005	0.4971	12.4%	6.16%	13.50	28.98	
AVERAGE GROWTH			5.31%	13.00%		5.13%
2006	0.4973	12.5%	6.22%		29.00	0.07%
2007	0.4974	12.5%	6.22%		29.60	1.06%
2009-2011	0.5000	13.0%	6.50%	6.00%	31.00	1.36%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
SWX	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.2870	06.6%	1.89%	17.27	32.49	
2002	0.2931	06.5%	1.91%	17.91	33.29	
2003	0.2743	06.1%	1.67%	18.42	34.23	
2004	0.5060	08.3%	4.20%	19.18	36.79	
2005	0.3387	06.5%	2.20%	18.60	39.20	
AVERAGE GROWTH			2.37%	4.00%		4.81%
2006	0.4710	08.0%	3.77%		40.00	2.04%
2007	0.5314	09.5%	5.05%		42.00	3.51%
2009-2011	0.6435	10.5%	6.76%	3.00%	45.00	2.80%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
WGL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2001	0.3298	11.2%	3.69%	16.24	48.54	
2002	-0.1140	07.2%	-0.82%	15.78	48.56	
2003	0.4435	14.0%	6.21%	16.25	48.83	
2004	0.3434	11.7%	4.02%	16.95	48.67	
2005	0.3744	12.0%	4.49%	17.8	48.65	
AVERAGE GROWTH			3.52%	3.00%		0.06%
2006	0.2703	10.0%	2.70%		48.70	0.10%
2007	0.2923	10.0%	2.92%		48.70	0.05%
2009-2011	0.3958	11.0%	4.35%	4.00%	48.80	0.06%

Data from Value Line Ratings & Reports, March 17, 2006.

DUQUESNE LIGHT COMPANY

DCF GROWTH RATES
ELECTRIC UTILITIES

COMPANY	br	+	sv=g*(1-(1/(M/B)))		=	g
CV	4.00%	+	0.00%	(1 - (1/ 1.22)))	=	4.00%
FE	5.00%	+	0.50%	(1 - (1/ 1.68)))	=	5.20%
GMP	5.00%	+	0.00%	(1 - (1/ 1.26)))	=	5.00%
PGN	3.00%	+	1.50%	(1 - (1/ 1.34)))	=	3.38%
AEE	3.75%	+	2.50%	(1 - (1/ 1.56)))	=	4.64%
CNL	5.00%	+	4.00%	(1 - (1/ 1.51)))	=	6.36%
DPL	6.50%	+	0.00%	(1 - (1/ 4.50)))	=	6.50%
EDE	3.50%	+	4.00%	(1 - (1/ 1.47)))	=	4.79%
ETR	6.00%	+	-0.25%	(1 - (1/ 1.70)))	=	5.90%
HE	3.50%	+	1.00%	(1 - (1/ 1.76)))	=	3.93%
PNM	5.75%	+	2.00%	(1 - (1/ 1.27)))	=	6.17%
PNW	5.00%	+	1.00%	(1 - (1/ 1.12)))	=	5.11%
UNS	5.00%	+	1.00%	(1 - (1/ 1.61)))	=	5.38%

Average Market-to-Book Ratio = 1.69

CV	=	Central Vermont P. S.
FE	=	FirstEnergy Corp.
GMP	=	Green Mountain Power
PGN	=	Progress Energy
AEE	=	Ameren Corp.
CNL	=	Cleco Corporation
DPL	=	DPL, Inc.
EDE	=	Empire District Electric
ETR	=	Entergy Corp.
HE	=	Hawaiian Electric
PNM	=	PNM Resources
PNW	=	Pinnacle West Capital
UNS	=	Unisource Energy

g*= expected growth in number of shares outstanding

DUQUESNE LIGHT COMPANY

GROWTH RATE COMPARISON
ELECTRIC UTILITIES

	DCF	Value Line Projected			Reuters	Value Line Historic			Reuters & VL	5-yr Compound Hist.		
COMPANY	Growth	EPS	DPS	BVPS	EPS	EPS	DPS	BVPS	AVGS.	EPS	DPS	BVPS
CV	4.00%	5.00%	0.50%	NMF	n/a	8.50%	0.50%	2.00%	3.30%	nmf	0.89%	1.22%
FE	5.20%	8.50%	4.50%	5.50%	4.38%	1.00%	2.00%	6.00%	4.55%	4.27%	3.94%	3.52%
GMP	5.00%	3.50%	11.00%	3.00%	n/a	37.50%	-6.50%	-0.50%	8.00%	3.19%	15.28%	5.02%
PGN	3.38%	0.00%	2.00%	2.50%	3.14%	5.50%	3.00%	8.50%	3.52%	nmf	2.66%	3.31%
AEE	4.64%	2.50%	0.00%	4.50%	5.17%	1.50%	0.00%	4.00%	2.52%	nmf	0.00%	5.83%
CNL	6.36%	4.50%	2.00%	8.00%	8.00%	1.00%	2.00%	4.00%	4.21%	-3.71%	0.68%	6.51%
DPL	6.50%	5.50%	3.00%	2.00%	5.50%	-1.00%	0.50%	-3.50%	1.71%	-4.26%	1.25%	-0.84%
EDE	4.79%	6.50%	0.00%	1.50%	2.00%	-5.00%	0.00%	2.00%	1.00%	12.22%	0.00%	2.21%
ETR	5.90%	5.00%	8.00%	4.50%	6.86%	11.00%	1.50%	5.50%	6.05%	8.35%	11.03%	3.82%
HE	3.93%	3.00%	0.00%	2.50%	2.90%	1.00%	0.00%	3.00%	1.77%	-1.28%	0.00%	3.22%
PNM	6.17%	5.50%	8.50%	4.00%	10.36%	-1.00%	5.00%	4.50%	5.27%	-8.76%	10.17%	2.48%
PNW	5.11%	6.00%	5.00%	3.50%	6.00%	-4.50%	6.50%	4.00%	3.79%	-4.00%	5.82%	3.83%
UNS	5.38%	7.00%	9.50%	5.00%	n/a	5.00%	0.00%	12.00%	6.42%	0.11%	16.00%	8.20%
		4.81%	4.15%	3.88%		4.65%	1.12%	3.96%		0.61%	5.21%	3.72%
AVERAGES	5.10%		4.28%		5.43%		3.24%		4.01%		3.18%	

Zack's growth rates: CV-n/a, FE-4.8%, GMP-n/a, PGN-3.8%, AEE-6.0%, CNL-8%, DPL-7.0%, EDE-n/a, ETR-7.4%, HE-5.2%, PNM-8.3%, PNW-6.8%, and UNS-n/a. Zack's average earnings growth = 6.3%.

DUQUESNE LIGHT COMPANY

DCF GROWTH RATES
GAS DISTRIBUTORS

COMPANY	br	+	sv=g*(1-(1/(M/B)))	=	g
ATG	5.00%	+	1.00% (1 - (1/ 1.73))	=	5.42%
ATO	4.25%	+	5.00% (1 - (1/ 1.27))	=	5.31%
CGC	4.00%	+	1.00% (1 - (1/ 1.60))	=	4.38%
LG	4.50%	+	2.50% (1 - (1/ 1.87))	=	5.66%
NJR	6.50%	+	0.00% (1 - (1/ 2.56))	=	6.50%
GAS	3.75%	+	0.00% (1 - (1/ 2.11))	=	3.75%
NWN	4.50%	+	1.00% (1 - (1/ 1.58))	=	4.87%
PGL	3.00%	+	2.00% (1 - (1/ 1.75))	=	3.86%
PNY	5.00%	+	0.50% (1 - (1/ 2.07))	=	5.26%
SJI	6.00%	+	1.50% (1 - (1/ 1.86))	=	6.69%
SWX	5.50%	+	3.00% (1 - (1/ 1.45))	=	6.44%
WGL	4.00%	+	0.50% (1 - (1/ 1.66))	=	4.20%

Average Market-to-Book Ratio = 1.79

ATG	=	AGL Resources
ATO	=	Atmos Energy Corporation
CGC	=	Cascade Natural Gas Corporation
LG	=	Laclede Group
NJR	=	New Jersey Resources Corp.
GAS	=	NICOR
NWN	=	Northwest Natural Gas Co.
PGL	=	Peoples Energy Corp.
PNY	=	Piedmont Natual Gas Company
SJI	=	South Jersey Industries, Inc.
SWX	=	Southwest Gas
WGL	=	WGL Holdlings

g*= expected growth in number of shares outstanding

DUQUESNE LIGHT COMPANY

GROWTH RATE COMPARISON
GAS DISTRIBUTORS

	DCF	Value Line Projected			Reuters	Value Line Historic			Reuters & VL	5-yr Compound Hist.		
COMPANY	Growth	EPS	DPS	BVPS	EPS	EPS	DPS	BVPS	AVGS.	EPS	DPS	BVPS
ATG	5.42%	4.00%	6.50%	6.00%	4.57%	13.50%	2.00%	8.50%	6.44%	11.20%	6.79%	10.74%
ATO	5.31%	7.00%	2.00%	5.00%	4.82%	6.50%	2.00%	8.50%	5.12%	4.71%	1.67%	7.82%
CGC	4.38%	8.50%	0.50%	10.50%	3.50%	-3.50%	0.00%	0.00%	2.79%	-7.42%	0.00%	2.32%
LG	5.66%	7.00%	2.00%	5.00%	4.00%	4.50%	0.50%	2.50%	3.64%	7.86%	0.88%	3.64%
NJR	6.50%	4.50%	4.50%	8.00%	5.20%	8.50%	3.00%	7.00%	5.81%	7.50%	4.53%	5.80%
GAS	3.75%	4.00%	1.50%	3.50%	3.10%	-0.50%	4.50%	1.00%	2.44%	-4.43%	1.11%	2.89%
NWN	4.87%	7.00%	4.00%	3.50%	5.21%	3.00%	1.00%	3.50%	3.89%	3.66%	2.00%	3.41%
PGL	3.86%	0.50%	1.00%	-1.50%	4.38%	1.00%	2.00%	2.00%	1.34%	-6.57%	1.34%	-1.93%
PNY	5.26%	6.00%	5.50%	3.50%	4.87%	5.00%	5.00%	6.50%	5.20%	5.18%	4.78%	6.18%
SJI	6.69%	7.00%	6.00%	6.00%	5.67%	11.50%	2.50%	13.00%	7.38%	9.98%	4.68%	13.02%
SWX	6.44%	8.50%	0.00%	3.00%	4.33%	1.50%	0.00%	4.00%	3.05%	6.15%	0.00%	2.09%
WGL	4.20%	2.00%	2.00%	4.00%	3.73%	6.00%	1.50%	3.00%	3.18%	-0.32%	1.39%	1.91%
		5.50%	2.96%	4.71%		4.75%	2.00%	4.96%		3.12%	2.43%	4.82%
AVERAGES	5.19%		4.39%		4.45%		3.90%		4.19%		3.46%	

Zack's Earnings Growth Projections: ATG-4.5%, ATO-5.5%, CGC-n/a, LG-n/a, NJR-6.0%, GAS-3.5%, NWN-5.3%, PGL-4.0%, PNY-5.2%, SJI-5.7%, SWX-6.0%, WGL-4.0%; Average = 4.97%.

DUQUESNE LIGHT COMPANY

STOCK PRICE, DIVIDENDS, YIELDS
ELECTRIC UTILITIES

COMPANY	AVG. STOCK PRICE 3/22/06-5/3/06 (PER SHARE)	ANNUALIZED DIVIDEND (PER SHARE)	DIVIDEND YIELD
CV	$20.50	$0.92	4.49%
FE	$49.79	$1.80	3.62%
GMP	$28.58	$1.12	3.92%
PGN	$43.14	$2.42	5.61%
AEE	$50.09	$2.54	5.08%
CNL	$22.19	$0.90	4.06%
DPL	$27.22	$1.00	3.67%
EDE	$22.33	$1.28	5.73%
ETR	$69.45	$2.16	3.11%
HE	$26.90	$1.24	4.61%
PNM	$24.68	$0.88	3.57%
PNW	$39.88	$2.00	5.01%
UNS	$30.27	$0.84	2.78%
		AVERAGE	**4.25%**

DUQUESNE LIGHT COMPANY

STOCK PRICE, DIVIDENDS, YIELDS
GAS DISTRIBUTORS

COMPANY	AVG. STOCK PRICE 3/22/06-5/3/06 (PER SHARE)		ANNUALIZED DIVIDEND (PER SHARE)	DIVIDEND YIELD
ATG	$35.17		$1.48	4.21%
ATO	$26.47		$1.26	4.76%
CGC	$19.81		$0.96	4.84%
LG	$34.05		$1.42	4.17%
NJR	$44.79		$1.44	3.22%
GAS	$39.84		$1.86	4.67%
NWN	$34.71		$1.38	3.98%
PGL	$36.15		$2.18	6.03%
PNY	$24.09		$0.96	3.98%
SJI	$26.77	*	$0.94	3.51%
SWX	$27.84		$0.82	2.95%
WGL	$29.72	*	$1.39	4.67%
			AVERAGE	**4.25%**

* Dividend increased by (1+g), derived on Schedule 5.

DUQUESNE LIGHT COMPANY

DCF COST OF EQUITY CAPITAL
ELECTRIC UTILITIES

COMPANY	DIVIDEND YIELD Schedule 6	GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
CV	4.49%	4.00%	8.49%
FE	3.62%	5.20%	8.82%
GMP	3.92%	5.00%	8.92%
PGN	5.61%	3.38%	8.99%
AEE	5.08%	4.64%	9.72%
CNL	4.06%	6.36%	10.42%
DPL	3.67%	6.50%	10.17%
EDE	5.73%	4.79%	10.52%
ETR	3.11%	5.90%	9.01%
HE	4.61%	3.93%	8.54%
PNM	3.57%	6.17%	9.74%
PNW	5.01%	5.11%	10.12%
UNS	2.78%	5.38%	8.15%
		AVERAGE	**9.35%**
		STANDARD DEVIATION	**0.80%**

DUQUESNE LIGHT COMPANY

DCF COST OF EQUITY CAPITAL
GAS DISTRIBUTORS

COMPANY	DIVIDEND YIELD Schedule 6	GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
ATG	4.21%	5.42%	9.63%
ATO	4.76%	5.31%	10.07%
CGC	4.84%	4.38%	9.22%
LG	4.17%	5.66%	9.83%
NJR	3.22%	6.50%	9.72%
GAS	4.67%	3.75%	8.42%
NWN	3.98%	4.87%	8.84%
PGL	6.03%	3.86%	9.89%
PNY	3.98%	5.26%	9.24%
SJI	3.51%	6.69%	10.20%
SWX	2.95%	6.44%	9.38%
WGL	4.67%	4.20%	8.87%
		AVERAGE	**9.44%**
		STANDARD DEVIATION	**0.54%**

DUQUESNE LIGHT COMPANY

CAPM COST OF EQUITY CAPITAL
ELECTRIC UTILITIES

$$k = rf + B\,(rm - rf)$$

T-BILLS

[rf]* = 4.69%
[rm - rf]† = 6.70% (geometric mean)
[rm - rf]† = 8.60% (arithmetic mean)
average beta = *0.812*

k = 4.69% + 0.81 (6.7%/8.60%)
k = 4.69% + 5.44%/6.98%
k = 10.12% / 11.66%

T-BONDS

[rf]* = 4.97%
[rm - rf]† = 4.90% (geometric mean)
[rm - rf]† = 6.50% (arithmetic mean)
average beta = 0.812

k = 4.97% + 0.81 (4.90%/6.50%)
k = 4.97% + 3.98%/5.27%
k = **8.95% / 10.25%**

*Current T-Bill & T-Bond yields, six-week average yield from Value Line Selection & Opinion (3/31/06-5/5/06)
†Geometric and arithmetric market risk premiums from Ibbotson Associates 2006 SBBI Yearbook, p. 28.

DUQUESNE LIGHT COMPANY

CAPM COST OF EQUITY CAPITAL
GAS DISTRIBUTORS

$$k = rf + B\ (rm - rf)$$

T-BILLS

[rf]* = 4.69%
[rm - rf]† = 6.70% (geometric mean)
[rm - rf]† = 8.60% (arithmetic mean)
average beta = 0.808

k = 4.69% + 0.81 (6.70%/8.60%)
k = 4.69% + 5.41%/6.95%
k = 10.10% /11.64%

T-BONDS

[rf]* = 4.97%
[rm - rf]† = 4.90%
[rm - rf]† = 6.50%
average beta = 0.808

k = 4.97% + 0.81 (4.90%/6.50%)
k = 4.97% + 3.96%/5.25%
k = **8.93% /10.23%**

*Current T-Bill & T-Bond yields, six-week average yield from Value Line Selection & Opinion (3/31/06-5/5/06)
†Geometric and arithmetric market risk premiums from Ibbotson Associates 2006 SBBI Yearbook, p. 28.

DUQUESNE LIGHT COMPANY
PROOF

If market price exceeds book value,
the market-to-book ratio is greater than 1.0,
and the earnings-price ratio understates the cost of capital.

MP = market price
BV = book value
i = cost of equity capital
r = earned return
E = earnings

1. At MP = BV, $i = r = \frac{E}{MP}$.
2. $E = rBV$.
3. Then, $\frac{E}{MP} = \frac{rBV}{MP}$.
4. When BV < MP, i.e., $\frac{BV}{MP} < 1$, then,
   a. $\frac{E}{MP} < r$, since $\frac{E}{MP} = \frac{rBV}{MP} < r$, because $\frac{BV}{MP} < 1$;
   b. $i < r$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $i < r$; and
   c. $\frac{E}{MP} < i$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $\frac{E}{MP} < i$, because,
      1) $\frac{BV}{MP} < 1$, through MP increasing, and, if so, $\frac{E}{MP}$ decreases, therefore, $\frac{E}{MP} < i$, or
      2) $\frac{BV}{MP} < 1$, through BV decreasing, and, if so, given $E = rBV$, $\frac{E}{MP}$ decreases, therefore, $\frac{E}{MP} < i$.
5. Ergo, $\frac{E}{MP} < i < r$, the earnings-price ratio is lower than the cost of capital, which is lower than the earned return.

DUQUESNE LIGHT COMPANY

MODIFIED EARNINGS-PRICE RATIO ANALYSIS
ELECTRIC UTILITIES

COMPANY	Reuters* 2007 Earnings (Per Share)	Market Price (Per share)	Earnings-Price Ratio	Current R.O.E. 2007	Projected R.O.E. 2009-2011
CV	$1.55	$20.50	7.56%	9.00%	11.00%
FE	$3.94	$49.79	7.91%	12.00%	11.00%
GMP	$2.30	$28.58	8.05%	10.00%	10.50%
PGN	$3.35	$43.14	7.77%	10.00%	10.00%
AEE	$3.80	$50.09	7.59%	10.00%	9.50%
CNL	$1.38	$22.19	6.22%	8.00%	9.00%
DPL	$1.65	$27.22	6.06%	24.50%	21.00%
EDE	$1.43	$22.33	6.40%	8.50%	9.50%
ETR	$5.53	$69.45	7.96%	11.00%	10.50%
HE	$1.85	$26.90	6.88%	10.00%	10.00%
PNM	$1.99	$24.68	8.06%	8.50%	8.50%
PNW	$3.33	$39.88	8.35%	9.00%	9.00%
UNS	$2.21	$30.27	7.30%	9.50%	8.50%
		AVERAGE	7.39%	10.77%	
		CURRENT M.E.P.R.		**9.08%**	
		AVERAGE	7.39%		10.62%
		PROJECTED M.E.P.R.		**9.00%**	

DUQUESNE LIGHT COMPANY

MODIFIED EARNINGS-PRICE RATIO ANALYSIS
GAS DISTRIBUTORS

COMPANY	Reuter's 2007 EARNINGS (Per Share)	MARKET PRICE (Per share)	EARNINGS-PRICE RATIO	CURRENT R.O.E. 2006	PROJECTED R.O.E. 2009-2011
ATG	$2.71	$35.17	7.71%	12.50%	12.00%
ATO	$1.98	$26.47	7.48%	9.00%	10.50%
CGC	$1.19	$19.81	6.01%	8.00%	8.50%
LG	$2.16	$34.05	6.34%	13.00%	13.00%
NJR	$2.87	$44.79	6.41%	16.50%	14.50%
GAS	$2.53	$39.84	6.35%	12.50%	13.00%
NWN	$2.39	$34.71	6.89%	10.00%	10.50%
PGL	$2.52	$36.15	6.97%	11.00%	13.50%
PNY	$1.42	$24.09	5.89%	11.00%	12.50%
SJI	$1.93	$26.77	7.21%	12.50%	13.00%
SWX	$1.92	$27.84	6.90%	8.00%	10.50%
WGL	$1.90	$29.72	6.39%	10.00%	11.00%
		AVERAGE	6.71%	11.17%	
		CURRENT M.E.P.R.		**8.94%**	
		AVERAGE	6.71%		11.88%
		PROJECTED M.E.P.R.		**9.29%**	

DUQUESNE LIGHT COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
ELECTRIC UTILITIES

$k = R.O.E.(1-b)/(M/B) + g$
[2006]

COMPANY								MARKET-TO-BOOK COST OF EQUITY
CV	k= NMF	(1-	0.4065)/	1.22	+	4.00%	=	nmf
FE	k= 12.0%	(1-	0.4800)/	1.68	+	5.20%	=	8.91%
GMP	k= 09.5%	(1-	0.4909)/	1.26	+	5.00%	=	8.85%
PGN	k= 10.0%	(1-	0.2492)/	1.34	+	3.38%	=	9.00%
AEE	k= 09.5%	(1-	0.1937)/	1.56	+	4.64%	=	9.57%
CNL	k= 08.0%	(1-	0.2800)/	1.51	+	6.36%	=	10.16%
DPL	k= 24.5%	(1-	0.2857)/	4.50	+	6.50%	=	10.39%
EDE	k= 06.5%	(1-	-0.2190)/	1.47	+	4.79%	=	10.16%
ETR	k= 11.5%	(1-	0.5304)/	1.70	+	5.90%	=	9.07%
HE	k= 10.0%	(1-	0.1733)/	1.76	+	3.93%	=	8.63%
PNM	k= 08.5%	(1-	0.4788)/	1.27	+	6.17%	=	9.67%
PNW	k= 08.5%	(1-	0.3233)/	1.12	+	5.11%	=	10.24%
UNS	k= 09.5%	(1-	0.5333)/	1.61	+	5.38%	=	8.13%
							AVERAGE	**9.40%**
							STANDARD DEVIATION	**0.74%**

Note: Equity returns and retention ratios based on Value Line current year projections.

DUQUESNE LIGHT COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
ELECTRIC UTILITIES

$k = R.O.E.(1-b)/(M/B) + g$
[2009-2011]

COMPANY								MARKET-TO-BOOK COST OF EQUITY
CV	k= 11.0%	(1- 0.5282)/	1.22	+	4.00%	=		8.25%
FE	k= 11.0%	(1- 0.4500)/	1.68	+	5.20%	=		8.79%
GMP	k= 10.5%	(1- 0.3961)/	1.26	+	5.00%	=		10.05%
PGN	k= 10.0%	(1- 0.2514)/	1.34	+	3.38%	=		8.98%
AEE	k= 09.5%	(1- 0.2638)/	1.56	+	4.64%	=		9.14%
CNL	k= 09.0%	(1- 0.4286)/	1.51	+	6.36%	=		9.75%
DPL	k= 21.0%	(1- 0.3371)/	4.50	+	6.50%	=		9.59%
EDE	k= 09.5%	(1- 0.1467)/	1.47	+	4.79%	=		10.29%
ETR	k= 10.5%	(1- 0.4717)/	1.70	+	5.90%	=		9.15%
HE	k= 10.0%	(1- 0.2914)/	1.76	+	3.93%	=		7.96%
PNM	k= 08.5%	(1- 0.4211)/	1.27	+	6.17%	=		10.06%
PNW	k= 09.0%	(1- 0.3155)/	1.12	+	5.11%	=		10.60%
UNS	k= 08.5%	(1- 0.4051)/	1.61	+	5.38%	=		8.52%
							AVERAGE	**9.32%**
							STANDARD DEVIATION	**0.82%**

Note: Equity returns and retention ratios based on Value Line three- to five-year projections.

DUQUESNE LIGHT COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
GAS DISTRIBUTORS

$k = R.O.E.(1-b)/(M/B) + g$
[2006]

COMPANY									MARKET-TO-BOOK COST OF EQUITY
ATG	k= 12.5%	(1-	0.4118)/	1.73	+	5.42%	=		9.67%
ATO	k= 09.0%	(1-	0.3189)/	1.27	+	5.31%	=		10.14%
CGC	k= 08.0%	(1-	0.0400)/	1.60	+	4.38%	=		9.16%
LG	k= 13.0%	(1-	0.4043)/	1.87	+	5.66%	=		9.81%
NJR	k= 16.5%	(1-	0.4786)/	2.56	+	6.50%	=		9.86%
GAS	k= 12.5%	(1-	0.2250)/	2.11	+	3.75%	=		8.35%
NWN	k= 10.0%	(1-	0.3867)/	1.58	+	4.87%	=		8.75%
PGL	k= 11.0%	(1-	0.0311)/	1.75	+	3.86%	=		9.95%
PNY	k= 11.0%	(1-	0.2615)/	2.07	+	5.26%	=		9.19%
SJI	k= 12.5%	(1-	0.4973)/	1.86	+	6.69%	=		10.07%
SWX	k= 08.0%	(1-	0.4710)/	1.45	+	6.44%	=		9.35%
WGL	k= 10.0%	(1-	0.2703)/	1.66	+	4.20%	=		8.58%
								AVERAGE	**9.41%**
								STANDARD DEVIATION	**0.61%**

Note: Equity returns and retention ratios based on Value Line current year projections.

DUQUESNE LIGHT COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
GAS DISTRIBUTORS

$k = R.O.E.(1-b)/(M/B) + g$
[2009-2011]

COMPANY								MARKET-TO-BOOK COST OF EQUITY
ATG	k= 12.0%	(1-	0.3966)/	1.73	+	5.42%	=	9.60%
ATO	k= 10.5%	(1-	0.4600)/	1.27	+	5.31%	=	9.78%
CGC	k= 08.5%	(1-	0.3677)/	1.60	+	4.38%	=	7.73%
LG	k= 13.0%	(1-	0.4643)/	1.87	+	5.66%	=	9.39%
NJR	k= 14.5%	(1-	0.4848)/	2.56	+	6.50%	=	9.42%
GAS	k= 13.0%	(1-	0.2786)/	2.11	+	3.75%	=	8.20%
NWN	k= 10.5%	(1-	0.4035)/	1.58	+	4.87%	=	8.83%
PGL	k= 13.5%	(1-	0.1704)/	1.75	+	3.86%	=	10.26%
PNY	k= 12.5%	(1-	0.3314)/	2.07	+	5.26%	=	9.30%
SJI	k= 13.0%	(1-	0.5000)/	1.86	+	6.69%	=	10.19%
SWX	k= 10.5%	(1-	0.6435)/	1.45	+	6.44%	=	9.01%
WGL	k= 11.0%	(1-	0.3958)/	1.66	+	4.20%	=	8.19%
							AVERAGE	**9.16%**
							STANDARD DEVIATION	**0.80%**

Note: Equity returns and retention ratios based on Value Line three- to five-year projections.

DUQUESNE LIGHT COMPANY
OVERALL COST OF CAPITAL

Type of Capital	PERCENT	COST RATE	WT. AVG. COST RATE
Common Equity	42.00%	9.50%	3.99%
Preferred Stock	9.00%	5.37%	0.48%
Total Debt	49.00%	6.90%	3.38%
Totals	100.00%		**7.85%**

PRE-TAX INTEREST COVERAGE* = 3.21x

*Assuming the Company experiences, prospectively, a combined income tax rate of 40%, the pre-tax overall return would be 10.84% [7.37%-(3.38%)=4.47% /(1-40%) = 7.46%+(3.38%)]. That pre-tax overall return (10.84%), divided by the weighted cost of debt (3.38%), indicates a pre-tax interest coverage level of 3.21 times.

Does the Constant Growth Discounted Cash Flow Model Portray Reality?

By JOSEPH F. BRENNAN and PAUL R. MOUL

The results of a major study completed in August, 1987, have raised serious questions about the usefulness and reliability of the constant growth discounted cash flow model in calculating the cost of common equity for public utilities, even though many regulatory agencies rely heavily on this methodology. The study, financially supported by nearly 60 utility companies, was published by the AUS Consulting Group after a six-month analysis. This article discusses the results of their study.

Increasingly, regulatory agencies rely upon a constant growth discounted cash flow (DCF) model to estimate the cost rate of common equity for public utilities. So strong is this reliance, the Federal Energy Regulatory Commission specifically prescribes this methodology in its September 30, 1987, Notice of Proposed Rulemaking (NOPR). The NOPR suggests that the DCF method will be used to determine the "benchmark" rate of return on common equity for the average risk electric company on an ongoing basis.

Beginning with the bull market in August, 1982, and in particular in 1986 and through mid-1987, stock prices rose to unprecedented heights. In August, 1987, common stock prices in general had reached a level which provided a dividend yield less than 3 percent. On only six occasions since 1926 had the dividend yield for the Standard & Poor's 500 Composite Index fallen below the 3 percent level. In each instance, the price of common stocks subsequently declined on average 44 percent, according to one investment advisor.

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Immediately prior to the stock market crash on October 19, 1987, lofty stock prices were accompanied by rising interest rates. Although the stock market continued to rise through August, 1987, common stock prices in the five-year-old bull market became substantially overvalued in light of rising interest rates. Prior to the crash, this phenomenon perplexed market professionals. For example, up until October, 1987, common stock prices had moved substantially beyond their capitalized earnings value when interest rates were higher than their former levels when price-earnings multiples were lower. Ultimately, rising interest rates had a pronounced effect on the valuation of equities.

Subsequently, the overvaluation was partially corrected when the stock market lost 36.1 percent of its value in just a two-month period. As measured by the Dow Jones Industrial Average, the stock market plunged from 2722.42 on August 25, 1987, to 1738.42 on October 19, 1987, with the climax of a record setting crash of 508.32 points. The stock market is now characterized by a loss of investor confidence and extreme volatility. With this background, we asked: Can DCF function and provide a reasonable estimate of a fair rate of return on common equity when stock prices are not based solely upon the underlying fundamentals of a firm?

Measurement of Cost of Capital

Our concern was heightened by the apparent insensitivity of the constant growth DCF to measure accurately

Table 1

Spread Between Quarterly DCF Results and A-rated Bond Yields

Benchmark Applicability Period	DCF Calculated Rate of Return	A-Rated Public Utility Bond Yields	Spread
7-1-85 to 7-31-85	14.44%	12.07%	2.37%
8-1-85 to 10-31-85	13.91	12.09	1.87
11-1-85 to 1-31-86	13.68	11.08	2.60
2-1-86 to 4-30-86	13.75	9.63	4.12
5-1-86 to 7-31-86	13.25	9.53	3.72
8-1-86 to 10-31-86	12.75	9.59	3.16
11-1-86 to 1-31-87	12.25	9.12	3.13
2-1-87 to 4-30-87	11.20	9.10	2.10
5-1-87 to 7-31-87	11.30	10.03	1.27
8-1-87 to 10-31-87	11.74	11.00	.74

the cost of capital. It became apparent that sometimes the DCF-determined equity cost rate barely provided a return above the yield on long-term investment grade quality public utility bonds. This was particularly prevalent prior to the October 19, 1987, stock market crash. To further demonstrate this point, we compared each of the individual DCF-calculated rates of return (using the FERC's quarterly DCF without regard to the quarterly cap initially used for indexing purposes) with A-rated public utility bond yields. This comparison shows that the spreads varied within the band of 1.87 percent to 4.12 percent from July 1, 1985, through April 30, 1987, or an average of 2.88 percent. Afterwards, there was a marked decline in the spread between the quarterly DCF result and the yield on A-rated public utility bonds. As Table 1 indicates, this spread shrank to 1.27 percent for the period May 1 to July 31, 1987, and further declined to 0.74 percent in the period August 1 to October 31, 1987.

These data should be considered in the context of prior FERC observations that the stability of the spread, previously shown to be 2.3 percent to 2.5 percent, confirmed the DCF result. Clearly, for the year 1987, that stability was lacking. Moreover, we became alarmed by the situation where the DCF result provided a *lower* calculated result (11.74 percent applicable from 8-1-87 to 10-31-87 versus 12.75 percent applicable from 8-1-86 to 10-31-86) when interest rates had *risen* (11 percent for the quarter ended 10-31-87 versus 9.59 percent for the quarter ended 10-31-86). These data show that the DCF model suggests a *declining* equity cost rate by about one percentage point while interest rates were *rising* by nearly one and one-half percentage points. Can a lower DCF result be verified in the marketplace for capital? The answer, based upon the data provided above, is a resounding "no."

We do not have to estimate the investor-required rate of return for long-term debt capital. It is what the marketplace says it is. We do have to estimate the investor-required rate of return for common equity capital. We should not lose sight of the fact that DCF is an estimate, and unfortunately, an unreliable estimate in the recent market environment. The constant growth DCF model mechanically computed does not always provide a reasonable, useful estimate of the investor-required rate of return on common equity. Often, investors do not behave according to the assumptions of the constant growth DCF model.

Reasonable and useful estimates of the common equity cost rate should provide a public utility with the opportunity to earn a return which: (1) meets the tests of capital attraction and maintenance of credit which are mandated by the *Bluefield* and *Hope* decisions; (2) provides adequate compensation for risk so as to result in a return which exceeds the current attraction rate of long-term debt capital as prescribed by the basic principles of corporate finance, and (3) meets the test of reasonableness from an investor's point of view in that a "reasonable" investor would *never* purchase a share of common stock unless his expectations included a positive return and would provide an appropriate premium above the current yield on long-term debt.

Design of a Study

Believing our research to be directed to one of the *most crucial* issues facing the utility industry today, in the spring of 1987 we retained the services of Dr. Lawrence R. Klein, Nobel Laureate in economics, Benjamin Franklin Professor of Economics at the University of Pennsylvania, and chairman of the professional board of Wharton Econometrics; and Dr. Andrew F. Brimmer, president of the consulting firm of Brimmer and Company, Inc., distinguished professor of economics at the University of Massachusetts, Amherst, and former member of the board of governors of the Federal Reserve System. Dr George R. Schink, senior vice president, represented Wharton Econometrics in our group. We met

Paul R. Moul is a vice president of Associated Utility Services, Inc., with two decades of experience in serving the utility industry (as an independent consultant to investor-owned utilities, municipal utilities, and regulatory agencies, and as an analyst with a major water utility holding company). He has testified in more than 100 cases on rate of return, capital recovery, capital allocation, cash working capital, and income taxes; and has appeared as an expert witness before the Federal Energy Regulatory Commission and 18 state public utility companies. **Mr. Moul** is a graduate of Drexel University.

sions during the period March through June of 1987 to specify the problem, identify the sample of utility firms to be used in the investigation, review preliminary results, and provide overall direction and guidance to the project. Dr. Schink, with the advice and counsel of Dr. Klein, (1) designed the econometric models for testing the traditional assumptions of the constant growth DCF model, and (2) devised an alternative model for deriving the growth component of the DCF while avoiding rigid adherence to the restrictive assumptions imposed by the traditional model as typically used in public utility rate cases.

The professional staff of Associated Utility Services was generally responsible for data assembly, background investigations, preliminary statistical analysis, and other support activities.

DCF History

The DCF method of calculating a price of an economic asset has been a staple tool of financial analysis for many years. In the early years of its use, fixed contract bonds were valued and yields to maturity calculated with this method. These tasks were made easier over time as risk classes were developed and bond ratings evolved. Preferred stocks, because they were usually perpetuities, were also valued in this manner.

Common stocks were, however, rather difficult to value with the DCF method because of the absence of reliable risk categories and, just as important, because the common stock dividend was variable. In 1938, Professor J. B. Williams of Harvard University, by making the simplifying assumption of a constant dividend growth rate, opened the door for the simplified DCF valuation model we use today. In a commonly used formulation:

$$P_0 = \frac{D_0(1+g)}{K - g}$$

where price (P_0) is established using the value of the next annual dividend ($D_0 (1 + g)$), the capitalization rate (K — the investor-required rate of return), and the assumed constant growth rate (g). This is the traditional dividend discount model.

Myron J. Gordon and Eli Shapiro (1956) apparently first applied the simplified model to derive the investor-required rate of return, where $K = D_1/P_0 + g$. Their initial purpose was to discover the discount rate (or hurdle rate) in capital budgeting decision-making. Subsequently, in 1966, Professor Gordon testified before the Federal Communications Commission concerning the American Telephone and Telegraph Company's capital structure and the cost of capital. This apparently was the first time that a rate-of-return recommendation in a DCF model. Although the FCC did not accept the model, Professor Gordon's recommendation was in general agreement with the FCC's finding.

Professor Gordon continued his research on public utility cost of capital during the early 1970s and, in 1974, published his now famous *The Cost of Capital to a Public Utility*. Professor Gordon adopted a simplifying assumption, namely that stock price growth, or the "g" part of the DCF model, was proportionate to growth in earnings, dividends, book value, or retention growth, given the further simplifying assumption of no change in the dividend payout ratio. This book quickly became the standard work in DCF cost of equity estimates for a large segment of the regulated sector and, just two years later, 17 regulatory bodies in North America stated that their preferred methodology for determining equity cost rates was the DCF method.

Professor Gordon's model required the assumption of not only a constant dividend growth rate, but also of equivalent (proportionate) growth rates in dividends per share (DPS), earnings per share (EPS), and book value per share (BVPS). This growth rate was stated in the form "br," where "b" equals the retention rate (the fraction of earnings retained by a firm, or the complement of the dividend payout ratio) and "r" equals the assumed rate of return on book common equity. Professor Gordon's model, either in its strict constant-equal-growth form or in a form where the growth rate in dividends is estimated exogenously, is now the most commonly used method of estimating the cost of equity in public utility rate cases by federal and state regulatory agencies.

Testing Model Assumptions

A primary thrust of our analysis was to test the model for its ability to predict accurately one-period stock price change. Our tests, involving over 100 electric, natural gas, water, and telephone public utility companies, reflected market results during the period 1967 to 1986. More than 3 million computations were performed during our study. Specifically, we reason that the following equations should hold true if the DCF model assumptions are valid:

$$\frac{P_1 - P_0}{P_0} = \frac{DPS_1 - DPS_0}{DPS_0}$$

$$= \frac{EPS_1 - EPS_0}{EPS_0}$$

$$= \frac{BVPS_1 - BVPS_0}{BVPS_0}$$

these equations for seven large groups of utilities by regressing the percentage change in the weighted average stock price on the percentage changes in DPS, EPS, and BVPS. As shown in Table 2, the percentage changes in DPS, EPS, and BVPS did a very poor job of explaining stock price change over a one-year holding period reaching back many years. We also tested several alternative lagged relationships with similarly unacceptable results.

The end result of our investigation leads to the inevitable conclusion that the market behavior during the study period was significantly different from the behavior required to be assumed by the constant growth DCF model employed by most regulatory agencies. This conclusion should not be surprising because the simplifying assumptions adopted by Professor Gordon — namely, price growth or "g" is proportionate to growth in earnings, dividends, book value, or retention growth — were derived from a period of time prior to the 1973 Arab oil embargo which was vastly different from the market environment of today. Since the work of Professor Gordon was published (based upon share values over the years 1958-68), public utility com-

TABLE 2

Evaluation of Simplified Discounted Cash Flow Model

	Utility Group (Estimation Period)	Percent Change in Dividends Per Share R-Squared	F-Test	Percent Change in Book Value Per Share R-Squared	F-Test	Percent Change in Earnings Per Share R-Squared	F-Test
1.	24 Electric (1968-1986)	−.057	—	−.030	—	.123	—
2.	24 Gas & Electric (1968-1986)	.345	**	.071	—	.027	—
3.	24 Gas Distribution (1968-1986)	.159	—	.169	*	.152	—
4.	9 Gas Transmission & Distribution (1968-1986)	−.023	—	.012	—	−.057	—
5.	5 Gas Transmission (1974-1986)	.056	—	−.001	—	−.012	—
6.	12 Water Supply (1979-1985)	−.182	—	.229	—	−.198	—
7.	8 Telephone (1974-1986)	−.048	—	−.071	—	.011	—

NOTES:

The R-Squared statistic indicates the percentage of the variation in the stock price growth explained by the regression while the F-Test statistic indicates whether the regression explains a statistically significant percentage of the stock price growth variation. The F-Test is reported as follows:

— = Not significant
* = Significant at the 5 percent level
** = Significant at the 1 percent level

The 5 percent level test implies that there is only a 5 percent chance that the regression is not significant while the 1 percent level test implies only a 1 percent chance that it is not significant. The percentage level of significance is the probability of rejecting the hypothesis that there is no relationship when, in fact, there is a relationship.

The R-Squared statistic is adjusted for degrees of freedom. As a result, it can have negative numerical values which should be interpreted as zeros; i.e., the equation explained none of the stock price growth variation.

tion stock prices have been influenced by fundamental changes in the regulatory and economic environments — including:

- The Safe Drinking Water Act of 1974.
- Public Utility Regulatory Policies Act of 1978 and Natural Gas Policy Act of 1978.
- The formation of the Department of Energy.
- The AT&T divestiture.
- Changes in customer attitudes regarding the use of energy.
- Increased awareness regarding conservation of natural resources.
- The evolution of alternative energy sources (such as cogeneration, resource recovery, and small power production).
- Suspected or impending merger and acquisition proposals.
- Increased competitiveness and deregulation which has been fostered by national policy.

None of the aforesaid is directly taken into account when using accounting values — i.e., DPS, EPS, or BVPS — as a proxy to determine the constant growth rate. Moreover, for the past few years in particular, billions of dollars of stock have been purchased by foreign investors. Foreign investors have been accustomed to much higher price-earnings multiples available in nondomestic equity markets than have been the norm for U. S. equities. Further, the shrinkage in supply of common stocks attributed to corporate demand has had a material impact on equity prices. In fact, equity price behavior is quite different from the restrictive assumptions of the constant growth DCF model.

The constant growth DCF result likely understates or overstates the cost rate of common equity in a market environment of rapidly changing capital cost rates. It is also not unusual for the DCF result (as calculated in public utility rate cases) to lag the actual cost of equity. Moreover, when stock prices diverge from book value, a DCF-derived cost rate applied to book value will almost certainly produce an inaccurate earnings level (either higher or lower) for a utility.

We believe the results of our investigation indicate that the assumptions necessary to implement the simplified constant growth DCF model are unrealistic and that the DCF cost rate provides an inaccurate measure of the cost of equity during many phases of the market. Therefore, the simplified constant growth DCF model should not be used as a sole or primary indicator of investor-required return on equity for rate-setting purposes. It is even more apparent that the mechanical application of the DCF model in a generic sense for an entire segment of the utility industry is inappropriate.

An Alternative Approach

As an alternative approach, we developed econometric models to explain stock price changes for the seven utility groups. The independent variables were: (1) the percentage change in the Standard & Poor's 500 price-earnings ratio; (2) various industry-specific factors; and (3) various company-specific financial characteristics (such as common equity ratio). Summary statistics shown for these models by utility type are provided in the appendix to this article. It is clear that these models explained a larger percentage of the change in stock price. This alternative econometric approach provides a superior explanation of stock price changes; i.e., growth rates for common stock to be employed in estimating investor-required rate of return on common equity.

As a final step in our analysis, we tested the econometric model developed for the group of 24 electric utilities for 1986. Using 1986 projections made and available in 1985, the model predicted the direction of stock price change accurately, but (because of an inaccurate projection of change in money supply in 1986) underestimated the magnitude of the stock price change. The model-derived growth rate was 17.4 percent in 1986. This compares with an actual 28.8 percent capital appreciation for the 24 electric utilities in 1986. In this instance, an econometric approach is clearly superior to the traditional growth rate — based upon various accounting values — usually considered in the simplified DCF model (such as 4 percent to 6 percent). However, these results still must meet the test of reasonableness from a rate-setting viewpoint. While it is possible to model stock price change with more reliability using an econometric approach compared to the constant growth assumption using accounting values, neither is necessarily investor expected nor investor required.

Realities of the Market

While estimates derived from an econometric model may permit more accurate measures of the capital gains yield than do mechanical applications of accounting-derived growth rates such as earnings, dividends, book value, or retention growth in a DCF calculation, the end result must be tempered with reasoned judgment in the rate-setting context. We conclude that the traditional DCF methodology as applied in the regulatory arena should not be relied upon as the sole or primary method for determining the appropriate return on equity to be allowed by regulators.

The reality of the market is quite different than the hypothesized world of DCF using accounting values. We must consider the rate-of-return principles enunciated by *Bluefield* and *Hope*; namely, the capital attraction and maintenance of credit standards. Other methods of estimating the allowed rate of return on equity should be

risk premium" method. Moreover, the end result of any judgment as to the cost rate for common equity should be tested by reference to the capital attraction standard using a before-income tax interest coverage approach, since the return on common equity, together with interest on borrowed capital.

Use of a variety of methods will better ensure a more reliable and fair rate of return so as to permit public utilities to raise capital on a timely basis in order to fulfill their public service obligation.

Appendix

Evaluation of Regressions Developed to Explain Utility Stock Price Growth
(Multivariate Regressions for Percentage Change in Stock Price)

		Summary Regression Statistics			
	Utility Group (Estimation Period)	R-Squared	F-Test	Standard Error	Durbin-Watson
1.	24 Electric (1968-1986)	.706	**	7.5	1.78
2.	24 Gas & Electric (1968-1986)	.676	**	8.2	1.67
3.	24 Gas Distribution (1969-1986)	.494	**	12.0	2.61
4.	9 Gas Transmission & Distribution (1969-1986)	.531	**	8.9	2.24
5.	5 Gas Transmission (1974-1986)	.291	—	17.3	2.37
6.	12 Water Supply (1979-1985)	.949	**	3.9	1.73
7.	8 Telephone (1974-1986)	.729	**	7.9	1.83

NOTES:

The R-Squared statistic indicates the percentage of the variation in the stock price growth explained by the regression, while the F-statistic indicates whether the regression explains a statistically significant percentage of the stock price growth variation. The F-Test results are reported as follows:

— = Not Significant
** = Significant at the 1 percent level

One percent level significance test implies only a 1 percent chance that the regression is insignificant. The percentage level of significance is the probability of rejecting the hypothesis that there is no relationship when, in fact, there is a relationship.

The Standard Error statistic is a measure of equation error stated in percentage point terms. The Standard Error statistic is adjusted for degrees of freedom. The Durbin-Watson statistic tests for the presence of serial correlation among the equation residuals. For all the above equations, one cannot reject the hypothesis of zero serial correlation.

Use of the Discounted Cash Flow Model Has Not Been Invalidated

By Stephen G. Hill*

The attempt by Joseph F. Brennan and Paul R. Moul to discredit the discounted cash flow model (DCF), funded by 60 utility companies and described in "Does the Constant Growth Discounted Cash Flow Model Portray Reality?" PUBLIC UTILITIES FORTNIGHTLY, January 21, 1988, pp. 24-29, falls far short of its goal, as have similar "What's wrong with the DCF?" articles which have appeared in this magazine over the past year. In my view, the only thing "wrong" with the DCF model, when properly applied, is that it produces cost of equity estimates under current conditions which are simply not high enough to suit the utility industry.

It is interesting to note that the industry and its cost of equity representatives like Mr. Brennan found no technical or theoretical problems with the DCF model in the early 1980s when, through the use of that model, allowed equity returns rose from the 11 percent to 12 percent level prevalent in the late 1970s to 15 percent to 17 percent. However, in recent years capital costs have fallen substantially as has utility industry support for the DCF.

The industry's motivation to reduce the impact of the DCF on allowed equity capital costs is quite logical. What utility manager wants to tell his stockholders or the financial community that their profit margin should be or will probably be decreased? However, continued reliance on the DCF would mean just that, because the DCF is currently indicating equity costs in the 11 percent to 12 percent range while utilities are expected to earn equity returns of 13 percent to 14 percent. Again, the motivation is logical; unfortunately the rationale Mr. Brennan uses to discredit the DCF is not.

The thesis of Mr. Brennan's article is that the DCF is not now a reliable method for estimating equity capital costs. His rationale is based on three arguments. First, the stock market is overvalued. Second, the DCF as represented by the Federal Energy Regulatory Commission's generic rate of return doesn't properly track debt cost rates. Third, the theoretical support for the DCF model is unrealistic and can be shown to be at variance with reality through statistical testing.

First Argument

In his first argument, Mr. Brennan is simply substituting his own judgement for that of the market. Regulation seeks to award the utility a return equal to that which the investor requires for the risk he faces, not the return an analyst thinks the investor should require. The market price of a stock is the mechanism through which investors adjust their required return and, along with the dividend, is an easily observable component of that return requirement. If the market price of the stock, which represents a consensus valuation opinion set through the transactions of thousands of investors every day, is not a useful measure of the investors' required return, then there is none and equity capital cost analysis falls into the realm of sheer guesswork.

Further, Mr. Brennan's lack of faith in equity investors' ability to properly value their expectations — i.e., set the "right" market price — seems especially curious in light of his confidence in fixed-income investors ability to do the same. He notes: "We do not have to estimate the investor-required rate of return for long-term debt capital. It is what the marketplace says it is." Although they have a better guide as to the stratification of relative risk, fixed-income investors set the return they require through market interaction given their expectations about the future in the same manner as equity investors. The market mechanism is the same. Many of the "big players" in both markets are the same. Mr. Brennan's position on the unreliability of the equity market's valuation abilities is in sharp contrast to his belief that values set in the fixed-income capital marketplace are not to be questioned. His first argument is, therefore, internally inconsistent.

Second Argument

Regarding the second argument, Mr. Brennan's conclusion about the purported inability of the FERC's generic equity capital cost estimate to follow changes in public utility bond yields is drawn from insufficient evidence and ignores the details of the FERC's DCF model methodology of which he is surely aware. In Table 1 of his article, there appears a comparison of FERC DCF quarterly ge-

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A-rated utility bond rates. From these data he concludes that the DCF must be flawed because the DCF equity cost had fallen between August 1986 and 1987 while interest rates had risen. If Mr. Brennan had continued his observation two more quarters he would have found that the FERC's DCF model produced successively higher equity capital cost estimates while interest rates were falling — exactly the opposite situation from the one which "heightened his concern" about the DCF.

The reasons for the discrepancy in the bond and equity cost rates shown in Brennan's Table 1 is not endemic to the DCF model or its underlying assumptions but to the manner in which the FERC chooses to apply the DCF. Because the FERC chooses to (1) re-evaluate the electric industry's equity capital cost at the beginning of each year and, in so doing, utilize stock price data from the preceding 12-month period, as well as (2) update that equity cost quarterly using the preceding six-month dividend yield data, the FERC generic equity capital cost will lag the actual capital cost by at least six months. This procedure will create transitional discrepancies such as those depicted on Mr. Brennan's Table 1 but by no means represents an indictment of the DCF as a reliable estimate of equity capital costs. If the FERC used more current stock price data in its DCF analysis its cost of equity determinations would more closely track bond yields. Mr. Brennan has been a commentor in many of the FERC's generic rate of return proceedings and is surely aware that it is the commission's particular application of the model rather than the DCF itself which creates the capital cost rate anomalies which he claims proves the DCF's unreliability.

Third Argument

The third argument Mr. Brennan uses to support his thesis that the DCF is no longer a reliable equity statistical test of the model's "steady state" assumption that a company's dividends, earnings, book value, and market price grow at the same constant rate. In so doing, he compares historical one-year percentage changes in dividends, earnings, and book value for different groups of utility companies to percentage changes in the stock price over the same period. His results showed, unsurprisingly, that historical one-year rates of change in dividends, earnings, and book value are not well correlated with rates of change in market prices. However, Mr. Brennan's "test" of the DCF, rather than an indictment of its usefulness as a cost of equity estimation technique, stands as a comparison of historical measures of growth. (I should note here that conspicuously absent from Brennan's growth rate comparison is the "b x r," or retention growth, which is Professor Gordon's preferred growth rate measure and is utilized in the FERC's generic rate of return model.) This is because the DCF model and cost of equity capital analysis in a regulatory setting is an expectational or *ex ante* phenomenon, whereas Mr. Brennan has studied actual historical or *ex post* data. The answer he receives from his statistical study, then, is not germane to the question he seeks to answer; namely, is the constant-growth DCF a reasonable framework in which to model investor *expectations?*

Although historical results certainly influence investors, they are only a part of the information which the investor analyzes in forming his current expectations. These historical events, the most recent being the most influential, are considered in the current economic environment along with the investor's expectations about the future, as the investment decision is made. In order for Mr. Brennan's statistical results to undermine the validity of the DCF, as he believes they do, it would have to be true that historical results are equivalent to investor expectations. If that market-basket of stocks in August of 1987 would have invested with the expectation that they would loose 30 percent of their investment's value before year's end. As Mr. Brennan notes in his article, "a 'reasonable' investor would *never* purchase a share of common stock unless his expectations included a positive return." Actual historical results do not necessarily represent investor expectations about the future and Mr. Brennan's statistical comparison of historical single-year growth rates has no relevance to the DCF's ability to estimate equity capital cost rates accurately.

It is undeniably true that the constant growth assumption inherent in the DCF does not precisely track reality. However, as I noted above, this is not surprising and that fact in no way invalidates the DCF as a primary indicator of equity capital costs. Any mathematical model of a real-world situation is necessarily an abstraction subject to simplifying assumptions and some degree of error. Mathematical modelling is the basis of much of modern life. It is the very essence of engineering applications. Even in that kind of "simplified" modeling situation where the number of operable variables are relatively few, the calculated results are not produced without error. For example, in designing a piping system there are assumptions of ideality regarding the smoothness of the pipe, the laminar or turbulent nature of the fluid flow in the pipe, the physical properties of the transported fluid, and pump efficiency without which the problem would become far too complex to be solvable. Yet, we get tap water every day out of a piping system that was designed with equations (mathematical models) which are only approximations of reality.

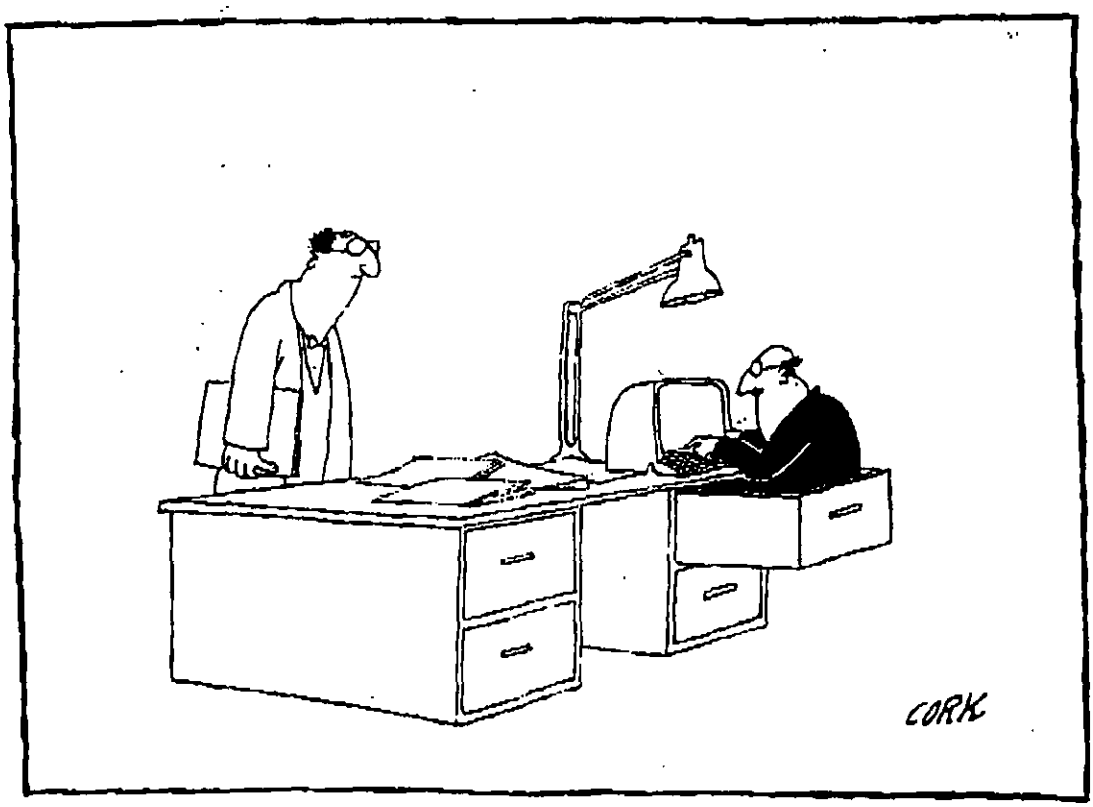
Assumptions in Proposed Replacement

With the myriad variables that accompany any societal phenomenon

which purports to represent something as intangible as investor opinions in an objective manner must be subject to simplifying assumptions, variability, and error. Mr. Brennan's concern about a capital cost estimation technique being out of keeping with reality is necessarily true, but is meaningful only in the sense that it applies equally to all equity capital cost estimation methodologies, not just the DCF. For example, Mr. Brennan's suggested replacement for the DCF, the "utility bond yield plus risk premium method," contains two implicit assumptions which are abstractions of reality. I believe both of these assumptions are far more removed from reality than the DCF assumption that investors expect on average that the market price, earnings, book value, and dividends of a company will grow at the same rate, over time.

The assumptions in Brennan's risk premium approach are: (1) today's economic conditions which produce [illegible] are the same as have existed, on average, over the past 60 years (this assumes use of Ibbotson's holding period return data which Mr. Brennan often uses — *Stocks, Bonds, Bills and Inflation* [Chicago: R. A. Ibbotson Associates]), and (2) the risk premium is constant over time. Mr. Brennan himself argues against the validity of the first assumption in his article by pointing out the changes in the economic environment that have occurred just since the mid-1970s. Also, the bond market has undergone a striking change in the past decade from a rather "sleepy" environment in which daily price changes were measured in 32nds of a point to a high pressure, new-product oriented market whose daily volume dwarfs that of the equities market and whose total return volatility exceeded that of the stock market during the five years ended 1985. This latter point argues against the validity of either risk premium assumption. Therefore, if Mr. Brennan were to reject the DCF because the "idealized" assumptions which allow their existence are unrealistic, then he must also reject the risk premium methodology, and, for that matter, any other cost of equity method currently in use — capital asset pricing model, earnings-price ratio, market-to-book ratio, t-model, as well as multivariate regression analysis.

I generally agree with Mr. Brennan's conclusion that: "Use of a variety of methods will better ensure a more reliable and fair rate of return." However, I must disagree with his conclusion that the DCF should not be relied on as the primary method for determining the appropriate return on equity to be allowed by regulators. For the reasons stated herein I believe Mr. Brennan and Mr. Moul have failed to prove by either logic or statistical analysis that the DCF does not now produce a reasonable and reliable estimate of the cost of capital.



OCA STATEMENT NO. 2S

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	
v.	:	*Docket No. R-00061346*
	:	
Duquesne Light Company	:	

SURREBUTTAL TESTIMONY OF

STEPHEN G. HILL

ON BEHALF OF THE

OFFICE OF CONSUMER ADVOCATE

AUGUST 2006

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: sghill@compuserve.com).

Q. ARE YOU THE SAME STEPHEN HILL THAT TESTIFIED PREVIOUSLY ON BEHALF OF THE OFFICE OF CONSUMER ADVOCATE REGARDING COST OF CAPITAL AND CAPITAL STRUCTURE ISSUES IN THIS PROCEEDING?

A. I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AT THIS TIME?

A. I will respond to issues raised in the Rebuttal Testimony of Duquesne Light Company (DLC, Duquesne, the Company) witnesses Paul Moul.

Q. HAS DLC WITNESS MOUL'S REBUTTAL TESTIMONY CAUSED YOU TO CHANGE YOUR EQUITY RETURN RECOMMENDATION IN THIS PROCEEDING IN ANY WAY?

A. No. Mr. Moul's own unadjusted updated DCF result for his electric utility sample group, 9.80%, confirms the reasonableness of my equity cost estimate in this proceeding—a fact that the Company witness fails to address in his Rebuttal. Although Mr. Moul's updated DCF result is somewhat higher than mine, it is important to understand that his DCF result is based solely on projected earnings growth rates and, as I note in Appendix B attached to my Direct Testimony, sole reliance on projected earnings growth rates, absent an examination of the underlying fundamentals of growth, will lead to an overstatement of the cost of equity capital. Therefore, My 9.50% recommendation remains reasonable, if not conservative, and is unaffected by Mr. Moul's rebuttal.

While, primarily, my rebuttal will address the Company witness comments regarding my Direct Testimony, it is important to note at the outset what has been left

unsaid. In my Direct Testimony I presented a substantial amount of evidence regarding recent research in the field of financial economics regarding the market risk premium and the significance of that new research on the cost of capital. I point out, through reference to many recent scholarly articles (which I also provided to the Company in my workpapers), that investors' equity return expectations for the future are substantially below what historical returns indicate they have been in the past. That is, the current, forward-looking market risk premium embedded in today's market prices is well below what is assumed in Mr. Moul's risk premium and CAPM analyses.

Objective proof that investors' current equity return expectations are relatively low is provided in Duquesne Light's own investment portfolio expectations. The Company's pension fund investment advisors indicate that the expected return on its equity investments will range from 8.5% to 9.2%, and the Company has based its pension expense on that expectation. That range of expected returns, provided by an independent source, is well below my equity return recommendation for DLC of 9.50% in this proceeding. Importantly, the parameter the Company is projecting for its investment portfolio is investors' expected return on equity. That is the very the definition of the cost of equity capital, and is the same parameter the Commission seeks to determine in its evaluation of the cost of equity estimation methods in rate proceedings.

In Rebuttal, Mr. Moul is completely silent on these issues. He offers no contrary position, rationale or theoretical research regarding the market risk premium in his Rebuttal Testimony, and continues to urge the Commission to rely on his excessive risk premium results rather than DCF results, although the latter are far closer to the *Company's own expectations for its equity investments.*

Duquesne Light expects to earn a return of 8% to 9.2% on its own equity investments in the capital marketplace (and uses that expectation to calculate its pension expense), while requesting that this Commission set rates using a return on utility common equity of 11.75%. The Company's requested return on equity, based on Mr. Moul's analysis, is 250 to 375 basis points higher that the return it expects to earn on its own equity investments. Moreover, the Company's retirement portfolio equity return

expectations comport with the recent theoretical research I provide regarding forward-looking market risk premiums. However, in rebuttal, the Company has elected not to respond to either the research I have cited or the enormous discrepancy between what DLC expects to earn on its own equity investments and what Mr. Moul says investors expect to earn.

Q. YOU'VE UNDERSCORED WHAT MR. MOUL DID NOT DISCUSS IN REBUTTAL, HOW DO YOU RESPOND TO ISSUES HE DID RAISE IN HIS REBUTTAL?

A. I will initially address Mr. Moul's leverage/risk adjustment to the market-based cost of equity capital. That adjustment adds 43 basis points to a DCF cost of equity estimates (Moul Rebuttal, p. 28). An equity return increment of that magnitude, adjusted for taxes and applied to the Company's requested rate base in this proceeding would cause Pennsylvania customers of DLC to provide, *unnecessarily*, $8.2 Million annually in rates. [(0.43%) x (1/(1-40% tax rate) x $1.143 Billion Rate Base = $8.19 Million].

Mr. Moul's leverage adjustment has no support in the theoretical finance literature, and is simply one more in a long list of upward adjustments to the cost of equity he has proposed over the years. That same unwarranted adjustment has been presented in his testimony in nineteen regulatory jurisdictions other than Pennsylvania but accepted in none of them. DLC's customers should not be required to shoulder what is an uneconomic and unnecessary increase in rates resulting from Mr. Moul's ad hoc adjustment to the cost of equity.

I address this issue initially because I believe it is important with regard to economically efficient regulation of utilities in Pennsylvania. This Commission began to use Mr. Moul's improper adjustment to the cost of equity capital a couple of years ago, believing that it was accounting for some sort of financial risk differential. However, there is no financial risk differential between market value capital structures and book value capital structures, as Mr. Moul claims. I have discussed that fact in detail in my testimony and Mr. Moul has not provided evidence to the contrary in his Rebuttal.

While there are certainly many aspects of rate of return analysis that are

subject to judgment and, thus, debate regarding the proper application of a particular technique, Mr. Moul's use of an imaginary risk difference between a market-based capital structure and a book value capital structure is not one of them. There is no evidence available in the literature of financial economics to support any risk difference between market-value and book-value capital structures. In fact, Mr. Moul agrees that there is no comparison of market-value and book-value capital structure in the economics literature (Moul Rebuttal , p. 33).

Following my discussion of Mr. Moul's improper leverage adjustment, I will address issues raised in Mr. Moul's Rebuttal related to an appropriate ratemaking capital structure as well as issues related to the determination of the cost of common equity capital (i.e., economic environment and interest rates, financial risk, the dividend yield and growth rate portions of the DCF model, and the reliability of corroborative equity cost estimation methods such as the CAPM, Risk Premium, Modified Earnings Price Ratio and the Market-to-Book Ratio analyses).

MR. MOUL'S IMPROPER "LEVERAGE" ADJUSTMENT

Q. MR. MOUL INDICATES (AT PAGE 28 OF HIS REBUTTAL) THAT HIS LEVERAGE/RISK ADJUSTMENT IS NOT A FUNCTION OF M/B (MARKET-TO-BOOK) RATIOS. IS THAT CORRECT?

A. No, that is not correct. Mr. Moul's "leverage/risk" adjustment is a function of the relationship between market price and book value, and would cease to exist if market price equaled book value. As Mr. Moul, himself, states in Rebuttal regarding the need for a leverage adjustment with the DCF and CAPM, the need for such an adjustment arises when the market-based capital structure is different from the book-value-based capital structure. That only happens when market price is different from book value:

> "The need for a leverage adjustment arises when the results of the DCF model (k) are to be applied to a capital structure that is different than indicated by the market price (P)" (Moul Rebuttal, p. 33, ll. 6-8)

> "My adjustment comes into play when market values diverge from book values, thereby indicating that less leverage exists in a capital structure measured with market values than exists in a capital structure that is measured with book values, as in the context of ratesetting."(Moul Rebuttal, p. 41, ll. 2-5)

The very essence of Mr. Moul's "leverage" adjustment to the cost of equity—its foundation—is the difference in market price and book value. Absent that difference, his "adjustment" does not "come into play." Therefore, Mr. Moul's improper adjustment to the market-based cost of equity is, at its core, a market-to-book ratio adjustment.

Q. MR. MOUL CLAIMS THAT HIS LEVERAGE ADJUSTMENT IS "MISCHARACTERIZED" AS A MARKET-TO-BOOK RATIO ADJUSTMENT BECAUSE STAFF AND THE OCA HAVE NOT UNDERSTOOD THAT HIS ADJUSTMENT IS A THREE-STEP PROCESS AND DOES NOT USE MARKET-TO-BOOK RATIOS IN THAT PROCESS. WHAT ARE YOUR COMMENTS?

A. Mr. Moul's adjustment is not difficult to understand and neither Staff witness Plonski nor I have mischaracterized it as fundamentally dependent on differences between market price and book value. Mr. Moul's adjustment begins with a market-value capital structure based on market prices of utility stock, and using that market-value capital structure, he calculates what the cost of equity would be if there were no debt in the capital structure. Then, Mr. Moul "re-levers" that cost of capital using the book value capital structure.[1] Mr. Moul's adjustment starts with a market-value capital structure and ends with a book value capital structure. The theoretical calculation performed to estimate the cost of equity without debt in the capital structure (i.e., what Mr. Moul refers to as "step two" in his leverage adjustment) doesn't change that fact.

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[1] In the "re-levering" using book value capital structure, Mr. Moul's adjustment departs from financial theory. The Miller/Modigliani theory Mr. Moul cites as a basis for this adjustment calls for the "re-levering" to be undertaken using market value capital structures—not the book value capital structures used by Mr. Moul. If Mr. Moul had performed the "re-levering" as prescribed by the theory he says he relied on, there would be no "adjustment" necessary, because the market value capital structures of the companies under review are all relatively similar, indicating no difference in financial risk.

If market prices are equal to book value, Mr. Moul's leverage adjustment methodology produces no change in the cost of equity. When market prices are above book value, as they are now, Mr. Moul's adjustment indicates an increase in the DCF equity cost estimate is necessary. When market prices are below book value, Mr. Moul's leverage adjustment indicates that the equity return should be reduced (this latter aspect of Mr. Moul's "leverage" adjustment is in direct conflict with his prior testimony before this Commission, Docket No. R-78100686). The motive force behind Mr. Moul's adjustment is the difference between market prices and book value. Mr. Moul's leverage adjustment is correctly understood as a market-to-book ratio adjustment to the cost of equity capital.

Q. MR. MOUL STATES AT PAGE 33 OF HIS REBUTTAL, THAT HIS "LEVERAGE/RISK" ADJUSTMENT DOES NOT VIOLATE ECONOMIC PRINCIPLES. IS THAT CORRECT?

A. No. Mr. Moul's "leverage/risk" adjustment is not consistent with accepted financial theory. As I noted in my Direct Testimony, the only two theoretical sources cited by Mr. Moul (Miller and Modigliani, and Morin) provide no support for Mr. Moul's claim of differing levels of financial risk between market value capitalization and book value capitalization. Mr. Moul even acknowledges that fact in his Rebuttal Testimony at page 33, ll. 21.

Miller and Modigliani indicate that one can compare equity ratios based on market value to determine risk differences (book value is never mentioned). Morin states that the use of market value capital structures in a regulatory setting can lead to "distorted cost of equity estimates."[2] Therefore, as I noted earlier, the financial literature contains no support for Mr. Moul's comparison of market-based capital structures and book-based capital structures.

Mr. Moul attempts to explain away the fact that the financial theory on which he purportedly relies, calls for comparisons between market-value capital

2 Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, 1994, p. 437

structures by stating, at pages 33 and 34 of his Rebuttal, that his adjustment "provides results that would be obtained from a market price and a book value which are assumed to be equivalent."

That rationale does not support his leverage adjustment. That is because he theorizes that market price and book are "assumed" to be equal, however, as noted above, if market price and book value are equal, then no adjustment to the cost of equity results from his analysis. Here, Mr. Moul attempts to rationalize his departure from financial theory by making an assumption that market price and book value are equal while, at the same time, recommending a 40-plus basis point upward increment to the cost of equity because market prices are different from book value. Mr. Moul's leverage adjustment is theoretically unsupported and should be rejected.

Q. MR. MOUL'S ADJUSTMENT USES ONE CAPITAL STRUCTURE RATIO COMPARED WITH ANOTHER, APPARENTLY LIKE THE THEORY SAYS. WHY IS HIS APPLICATION INCORRECT?

A. First, comparing market-based capital structures to other market-based capital structures is supported by the literature. Comparing book-based capital structures to book-based capital structures is supported by the literature. However, the comparisons must be similar—apples to apples and oranges to oranges. Mr. Moul's comparison of market-based capital structure to book-based capital structure has no economic meaning. It is not supported in the literature.

Second, capital structure ratios alone do not tell the whole story. The real source of financial risk is the debt expense that is created by electing to finance operations with debt capital. It is those fixed obligations—the interest payments on the debt—that encumber the income stream of the firm and create financial risk. The equity and debt ratios are simply a way to measure that financial risk.

Reliable financial theory (the theory that Mr. Moul purports to rely on) holds that if a company adds more debt to its capital structure, its fixed costs (interest payments) rise relative to its level of income. In that way, its financial risk is increased.

That increase in financial risk is indicated by an increase in the percentage of debt (or a reduction in the percentage of equity) in the capital structure, as long as capital structures are measured in a consistent manner.

The financial literature indicates that one way to measure the increase in financial risk (and its impact on the cost of equity capital) is to compare the market-based capital structures of the company before and after it added the debt. In the alternative, a company's market-based capital structure can be compared to a sample group's market-based capital structure. Those comparisons can also be made using book-value capital structures, but the literature is very clear, *the comparisons must be made on a similar value basis*—market to market or book to book. The type of measurement comparison "pioneered" (his word) by Mr. Moul has no meaning according to the literature of finance—it is an economic non sequitur.

At page 34 of his Rebuttal, Mr. Moul admits that the parameter that causes financial risk—the interest payments—do not change no matter how the capital structure is measured. The question, then, is this: If the parameter that causes financial risk does not change, how can there be a change in financial risk? As Mr. Moul admits, there is no change in the parameter that causes financial risk (interest expense). If there is no change in financial risk, there is no need to "adjust" the cost of capital. Market value capitalization and book value capitalization are simply two different measures used to gauge the same financial risk. Those two measures cannot, with any meaning, be compared to each other as Mr. Moul would have it.

I am six feet four inches tall, and whether one measures my height in centimeters, inches, yards, or miles—my height is the same even though the numbers are different. Whether one measures financial risk with market value capital structures or book value capital structures the financial risk does not change, only the numbers change.

Q. AT PAGE 29 OF HIS REBUTTAL, MR. MOUL DISAGREES WITH STAFF WITNESS PLONSKI'S TESTIMONY THAT MARKET PRICES IN EXCESS OF BOOK VALUE ARE SYMPTOMATIC OF EARNINGS THAT EXCEED A FIRM'S COST OF CAPITAL. IS MR: MOUL'S POSITION ACCURATE?

A. No. It is a long-held and widely understood tenet of regulatory finance that when investors pay market prices above book value, they do so because they believe that the utility will earn a return in excess of its cost of equity capital. In other words, when market prices are above book value, investors expect utilities to earn ROEs greater than the cost of equity capital. Therefore, Mr. Plonski is correct; Mr. Moul is not.

Q. PLEASE EXPLAIN IN MORE DETAIL WHY A UTILITY'S MARKET-TO-BOOK RATIO IS INDICATIVE OF THE RELATIONSHIP BETWEEN THE EXPECTED RETURN AND THE COST OF EQUITY CAPITAL.

A. A simple example will illustrate this important point. Assume that a utility has a book value of equity capital equal to $10 per share. Let's also assume, for the sake of simplicity that this utility pays out all its earnings in dividends. If regulators allow the utility a 12% return on that equity, investors will expect the company to earn (and pay out) $1.20 per share. If investors require a 12% return on this investment, they will be willing to provide a market price of $10 per share for this stock ($1.20 dividends/$10 market price = 12% required return). In that case, the allowed/expected return (12%) is equal to the cost of capital (investors' required return, 12%), and the per share market price is equal to the book value (M=B, or M/B=1.0).

Conforming our example to the market situation that exists with electric utilities today, assume that investors' required return (the utility's cost of equity capital) falls to 10%, but the utility continues to be allowed a 12% return on the equity portion of its rate base investment. Investors would be drawn to a utility stock in a risk class for which they require a 10% return but which was expected to pay out a 12% return. This increased demand by investors would result in an increase in the market price of the stock until the total share yield equaled the investors' required return. In our example, that point

would be $12 per share ($1.20 dividends/$12 market price = 10% required return). In that case, the allowed/expected return (12%) is greater than the required return (10% - the cost of equity capital) *and* the per share market price ($12/share) exceeds the book value ($10/share), producing a market-to-book ratio greater than one ($12/$10 = 1.20).

Therefore, the market-to-book / expected return relationship that actually exists today in the market for utility stocks indicates that investors expect that those companies will earn a return on the book value of their equity (ROE) which exceeds the cost of equity capital.

Q. DOES THIS RELATIONSHIP BETWEEN MARKET PRICE, BOOK VALUE, THE EARNED RETURN AND THE COST OF CAPITAL HOLD FOR UNREGULATED FIRMS?

A. No. For a regulated firm, there is a direct relationship between the firm's book value and its expected earnings because the return allowed in the rate-setting process is based on the book value (rate base) of that firm. However, for unregulated firms, there is no such nexus between the book value of a firm and its earnings as there is for utility firms. Therefore, a market price above book value is not indicative of whether or not an unregulated firm is earning its cost of capital.

For a utility firm however, a market price well above book value indicates that investors expect that firm to earn a return above the return they require to invest in that type of firm (the cost of equity capital). Therefore, Mr. Moul's claim that utility stock prices that are above book value are to be expected because the stock prices of unregulated firms are above book value is relevant to the discussion of the meaning of utility market-to-book ratios. Because utilities earn returns on the book value of their plant investment, a market price above book value indicates that the utility will earn a return on that book value which is above the cost of capital for that type of firm. The same relationship between book value, ROE and the cost of equity capital does not hold for unregulated firms.

Q. IS THE RELATIONSHIP BETWEEN A UTILITY'S MARKET-TO-BOOK RATIO, THE EXPECTED BOOK RETURN, AND THE COST OF EQUITY CAPITAL YOU HAVE JUST OUTLINED WELL DOCUMENTED IN THE FINANCIAL LITERATURE?

A. Yes. The DCF model is often referred to as the "Gordon model" because of the definitive work Myron Gordon has done regarding the DCF model and the cost of equity capital of utilities.[3] At pages 63 and 64 of Professor Gordon's 1974 book on utility cost of equity estimation (The Cost of Capital to a Public Utility, MSU Public Utility Studies, Lansing, Michigan), he points out that the market-to-book value ratio is greater than (equal to, less than) one when the ratio of the allowed (or expected) rate of return to the cost of capital is greater than (equal to, less than) one.

Also, there is other support in the financial literature for the value of market-to-book ratios in regulation (e.g., Kolbe, Read, Hall, The Cost of Capital, Estimating the Rate of Return for Public Utilities, MIT Press, Cambridge MA, 1986, pp. 25-33), the most recent of which was published recently in the National Regulatory Research Institute Quarterly Bulletin ("The Importance of Market-to-Book Ratios in Regulation," by Lawrence Booth, NRRI Quarterly Bulletin, Vol. 18, No. 4, Winter 1997, pp. 415-426).

I generally agree with Company witness Moul that the relationship between market price and book value for a utility operation is not a precise relationship. That is, just because the stock price of a particular utility is, say, 50% above its book value does not indicate that its cost of equity is 50% below the utility's expected book return. Also, there are differences between book value and rate base, which mean that, even if a utility is allowed and expected to earn its cost of equity capital, the market price may not exactly equal book value. However, for utility operations, the market price will approximate book value, as supported in the financial literature noted above. Therefore,

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3 Although Company witness Moul, at page 21 of his Rebuttal, refers to Gordon as "the foremost proponent of the DCF," Gordon literally "wrote the book on the DCF." First in general terms in 1962 (Gordon, M., The Investment, Financing, and Valuation of the Corporation, Richard Irwin, Inc., Homewood, Ill.) and then, specifically directed to the determination of utility cost of capital in 1974 (Gordon, M., The Cost of Capital to a Public Utility, MSU Public Utility Studies, East Lansing, MI). In fact, the DCF is also widely known as "the Gordon model."

market-to-book ratios, when reviewed in conjunction with expected returns on book equity, provide a valuable indication of the proper range of equity capital costs for utilities.

One final note on this point—Mr. Moul's "leverage" adjustment turns this long-standing regulatory foundation on its head. A market price well above book value indicates that the utility is earning a return in excess of its cost of capital. Mr. Moul's adjustment results in a utility that is already earning a return above its cost of capital requiring an additional upward adjustment to its allowed return. In that way, Mr. Moul's "leverage" adjustment is counter to the very foundations of the DCF itself.

Q. AT PAGE 21 OF HIS REBUTTAL, MR. MOUL COMMENTS ON THE WEST VIRGINIA COMMISSION'S REJECTION OF HIS LEVERAGE ADJUSTMENT, SAYING THAT IT "FAILED TO COMPREHEND" THE ADJUSTMENT. WHAT ARE YOUR COMMENTS?

A. The West Virginia Commission understood very well that Mr. Moul's so-called leverage adjustment is illegitimate.[4] They understood that Mr. Moul was requesting that they provide a higher return on the book value of the company's plant investment due to the difference in market price and book value (certainly an accurate assessment). They also opined that the same revenue requirement could be achieved by either using Mr. Moul's leverage adjustment (based on the fair-value or market price of the company's capital), or increasing the value of the company's rate base to a level equal to that which would exist under a fair-value ratemaking paradigm. The West Virginia Commission understood that valuing the company's capital based on market value rather than book value, as Mr. Moul does in his leverage adjustment, is effectively using "fair value." Fair-value ratemaking is illegal in West Virginia, as it is in most regulatory jurisdictions in the U.S. Therefore, the West Virginia Commission found it unreasonable to allow an equity return adjustment that would produce the same result as would the use of a fair value rate base.

[4] Mr. Moul attempts to dismiss the West Virginia Commission's Order because it was appealed. The appeal was withdrawn and the Order stands as written.

Mr. Moul also responds to a hearing examiner's report in a Virginia rate proceeding in which the examiner correctly noted that "[t]he underlying risk of a utility does not vary when viewed from the perspective of market valuation or the perspective of book valuation." Mr. Moul's attempt to respond to that logic simply re-states his position that the DCF needs adjustment when market price is different from book value. (Moul Rebuttal, p. 22, l. 23 through p. 23, l. 4) He provides no response to the Virginia examiner's conclusion that the financial risk of a utility does not change when viewed with either book or market value capitalization, because there is none. There is no financial risk difference between those two perspectives and there is no need for any phantom, theoretical "leverage" adjustment.

Q. CAN YOU SUMMARIZE THE REASONS THAT THIS COMMISSION SHOULD RECONSIDER ITS POSITION REGARDING MR. MOUL'S "LEVERAGE" ADJUSTMENT TO THE COST OF EQUITY CAPITAL?

A. Yes. Mr. Moul's "leverage" adjustment to the cost of equity capital should be rejected by this Commission for the following reasons.

- The comparison of market value capital structures and book value capital structure to measure financial risk differences, is not supported in the literature of finance, a fact which Mr. Moul admits;
- There is no financial risk difference between market value and book value capital structures because interest expense (the actual source of financial risk) doesn't change, regardless of the perspective;
- One company cannot have two levels of financial risk;
- There is no significant financial risk difference between Mr. Moul's sample group of electric utilities and the ratemaking capital structure requested by DLC in this proceeding, the capital ratios are approximately the same (see Hill Direct, pp. 66,);
- The DCF model does not "mis-specify" the cost of equity when market prices are different from book value, and utilities are able to attract capital on reasonable terms absent any so-called "leverage" adjustment;

- Moul's "leverage" adjustment is, fundamentally, a market-to-book ratio adjustment, and this Commission has rejected market-to-book ratio adjustments in the past;
- The "leverage" adjustment is based on the "fair value" of the capital employed in financing the utility operation, as such it is a surrogate for "fair value" rate base, which results in a revenue requirement higher than that required by law in a regulatory jurisdiction in which rates are to be based on original cost (depreciated book value);
- A utility market price significantly above book value indicates that investors expect that firm to earn a return above its cost of equity, but according to Mr. Moul's "leverage" adjustment the higher the market price, the greater the upward adjustment necessary, which would exacerbate the over-recovery;
- The "leverage" adjustment recommended by Mr. Moul has been presented in 20 regulatory jurisdictions. It has been rejected by 19 of those jurisdictions.

Q. MR. MOUL CLAIMS THAT THIS COMMISSION HAS CONSIDERED ALL THE POINTS YOU RAISE IN THIS CASE IN ITS PRIOR DECISIONS. WHAT ARE YOUR COMMENTS.

A. The rationale I am aware that the Commission has referenced in its orders regarding this adjustment relates to its acceptance of Mr. Moul's position that some sort of financial risk difference exists between a market-value capital structure and a book value capital structure. As I've noted in detail above that rationale has no economic foundation and is without merit. Moreover, I am not aware of any Commission discussion of the pros and cons of all of the other issues I raise here.

Second, Mr. Moul appears to point to this Commission's acceptance of his adjustment over the past couple of years as authority for its continued use. In response, I would simply point out that this Commission regulated electric utilities in Pennsylvania for many, many years prior to its acceptance of Mr. Moul's "leverage" adjustment, without using that adjustment. Mr. Moul, himself, didn't construct the adjustment until

1996. In other words, this Commission has a longer history of using a standard (unadjusted) DCF result than it has using Mr. Moul's theoretically unsupported "leverage" adjustment.

Third, both Mr. Moul and Ms. Cannell point to equity returns from other regulatory jurisdictions, apparently, as a metric for this Commission to follow. If this Commission elects to base its decisions on what other regulators are doing, it should discontinue its use of Mr. Moul's incorrect "leverage" adjustment. It has been accepted nowhere else.

APPROPRIATE RATEMAKING CAPITAL STRUCTURE

Q. PRIOR TO ADDRESSING THE SPECIFICS OF MR. MOUL'S REBUTTAL TO YOUR CAPITAL STRUCTURE RECOMMENDATION, DO YOU HAVE ANY COMMENTS THAT PUT THIS ISSUE IN SOME PERSPECTIVE?

A. Yes. Capital structure, especially the capital structure of the subsidiary of a parent holding company, is the result of decisions made by company management. In that way, capital structure is no different from management decisions regarding staffing levels, tree-trimming costs, or transportation costs. Management makes choices regarding the level of costs it will incur and the regulatory body reviews those management choices to determine if they are reasonable.

For example, let's assume a utility came before this Commission and for three years prior to its test year, it executed its public service obligations flawlessly with 3,000 employees. Let's also assume that during the test year, this utility hired 1,000 additional employees with no expectation for any significant expansion of its operations or change in its mission. Would any responsible regulatory body imbued with protecting the public interest set rates based on an employee count of 4,000 without examining whether or not the additional personnel were necessary, simply because the utility actually hired those people?

Even though the Company had actually expended the funds to hire the people, the regulatory body would have to review those actions and decide whether or not the additional costs resulting from those actions were reasonably incurred. I submit that a substantial portion of a decision to allow or disallow those costs would hinge on a) how well the utility had operated in the past without the test-year changes and b) what operating characteristics were changing during the test year that might justify the increased costs. Duquesne Light Company's test-year capital structure changes should receive the same analytical treatment.

The Company's capital structure shift during the test year created a capital structure that, if included in rates, will be *substantially* more expensive than the capital structure DLC had used for many years prior to the third quarter of 2005. As I note in my Direct Testimony, at page 27, the new test-year capitalization will cost the Company's ratepayers approximately $20.6 Million more every year than the capital structure it relied on for many years. The Company asks this Commission to adopt its expensive capital structure simply because it existed during the latter part of the test year (and was used to projected a rate-year capitalization), without any review of the reasonableness of its increased cost to customers. I do not believe this Commission would treat other management decisions that caused substantial cost increases in that manner, and I do not believe it should treat DLC's management's capital structure decision that way either.

Q. CAN YOU POINT TO ANY OBJECTIVE EVIDENCE THAT DLC'S CAPITAL STRUCTURE IS A MANAGEMENT DECISION?

A. Yes. At pages 7 through 9 of his Rebuttal Testimony, Mr. Moul discusses the manner in which Duquesne Light Holding's financial management, in the third and fourth quarters of 2005, added $300 Million in debt to its books while Duquesne Light Company moved $300 Million of debt off of its books. As I note at page 33 of my Direct Testimony, there is, effectively, no difference in the financial management of DQE and DLC—the same person is the treasurer of both companies.

In addition, Mr. Moul points out very succinctly how the management of a parent holding company decides what the capital structure of its subsidiary will be. At page 8 of his Rebuttal, regarding the transfer of $250 Million between Duquesne Light Holding and DLC, Mr. Moul states, "Duquesne Light [Company] previously had loaned $250 million of its proceeds from the sale of generating facilities to its parent in lieu of paying such amounts as a dividend." As Mr. Moul points out, the management gets to decide whether a $250 million cash contribution is characterized as equity or debt. Management can elect to determine that the cash contribution is a loan (debt) or a dividend (equity).

Therefore, following the rate case, if Duquesne Light Holdings decides that $300 Million of its equity investment in DLC should be characterized as debt instead of equity, it can do so at any time. This is not an arms-length transaction, the financial management of both companies is the same. No money changes hands, but the capital structure of DLC could be very easily substantially changed, returning to its pre-2005 form.

Q. HOW WAS DUQUESNE LIGHT COMPANY CAPITALIZED PRIOR TO THE END OF 2005?

A. As shown on Company's witness Moul's Schedule 2, Duquesne Light Company was capitalized from 2000 through 2004 with an average capital structure that consisted of 31.3% common equity, 5.1% preferred stock and 63.5% long-term debt. The year-to-year capital ratios did not diverge from those averages to any substantial degree. In March and June of 2005, DLC was capitalized with about 33% common equity, 9% preferred and 58% long-term debt, as shown on page 1 of Schedule 2 attached to my Direct Testimony.

At the end of 2005, the Company made a significant change to the capital structure of Duquesne Light Company. By the end of the year, 2005, DLC, with the help of the parent's repayment of a $250 Million debt had reduced its debt substantially and, through additional equity infusions from the parent, had raised its common equity ratio to approximately 46% of total capital. That represents an increase of about 15 percentage

points over its 2000-2004 historical common equity ratio and an increase of about 13 percentage points over the common equity ratio used in the first part of 2005.

The Company maintained its "BBB" bond rating during the time it was capitalized more cost effectively, i.e., with a much lower common equity ratio. Also, DLC shifted its capital structure during the time its was preparing for this rate case. In my view, this capital structure shift is the result of a management decision that, if adopted, would impose substantial additional costs on the Company's ratepayers, which the Company did not incur in the past and which were not needed to maintain the Company's financial position.

Q. DO YOU RECOMMEND THAT THIS COMMISSION SET THE COMPANY'S RATES USING ITS HISTORICAL AVERAGE CAPITAL STRUCTURE?

A. No. I do not believe that a common equity ratio of 31% or 33% is appropriate for ratesetting purposes in this case. I recommend an increase in the Company's ratemaking common equity ratio to support its financial position in the future. I recommend that the Company's rate be set using a capital structure that contains 42% common equity—substantially more common equity than DLC used historically, which will help to support its financial position.

I provide the rationale for the determination of a ratemaking capital structure in Section II of my Direct Testimony, and note at page 27 that the average common equity ratio of Mr. Moul's similar risk companies is 43%. The average common equity ratio of the S&P Utilities (again, according to Mr. Moul) has been 37.9% over the past five years. The current average common equity ratio of the electric utility industry is 44%, as reported by AUS Utilities reports. Those average common equity ratios are for companies that have generation risk—a risk the Duquesne Light Company does not have. Also, the parent holding company is currently capitalized with 36.5% common equity—an equity level far below the level the Company is requesting in this case. Therefore, a ratemaking common equity ratio of 42% will, as required by Hope and Bluefield, provide the Company an opportunity to maintain or improve its financial position, while

protecting the interests of consumers by using a more cost-effective capital structure appropriate for similar-risk companies.

Q. AT PAGES 9 AND 10 OF HIS REBUTTAL, MR. MOUL TESTIFIES THAT THE COMPANY'S EXHIBIT III-F-2 DOESN'T INDICATE THAT THE COMPANY'S EQUITY RATO IS PROJECTED TO DECLINE. IS THAT CORRECT?

A. No. The Company's external debt funding over the next four years is expected to exceed its equity funding, even including debt repayments, by a ratio of 5.8-to-1. Moreover, as I noted above, the parent company, through accounting decisions, can determine what the capital structure of DLC will be.

Q. AT PAGE 10 OF HIS REBUTTAL, MR. MOUL INDICATES THAT YOUR RECOMMENDED RATEMAKING CAPITAL STRUCTURE, BY USING MORE DEBT CAPITAL THAN THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY WOULD "OVERCHARGE" RATEPAYERS AND CAUSE THEM TO PAY DEBT EXPENSE THE COMPANY DOES NOT HAVE. WHAT ARE YOUR COMMENTS?

A. From a ratepayer's point of view, the utility's use of common equity capital is twice as costly as its use of debt capital. For example, assuming a 40% combined Federal and State tax rate, the pre-tax (ratemaking) cost of common equity for DLC would be 15.8% [9.50% cost of equity ÷ (1-40%) = 15.83%]. The Company embedded cost of debt is 6.90%, less than half of the pre-tax cost of equity. Therefore, if DLC were concerned about customers overpaying, it would lower the amount of expensive equity capital in favor of more debt capital in the ratemaking capital structure. I have made such an adjustment in my recommended ratemaking capital structure in this case, which will save ratepayers considerable sums of money relative to the capital structure requested by the Company. I have used a capital structure that is based on that of other companies of similar risk, contains increased amounts of common equity to support the Company's

financial postion and provides a more cost-effective financial structure for ratepayers than that proposed by the Company.

As shown in the Table below, assuming the same cost rates for the types of capital, the total pre-tax overall cost of capital comparison between the capital structure requested by DLC and that recommended by OCA shows that ratepayers will be "overcharged" if and only if the Commission elects to rely on the Company's requested capitalization.

TABLE I.

REQUESTED CAPITAL STRUCTURE

Type of Capital	Percent	Cost Rate	Wt. Average Cost Rate	Pre-tax Wt. Av. Cost Rate
Common Equity	47.93%	9.50%	4.55%	7.59%
Preferred Stock	9.04%	5.37%	0.49%	0.81%
Long-term Debt	43.03%	6.90%	2.97%	2.97%
	100.00%			**11.37%**

OCA RATEMAKING CAPITAL STRUCTURE

Type of Capital	Percent	Cost Rate	Wt. Average Cost Rate	Pre-tax Wt. Av. Cost Rate
Common Equity	42.00%	9.50%	3.99%	6.65%
Preferred Stock	9.00%	5.37%	0.48%	0.81%
Long-term Debt	49.00%	6.90%	3.38%	3.38%
	100.00%			**10.84%**
			COST OF CAPITAL DIFFERENCE =	**0.53%**

The pre-tax overall cost of capital difference between the Company's requested capital structure and that recommended by OCA is 0.53%. That capital cost reduction afforded by OCA's recommended capital structure, operating through the Company's $1.14 Billion rate base, would save DLC's ratepayers $6 Million annually. Therefore, Mr. Moul's claim that OCA's recommended ratemaking capital structure would be costly to ratepayers is inaccurate. The Company would be provided an opportunity to improve its financial position and ratepayers would enjoy the lower rates afforded by a more cost-effective capital structure if the OCA's recommended ratemaking capital structure is used to set rates in this proceeding.

COST OF COMMON EQUITY ISSUES

Q. AT PAGES 2 AND 3 OF HIS REBUTTAL TESTIMONY, MR. MOUL INDICATES THAT THE OCA's EQUITY RETURN RECOMMENDATION IS INADEQUATE AND DOES NOT TAKE INTO ACCOUNT CURRENT FORECASTS OF UPWARD INTEREST RATE MOVEMENTS. IS THAT CORRECT?

A. No, it is not a correct statement. First, my recommended 9.5% return on equity, operating through OCA's recommended ratemaking capital structure indicates an overall return of 7.85%. That overall return affords the Company an opportunity to achieve a pre-tax interest coverage level of 3.21 times. That level of pre-tax coverage is well above the level of interest coverage actually achieved by DLC over the past three years, which has averaged 2.33x.[5] Therefore, the equity return I recommend is not inadequate, as Mr. Moul claims. Rather, it directly adheres to the requirements of Hope and Bluefield of providing the Company an opportunity under efficient management to earn a return that supports and maintains its ability to attract capital.

Second, the forecast of increasing interest rates is not new. As I pointed out in my discussion of the macro-economy in my Direct Testimony, interest rates are expected to increase somewhat in the future. Moreover, capital markets are

5 Duquesne Light 2005 S.E.C. Form 10-K, Exhibit 12.

informationally efficient. That means that economic information of the type shown in my Direct and Mr. Moul's Rebuttal are widely disseminated, reviewed by investors and incorporated into stock prices. Therefore the market models that I use to estimate the cost of equity capital in this proceeding implicitly include the expectation of increasing interest rates and represent investors current long-term expectation with regard to their required return on common equity.

Mr. Moul's characterization of the equity cost estimates proffered by OTS and OCA as too low because interest rates are expected to increase is not apt. The interest rate projections were known at the time I performed my analyses and are therefore included in my equity cost estimates.

Q. AT PAGES 18 AND 19 OF HIS REBUTTAL, MR. MOUL DISCUSSES WHAT HE BELIEVES TO BE SOME INFIRMITIES OF THE DCF MODEL. WHAT ARE YOUR COMMENTS?

A. While no cost of equity formula that purports to model something as complex as investor behavior with simple algebra can be considered infallible, the DCF is, by far the most widely-used equity cost estimation method in regulation. The DCF and CAPM were developed about the same time (late 1960s and early 1970s) and there was no requirement that either one be used to supplant the profit-setting schemes that went before. However, thirty years later, experience shows clearly that the DCF is the preferred method. In my view, as a rate of return practitioner for twenty-five years, the dominance of the DCF in equity cost estimation for regulated industries is due to one simple reason—it works, and it works well. While I agree that the DCF is not infallible and should be checked with other methods, as I have done, it should receive primary emphasis and its results not simply "averaged" with other methods like the Risk Premium, which are far more subject to manipulation. The DCF should be the primary indicator of the cost of equity in this proceeding.

Finally, Mr. Moul, at page 19 of his Rebuttal repeats his "mantra" that DCF results cannot be applied directly to a utility's book value capitalization when the

market price is substantially different from book value. Again, this is simply not true. The DCF has been applied—absent any leverage adjustment—in regulation in the U.S. for more than thirty years. There is no evidence that the DCF model does not accurately estimate the cost of capital, no matter what the relationship between market price and the cost of capital.

Q. AT PAGE 5 OF HIS REBUTTAL, DISCUSSING RELIANCE ON THE DCF MODEL, MR. MOUL DISCUSSES A NARUC SURVEY OF REGULATORY COMMISSIONS IN THE U.S. AND CANADA. WHAT ARE YOUR COMMENTS REGARDING THAT SURVEY?

A. The NARUC survey that Mr. Moul discusses shows very clearly that the DCF is used by nearly every single regulatory body in the U.S. and Canada, while other methods such as the CAPM is mentioned as a reliable method much less frequently. In that survey the DCF is listed as a favored method by 47 regulatory bodies. The CAPM is listed as a methodology by 11 regulatory bodies, and the risk premium by 13.

Q. AT PAGES 16 AND 17 OF HIS REBUTTAL, MR. MOUL TAKES ISSUE WITH YOUR SELECTION OF SIMILAR-RISK SAMPLE GROUP COMPANIES. HOW DO YOU RESPOND?

A. There are two points to note here. First, Mr. Moul's seems concerned that my companies do not operate in the same region of the country as DLC. In today's marketplace, capital is not confined to one geographical area and investors can purchase shares in any company anywhere in the world. In order to find an accurate opportunity cost of equity capital for a utility operation, restricting the sample group to one certain geographical area simply limits the accuracy of the estimate. Investors can find information about and invest in Pinnacle West Capital Corporation (the parent company of Arizona Public Service Company) just as easily as they can find information about and invest in DQE (DLC's parent).

While it is true that Bluefield makes reference to geographical areas, I submit that information distribution in capital markets was very different in 1923 (the date of the Bluefield decision), than it is today. While it might have made sense to compare an allowed return to what other similar-risk companies in the same region of the Company during a time when it would have taken weeks to drive across the U.S., that distinction no longer has currency. Information is immediate and markets are worldwide. Mr. Moul's concern that my sample group has companies that operate in other parts of the U.S. is not a rational concern in the market environment in which we all live today.

Second, Mr. Moul's concerns regarding specific companies relates to those companies have greater operating risk than DLC (e.g., unregulated operations or poor earnings years due to generation problems). However, this does not present a case for excluding those companies, rather it indicates that the cost of equity estimate based on those companies may be too high to be appropriate for DLC, a company that does not have unregulated operations or generation risks.

Q. AT PAGE 20 OF HIS REBUTTAL, MR. MOUL EXPRESSES CONCERN THAT YOU DID NOT INCREASE YOUR DIVIDEND FOR EACH COMPANY ACCORDING TO A FORMULA. WHAT ARE YOUR COMMENTS?

A. As I noted in my Direct Testimony, many of the companies under study in my sample groups had recently (in the most recent quarter) increased dividends, or were not expected to increase dividends during 2006 (according to Value Line projections). Therefore, those companies did not require any dividend increase, and the sort of automatic increase recommended by Mr. Moul would simply lead to an overstatement of investor expectation. Mr. Moul also fails to note that I checked my dividend yield projections with those available in Value Line and found mine to be conservative (i.e., higher than Value Line's projections). Also, as Mr. Moul takes care to point out in his Rebuttal at page 27 that Value Line is a widely disseminated source of investor information and that information, therefore, is likely to be representative of investor expectations. My DCF

dividend yield, therefore, comports with investor expectations and Mr. Moul's implication that my DCF dividend yields are understated is incorrect.

Q. AT PAGES 11 THROUGH 15 OF HIS REBUTTAL, MR. MOUL DISCUSSES YOU DCF GROWTH RATE ANALYSIS. WHAT ARE HIS CONCERNS AND HOW DO YOU RESPOND TO THOSE CONCERNS?

A. First, Mr. Moul is concerned that I used Value Line's published ROEs for the companies under study rather than adjusting those values. There are three reasons why the use of Value Line unadjusted data is reasonable:

1) It is reasonable to believe that investors use Value Line data as published, without the adjustments Mr. Moul recommends and he has offered no proof that investors do not rely on Value Line data as published. In fact Mr. Moul touts the reliability of Value Line data. (Moul Rebuttal, p. 27)

2) The year-end return on equity can be higher or lower than the average return on equity depending on whether the Company has issued or bought back shares. Therefore it is not clear that the use of year-end data always understated the investor-expected ROE. Also, it is not clear that it uses year-end data to calculate ROEs, as Mr. Moul claims.

3) Value Line's long-term projections in the 2009-2011 period are not based on any particular year and it is not reasonable to make assumptions that neither Value Line not its subscribers make in order to attempt to calculate a ROE based on a hypothetical average year. The use of actual data published by Value Line is a reasonable procedure through which a long-term sustainable growth rate may be estimated.

Second, Mr. Moul takes issue with the external portion of my sustainable growth analysis. At page 24 of his testimony, Mr. Moul states that I have averaged the current market price with each company's book value in calculating the external growth rate. Mr. Moul is incorrect. As shown on Exhibit__(SGH-1), Schedule 5, pages 1 and 3, the stock price I use in the calculation of the "sv"

portion of the sustainable growth rate is the same as the stock price I use in calculating the dividend yield. Mr. Moul is objecting to an adjustment I did not make.

Q. AT PAGES 35 AND 36 OF HIS REBUTTAL, COMPANY WITNESS MOUL DISCUSSES THE RISK PREMIUM ANALYSIS. WHAT ARE YOUR COMMENTS?

A. I have three comments regarding Mr. Moul's discussion of the Risk Premium analysis. First, I do not believe that methodology should be given equal weight with the DCF analysis as Mr. Moul recommends. The Risk Premium analysis, especially the type of historical time period analysis proffered by witness Moul can produce any result desired by the analyst—depending on the time period chosen for the study. As I noted in my direct testimony the historical earned return differences between stocks and bonds are extremely volatile, showing wide period-to-period fluctuations. Therefore, the selection of a particular historical time period can have a dramatic effect on the resulting risk premium and, ultimately the cost of equity estimate.

Second, Mr. Moul elects to focus only on projected earnings growth rate data to determine a DCF growth rate. However, in this portion of his Rebuttal Testimony, however, he extols the virtues of historical data: "[p]ast performance, after all, provides the only data that can be statistically analyzed with any degree of precision." Again, the Company witness cannot, logically, have it both ways.

Third, I pointed out at pages 83 of my Direct Testimony that Mr. Moul's use of "median" historical risk premiums drew equity and debt returns from different historical periods and was, therefore, meaningless. The witness fails to address those comments in his rebuttal.

Q. COMPANY WITNESS MOUL DISCUSSES YOUR MODIFIED EARNINGS-PRICE RATIO AND MARKET-TO-BOOK RATIO EQUITY COST ESTIMATION METHODS AT PAGES 37 AND 38 OF HIS REBUTTAL. WHAT ARE YOUR COMMENTS?

A. The modified earnings-price ratio methodology is based on the use of two measures of the cost of capital: the earnings-price ratio and the expected return on book value. Also the relationship between those two parameters, the market-to-book ratio and the cost of capital is set out in Schedule 8. The fact that the expected return on book value will equal the cost of capital when a utility's market price approximates its book value is a long-accepted theorem of regulation, first propounded in Myron Gordon's seminal work, The Cost of Capital to a Public Utility.[6] As Professor Gordon noted, the market-to-book value ratio will be > 1, when the ratio of the allowed rate of return to the cost of equity capital is > 1; and the market-to-book value will be < 1, when the ratio of the allowed rate of return to the cost of capital is < 1.

Schedule 8 attached to my direct testimony begins with the premise, set out by Professor Gordon, that when utility market price equals the book value, the cost of equity equals the expected return. Also, when market price equals book value, the earnings-price ratio equals the cost of capital.[7] Schedule 8 goes on to show how, when market prices diverge from book value, the expected return and the earnings-price ratio diverge in opposite directions from the cost of capital. So, in the current market situation where market prices exceed book value, the expected return exceeds, and the earnings-price ratio understates the cost of capital. However, because both of those econometric measures revolve around the cost of capital, and are equivalent to the cost of capital when the market price equals book value, the average of the two parameters (earnings-price ratio and the expected return on book value) provides a corroborative estimate of their locus—the cost of equity capital. However, Mr. Moul fails to mention my Schedule 8 in his rebuttal of my modified earnings price ratio.

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6 Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, 1974, pp., 63.

7 At $MP = BV$, $i = r = \frac{E}{MP}$

Regarding my use of the market-to-book ratio analysis, in my Direct Testimony I point out quite clearly that that methodology is an algebraic re-arrangement of the DCF and cannot be considered a stand-alone methodology. However, as I noted previously, the DCF is the most reliable equity cost estimation methodology. Also, the Market-to-Book Ratio (MTB) method uses point-in-time parameters projected one year and three-to-five years into the future, rather than the data used in the DCF, which are "smoothed" to replicate investors' long-term sustainable growth rate expectations. Because of that fact, the MTB does provide information to corroborate and temper the results of a traditional DCF.

Q. HOW DO YOU RESPOND TO MR. MOUL'S DISCUSSION OF YOUR CAPM ANALYSIS AT PAGES 38 THROUGH 40 OF HIS REBUTTAL?

A. First, contrary to Mr. Moul's statements, I do not rely on the results of my CAPM analysis that use Treasury Bill yields. Second, the use of Treasury Bills in the calculation of a CAPM cost of equity estimate is not "unusual." In fact, it is the most theoretically correct basis for calculating the CAPM because it is the closest thing there is to a truly "risk-free" rate of return in the U.S. economy. Long-term Treasury securities have maturity risk that T-Bills do not have and, thus, are not truly "risk-free" securities like T-Bills. Also under the circumstances of a normal Treasury yield curve, the CAPM results that are produced through the use of a T-Bill risk-free rate are not substantially different from a CAPM equity cost produced using a long-term Treasury yield. That is because the market risk premium used with the T-Bill yield (the market return less the T-Bill return) is significantly larger than the market risk premium that corresponds to the use of a long-term Treasury yield (the market return less the T-Bond return). The larger market risk premium combined with the smaller risk free rate (T-Bills) produces an equity cost estimate similar to that produced by the larger risk free rate (T-Bonds) and the smaller market risk premium.

However, as I note in my Direct Testimony in Appendix D, my current concern with the T-Bill is that that yield can be directly influenced by government

monetary policy. In its attempt to hold down potential inflation, the Federal Reserve has recently pushed up short-term U.S. Government interest rates. Therefore the current spread between T-Bonds and T-Bills is abnormally small. For that reason, the CAPM based on the T-Bill yield produces a result that is most likely above the cost of capital of the utility groups studied in my analysis. Therefore, I do not rely on the T-Bill-based CAPM results presented in my analysis in this proceeding. Instead, I rely on the CAPM results that are based on the long-term Treasury yields.

Third, with regard to the use of arithmetic or geometric average market risk premiums, I believe it is reasonable to present both results. The data source from which I obtain the market risk premiums (Ibbotson Associates) publishes both the arithmetic and geometric mean data. Therefore, it is available to investors and should be considered.

Fourth, in his response to my criticism of his use of re-levered betas in a CAPM analysis, Mr. Moul continues to attempt to paint his leverage adjustment as something other than a market-to-book adjustment. Unfortunately, at is core, that is all it is—a market-to-book adjustment. As I have explained previously such an adjustment is improper and unnecessary.

Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY, MR. HILL?

A. Yes, it does.

OCA Statement No. 3

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	:	
v.	:	DOCKET NO. R-00061346
DUQUESNE LIGHT COMPANY	:	

DIRECT TESTIMONY

OF

RICHARD A. GALLIGAN

ON BEHALF OF THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

JULY 7, 2006

EXETER
ASSOCIATES, INC.
5565 Sterrett Place
Suite 310
Columbia, Maryland 21044

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I. Introduction

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard A. Galligan. I am a Principal with Exeter Associates, Inc., a firm of consulting economists specializing in utility economics. My business address is 5565 Sterrett Place, Suite 310, Columbia, Maryland 21044.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I have two degrees from the University of Wisconsin, including a Master's degree in economics and, in addition, I completed two years of graduate study at the University of Minnesota, where I fulfilled all of the course work requirements for the Ph.D. degree.

Q. WHAT IS YOUR PROFESSIONAL EXPERIENCE?

A. I have taught economics at the University of Minnesota, the University of Wisconsin, Mankato State University and Webster College. In these positions, I taught a wide range of courses covering all aspects of economics.

In January 1975, I joined the staff of the Minnesota Public Service Commission at the commencement of that Commission's responsibility over gas and electric utility operations in the State of Minnesota. From 1976 to 1984, I was an economic consultant specializing in public utility rate regulation of gas, electric and telephone utilities.

From 1984 until 1987, I was Director of Utilities Division at the Iowa State Commerce Commission and Executive Director of the Texas Public Utility Commission. At Iowa, my responsibilities included the management and administration of all Utilities Division activities regarding the regulation of gas, electric and telephone utilities operating in the State of Iowa under Iowa State Commerce Commission jurisdiction. At the Texas Public Utility Commission, I was responsible for the management and day-to-day administration of that Commission's regulatory activities regarding all aspects of its jurisdictional responsibilities. I also served briefly as General Manager of Rates &

Regulatory Affairs at Gas Company of New Mexico before assuming my present position at Exeter Associates, Inc., in October 1987.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN REGULATORY PROCEEDINGS ON UTILITY RATES?

A. Yes. I have previously presented testimony on more than 100 occasions before the Federal Energy Regulatory Commission ("FERC") and the public utility commissions of Alabama, California, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Louisiana, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Jersey, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah and Vermont.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. Exeter Associates, Inc., was retained by the Pennsylvania Office of Consumer Advocate ("OCA") to review the class cost of service study, proposed revenue allocation and rate design proposals for the residential class reflected in Duquesne Light Company's ("Duquesne's" "the Company's") current application for a general rate increase. My testimony addresses the allocation of certain distribution costs in the cost of service study, the revenue allocation and rate design issues applicable to the Residential class.

Q. HAVE YOU PREPARED SCHEDULES TO ACCOMPANY YOUR TESTIMONY?

A. Yes. I have prepared Schedules RAG-1 through RAG-4, which are attached to my testimony.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. Following this introductory section, my testimony is divided into three additional sections. The first additional section begins with a brief summary overview of the

distribution cost allocation philosophy reflected in the class cost of service study submitted on behalf of Duquesne. Following the overview, I detail the reasons that support a finding that the Company's proposed allocation of distribution costs produces an unreliable indication of the costs of serving the various customer classes.

The second additional section presents my recommendation regarding the allocation among the various customer classes of any revenue increase authorized in this proceeding. The third additional section presents my recommendation to adopt the revenue spread presented by the Company. The final section is a discussion of the Company's Residential rate design proposals and my evaluation and recommendations with respect to Duquesne's proposals.

Q. WHAT CONCLUSIONS HAVE YOU REACHED AS A RESULT OF YOUR REVIEW AND ANALYSIS?

A. I have reached the following conclusions:

- Duquesne's allocation of a large portion of its secondary distribution plant and related costs is at odds with the principle of cost causality, and produces unrealistic indications of calculated class rates of return;
- The fundamental service that Duquesne provides is the delivery of its customers' annual energy requirements at all times during the year, and at varying rates of delivery;
- A large portion of Duquesne's annual delivery costs are directly related to the fundamental service that Duquesne provides;
- Duquesne's proposed cost-of-service study allocates no costs on the basis of the fundamental service it provides, violating the principle that costs should be allocated on the basis of the service units that cause the costs to be incurred;

- The Company's "customer" component of its secondary distribution system actually includes costs related to the provision of capacity service as well as the provision of "customer" service, thus overstating its claimed "customer" costs;
- Duquesne further errs in the performance of its cost of service study by failing to recognize the capacity component of service that can be provided from its "customer" cost of service when it allocates capacity related distribution costs on the basis of customer demands;
- The allocation of Primary and Secondary distribution plant investment and related costs, partially on the basis of average demands and partially on the basis of peak demands eliminates the misallocations in Duquesne's study by reflecting the load carrying capabilities of the distribution system, and is consistent with the principle of cost causality;
- Duquesne's proposed revenue spread is reasonable; and
- The requested authority to increase the Residential RS Customer Charge from $6.48 to $11.50 should be denied.

II. Allocation of Distribution Costs in the Cost of Service Study

Q. PLEASE DESCRIBE THE ATTRIBUTES OF A CLASS COST OF SERVICE STUDY.

A. Average, embedded, historic class cost of service studies of the type performed by Duquesne and included in exhibits HSG-1 through HSG-8 are performed in an attempt to determine the share of total costs that is incurred to provide service to each class of customers. The studies are called average, embedded, historic cost studies because they attempt to directly assign or allocate actual book plant and related costs, adjusted to test year levels as authorized by the Commission, to each customer class. The average costs of service, i.e., the total costs of service divided by the related service units, are allocated to each class on the basis of each class' service units that have "caused" the costs to be incurred. The costs are first functionalized into broad cost categories such as Distribution costs, often by voltage level, or Customer costs. Costs are then classified as to whether the costs are demand related, energy related, customer related or related to revenues. Finally, the costs are allocated to the customer classes on the basis of various measures of demand, customers, etc., in proportion to each class' contribution to the various allocation measures. Duquesne totally omits the energy-related cost classification as it classifies its total costs of service.

Q. PLEASE DESCRIBE THE VARIOUS TYPES OF DISTRIBUTION PLANT INVESTMENT THAT ARE INCLUDED IN THE COMPANY'S TOTAL COST OF SERVICE IN THIS PROCEEDING AND ARE SUBJECT TO ALLOCATION IN THE COMPANY'S COST STUDIES.

A. Duquesne's distribution plant can be typified in a number of ways. One useful way to understand the allocation issues regarding Duquesne's distribution plant is to divide distribution plant into three categories: One, "Primary Distribution" plant, which

includes Duquesne's distribution substations and primary overhead and underground lines. Two, "Secondary Distribution" plant, which consists of the lower voltage, secondary portion of Duquesne's distribution plant, including secondary overhead and underground lines, poles and line transformers. Secondary Distribution Plant is system plant, since it generally serves more than one customer and is built and must be sized to provide for various demands that may be placed on the plant components. Three, "Services and Meters" plant. Services and Meters plant consists of exactly those two components and is that portion of Duquesne's plant which is located closest to its customers, providing the delivery of electricity to individual customers.

The Primary Distribution plant delivers electricity from the Transmission system to the secondary system, stepping the voltages down from 69 kV, 23 kV and 4 kV and ultimately to secondary voltage levels. The Secondary Distribution plant distributes electricity throughout Duquesne's service area by delivering electricity from the primary system to customer Services while completing the transformation of voltages down to delivery level voltages. Generally, Services complete the delivery of electricity from the output, or low side of line transformers to the Meters located on or near structures on the customers' premises. Services and Meters plant is generally associated with the provision of service to individual customers. As mentioned above, Secondary Distribution plant, including overhead and underground lines, poles and line transformers performs a system function, being plant that is generally used by multiple customers. Primary Distribution plant, too, including substations and primary lines performs a system function and is generally used by multiple customers. Primary and Secondary Distribution facilities provide the delivery of average electricity demands and peak electricity demands. Because peak electricity demands exceed average demands,

accommodating peak demands requires some additional costs above the costs incurred to meet average demands.

Q. PLEASE DESCRIBE THE BASIS UPON WHICH DUQUESNE ALLOCATED ITS PRIMARY PLANT, ITS SECONDARY DISTRIBUTION PLANT AND ITS SERVICES AND METERS PLANT.

A. Generally, each of the three categories of distribution plant were allocated by Duquesne on one of three different allocation bases. Generally, Services and Meters plant was allocated by Duquesne to classes on a customer count basis. The Primary Distribution plant was allocated to classes solely on the basis of class noncoincident demands, regardless of when during the year the class peak is established. Secondary Distribution plant, including lines, poles and line transformers, was allocated on a separate customer/demand basis applied to the various plant items included in the Secondary Distribution plant category. For example, Duquesne classifies 93 percent of its secondary overhead conductors and devices (Account 365) as customer related, and 87 percent of its secondary line transformers (Account 368) as customer related.

I have not challenged Duquesne's allocations of its Services and Meters plant and related costs. However, Duquesne fails to allocate any of its Primary and Secondary Distribution costs on the basis of energy deliveries. This, in combination with Duquesne's reliance on a customer component based on the "minimum system" concept to allocate large portions of its Secondary Distribution plant located upstream of Services investment, or its system integrated plant, produces unreliable indications of the cost of providing service to its several customer classes.[1] Immediately below I discuss the misallocations inherent in Duquesne's allocation of its Secondary Distribution plant.

[1] Upstream relates to distribution facilities located farther and farther away from customer premises, in terms of electricity flows. Electricity flows downstream from generators, through transmission facilities, through primary and then secondary facilities, and on through customer Services and then meters.

Later in my testimony, I present the results of an alternative allocation of Duquesne's Primary and Secondary Distribution plant that both eliminates the errors incorporated in the Company's study and better comports with the principle of allocating costs on the basis of cost causality.

The Misallocation of Duquesne's Secondary Distribution System Integrated, Plant Inherent in Duquesne's Cost Studies

Q. IN ITS HISTORIC AND FUTURE TEST YEAR STUDY VARIANTS WHICH CLASSIFY A PORTION OF ITS SECONDARY DISTRIBUTION PLANT AS CUSTOMER-RELATED, HOW DID DUQUESNE DETERMINE THE AMOUNT OF COMMON DISTRIBUTION PLANT INVESTMENT TO CLASSIFY AS CUSTOMER RELATED?

A. The Company determined its customer component of Secondary Distribution system plant based on the minimum system cost concept. Under this approach, the customer component of each plant account that is deemed to be partially customer and partially demand related was determined by Duquesne based on the smallest sized plant that is capable of providing service to the customers' load. Duquesne determined the customer related portion of its poles, lines and line transformers by first determining how much of its investment installed in each of these type of plants would have cost, if the total amount of each type of plant were based entirely on the costs of the minimum sized equipment necessary to provide reliable service. Duquesne used the minimum sized equipment as the basis for determining the minimum cost it would incur to deliver electricity to its customer loads if all its customers were provided service with the minimum sized system.

For example, the minimum sized transformer Duquesne used to determine the customer component of transformers is a 25 kVa transformer. The total calculated cost of all of Duquesne's 92,242 transformers of varying size would be $92,612,000 if each actual installed transformer were to cost the same as Duquesne's average embedded $1,004.02 cost of its 25 kVa transformers. This plant investment cost that Duquesne would have incurred if all its transformers were installed at the cost of its 25 kVa transformers compares to Duquesne's actual book cost of $106,509,000 for the actual transformers Duquesne did install. The ratio of the calculated transformer investment costs if all the transformers were of the minimum size, $92,612,000, to the transformer investment cost of Duquesne's actual transformers installed, $106,509,000, or in this case 87 percent, is deemed to be the customer portion. The cost in excess of the 87 percent customer portion, or 13% (100% - 87% = 13%), is deemed to be demand related.

Details of Duquesne's determination of each of the customer components that Duquesne contends is included in its Secondary Distribution plant are shown in Duquesne witness Gorman's Exhibit HSG-6B. For each account deemed by Duquesne to have a customer component, the customer component is based on the ratio of the investment cost Duquesne would have incurred if all pieces of equipment in the account were of the minimum sized component compared to the investment cost of Duquesne's actual equipment installed.

Q. ARE THERE PROBLEMS WITH DUQUESNE'S CUSTOMER/DEMAND DETERMINATIONS FOR THOSE SECONDARY DISTRIBUTION PLANT COMPONENTS THAT DUQUESNE CONTENDS HAVE A CUSTOMER COMPONENT?

A. Yes. The first problem is that Duquesne calculated its proposed customer component in a way that allowed capacity, or demand related costs, to be included in the customer related

cost component. The second problem is that Duquesne allocated the demand related portion of its Secondary Distribution plant accounts in a manner that failed to recognize that all or a portion of smaller customer demands and a portion of its larger customer demands can be met with the plant Duquesne included in its minimum sized system.

In addition to these flaws in how Duquesne tried to quantify a customer component in that portion of its plant that Duquesne believes has both a customer component and a demand component of service, Duquesne has allocated no costs on average demands through the year. This is ironic because the basic service that Duquesne provides, and the reason why Duquesne exists and costs are incurred, is the delivery of electricity throughout the year to meet its customers average demands. After discussing the measurement problems in Duquesne's customer cost determinations, I address the misallocation of Duquesne's demand related costs.

Q. PLEASE EXPLAIN YOUR FIRST CONCERN WITH DUQUESNE'S INCLUSION OF CAPACITY RELATED COSTS IN ITS CUSTOMER COMPONENT OF ITS COMMON DISTRIBUTION PLANT.

A. Let me use line transformers as an example. Duquesne subscribes to the notion that line transformers contain both customer and capacity components of service. The determination of Duquesne's claimed customer component of overhead line transformers serves as an example of the improper inclusion of capacity related costs in a customer cost determination. Because a 25 kVA transformer is the smallest transformer typically installed by Duquesne, Duquesne used the costs of its 25 kVA overhead transformers as the basis of its overhead line transformer customer cost determination. A 25 kVA transformer provides substantial capacity as well as being a part of Duquesne's alleged customer related costs. In fact, many of Duquesne's customers have their entire electric demands provided by 25 kVA or smaller transformers. When the capacity related

component inherent in Duquesne's 25 kVA transformers is allocated on a customer count basis instead of being allocated on the demands of customers, a misallocation of costs results. For example, because Residential RS customers represent 85 percent of Duquesne's customer count, Residential RS customers are allocated 85 percent of the customer component of line transformers (which actually includes a capacity component as well), but Residential RS customers are responsible for only 44 percent of the demands placed on line transformer capacity. By including capacity costs in the customer component and allocating 85 percent of the capacity costs to residential customers on a customer count basis instead of 44 percent on a demand basis, capacity costs are misallocated to the detriment of residential customers.

Q. CAN CUSTOMER COSTS BE DETERMINED IN A MANNER THAT ATTEMPTS TO KEEP CAPACITY RELATED COSTS OUT OF THE CUSTOMER COMPONENT?

A. Yes. The minimum intercept, or zero intercept method, attempts to determine the hypothetical no-load, or zero intercept, costs that would include no capacity related costs. The zero intercept method confirms the impropriety of including capacity costs in customer cost determinations. I do not advocate the use of zero intercept method because that method itself has some problems, but they are moot, since Duquesne did not use the zero intercept methodology in its attempt to determine customer costs.

Q. IS THE AMOUNT OF CAPACITY THAT CAN BE PROVIDED BY A 25 KVA TRANSFORMER AND INCLUDED IN DUQUESNE'S CUSTOMER COST DETERMINATION A SIGNIFICANT CONCERN?

A. Yes. Duquesne reports on page 1 of Exhibit HSG-5C-1, for example, that Residential RS customers have class maximum demands of 1,352,000 kW. Page 1 of that same exhibit also shows the number of Residential RS year-end customers at 497,515 customers. This

equates to each Residential RS customer contributing 2.7 kW to the peak residential class demand, whenever throughout the year the residential class demand peaks. Granted, there is diversity among customer demands and several customers may be served from one transformer, but the 25 kVA size transformer that Duquesne currently installs is capable of providing for about 25 kW of demand and does, in fact, meet the peak demands of many residential customers. Moreover, prudent planning requires the installation of transformers that do, in fact, meet the peak demand of all customers served from the installed transformer (and typically, prudent planning also requires expected load growth to be considered when sizing transformers, as well).

The minimum sized system methodology as applied by Duquesne in this case to estimate customer costs includes significant capacity costs, which are then misallocated on a customer basis. Because Duquesne's Residential RS customers account for fully 85 percent of the customers receiving an allocated share of the customer related overhead line transformer costs, the overstatement of customer costs leads to particularly overstated costs of serving residential customers.

Each type of Secondary Distribution plant that Duquesne identifies as customer related suffers from the same malady as Duquesne's overhead line transformer customer classification -- the inclusion of capacity related costs in the minimum sized system. For example, Duquesne's minimum sized underground line transformers have 25 kVA of capacity. Duquesne's minimum overhead and underground lines can each provide capacity, and Duquesne's minimum sized poles can support the capacity carrying lines and line transformers. In each case, customer costs are overstated, since the customer related plant also includes the provision of capacity. Allocating the capacity related costs included in all these customer components on a customer count basis instead of a demand basis overstates the allocated costs of providing service to Duquesne's smaller customers.

Q. PLEASE EXPLAIN YOUR SECOND CONCERN REGARDING HOW DUQUESNE ALLOCATED ITS PROPOSED DEMAND RELATED COSTS INCLUDED IN THOSE SECONDARY DISTRIBUTION COST ACCOUNTS ALLEGED TO HAVE BOTH CUSTOMER AND DEMAND RELATED COST RESPONSIBILITY.

A. Duquesne believes that its Common Distribution plant accounts housing its investment in lines, poles and transformers contain both a customer related cost component and a demand related cost component. Duquesne deducts its calculated customer costs from the total plant account costs for each of its lines, poles and transformer accounts and reasons that the plant costs in excess of customer costs are related to the maximum noncoincident demands Duquesne's customers place on its distribution delivery system. Duquesne allocates this demand related portion of the plant account balances on the basis of the ratio of each customer class' noncoincident peak demand to the total of all class' *noncoincident peak demands.*

Q. CAN YOU EXPLAIN WHY THERE IS A PROBLEM WITH DUQUESNE'S ALLOCATION OF THE DEMAND RELATED PORTION OF COSTS IN THOSE PLANT ACCOUNTS THAT DUQUESNE BELIEVES HAVE BOTH CUSTOMER AND DEMAND RELATED COSTS?

A. Yes. As discussed immediately above, Duquesne has included capacity costs in its customer component of its poles, lines and transformer plant accounts. Thus, a portion of the distribution capacity costs that are related to customer demands has already been allocated (albeit improperly on a customer-count basis) to Duquesne customers. The problem with Duquesne's allocation of the remaining demand related portion of costs is that the Company does not recognize the customer demands that can be accommodated by the capacity it has included in its customer cost determination. Because Duquesne

gives no recognition that a portion of each customer class' peak demands can be met with the customer related plant costs that, in fact, include capacity, a "double count" results, producing an overallocation of demand costs to classes containing relatively large numbers of customers.

Q. PLEASE GIVE AN EXAMPLE OF HOW DUQUESNE'S ALLOCATION OF THE DEMAND RELATED PORTION OF COSTS IN THOSE PLANT ACCOUNTS HAVING BOTH CUSTOMER AND DEMAND RELATED COSTS RESULTS IN A MISALLOCATION OF COSTS.

A. Customers whose loads are served by a 25 kVA transformer or smaller obviously have all of their capacity requirements provided for in their customer allocation of costs. This being the case, these customers should not also be responsible for an allocation of any demand related transformer costs. In general, the demands that are provided for and included in the minimum sized customer cost determinations, be they the total demands of some customers or a portion of the demands of other customers, should be excluded from the allocation of capacity related costs associated with meeting higher demands. Duquesne has failed to remove the demands that can be met with its minimum sized system from also bearing cost responsibility for the demand portion of plant accounts having both customer and demand related costs in the Company's studies.

Because the capacity included in the minimum sized system is a greater percentage of smaller customer demands, Duquesne's failure to remove the demands that can be met with the minimum sized system from the demands on which the capacity related portions of the subject accounts are allocated is particularly detrimental to Duquesne's smaller customers.

Q. BESIDE THE OVERSTATEMENT OF CUSTOMER COSTS AND THE ALLOCATION OF CAPACITY RELATED COSTS ON A CUSTOMER BASIS

THAT YOU HAVE JUST DISCUSSED, IS IT REASONABLE TO INCLUDE ELECTRIC FACILITIES UPSTREAM OF CUSTOMER SERVICES IN THE CUSTOMER COST CATEGORY?

A. No. Duquesne's overstatement of customer costs occurs because it classifies as customer costs the minimum sized facilities Upstream of Services that, in fact, include capacity costs. Duquesne misallocates these capacity costs on a customer basis, and further misallocates the capacity related portion of costs by failing to net out of its capacity allocator, i.e., class noncoindent peaks, the amount of capacity that can be met from the capacity improperly included in the customer portion.

Besides these measurement errors in the classification and allocation of the secondary plant facilities upstream of Customer Services, the costs of facilities upstream of Customer Services is incurred to meet the load requirements placed on the facilities. For example, transformers are required to meet customer load requirements at all times, including the peak demand placed on each transformer. There is no unique requirement to install a transformer for each customer, or for any given number of customers. However, all electricity delivered to customers must be transformed to usable voltages, and additional transformer costs are incurred to meet the coincident peak demands placed on each transformer. The peak demands on each transformer are caused by the coincidence of customer demands, or the lack of diversity of demands, not by the number of customers.

Similarly, conductors are required to meet any and all electricity demands carried by the wires, and the conductors will be sized to meet peak demands flowing across the wires. Once again, investment in conductors is a function of the loads placed on the conductors. Those loads, in turn, are a function of the diversity experienced in the demands for electricity. In short, the costs of Secondary Distribution facilities upstream

of Customer Services are determined by the coincidence of demands for electricity placed on the subject facilities. Consistency with the principle of cost-causality requires that these costs be allocated on the basis of the loads that are placed on the facilities, not on the basis of the number of Duquesne's customers. I will comment further on this topic in the next section of my testimony.

Q. DO YOUR CRITICISMS OF DUQUESNE'S PROPOSAL TO INCLUDE A "CUSTOMER" COMPONENT OF COSTS IN SECONDARY FACILITIES UPSTREAM OF CUSTOMER SERVICES MEAN THAT YOU TOTALLY REJECT THE NOTION OF CUSTOMER CLASSIFIED COSTS?

A. No. A meter and minimal service facilities are required for each customer. Meters and Services are directly related to the number of customers. Thus, Meters and Services investment is properly classified as customer-related. Duquesne has classified $74.258 million of its Services plant and $76.191 million of its Meter plant as customer-related, and I do not dispute this classification. However, investment in transformers, conductors and other facilities upstream of Services, including the poles on which such facilities are mounted, are incurred to meet all electricity demands and are sized to meet coincident neighborhood loads. Installed to meet the average placed upon them and sized to also meet peak load requirements, these facilities are properly allocated on average and peak demands, not the number of customers.

Q. WHAT DO YOU CONCLUDE FROM YOUR REVIEW OF DUQUESNE'S COST OF SERVICE STUDIES?

A. Based on:

- Duquesne's overstatement of customer costs through the inclusion of capacity, or demand related costs, in the customer cost category, coupled with Duquesne's allocation of the capacity related costs on a customer-count basis;

- Duquesne's over-allocation of the demand related portion of its Secondary Distribution facilities' costs to customers whose total or partial demands can be provided for with Duquesne's minimum sized equipment; and

- Duquesne's failure to allocate any Primary or Secondary costs on the basis of the fundamental service the Company provides, i.e., the delivery of energy throughout the year and at the varying amounts its customers demand;

I conclude that Duquesne's cost of service study results are an unreliable indication of the adequacy of class revenues compared to allocated costs. A class cost of service study compares each class' revenues to each class' allocated costs of service in order to assist in the determination of reasonable rates. Because major categories of costs have been improperly determined and misallocated, Duquesne's proposed cost of service study results do not present a useful guide to the Commission for use in the setting of rates in this proceeding.

III. An Alternative Allocation of Duquesne's System Distribution Plant -- Peak and Average Methodology

Q. ARE THERE OTHER COST OF SERVICE STUDIES THAT CAN BE USED TO ASSESS THE COSTS ASSOCIATED WITH THE PROVISION OF SERVICE TO DUQUESNE'S SEVERAL CUSTOMER CLASSES?

A. Yes. There are numerous cost study variants that can be used to allocate Duquesne's average, embedded, historic costs among Duquesne's several customer classes. Cost allocations will vary among these studies to address the concerns or to represent the differing views of cost practitioners performing the studies. For example, Duquesne has performed its 2006 class cost of service study in such a manner that it concludes that a substantial amount of its total Secondary Distribution plant costs for overhead lines, underground lines and line transformers, is customer related. Professor James Bonbright warns of using the customer cost category as a dump for the costs of minimum sized system. At page 492 of his Principles of Public Utility Rates text, Professor Bonbright puts it this way:

> ...But if the hypothetical cost of a minimum-sized distribution system is properly excluded from the demand-related costs for the reason just given, while it is also denied a place among the customer costs for the reason stated previously, to which cost function does it then belong? The only defensible answer, in our opinion, is that it belongs to none of them. Instead, it should be recognized as a strictly unallocable portion of total costs. And this is the disposition that it would probably receive in an estimate of long-run marginal costs. But fully-distributed cost analysts dare not avail themselves of this solution, since they are the prisoners of their own assumption that "the sum of the parts equals the whole." They are therefore under impelling pressure to fudge their cost apportionments by using the category of customer costs as a dumping ground for costs that they cannot plausibly impute to any of their other cost categories. [Emphasis added]

Clearly, how the costs that Duquesne ascribes to the customer cost function are allocated is controversial, at best.

Q. IS THERE ANOTHER VIEW AS TO HOW PRIMARY DISTRIBUTION PLANT AND DISTRIBUTION COSTS RELATED TO POLES, LINES AND TRANSFORMERS MAY BE REASONABLY ALLOCATED?

A. Yes. Duquesne has allocated the subject costs on two bases: One, that customers exist, and two, that customers have a peak demand during one hour of a typical year's 8,760 hours. Quite frankly, from a practical point of view, if Duquesne only had potential customers who merely wanted to be hooked up to an electric system and those potential customers only wanted to use electricity one-hour per year, Duquesne's distribution system, with its attendant costs, would not be practical, nor would it even exist. From a financial perspective, if Duquesne faced a market characterized by customers who wanted to be hooked up so they could use electricity only one-hour per year, Duquesne would have difficulty raising capital for such an enterprise. In short, Duquesne's proposed allocation, totally omitting customers usage, or commodity, and driven only by the existence of one, the number of customers and two, peak demands during the one-hour per year when the classes peak, does not result in costs being allocated on the basis of the services causing those costs to be incurred.

Q. WHAT SERVICE DEMANDS HAVE CAUSED THE COSTS RELATED TO DUQUESNE'S PROVISION OF DISTRIBUTION DELIVERY SERVICE?

A. The demands for delivered electricity, both in annual amounts sufficient to warrant Duquesne's existence and in amounts that reflect maximum demands, cause the costs that Duquesne seeks to recover in this proceeding. These demands for electricity are what economists call "derived demands." Electricity is not demanded for its own sake; rather, electricity is demanded because people have a demand for things like warmed and cooled living and working spaces, refrigerated and frozen and cooked foods, warm water showers, clean and dried clothes, home and business video and audio entertainment or

presentations, or the desire to see clearly at night, and in general, the use of all the other electricity-using appliances and equipment that are used to satisfy the revealed demands of market participants. The use of all these electricity-using appliances creates the demands for delivered electricity on Duquesne's system. These demands exist year-round, creating an annual demand for electric service. Without this annual demand in sufficient amounts there would be no Duquesne delivery system costs of service because there would be no Duquesne electric distribution system. It is the sustained demand for electricity, which is ultimately responsible for Duquesne's existence, and costs, which has been relieved of any cost responsibility by Duquesne in its proposals to allocate its total costs of providing service.

Now, if the annual demand for electricity delivered across Duquesne's distribution system were an absolutely level amount each day of the year and each hour of the day, Duquesne's distribution system would only have to be built to deliver this average hourly amount of capacity. A system designed to meet this constant average demand is the smallest sized system that could deliver the annual energy requirements of Duquesne's customers. But electricity demands are not constant. At times, the demands for electricity delivery are higher than at other times. Duquesne distribution company exists not only to service its customers' average delivery service requirements, but Duquesne must also stand ready to meet elevated delivery service requirements whenever they exist throughout the year. From this perspective it is the annual, or average service demands,[2] and the elevated, or peak demands, that cause Duquesne to incur its costs of providing service. Consistent with this practical, realistic view of Duquesne's delivery service operations (compared to Duquesne's) view that its costs are driven by number of

[2] Average demands for service bear the same relationship as annual demands, since average demands are annual demands divided by a constant 8,760 hours.

customers and their one-hour per year peak demands only, Duquesne's Primary and Secondary Distribution costs are related partially to Duquesne's customers' average demands for service and partially to customers' peak demands for service.

Q. HAVE YOU HAD PREPARED A STUDY BASED ON THE VIEW THAT DUQUESNE'S DELIVERY COSTS ARE CAUSED BY CUSTOMERS' ANNUAL, OR AVERAGE, DEMANDS, AND BY CUSTOMERS HAVING ELEVATED DEMANDS THAT PRODUCE, AT SOME TIME DURING THE YEAR, CUSTOMER CLASS PEAK DEMANDS?

A. Yes. The peak and average cost study methodology explicitly recognizes that distribution plant upstream of Services exists, and is caused, in part, by sustained electricity usage and in part by peak usage demands. Because the Company said its cost of service model utilized in this proceeding is proprietary, I specified the peak and average allocation factors to apply to Duquesne's Primary Distribution and Secondary Distribution plant, and Duquesne re-ran its cost study. Schedule RAG-1 contains the summary pages of the class cost of the service study that allocates Primary Distribution costs and Secondary Distribution costs partially on the basis of class average demands and partially on the basis of class peak demands. Those study results are based on 56 percent weighting of average demands and a 44 percent weighting of peak demands. Theoretically, under the peak and average cost allocation methodology, the capacity required to deliver average demands is based on the ratio of average demands to peak demands, which is simply the definition of system load factor, because no smaller amount of system capacity could deliver the annual demands for electricity on the Duquesne system. Duquesne's system load factor is 56 percent, which simply establishes that if Duquesne's 14,706,933 MWh annual load requirements were utilized at a steady flow throughout the year, its average demand each hour of the year would be 1,679

MWh, which is 56 percent of Duquesne's peak demand of 3,003 MWh. Because Duquesne's Primary and Secondary Distribution plant must be sized to not only accommodate Duquesne's average demands, but to also deliver electricity at times of peak demand, the remaining 44 percent of Primary and Secondary Distribution plant costs has been allocated on class noncoincident peak demands. Schedule RAG-1 includes the summary pages from the peak and average study at both present, and proposed rates.

Q. PLEASE COMPARE THE RESIDENTIAL RS CUSTOMER COST STUDY RESULTS PRODUCED BY THE PEAK AND AVERAGE COST STUDY TO THE RESULTS FOUND IN DUQUESNE'S CUSTOMER/PEAK DEMAND COST STUDY.

A. Schedule 2 is a table showing the overall jurisdictional and the individual class cost of service study results at both present and proposed rates for the future test year 2006. When costs are allocated on the basis of the service requirements which drive, or cause the costs to be incurred, including average demands and elevated demands as explained above, the cost misallocations inherent in Duquesne's study are removed. Looking at Schedule RAG-2 and focusing on the regular Residential RS column, the Company's study suggests that regular Residential RS customers are paying current rates that yield virtually no return at present rates, or even a bit negative at -0.56 percent return, and after the proposed rate increase, they would be paying rates that would provide a 5.30 percent rate of return, or about 58 percent of the system average requested 9.08 percent rate of return.

A much different picture, however, relates to the peak and average cost study results that allocate a 56 percent share of Distribution system costs on the basis of energy requirements, the *raison d'etre* for the existence of the Duquesne electric delivery system

in the first place. There it is shown that regular Residential RS customers are currently paying rates that essentially cover all of their cost-based revenue requirements exhibited by a rate of return of 2.87 percent, or 1.05 times the system average, and this continues to be the case, i.e., full cost recovery, at Duquesne's proposed rates. Reasonably allocated costs are totally recovered from regular Residential customers at Duquesne's proposed Residential RS rates. These study results are shown at Duquesne's proposed rates for illustrative purposes. I do not endorse Duquesne's requested overall increase.

Q. THE COMPANY HAS ALSO ALLOCATED UNIVERSAL SERVICE COSTS TO RESIDENTIAL CUSTOMERS IN ITS STUDY. DO YOU AGREE?

A. No. No service that Duquesne provides to non-universal service recipients has caused these costs. An allocation of these costs on an energy or total delivery cost basis to all customer classes least distorts allocated costs of service, and is consistent with the broad-sharing principle of these otherwise non-allocable costs. A broader sharing of these costs to all customer classes in the cost of service study would increase somewhat the index rates of return for residential customers reported in Schedule RAG-2.

IV. Revenue Allocation

Q. HOW DO YOU PROPOSE TO USE YOUR COST OF SERVICE STUDY RESULTS?

A. Cost of service study results should be used as a guide to the setting of rates. Rates should bear a relationship to costs, and that relationship may, indeed, vary among customer classes. The determination of rates and the associated class revenue requirements should also include the principle of gradualism. Rates should be determined so they are practical, free from controversy, reasonably stable in design, avoid "undue discrimination" and be efficient, as discussed by Professor Bonbright in his seminal text, Principles of Public Utility Rates. Cost study results should not slavishly be converted into rates.

Q. BASED ON YOUR STUDY RESULTS AND THE PRINCIPLES YOU DISCUSS, WHAT REVENUE SPREAD DO YOU RECOMMEND?

A. I recommend the class revenues proposed by Duquesne in this proceeding.

Q. SHOULD DUQUESNE BE AWARDED LESS REVENUE THAN IT HAS REQUESTED, HOW SHOULD THE CLASS REVENUES BE DETERMINED?

A. Class revenues should be scaled back from their proposed levels.

V. Residential Rate Design

Q. PLEASE DESCRIBE DUQUESNE'S RESIDENTIAL RATE DESIGN.

A. Duquesne classifies its residential customers into three groups: one, regular residential customers, who are served under rate schedule RS; two, residential heating customers, who are served under rate schedule RH; and three, residential add-on heat pump customers, who are served under rate schedule RA. All three residential schedules contain a monthly customer charge that Duquesne proposes to increase from $6.48 to $11.50. Rate schedule RS contains a single kWh rate for all kilowatt hours. Rate schedules RH and RA contain a single kWh rates in the summer that apply to all kilowatt hours. In the winter, both the RH and RA schedules include two kWh rates: a rate equal to the summer rate that applies to the first 500 kWh of monthly winter use, and a second, lower rate that applies to monthly winter use in excess of 500 kilowatt hours. The RH and RA kWh rates differ from each other. In this case, Duquesne is proposing to progress toward more commonality among these rate schedules by equating the RS summer and the initial RH winter block rates.

Q. HAVE YOU DEVELOPED MODEL DISTRIBUTION RATES FOR REGULAR RESIDENTIAL CUSTOMERS BASED ON DUQUESNE'S PROPOSED OVERALL REVENUE INCREASE?

A. Yes. Schedule RAG-3 shows model residential rates at Duquesne's proposed overall rate increase. These rates maintain the current residential rate design. The $7.00 Customer Charge shown on Schedule RAG-3 is an increase from the current $6.48 Customer Charge, and is also in excess of the $4.98 cost shown on Schedule RAG-4. Duquesne's proposed $11.50 monthly Customer Charge should be rejected, as it is far in excess of the costs typically authorized by the Commission for inclusion in the Customer Charge. Consistent with the $7.00 residential customer charge, the single kilowatt-hour charge

would be 4.49846 cents. The incorporation of Duquesne's overall proposed rate increase in the development of these model Residential Rates is for ease of comparison only. I do not endorse Duquesne's proposed increase.

Q. HAVE YOU DETERMINED DUQUESNE'S RESIDENTIAL CUSTOMER COSTS ELIGIBLE FOR INCLUSION IN DUQUESNE'S CUSTOMER CHARGE?

A. Yes. Schedule RAG-4 shows the determination of Duquesne's customer costs eligible for inclusion under my understanding of Commission precedent. In Pennsylvania, customer costs included in a monthly fixed Customer Charge include return, taxes on return, and depreciation on services plant and meter plant. The return and taxes costs are $11,901,000, as shown on Schedule RAG-4. Other fixed costs included in the monthly Customer Charge are the $1,589,000 and the $1,300,000 of depreciation expense on services and meter plant. Also considering variable O&M costs included in the Customer Charge, as shown on Schedule RAG-4, results in total Customer Charge costs of $29,755,000 million. Utilizing the costs shown on Schedule RAG-4, the calculated monthly Customer Charge would be $4.98 per customer per month. A more economically meaningful Customer Charge price signal would exclude the fixed costs, or depreciation and return and taxes, from the Customer Charge determination.

Q. HAVE YOU REVIEWED RIDER 21, THE UNIVERSAL SERVICE CHARGE RIDER APPLICABLE TO RESIDENTIAL CUSTOMERS?

A. OCA witness Colton addresses Rider 21 in detail in his testimony.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes, it does.

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BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	:	
v.	:	DOCKET NO. R-00061346
DUQUESNE LIGHT COMPANY	:	

SCHEDULES ACCOMPANYING THE

DIRECT TESTIMONY

OF

RICHARD A. GALLIGAN

ON BEHALF OF THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

JULY 7, 2006

EXETER

ASSOCIATES, INC.
5565 Sterrett Place
Suite 310
Columbia, Maryland 21044

DUQUESNE LIGHT COMPANY
Distribution Revenue Requirements
at Present Rates
Class Rates of Return

	Total Dollars	Residential Service RS	Residential Heating RH	Residential Add-On Heat Pump RA	General Small/General Medium	General Medium Heating	General Large	General Large Heating	Large	High Voltage Power Service	Archi-tectural Lighting	Street Lighting Energy	Street Lighting Municipal	Street Lighting Highway	Municipal Traffic Signals	Private Area Lighting
Operating Revenues at Present Rates																
Distribution Revenues	279,955	147,575	5,209	761	65,831	4,089	31,636	2,903	10,068	425	1	1,494	9,129	71	590	173
Transmission Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forfeited Disc / Misc Svc Revenue	3,050	2,530	154	23	183	13	74	11	26	20	0	3	11	0	1	0
Misc Service Revenue	3,185	1,679	59	9	749	47	360	33	115	5	0	17	104	1	7	2
Rent from Utility Property	8,047	2,870	336	31	1819	188	1,848	325	584	0	0	8	21	11	6	1
Total Operating Revenues	294,237	154,654	5,759	824	68,581	4,337	33,918	3,272	10,793	450	1	1,522	9,264	83	604	176
TOTAL EXPENSES	260,499	140,463	11,177	1,246	47,168	4,336	34,090	6,023	10,680	297	2	245	4,345	220	176	30
NET INCOME at Present Rates	33,738	14,191	(5,419)	(422)	21,414	1	(172)	(2,752)	113	153	(1)	1,277	4,919	(137)	428	146
	2.74%	2.87%	-11.16%	-8.77%	8.08%	0.00%	-0.07%	-6.00%	0.15%	47.64%	-6.70%	132.56%	19.52%	-8.66%	59.79%	179.14%

DUQUESNE LIGHT COMPANY
Distribution Revenue Requirement
at Proposed Rates
Class Rates of Return

Peak and Average Study

	System	Residential	Residential Heating	Residential Add-On Heat Pump	General Small/General Medium	General Medium Heating	General Large	General Large Heating	Large	High Voltage Power Service	Architectural Lighting	Street Lighting Energy
Proposed Distribution Tariff revenue allocation	423,637	204,184	13,602	1,364	89,274	7,103	66,424	8,811	20,990	394	1	1,511
Other Distribution revenue	14,283	7,079	550	63	2,750	248	2,282	369	725	25	0	28
Total Distribution revenue	437,920	211,263	14,152	1,427	92,024	7,351	68,706	9,180	21,715	419	1	1,539
Operating expenses	166,288	98,020	7,786	888	27,071	2,504	18,207	3,255	5,705	228	1	98
Depreciation expenses	66,400	28,481	2,637	267	13,918	1,370	12,161	2,256	3,800	34	1	50
General taxes	7,996	3,922	321	34	1,579	150	1,217	222	381	9	0	5
Gross receipts tax	25,270	12,196	817	82	5,312	424	3,966	530	1,254	24	0	89
Total expenses	265,954	142,619	11,561	1,271	47,880	4,448	35,551	6,263	11,140	295	2	242
Return before Income taxes	171,966	68,644	2,591	156	44,144	2,903	33,155	2,917	10,575	124	-1	1,297
Income tax expense	60,085	23,984	905	54	15,424	1,014	11,584	1,019	3,695	43	0	453
After-tax Return on Distribution Rate Base	111,881	44,660	1,686	101	28,720	1,888	21,570	1,898	6,880	81	-1	844
Distribution Rate Base	1,234,856	493,665	48,574	4,812	265,057	28,496	243,473	45,844	76,065	320	13	963
After-tax Return on Distribution Rate Base	9.06%	9.05%	3.47%	2.10%	10.84%	6.63%	8.86%	4.14%	9.05%	25.17%	-5.29%	87.64%

DUQUESNE LIGHT COMPANY
Distribution Revenue Requirements
at Proposed Rates
Class Rates of Return

	System	Residential RS	Residential Heating RH	Residential Add-On Heat Pump RA	General Small/General Medium	General Medium Heating	General Large	General Large Heating	Large	High Voltage Power Service	Archi-tectural Lighting	Street Lighting Energy	Street Lighting Municipal	Street Lighting Highway	Municipal Traffic Signals	Private Area Lighting
Duquesne Study[1]																
Rate of Return at Present Rates	2.74%	-054%	-11.42	-9.25	12.27	1.49	5.21	3.77	4.94	47.95	-7.72	68.09	18.91	2.41	45.51	98.53
Index Return	1.00	-0.20	-4.17	-3.38	4.48	0.54	1.90	1.38	1.80	17.35	-2.82	24.85	6.90	0.88	16.61	35.96
OCA Study[2]																
Rate of Return at Present Rates	2.74%	2.87	-11.16	-8.77	8.08	0.00	-0.07	-6.00	0.15	47.64	-6.70	-132.56	19.52	-8.66	59.79	179.14
Index Return	1.00	1.05	-4.07	-3.20	2.95	0.00	-0.03	-2.19	0.05	17.39	-2.45	48.38	7.12	-3.16	21.82	65.38
Duquesne Study[1]																
Rate of Return at Proposed Rates	9.08%	5.30	1.00	1.00	14.60	8.62	16.04	8.62	15.47	25.04	-4.47	45.19	12.55	9.92	29.84	37.05
Index Return	1.00	0.58	0.11	0.11	1.61	0.95	1.76	0.95	1.70	2.76	-0.49	4.76	1.38	1.09	3.29	4.08
OCA Study[2]																
Rate of Return at Proposed Rates	9.07%	9.05	3.47	2.11	10.84	7.13	8.86	4.14	9.05	25.10	-3.70	87.71	12.95	-3.47	39.14	78.43
Index Return	1.00	1.00	0.38	0.23	1.19	0.79	0.98	0.46	1.00	2.70	-0.40	9.66	0.78	-0.38	4.31	8.64

[1]Plant and related costs upstream of Services allocated on Customer/Peak Demands.
[2]Plant and related costs upstream of Services allocated on Peak and Average Demands.

Docket No. R-00061346
Schedule RAG-2
Page 1 of 1

DUQUESNE LIGHT COMPANY
Regular Residential RS
Model Rate Design
at Proposed Rates

Customer Distribution Charge	$7.00 per month
All Kilowatt-hours	$4.49846 cents

DUQUESNE LIGHT COMPANY
Customer Charge Determination
Residential RS

			Cost 000's
Return and Taxes			11,901
Distribution Depreciation Expense		7,224	
Services Plant Ratio	x	22%	1,589
Distribution Depreciation Expense		7,224	
Meter Plant Ratio	x	18%	1,300
Meter expense		1,337	
Maintenance of Meters		1,094	
Maintenance of Services		1,240	
Meter Reading Expense		1,485	
Customer Records and Collection		6,575	
Customer Assistance		1,986	
Employee Benefits @ 10% of O&M		1,248	
			14,965
Total			**$29,755**
Number of Customers			497,515
Number of Months			12
Customer Costs per customer per month			$4.98

OCA Statement No. 3R

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	)	
v.	)	DOCKET NO. R-00061346
DUQUESNE LIGHT COMPANY	)	

REBUTTAL TESTIMONY

OF

RICHARD A. GALLIGAN

ON BEHALF OF THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

AUGUST 2, 2006

EXETER
ASSOCIATES, INC.
5565 Sterrett Place
Suite 310
Columbia, Maryland 21044

I. Introduction

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard A. Galligan. I am a Principal with Exeter Associates, Inc., a firm of consulting economists specializing in utility economics. My business address is 5565 Sterrett Place, Suite 310, Columbia, Maryland 21044.

Q. ARE YOU THE SAME RICHARD A. GALLIGAN WHO FILED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to comment on the direct testimony of witnesses Steven J. Baron and James T. Selecky addressing the proper basis of the allocation of any authorized revenue increase. I also address several aspects of Vice Chairman Cawley's July 12, 2006 Directed Questions to participants in this proceeding.

Q. PLEASE DESCRIBE MR. BARON'S AND MR. SELECKY'S REVENUE INCREASE PROPOSALS.

A. Mr. Baron proposes that Duquesne's distribution rate increase should be allocated in such a manner that current distribution rate "subsidies," based on the Company's cost of service study, be reduced by 50 percent at proposed rates. Mr. Selecky proposes that each rate class would pay the same percentage increase on present distribution revenues. However, if the Company is awarded less than its requested increase, Mr. Selecky recommends that any reduction from the requested amount be allocated to those classes whose rates are above cost of service based on the Company's class cost of service study.

Q. AS YOU DESCRIBED BOTH MR. BARON'S AND MR. SELECKY'S REVENUE SPREAD RECOMMENDATIONS YOU EXPLAINED THAT BOTH RECOMMENDATIONS ARE BASED ON THE RESULTS OF THE DUQUESNE COST OF SERVICE STUDY. IN YOUR OPINION, IS IT REASONABLE TO TIE REVENUE SPREAD PROPOSALS TO THE COMPANY'S CLASS COST OF SERVICE STUDY?

A. No. As I explained in my direct testimony, the Company's study contains misallocations of major cost categories, resulting in erroneous class allocated costs of service. Mr. Baron's recommendation to close half the gap between revenues and allocated costs of service based on the Company's class cost of service study is a recommendation that relies on a study that contains unreasonable allocations of costs. Similarly, Mr. Selecky's recommendation to apply any reduction from requested revenues to classes whose revenues are above allocated costs based on the Company's class cost of service study is a recommendation that is also reliant on an unreasonable allocation of major service cost components.

Generally, Duquesne's distribution facilities exist because there is a daily need for such facilities. Indeed, electric service outages, often related to distribution delivery interruptions, are a major concern to affected customers whenever, throughout all days of the year, such interruptions occur. This electric service outage example clearly demonstrates that Duquesne's delivery system costs were incurred primarily to provide the daily deliveries of electricity in the daily quantities required by their customers. Absent these daily electricity requirements, there would be no Duquesne delivery system. It is unreasonable to allocate no costs on the basis of daily delivery requirements, as Duquesne has done in its study, when it is those daily demands that have caused the costs attendant to daily deliveries throughout the year. If major electric distribution costs are

not allocated on the basis of the service units that have caused the costs, resulting in unreasonable cost allocations, Mr. Baron's and Mr. Selecky's reliance on those cost allocation results in crafting their recommended revenue spread proposals, too, is unreasonable.

Q. PLEASE COMMENT ON MR. SELECKY'S ASSERTION THAT WHEN RATES ARE BASED ON AVERAGE, EMBEDDED, ALLOCATED COSTS TO EACH CLASS, THE RESULTING RATES ARE EQUITABLE.

A. At page 5, lines 13-17 of his direct testimony, Mr. Selecky explains that equity is achieved when rates are based on average, embedded, allocated class costs of service. Essentially, Mr. Selecky testifies that when rates are based on costs of service they are equitable, and when rates are not based on costs of service, they are inherently inequitable.

First, to the extent that Mr. Selecky fails to consider any noncost - basis for the setting of rates, Mr. Selecky's proposition is incomplete. Myriad noncost bases may be, and are routinely considered by regulatory authorities, including the Pennsylvania Commission. This Commission clearly considers cost study results as but one factor to be considered as a guide to the setting of rates. Mr. Selecky is incorrect when he testifies that, if rates are not based on average, embedded, allocated costs, the rates are inherently inequitable.

Second, of Mr. Selecky's assertion that rates must be based on Duquesne's cost of service study or else they are inequitable does not necessarily follow. There are numerous variants of average, embedded allocated cost studies, and the selection of the study itself affects what would be cost-based rates. Any suggestion that in order to be equitable, rates must be based on the exact study performed by Duquesne, with or

without the extension of the "customer" cost notion to primary facilities as advocated by Mr. Selecky, and containing the cost misallocations I have identified in my direct testimony is wrong.

Q. BOTH MR. BARON AND MR. SELECKY TESTIFY THAT THE PROPOSED DISTRIBUTION REVENUE INCREASE SHOULD BE EVALUATED ON THE BASIS OF DISTRIBUTION COSTS ONLY, NOT TOTAL COSTS. DO YOU AGREE?

A. No. Mr. Baron does not agree that the impact of the combined transmission and distribution increases on a total bill basis for a customer class should be considered by the Commission. [Stephen J. Baron, Testimony, p. 17, lines 1-3] Mr. Selecky testifies that the impact of the proposed distribution revenue increase should be evaluated relative to distribution costs only, and not total costs. [James T. Selecky, Testimony, p. 13, lines 27-28] In my opinion, the Commission is certainly entitled to consider the total cost of electricity, along with all other facts that participants in this general rate case proceeding bring to the Commission's attention in the rate setting process.

Q. VICE CHAIRMAN CAWLEY HAS REQUESTED THAT PARTIES TO THIS PROCEEDING ADDRESS SEVERAL RATE DESIGN ISSUES, INCLUDING THE EFFECT OF FIXED RESIDENTIAL CHARGES ON CONSERVATION OF ENERGY, AND THE EFFECT OF DECLINING BLOCK RATE DESIGNS ON ENERGY CONSERVATION. DO FIXED CHARGES FOR RESIDENTIAL CUSTOMER DISTRIBUTION SERVICES DISCOURAGE CONSERVATION OF ENERGY?

A. Yes. Other things equal, higher Customer charges necessitate lower energy charges. It is the per-kWh energy charge that the customer saves for each kWh conserved. The lower the savings achieved from reduced consumption, the lower is the incentive to conserve.

Schedule RAG-4 develops a monthly Residential Customer cost of $4.98 for inclusion in a Customer charge. This customer cost includes variable customer costs and the fixed depreciation and return costs associated with meters and services plant. Increasing the Residential Customer charge is tantamount to including even more fixed costs in the charge, necessitating a lower energy charge and reducing incentives to conserve.

Q. IS A REVENUE DECOUPLING APPROACH REQUIRED TO REASONABLY STABILIZE DUQUESNE'S REVENUES?

A. Revenue decoupling should be considered only after all aspects of such a program are comprehensively addressed, including a comprehensive energy conservation program. For example, Duquesne's Residential Heating customers represent less than 5 percent of the Company's customers, and less than 3 percent of the Company's energy requirements. One would not expect significant revenue instability from these large Residential customers' conservation activities. Then, too, there are offsets to potential conservation in the form of a proliferation of new, electricity-using consumer devices which are the result of technological advances. Neither should decoupling programs be considered absent consideration of a periodic requirement for a general rate review. In short, consideration of the decoupling program should be comprehensive, result only upon a showing of need, and broad enough for a consideration of all related aspects attendant to such a program.

Q. DO DECLINING BLOCK RATES AFFECT RESIDENTIAL INCENTIVES TO CONSERVE ENERGY?

A. Most generally, yes. Larger customers, including heating customers, are most likely to have sufficient electric energy requirements so as to consume energy in the blocks subject to declining prices. Larger customers would be expected to have greater opportunity to conserve than smaller customers.

Duquesne's regular residential customers do not pay declining block rates. The RS rate schedule consists of a Customer charge and a single kWh rate. Duquesne's residential heating, RH, and residential add-on heat pump, RA, customers pay rates that include a winter declining block price. To the extent that high winter usage is off peak, this rate design has a basis in cost. Historically, the RH and RA rate feature created reliance upon the rate by currently affected customers. Moderation should be strongly considered if modifying the declining nature of this winter RH and RA rate feature is proposed by any party to these proceedings.

Q. SHOULD RATE DESIGNS NECESSARILY BE CONSISTENT AMONG CUSTOMER CLASSES?

A. No. Customers differ in their level of sophistication to understand different billing elements, and metering capabilities differ among customers. Professor James C. Bonbright lists 8 criteria of a sound rate structure:

1. The related, "practical" attributes of simplicity, understandability, public acceptability, and feasibility of application.
2. Freedom from controversies as to proper interpretation.
3. Effectiveness in yielding total revenue requirements under the fair-return standard.
4. Revenue stability from year to year.

5. Stability of the rates themselves, with a minimum of unexpected changes seriously adverse to existing customers (Compare "The best tax is an old tax.")

6. Fairness of the specific rates in the apportionment of total costs of service among the different consumers.

7. Avoidance of "undue discrimination" in rate relationship.

8. Efficiency of the rate classes and rate block in discouraging wasteful use of service while promoting all justified types and amounts of use:

   a. *in the control of the total amounts of service supplied by* the company:

   b. in the control of the relative uses of alternative types of service (on-peak versus off-peak electricity, Pullman travel versus coach travel, single-party telephone service versus service from a multi-party line, etc.).

> Lists of this nature are useful in reminding the rate maker of considerations that might otherwise escape his attention, and also useful in suggesting one important reason why problems of practical rate design do not readily yield to "scientific" principles of optimum pricing. [Bonbright, James C., Principles of Public Utility Rates, Columbia University Press, New York, 1961, p. 291]

Because consideration of these criteria is likely to differ among rate classes, practical rate designs are also likely to differ.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes.

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OCA STATEMENT NO. 3S

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	
v.	:	Docket No. R-00061346
	:	
Duquesne Light Company	:	

SURREBUTTAL TESTIMONY

OF

RICHARD A. GALLIGAN

ON BEHALF OF THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

AUGUST 16, 2006

I. Introduction

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard A. Galligan. I am a Principal with Exeter Associates, Inc., a firm of consulting economists specializing in utility economics. My business address is 5565 Sterrett Place, Suite 310, Columbia, Maryland 21044.

Q. ARE YOU THE SAME RICHARD A. GALLIGAN WHO FILED DIRECT AND REBUTTAL TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

The purpose of my surrebuttal testimony is to comment on the rebuttal testimony of witnesses Howard S. Gorman, Steven J. Baron, and Brian Kalcic addressing certain aspects of the proper allocation of distribution costs. I first address Mr. Gorman's rebuttal testimony followed by Messrs. Baron and Kalcic. When a given topic has been addressed by more than one of these witnesses, I expand my comments to include all witnesses addressing the same issue.

Q. AT PAGE 5 OF HIS REBUTTAL TESTIMONY, LINES 12-19, MR. GORMAN CLAIMS THAT THE NARUC ELECTRIC UTILITY COST ALLOCATION MANUAL SUPPORTS HIS BELIEF THAT NO PORTION OF PRIMARY AND SECONDARY DISTRIBUTION SHOULD BE ALLOCATED ON THE BASIS OF AVERAGE DEMANDS. PLEASE COMMENT.

A. Mr. Gorman states at page 5, lines 17-19 of his rebuttal testimony that, "The NARUC Manual supports this, stating at page 89, '...there is no energy component of distribution-related costs.' (sic)" Addressing the propriety of allocating a portion of distribution costs on the basis of energy, and whether the NARUC Manual recognizes the legitimacy of an energy allocation, Mr. Baron testifies at page 8 of his rebuttal testimony, "In fact, there is

no recognition to any use of kWh energy (average demand) to allocation (sic) distribution facilities....There is no basis to allocate any (let alone 56%) of distribution plant and expenses on the basis on energy." Mr. Baron includes in his rebuttal Exhibit ____ (SJB-1R), Chapter 6 of the NARUC Manual, including the page 89 material, "...there is no energy component of distribution-related costs" also cited by Mr. Gorman.

First, it should be noted that the NARUC Manual is a positive, rather than a normative, manual. The authors of the NARUC Manual put it this way, "The writing style should be non-judgmental; not advocating any one particular method but trying to include all currently used methods with pros and cons." [Electric Utility Cost Allocation Manual, NARUC, January, 1992, page ii] The NARUC Manual was not written to advocate any one particular cost allocation methodology.

Regarding what the NARUC Manual has to say about the classification of Distribution costs, in addition to the selective quote Mr. Gorman includes in his testimony and the selective material Mr. Baron includes in his Exhibit ____ (SJB-1R), the NARUC manual is just that, a manual. I have reviewed the very same NARUC Manual referred to by Messrs. Gorman and Baron and have found three instances that refer to the inclusion of an energy component of Distribution costs. At page 34 of the NARUC Manual is a table that clearly shows that all Distribution function plant except Services and Meters may properly contain an energy (average demand) component. I have included the Section II, Classification in General, NARUC Manual section, page 34 in my Exhibit RAG-1S. Also, at page 21 of the NARUC Manual, the summary of typical cost classifications clearly shows an energy component of Distribution costs. Page 21 of the NARUC Manual is also included in Exhibit RAG-1S.

Q. MR. GORMAN TESTIFIES THAT INVESTMENT IN DISTRIBUTION FACILITIES IS CAUSED BY THE EXISTENCE OF CUSTOMERS, NOT BY AVERAGE DEMANDS. PLEASE RESPOND.

A. Mr. Gorman testifies, "As I stated above, distribution plant is not caused by, or sized to meet, average demands. *It is caused by the existence of customers and sized to meet* peak demands." [Gorman, Howard S., Rebuttal Testimony, p. 6] Duquesne is not in business to simply "connect customers." Duquesne would not "connect" customers who used no electricity or used it just during the peak hour (without a substantial customer advance to essentially cover related costs.) It would not be rational for a potential customer to incur costs to connect to the Duquesne system and use no electricity. Duquesne is in the business of selling and delivering electricity. It incurs distribution costs to provide delivery of its customers' annual electricity requirements and it sizes it system to meet peak demands as well as average demands. Duquesne incurs distribution costs to provide delivery of annual requirements, and to meet peak demand delivery requirements as well as average demand requirements.

Q. MR. GORMAN CLAIMS THAT YOUR TESTIMONY THAT DUQUESNE WOULD NOT BE FINANCIALLY VIABLE IF CUSTOMERS DID NOT USE ELECTRICITY OR USED IT FOR ONLY ONE HOUR PER YEAR IS MISLEADING. PLEASE COMMENT.

Mr. Gorman testifies, "The claim that the Company would not be financially viable if the system were built to serve customers, but the customers did not use it or used it only for one hour a year is misleading. That a utility might collect some of its customer-related and demand-related revenue requirement in energy-based charges is a function of rate design. Costs are not classified based on the way revenue is collected; rate design should follow cost classification, not the other way around. Therefore, it

would be inappropriate to allocate these costs based on energy." [Gorman, Rebuttal Testimony, pp. 5-6]

The point of my testimony to which Mr. Gorman is responding is that there must be a sufficient, sustained demand for electrical energy or Duquesne's distribution system would not exist. The argument is quite straight-forward: with sustained energy demands throughout the year, the Duquesne delivery system is financially viable; without sustained demands the Duquesne delivery system is not financially viable, and would not exist. Mr. Gorman misstates the predicate of the argument. It is only because Duquesne's customers do have sustained demands for energy throughout the year that the costs of Duquesne's delivery system can be supported. The choice of rate design is irrelevant to the validity of the reasoning.

Q. AT PAGE 4 OF HIS REBUTTAL TESTIMONY, LINES 3-10, MR. GORMAN TESTIFIES THAT THE COSTS OF THE MINIMUM DISTRIBUTION SYSTEM ARE CAUSED BY THE NUMBER OF CUSTOMERS SERVED AND THAT THIS CUSTOMER ALLOCATION IS WELL SUPPORTED, INCLUDING THE NARUC MANUAL. PLEASE COMMENT.

A. As addressed above and in my direct testimony, Duquesne is in the business of delivering electrical energy, and is not in the business of "connecting customers." Because customers place sustained demands for the delivery of electrical energy on the system, the system exists and costs are incurred. Thus, a portion of secondary distribution costs relates to this sustained demand for energy (average demand), which has caused the costs, and a portion relates to the extra costs incurred to meet peak demands.

Regarding whether costs related to a "minimum system" are caused by, and should be allocated on, the number of customers, that proposition is extremely controversial. Professor Bonbright put it this way:

> Customer costs are those operating and capital costs found to vary with number of customers regardless, or almost regardless, of power consumption. Included as a minimum are the costs of the drop wire, metering and billing, along with whatever other nonrecoverable expenses the company must incur in taking on another consumer. In more general terms, they are the minimum service, metering, accounting, etc. costs of connecting another customer or the savings in costs of not connecting the customer....
>
> The *FERC Handbook* (1983, p. 52) recognizes that while there are no hard-and-fast rules for allocating customer costs, as they depend on the type of costs involved, the issue is not usually litigated as the dollars involved are usually not substantial. The really controversial aspect of customer-cost imputation arises because of the cost analyst's frequent practice of including, not just those costs that can be definitely earmarked as incurred for the benefit of specific customers, but also a substantial fraction of the annual maintenance and capital costs of the secondary (low-voltage) distribution system -- a fraction equal to the estimated annual costs of a hypothetical system of minimum capacity. [Bonbright, James, C. Principles of Public Utility Rates, Public Utility Reports, Inc., Arlington, VA, Second edition, 1988, pp. 490-491, emphasis added]

Simply asserting that distribution costs are caused by the connection of customers, when that is a service that is neither demanded nor provided by Duquesne, nor would mere connection of customers in the absence of sustained electric requirements support the distribution system in the first place, does not establish cost causality. Weighed against this assertion is the observation that Duquesne is in the electric delivery service business, it incurs costs to provide for the delivery of annual energy demands each and every day of the year (average demands), and it incurs additional costs to meet peak demands over and above the costs associated with a system sized sufficiently to deliver average demands.

Q. MR. BARON TESTIFIES THAT THE NARUC MANUAL REQUIRES THE ALLOCATION OF A PORTION OF DISTRIBUTION FACILITIES ON A CUSTOMER BASIS. PLEASE COMMENT.

A. At page 4, lines 14-18 of his rebuttal testimony, Mr. Baron explains the "underlying argument" in support of the allocation of the minimum system facilities on a customer basis; i.e., "there is a minimal level of distribution investment necessary to connect a customer to the distribution system." At page 7 of his rebuttal testimony, lines 11-13, Mr. Baron again refers to the minimal facilities "simply due to the requirement to interconnect the customer..." Of course, as I have explained above and in my direct testimony, Duquesne is not in the business of "connecting" customers who use no energy (or who use energy only during a 15 minute to one-hour period coinciding with peak demands each year); the costs of the Duquesne system could not be supported, and hence, would not be undertaken, merely to connect customers who had no sustained demands for electric energy. Given these facts, it is not the number of customers that cause distribution costs upstream of Services, but the sustained loads over the course of each year and the fact that loads are, at times, elevated that cause distribution costs.

My comments addressing Mr. Gorman's reliance on the NARUC Manual are equally applicable to Mr. Baron's reliance on the Manual.

Q. IN ADDRESSING YOUR PEAK AND AVERAGE COST ALLOCATION METHODOLOGY, MR. BARON TESTIFIES THAT DISTRIBUTION COSTS SHOULD BE ALLOCATED ON A CUSTOMER/PEAK DEMAND BASIS, OR A PURE PEAK BASIS. PLEASE COMMENT.

A. At pages 8-9 of his rebuttal testimony Mr. Baron testifies that if the minimum system concept were rejected, *arguendo,* then all distribution plant should be allocated on peak demand measurements. Mr. Baron argues that this is so because distribution facilities are

sized to meet peak demands, and off-peak demands, as long as they do not create new localized peak demands, do not contribute to the need for facilities.

Because demands for delivered electricity vary seasonally, diurnally, and often with the temperature, the delivery system must be built also to accommodate these peak requirements. Therefore, a portion of distribution delivery costs, i.e., the extra costs associated with a system sized, not just to meet average demands but peak demands too, is caused by the peak demands. Average demands are the *raison d'etre* for the existence of the Duquesne system and they are responsible for the load factor share of distribution facilities' costs. Peak demands are responsible for the remainder of distribution facilities' costs. Peak demands which, if they were the only demands that existed, would not support Duquesne distribution delivery system, and peak demands are not the cause of all Duquesne's' distribution facilities' costs.

Q. MR. BARON ADVOCATES THE ALLOCATION OF UNIVERSAL SERVICE COSTS ONLY TO RESIDENTIAL CUSTOMERS. DO YOU AGREE?

A. No. At pages 11-12 of his rebuttal testimony, Mr. Baron points out that certain residential customers receive assistance, and that large C&I customers do not cause the incurrence of these costs. Mr. Baron also acknowledges that universal service costs are not caused by all residential customers. In spite of this, Mr. Baron advocates these costs should be allocated and recovered from the residential class only because to do otherwise "...(for example, allocating to all customers on the basis of kWh usage) is effectively a tax and should not be imposed by the Commission." [Baron, Rebuttal Testimony, p. 12] Mr. Kalcic, at page 5 of his rebuttal testimony also argues that the residential class should be assigned 100 percent of universal cost responsibility.

Since non-participants in the universal service program do not cause the costs, be they members of any class including residential customers, these costs cannot be

allocated on a cost-causality basis. All utility market participants benefit when the utility's rates are set to provide the utility with the opportunity to recover its total costs of service. The broad-sharing principle of allocating universal service costs to all customers recognizes this. Also, a broad sharing of universal service costs least distorts resulting prices. Mr. Baron suggests that a charge resulting from the allocation of a cost that one did not cause is effectively a tax. However, in this sense, the price increment related to universal service costs would be a tax not just to C&I customers, but to all customers who are assigned this cost responsibility. Mr. Baron's tax argument is no more applicable to C&I customers than it is to other Duquesne customers.

Q. OBJECTING TO THE ALLOCATION OF ANY PART OF ELECTRIC DISTRIBUTION COSTS ON THE BASIS OF ENERGY (AVERAGE DEMAND), MR. BARON TESTIFIES THAT THERE ARE DIFFERENCES IN ELECTRIC AND NATURAL GAS INTERRUPTIBLE SERVICE THAT PRECLUDE THE ALLOCATION OF DISTRIBUTION COSTS ON AN ENERGY (AVERAGE DEMAND) BASIS. PLEASE COMMENT.

A. At page 9 of his rebuttal testimony, after testifying that he did not review the specific cases I provided in direct response to DII data requests, Mr. Baron continues,

A. "...however, in general in the gas industry, there have been a number of methodologies to classify distribution mains and other facilities partially on the basis of commodity usage. The FERC's use of the "Seaboard formula" (50% peak demand, 50% commodity) is an example of such a methodology. All of these methods were designed to allocate some portion of the gas distribution systems to interruptible customers, who would not otherwise have paid any of the costs for distribution. This issue does not exist in electric utility cost allocation analyses since interruptible customers are always allocated 100% of their demand and customer based share of distribution costs, without any adjustment made for interruptible load."

Mr. Baron's testimony here is incorrect. The FERC's use of the *Seaboard* formula related entirely to interstate pipeline transmission costs and not to local gas distribution company distribution costs. Nowhere in his testimony does Mr. Baron explain this difference. Mr. Baron presents the Federal Power Commission's ("FPC," the predecessor of the Federal Energy Regulatory Commission) adoption of the Seaboard formula (50 percent demand/50 percent commodity) as being created to properly address the allocation of costs to interruptible service. Rather, the FPC, discussing the allocation of costs on the basis of peak demands and annual service requirements put it this way:

> We are unable, however, to acept the premise that merely because certain costs do not vary with use they automatically become in toto demand or capacity costs. A pipeline would not normally be built to supply peak service, that is to say, service on the peak days only. We know from our administration of section 7 of the Natural Gas Act, which involves the issuance of certificates of public convenience and necessity, that pipelines are built to supply service not only on the few peak days but on all days throughout the year. In proving the economic feasibility of the project in certificate proceedings, reliance is placed upon the annual as well as the peak deliveries. Stated another way, the capital outlay for the pipeline facility is made—and justified—not only for service on the peak days but for service throughout the year. Both capacity and annual use are important considerations in the conception on the project and in the issuance of certificates of public convenience and necessity. Both capacity and volume, therefore, are what are known as cost factors or incidences in respect to the capital outlay for a pipeline project. It follows that reasonably accurate results can be achieved only by allocating the fixed expenses flowing from the capital outlay to both operating functions, viz., capacity and volume. [11 F.P.C. 43, 54 (1952)]

The FPC included a discussion of interruptible service solely as an example of the propriety of the 50 percent peak/50 percent average demand allocation method. The underlying premise of *Seaboard* therefore dovetails precisely with the arguments I have advanced in this proceeding regarding the proper allocation of distribution costs, i.e., the

incurrence of costs related to the delivery of annual service requirements and the incurrence of additional costs related to the delivery of elevated, or peak, demands.

Q. MR. KALCIC OBJECTS TO THE PEAK AND AVERAGE COST OF SERVICE METHODOLOGY BECAUSE HE CONTENDS THAT THE METHODOLOGY EFFECTIVELY COUNTS A CLASS'S AVERAGE DEMAND COMPONENT TWICE. PLEASE COMMENT.

A. At page 6 of his rebuttal testimony, Mr. Kalcic testifies that the peak and average method double-counts the average component -- once in the average demand component and once in the peak demand component. Mr. Kalcic then continues, "This double counting of the average demand component is inappropriate since it requires a class to 'pay' for the average demand component of its load a second time." [Kalcic, Rebuttal Testimony, p. 6]

In the peak and average cost of service study I sponsor, the system load factor percentage, 56 percent, of costs is allocated on average demands, and the remainder of costs, 44 percent, is allocated on peak demands. This exactly comports with the peak and average application in the NARUC Gas Distribution Rate Design Manual that I discuss below. If Mr. Kalcic were right, that the peak and average method "requires a class to 'pay' for the average demand component of its load a second time," then the P&A method would have allocated 56 percent of total costs twice, and 44 percent of the costs once, for a total allocation of 156 percent of total costs. This is factually untrue -- the P&A method I relied upon allocated appropriately 100 percent of Duquesne's total costs of service.

There are 8,760 hours in a year. If peak demands represent the maximum class demands during any one of those hours, then the average demand represents the class demands over each of those 8,760 hours. Mr. Kalcic's concern is that during one of the

8,760 hours, the peak hour, the average demand is counted twice. Assuming, *arguendo,* and not granting the predicate of Mr. Kalcic's assertion, that a double-count actually exists, then any effect on cost allocations based on the spectre of double-counting the average loads in any one of the 8,760 hours in a year would be *de minimus* and insignificant.

The NARUC Gas Distribution Rate Design Manual includes a description of the peak and average method.

> This method reflects a compromise between coincident and non-coincident demand methods. Total demand costs are multiplied by the system's load factor to arrive at the capacity costs attributed to average use and are apportioned to the various customer classes on an annual basis. The remaining costs are considered to have been incurred to meet individual peak demands of the various classes of service and are allocated on the basis of the coincident peak of each class." [NARUC Gas Distribution Rate Design Manual, pp. 27-28]

This NARUC description of the peak and average method exactly describes the application of the method to Duquesne's total costs of service in this case.

Finally, the peak and average cost of service methodology has been accepted as a matter of policy in gas distribution rate cases in Pennsylvania since at least 1988. There simply is no "double-counting" concern with the peak and average method, either in fact, application, or acceptance in Pennsylvania.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes.

EXHIBIT RAG-1S

ACCOMPANYING THE

SURREBUTTAL TESTIMONY OF

RICHARD A. GALLIGAN

ON BEHALF OF THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

AUGUST 16, 2006

ELECTRIC UTILITY COST ALLOCATION MANUAL

January, 1992

NATIONAL ASSOCIATION OF
REGULATORY UTILITY COMMISSIONERS

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PREFACE

This project was jointly assigned to the NARUC Staff Subcommittees on Electricity and Economics in February, 1985. Jack Doran, at the California PUC had led a task force in 1969 that wrote the original **Cost Allocation Manual**; the famous "Green Book". I was asked to put together a task force to revise it and include a Marginal Cost section.

I knew little about the subject and was not sure what I was getting into so I asked Jack how he had gone about drafting the first book. "Oh" he said, "There wasn't much to it. We each wrote a chapter and then exchanged them and rewrote them." What Jack did not tell me was that like most NARUC projects, the work was done after five o'clock and on weekends because the regular work always takes precedence. It is a good thing we did not realize how big a task we were tackling or we might never have started.

There was great interest in the project so when I asked for volunteers, I got plenty. We split into two working groups; embedded cost and marginal cost. Joe Jenkins from the Florida PSC headed up the Embedded Cost Working Group and Sarah Voll from the New Hampshire PUC took the Marginal Cost Working Group. We followed Jack's suggestions but, right from the beginning, we realized that once the chapters were technically correct, we would need a single editor to cast them all "into one hand" as Joe Jenkins put it. Steven Mintz from the Department of Energy volunteered for this task and has devoted tremendous effort to polishing the book into the final product you hold in your hands. Victoria Jow at the California PUC took Steven's final draft and desktop published the entire document using Ventura Publisher.

We set the following objectives for the manual:

- It should be simple enough to be used as a primer on the subject for new employees yet offer enough substance for experienced witnesses.
- It must be comprehensive yet fit in one volume.
- The writing style should be non-judgmental; not advocating any one particular method but trying to include all currently used methods with pros and cons.

Typical cost classifications used in cost allocation studies are summarized below.

Typical Cost Function	Typical Cost Classification
Production	Demand Related Energy Related
Transmission	Demand Related Energy Related
Distribution	Demand Related Energy Related Customer Related
Customer Service	Customer Related Demand Related

The typical cost classifications shown above reflect the following types of assumptions regarding cost causation for electric utilities.

1. Production

Costs that are based on the generating capacity of the plant, such as depreciation, debt service and return on investment, are demand-related costs. Other costs, such as cost of fuel and certain operation and maintenance expenses, are directly related to the quantity of energy produced. In addition, capital costs that reduce fuel costs may be classified as energy related rather than demand related. In the case of purchased power, demand charges are normally assumed to be demand related and energy charges are normally assumed to be energy related. Fuel inventory may be either demand or energy related.

2. Transmission and Subtransmission

The costs of transmission and subtransmission are generally considered fixed costs that do not vary with the quantity of energy transmitted. However, to the extent that transmission investment enables a utility to avoid line losses, some portion of transmission may be classified as energy related.

3. Distribution

The costs of electric distribution systems are affected primarily by demand and by the number of customers. As in transmission, it may be possible to identify some energy component of the cost.

II. CLASSIFICATION IN GENERAL

Classification is a refinement of functionalized revenue requirements. Cost classification identifies the utility operation -- demand, energy, customer -- for which functionalized dollars are spent. Revenue requirements in the production and transmission functions are classified as demand-related or energy-related. Distribution revenue requirements are classified as either demand-, energy- or customer-related.

Cost classification is often integrated with functionalization; some analysts do not distinguish it as an independent step in the assignment of revenue requirements. Functionalization is to some extent reflected in the way the company keeps its books; plant accounts follow functional lines as do operation and maintenance (O&M) accounts. But to classify costs accurately the analyst more often refers to conventional rules and his own best judgment. Section IV of this chapter discusses three major methods for classifying and allocating production plant costs. We will see that the peak demand allocation methods rely on conventional classification while the energy weighting methods and the time-differentiated methods of allocation require much attention to classification and, indeed, are sophisticated classification methods with fairly simple allocation methods tacked on.

The chart below is a basic example of an integrated functionalization/classification scheme.

FUNCTIONALIZED CLASSIFICATION OF ELECTRIC UTILITY COSTS

	Cost Classes			
Functions	**Demand**	**Energy**	**Customer**	**Revenue**
Production				
Thermal	X	X	N/A	N/A
Hydro	X	X	N/A	N/A
Other	X	X	N/A	N/A
Transmission	X	X	X	N/A
Distribution	X	X	X	N/A
OH/UG Lines	X	X	X	N/A
Substations	X	X	X	N/A
Services	N/A	N/A	X	N/A
Meters	N/A	N/A	X	N/A
Customer	N/A	N/A	X	X