Trial Staff Statement-DPD2
Witness: D. P. Dougherty
Date: 3/17/86 Hbg
R-850152 JK

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PHILADELPHIA ELECTRIC COMPANY

Docket No. R-850152

Surrebuttal Testimony
of
Dennis P. Dougherty

Concerning: Quantification of the Cost Resulting from Limerick Unit 1 in not Meeting the in-service date of April 1981

Q. Are you the same Dennis P. Dougherty who previously has offered direct testimony concerning the quantification of costs associated with Limerick Unit 1 not meeting the April, 1981 in-service date?

A. Yes.

Q. What is the purpose of your surrebuttal testimony?

A. The purpose of this testimony is to address certain contentions raised by the Company with respect to the methodology used by Staff to quantify the costs associated with Limerick Unit 1 not meeting the April, 1981 in-service date. The Company's position is presented primarily in PECO Statement No. 4A, Rebuttal Testimony of James J. Clarey.

Q. What is the first area of disagreement presented by Mr. Clarey in PECO Statement No. 4A?

A. The first and most significant issue addressed by Mr. Clarey is the use of April 1981 for the unit's in-service date. Mr. Clarey apparently believes that it is Staff's opinion that Limerick Unit 1 should have been completed and in service by April 1981. The thrust of his rebuttal testimony is that this in-service date was not achievable because of physical, financial and regulatory constraints. This same contention also is contained in the rebuttal testimony of other PECO witnesses, such as Boyer (PECO Stmt. 1A), Sproat (PECO

Stmt. 6A), Helwig (PECO Stmt. 5A), Hill (PECO Stmt. 18D) and Love/Kononentz (PECO Stmt. 8A).

Q. Is this contention relevant or accurate?

A. Absolutely not. These various pieces of rebuttal testimony do not accurately reflect Staff's position. The fact is that nowhere in my testimony or that of Staff's Limerick witness Robert Rosenthal is there any statement that Staff believes that Limerick Unit 1 could have been in service by April 1981. *See also*, my responses upon cross and redirect examination on February 6, 1986 at Tr. 2665, 2703.

As explained in more detail by Mr. Rosenthal in his surrebuttal testimony, the April 1981 in-service date was incorporated in my analysis because it was the company-projected in-service date in effect when PECO announced its 1976 deferral. This is discussed - as an uncontroverted fact - in the Commission's I-8010034 order referenced in my direct testimony. To put it another way, the April 1981 date was the last completion date found prudent by the Commission.

Q. What was the purpose of your direct testimony?

A. As stated there, the purpose of my direct testimony was to quantify the cost resulting from Limerick Unit 1 not meeting the company's announced in-service date of April 1981. In other words, I simply identified the costs associated with the 1976 and 1978 delays found imprudent by the Commission. I made no recommendation as to what the appropriate cost of Limerick #1 is or when it should have been completed.

Q. Please discuss the other criticisms of your analysis made by the company.

A. PECO witness Clarey, on page 23 of his rebuttal testimony, cites two problems associated with reliance on actual data only up through October, 1984. The first problem is that of not including the direct costs incurred after October, 1984 when determining the amount of reasonable AFUDC recoverable by the Company. Mr. Clarey, states at p. 23 that failure to consider these post October, 1984 direct costs significantly understates the reasonable amount of AFUDC recoverable by the Company.

Q. Do you agree with this contention?

A. Yes and no. It is correct that had Staff been able to work with total project expenditures up through February, 1986 rather than expenditures only up through October, 1984 the quantified costs would have been different than those presented in Staff Statement DPD-4. It also is correct that the October, 1984 cutoff results in an overstatement to the AFUDC assigned by Staff as being associated with the construction delays. However, what

Mr. Clarey fails to mention is that the October, 1984 cutoff results in an understatement to Staff's direct costs assigned to the construction delays. While the direct cost understatement does not completely offset the AFUDC overstatement the problem associated with using the October, 1984 cutoff is not as significant as indicated by Mr. Clarey. As shown on Staff Exh. DPD-1A, Schedules 1 and 2, the direct cost understatement is approximately $18 million and the AFUDC overstatement is approximately $30 million for a net difference of $12M.

Q. You mentioned earlier that PECO witness Clarey had two criticisms of your analysis. What is the other criticism he discussed?

A. Mr. Clarey states that the post April 1981 recoverable direct costs should be spread over a 57 month period rather than the 42 months utilized by Staff to reflect the pre-commercial testing period. This longer compounding period results in a greater amount of recoverable AFUDC and a lower cost of delay than that calculated by Staff.

Q. Do you agree that this is a valid criticism?

A. No. I agree that there is usually some period required between fuel load and commercial operation, I am not convinced that there would have been a 15-month lag had construction proceeded in accordance with the announced schedule. A comparison between the I-80100341 in-service date of April 1981 and Schedule 33, Sheet 1 of 3 of PECO Statement No. 8, indicates that only a 6 month lag (10/80-4/81) between fuel load and commercial operation was expected by the Company prior to announcing the 1976 delay.

Q. Are there any other issues raised by PECO witness Clarey that you wish to address.

A. Yes. Mr. Clarey makes the additional assertions that my analysis is flawed because (1) it assumes uniform monthly expenditures and (2) fails to reflect the capitalization of PURTA taxes.

Q. Is his first contention valid?

A. No. While it is correct that my analysis does allocate the revalued costs evenly over a 42-month period, it must be remembered that the analysis is based on the comparison between the actual amount and pattern of project to date expenditures as of April 1981 and October 1984. It was only the post April 1981 reasonable direct costs that were distributed evenly over a 42-month period. Since this amount was then added to the actual amount of AFUDC accrued up through April 1981, Staff's AFUDC calculation has imbedded in it, the project's actual cash flow.

Q. What is Mr. Clarey's second contention concerning the PURTA tax?

A. If I understand his testimony at p. 24 of his rebuttal testimony, Mr. Clarey is saying that if the plant had been completed in April 1981, the amount of PURTA tax capitalized and the associated AFUDC would have been greater. He notes that these taxes have been expensed since April 1982.

The reasons are that (1) the absolute dollars of PURTA tax would have been greater as of April 1981, as the company's investment would have been greater and (2) the percentage of PURTA taxes capitalized would have been higher since beginning in April 1982 the company began the expensing of PURTA taxes. Thus, had LGS been completed in April 1981, 100% of the PURTA taxes would have been capitalized, rather than only a part of them.

Q. Please comment.

A. There are three facts that it is important to remember. First, my analysis did not include these taxes one way or the other, since as shown on Staff Exh. DPD-30 attached to my direct testimony, the amount of overheads and taxes, and therefore the accrued AFUDC, was insignificant in relation to my total quantified cost.

Second, PECO has been expensing this tax since 1982, and recovering the expense via the State Tax

Adjustment Surcharge, even though the investment giving rise to the tax expense is not used or useful and has not yet been included in rate base.

Third, as is established in the testimony submitted by me and other witnesses in this proceeding, excess costs resulted from the 1976 and 1978 delays found imprudent by the Commission. Since these excessive costs were included in PECO's investment, the amount of PURTA tax expense has been inflated.

Q. Does this conclude your surrebuttal testimony?

A. Yes.

Determination of Post
October 1984 Reasonable Direct Costs Applicable
To Unit 1 and Common Plant

	Unit 1	Common	Total Unit 1 and Common
Total Direct Costs Incurred Subsequent to October 1984 (A)	$133.1	$70.1	$203.2
Percent of Total Direct Costs Associated with Not Meeting April 1981 In-Service Date (Based on costs Incurred April 1981 through October 1984-See Schedule 3)	8.94%	8.94%	8.94%
Cost of Not Meeting April 1981 In-Service Date Applicable to Post October 1984 Direct Costs (B)	$11.9	$6.3	$18.2
Total Reasonable Post October 1984 Direct Costs (A)-(B)	$121.2	$63.8	$185.0
Number of Months (May 1981 Through October 1984)	42	42	42
Assumed Monthly Expenditures Needed to Complete Unit 1 and Common Plant by April 1981	$2.885714	$1.519048	$4.40762

Calculation of Incremental AFUDC
On Reasonable Post October 1984 Direct Costs
Unit 1 and Common

e Period	Assumed Monthly Expense	No. Of Months	Total Construct. Costs	Prior Per. Const. Costs	Compound Interest	Total Interest Base	Applicable Interest Rate	Time Factor	Increment AFUDC Calc.
1/77 Thru 12/30/77	4404762	2	8809524	$0	$0	$8,809,524	0.087	0.166666666667	$127,738
/78 Thru 6/30/78	4404762	6	26428572	$8,809,524	$127,738	$35,365,834	0.071	0.5	1,255,48[illegible]
/78 Thru 12/30/78	4404762	6	26428572	35,365,834	1,255,487	$63,049,893	0.073	0.5	2,301,321
/79 Thru 6/30/79	4404762	6	26428572	63,049,893	2,301,321	$91,779,786	0.074	0.5	3,395,852
/79 Thru 12/30/79	4404762	6	26428572	91,779,786	3,395,852	121,604,210	0.075	0.5	4,560,158
/80 Thru 12/30/80	4404762	6	26428572	121,604,210	4,560,158	152,592,940	0.075	0.5	5,722,235
/80 Thru 12/30/80	4404762	6	26428572	152,592,940	5,722,235	184,743,748	0.082	0.5	7,574,494
/81 Thru 4/30/81	4404762	4	17619048	184,743,748	7,574,494	209,937,289	0.083	0.333333333333	5,808,265
		42	185,000,004	657,945,936	24,937,285	867,883,225			30,745,550

Staff Exh. DPD-1A
Schedule 2

Staff Exh. DPD-1A
Schedule 3

Limerick Unit 1 and Common - Calculations of
Percentage of Direct Costs, Incurred April 1981 through October 1984,
Applicable To Not Meeting April 1981 In-Servie Date

Total Direct Costs, April 1981 through October 1984, Associated With Not Meeting April 1981 In-Service Date		$192,735,190
Total Direct Costs, Project to Date at October 1984, for Unit 1 & Common	÷	2,155,000,000
Percentage of Direct Costs Associated with not meeting April 1981 In-Service Date	=	8.94%

Limerick Unit 1 and Common - Calculations of
Percentage of Direct Costs, Incurred April 1981 through October 1984,
Applicable To Not Meeting April 1981 In-Servie Date

Total Direct Costs, April 1981 through October 1984, Associated With Not Meeting April 1981 In-Service Date		$192,735,190
Total Direct Costs, Project to Date at October 1984, for Unit 1 & Common	÷	2,155,000,000
Percentage of Direct Costs Associated with not meeting April 1981 In-Service Date	=	8.94%

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PHILADELPHIA ELECTRIC COMPANY
DOCKET NO. R-850152

Professional Qualifications

of

Gary A. Fawcett, CPA

I. Current Employment:

I am presently employed as an Auditor III by the Pennsylvania Public Utility Commission. As an Auditor III, I am responsible for being in charge of the field work on audits of Class A utilities. The type of audits we generally perform includes: Energy Cost Rate (ECR), Gas Cost Rate (GCR), and Continuing Property Record (CPR). Since being employed by the Commission in September, 1978, I have been involved in approximately 30 audits including the following:

Philadelphia Electric Company	-	ECR, GCR
Pennsylvania Power & Light	-	ECR
Pennsylvania Gas & Water	-	GCR
Metropolitan Edison Co.	-	ECR
UGI Corp.	-	ECR, CPR
Penn Fuel Gas, Inc.	-	GCR, CPR
Philadelphia Suburban Water	-	CPR

II. Prior Work Experience:

Prior to working for the Commission, I was employed as an accountant for the Montgomery County Mental Health/Mental Retardation Program.

III. General Education:

1976 - Bachelor of Science in Accounting from West Chester State College, West Chester, PA.

1974 - Associate in General Studies, from Montgomery County Community College, Blue Bell, PA.

R-850152
3/17/86

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Public Utility Commission

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION :
:
v. : Docket No. R-850152
:
PHILADELPHIA ELECTRIC COMPANY :

DOCKETED
MAR 24 1986

COMMISSION TRIAL STAFF EXHIBIT NO. 41

Documents from the record of **Limerick Nuclear Generating Station Investigation, Docket No. I-80100341** incorporated into the record of the instant proceeding by Order of the Presiding Officer, entered December 20, 1985.

DOCUMENT FOLDER

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COMMONWEALTH OF PENNSYLVANIA

PUBLIC UTILITY COMMISSION

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Limerick Nuclear Generating Station Investigation.	
	Docket No.
Further Hearing	I-80100341

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Pages 178 through 311.

Hearing Room 1
State Office Building
Broad and Spring Garden Streets
Philadelphia, Pennsylvania

Wednesday, March 25, 1981

Met, pursuant to adjournment, at 10:00 a.m.

BEFORE:

JOSEPH J. KLOVEKORN, Administrative Law Judge

APPEARANCES:

WALTER R. HALL, II, Esquire
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generation is now more required by improvement of operating costs than improvement of reliability. I think it is written in my testimony here somewhere that in a recent DOE study this comes out very strongly, that because of the high variation in different fuel prices that reserves as high as 50 and 70 percent in some part of the country, particularly oil-burning parts of the country, can be utilized economically, and that there is really nothing magic about a 20 percent or even a 25 or 30 percent reserve. But that significantly large parts of the United States can have much higher reserves and still perform economically for their customers.

Q Turning to the specifics of this case, would you agree that from that kind of an analysis, particularly in light of the fuel savings, that it makes economic sense to get Limerick on line as soon as possible?

A Yes.

Q How long has that been the case?

A I would say that we have come to that conclusion in about the last year and one-half or perhaps two years, as the price of fuels has spread. It has become much apparent that Limerick will definitely be a saving to our customers; Limerick coming on line.

Q Wasn't the same true three years ago?

A Less so.

Q But still a saving?

A Less pronounced; it has been a savings, yes, but much less pronounced.

Q Was there any time in the past where the prompt completion of Limerick would not have provided a saving?

A In 1969, which is when I remember that we authorized Limerick as a company, the basis for the authorization was on the need for maintaining proper reserves and reliability. The situation has evolved from that to the point where now it is required to improve the operating performance of the company, the cost performance.

Q In other words, fuel savings?

A Fuel savings.

Q Of course, at the same time it is consistent for a plant to be both a substantial fuel saver and necessary for reliability?

A Yes.

Q Was that true all along?

A The reliability is always there. It does add to the reliability. The ability to reduce the cost of operation; I am not certain where that became a pronounced benefit. It is a function of what load growth we are prognosticating at any given time.

Another way to answer your question would be to say that at the time in 1969 and at all times thereafter we have been checking to determine that Limerick was the best almost as it was spent, and the same thing for building modifications?

A We are getting into such a conjectural sort of thing that I really feel that I have no expertise to add to this line of questioning, frankly.

MR. HALL: Mr. Sayre, your questions really go to the rate base treatment of various investments made by the company. Mr. Kasum as a System Planner is not familiar with the regulatory process in terms of the rate base inclusion and exclusion, AFUDC and so forth, and the financial implications of that, which your question really directs itself to.

MR. SAYRE: Let me fine it down a little bit.

BY MR. SAYRE:

Q Can you think of any substantial capital projects that would have to be undertaken by the company to control the peak?

MR. HALL: You say "would have to be undertaken." For what purpose?

MR. SAYRE: If the company decided that its most economic alternative to the problem of generation not being the same as the forecast peak would be for the company to work on the peak rather than work on the generation, I would like the witness to explain, if he knows of any substantial long-term construction projects that would have to be undertaken by the company, if that alternative were chosen.

MR. HALL: If that is in his area of responsibility.

THE WITNESS: Basically, it isn't. Some of our current generating capacity would become almost useless. There would have to be some kind of a replacement there depending to what degree this was exercised.

BY MR. SAYRE:

Q So is it fair to say that you in your division, in deciding how the company is going to meet the peak, don't look substantially at that kind of alternative? What you look at is what generation the company needs.

A That has been the situation, yes.

MR. SAYRE: I have no further questions.

JUDGE KLOVEKORN: Ms. Bush.

MS. BUSH: Your Honor, we have some exhibits, interrogatory responses, that I would like at this time to identify; CA Exhibit 1.

I will call off what interrogatories responses they are. The interrogatory responses are all IR-2, and the ones that are included are 1-27, 1-28, 4-1, 4-4, 4-5, 4-6, 4-7, 6-15, 7-30, 7-53 and 7-55.

We will be throughout the proceeding identifying interrogatory responses in this manner. This is not exhaustive of what we will be putting into the record.

JUDGE KLOVEKORN: Without objection, that will be identified as CA Exhibit 1.

COMMONWEALTH OF PENNSYLVANIA

PUBLIC UTILITY COMMISSION

Limerick Nuclear Generating Station Investigation Further Hearing	Docket Number I-80100341

Pages 485 through 591

Hearing Room 1
State Office Building
Broad and Spring Garden Streets
Philadelphia, Pennsylvania

Tuesday, March 31, 1981

Met, pursuant to notice, at 10:00 a.m.

BEFORE:

JOSEPH J. KLOVEKORN, Administrative Law Judge

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C O N T E N T S

WITNESS	DIRECT	CROSS	REDIRECT	RECROSS
Joseph F. Paquette, Jr.	487	---	---	---
By Mr. Young		488	---	---
By Mr. Sayre		528	---	---
By Mr. Popowsky		564	---	---
By Ms. Zitzer		572	---	---
By Mr. Lewis				

E X H I B I T S

NUMBER	FOR IDENTIFICATION	IN EVIDENCE
Philadelphia Electric Company		
Statement No. 9	488	---

P R O C E E D I N G S

JUDGE KLOVEKORN: I call to order this hearing in case number I-80100341, the Pennsylvania Public Utility Commission's investigation into the Limerick nuclear generatin station.

Do we have any preliminary matters this morning?

(No response.)

JUDGE KLOVEKORN: I believe our witness for today is Joseph F. Paquette.

MR. YOUNG: That's correct.

DIRECT EXAMINATION

BY MR. YOUNG:

Q. Mr. Paquette, would you give your name and address for the record?

A. My name is Joseph F. Paquette, Junior, Philadelphia Electric Company, 2301 Market Street, Philadelphia.

Q. Mr. Paquette, have you prepared your testimony for this proceeding in question and answer form, a form which has previously been identified as Statement number 9?

A. Yes, I have.

Q. If you were to testify today under oath would your testimony be as is set forth in that statement and would it be true and correct as of this date?

A. Yes.

JUDGE KLOVEKORN: Before we go any further, I don't believe Mr. Paquette has been sworn.

Whereupon

JOSEPH F. PAQUETTE, JR.

having been duly sworn, testified as follows:

BY MR. YOUNG:

Q. Does that oath apply to the testimony you've already given?

A. Yes.

MR. YOUNG: If Your Honor please, we would like to have identified as PECo Statement number 9 Mr. Paquette's testimony for the purpose of this proceeding.

JUDGE KLOVEKORN: Without objection it will be so identified.

(Whereupon, the document was marked as PECo Statement No. 9 for identification.

MR. YOUNG: Mr. Paquette is available for cross-examination.

JUDGE KLOVEKORN: Mr. Sayre?

CROSS-EXAMINATION

BY MR. SAYRE:

Q. Good morning, Mr. Paquette.

A. Good morning.

Q. I'm sure you know I represent the Trial Staff.

A. Yes, sir.

Q. Will Philadelphia Electric be able to finish Limerick on

Forecast 5 schedule without some kind of unusual rate treatment, such as interest expense above the line?

A. Based on current economic factors we probably won't be able to attract all the capital needed to complete Limeric unless we are granted an exceedingly high rate of return on equity or some alternative new rate making technique, such as CWIP and rate base or the interest adjustment which we have in the current rate case; something of that magnitude to allow us to improve our interest coverage ratio and to be abl to attract the capital necessary.

Q. And if you were not granted such rate treatment, the equity return that you would require would be something on the order of 20 percent?

A. It could be that high. I've not done a recent study, but with interest rates the way they are today, in the area 15 percent for debt, it could well be close to that number, yes

Of course, that is not much higher than what we are requesting in the current electric rate case, which is 16 percent and which I've seen some financial writers recommend that it should be the goal for utilities in today's market anyway, we should be shooting for something closer to 20 to properly compensate investors today.

Q. If you assume that the Commission, for the sake of this question, grants Philadelphia Electric something in the neighborhood of 15-and-three-quarter percent return on equity to maybe sliding up towards 16-and-a-half over the next few years, do you have any opinion as to how much unusual relief such as CWIP and rate base, that PECo will require in dollar terms to get the plant built on schedule?

A. No, I have not made a study, and furthermore, I think a critical point is not so much what the Commission allows us but what we actually earn. There has been a big difference between those two numbers, as you are probably well aware. We are never able to earn what the Commission allows us because primarily, the test year is out of date, we are always at least 12 to 14 months behind in terms of the noncoincidence of the test year versus when the rates become effective, even under the new PUC law.

So, we would have to be earning on the order of 16 or 17 percent to really make a difference, as opposed to the Commission allowing us that much.

Q. So that the Commission, under current Commission rate making treatments, would have to allow you something in the 20's then?

A. Or use a truly future test year, which we have been endeavoring to do, but unsuccessfully in terms of getting the test year that we have utilized more up to date in terms of adjustments beyond the end of the current test year.

Q. Is it correct that you are testifying that every alternative that you have examined to finishing Limerick on schedule will cost the rate payers more than finishing it on schedule?

A. Yes, I believe that is true, that all of the alternatives that we have studied would cost our rate payers considerably more than finishing Limerick on its present schedule.

Q. So that the least costly alternative, then, is to have rates of return allowed in the 20's and achieved in the 17 to 18 percent range, or some kind of special rate making treatment, is that correct?

A. Yes, that would be -- of course, what you're talking about is only the special rate making points that we talk about are just required in the very short interval between now and 1985 when Limerick would be finished. It's not required beyond that period, and as a matter of fact, it would considerably ease the burden of what the customer would have to pay when Limerick goes in service because if we could get, for instance, CWIP and rate base while that might increase rates in the short run, in the long run it would considerably lower rates because of the lower rate base that a rate payer would have to support, and over the life of the project it would result in considerable dollar savings to the consumer and present a good payoff for the customer.

Q. But over the next few years isn't it true that you have informed the Commission in PECo's last annual review that unless some substantial changes are made in the Commission's rate making policies, PECo is going to have to come in every year for rate increases?

A. With today's inflation, it would probably have to be that we come in every year regardless of whether we get the new rate making policies or not.

Q. Would you agree that every postponement of the Limerick plant has added to its direct construction costs and AFUDC?

A. I don't believe I've done an analysis of every decision in terms of its ultimate impact. There's no doubt that every time a unit is delayed, generally it results in more AFUDC under the construction cycle, and you can subject yourself to additional inflation.

That does not necessarily mean, however, that the final cost of a delayed project is more costly than a project that would have started later but would have finished at the same time as a delayed project.

Q. But it will be more costly than a project started earlier and finished without any delays?

A. Generally, that's true.

Q. Did Philadelphia Electric intend, when it was decided to go ahead with Limerick, to be the sole owner?

A. Yes, that's true. You're talking about the original decision back in the late '60's?

Q. Yes.

A. Yes.

Q. When did PECo first start looking for possible joint owners?

A. I'm not sure I know the precise date, but it was -- if I recall, it was around three to five years ago; somewhere in that period that we decided that it might be beneficial to try to find another utility that, perhaps, we could swap Limerick with and obtain part of their plant if it was coming in at a later time or just an outright sale of part of Limerick either having them buy in or purchase part of the output. It was roughly in the range of three to five years ago, as I recal

Q. That would be 1976 to 1978?

A. Approximately.

Q. You're not aware of any such search for joint owners prior to 1976?

A. I just don't recall that there was. There could have been. I just don't have that accurate a memory on that. I have not been the person who has been actively pursuing a possible sale.

Q. Is it correct that all of PECo's prior very large stations were owned partly by other utilities?

A. We only have one other station that is partly owned by another utility, and that's Peach Bottom. All of our othe plants, Eddystone, Cromby, are 100 percent owned by the compa except for our joint ownership in the Keystone project becaus that's not our plant. That was designed to be a joint plant.

Q. Keystone, Conemaugh and Salem?

A. Right.

Q. In your testimony that the 1976 two year postponement was desirable from a financial standpoint, are you saying that PECo actually announced financial constraints as one of the reasons for postponement at the time of the postponement?

A. I believe we did, yes. You're talking about the 1976 delay?

Q. 1976.

A. Yes.

Q. Can you refer me to any documents or press releases where you mention that that was one of the reasons?

(Witness perusing documents.)

A. I believe we put out a press release at that time. I don't, unfortunately, have it with me. But in addition, we did put out, in connection with releasing our five year forecast to analysts, which we distributed -- it was dated May 24, 1976 -- it was accompanied by a letter from John Austin who was then vice president of finance and accounting, where he did state that, "The company has earned an unsatisfactory return on investment for several years, our stock continues to sell below book value," and it says, "The continued large sales of additional stock under these conditions would, over time, unacceptably erode the value of our shareholder's investment. Accordingly, planned construction expenditures for the years 1977 to '80 have been further reduced in this new forecast by almost 30 percent, or about $750 million."

And I believe the same kind of a message was includ in the press release that was issued at about that same time, that put the reason for the reduced construction program primarily on reduced load growth, but also on adverse financia factors and the inadequate returns being earned by the company

Q When the company postponed Limerick in 1978, financial constraints were publicly announced then, were they not?

A I believe we did.

Q I won't ask for a reference. I will accept your statement.

Is it correct that after 1978 and through 1980 the expenditures for Limerick were actually continued on the prior 1983 to 1985 schedule?

A That's correct.

Q So that financial constraints actually did not require the 1978 postponement?

A We were able to budget and obtain the additional capital required to keep it on the '83/'85 schedule for the two years involved, and it was really 1978 and 1979 that required additional expenditures; and those expenditures each year were only of the magnitude of less than $20 million per year. So we did not require a significant amount of dollars in those two years.

Where the expected significant savings were going t be produced were in the years after 1980. That was where we expected to see the difference between the '83/'85 schedule a the '85/'87.

So it did not cost the company significant amounts of new capital to keep the Limerick plant on the '83/'85 schedule and, in fact, it was a very worthwhile investment to make because of the possibility that we could find the means, the financial means, to keep it permanently on the '83/'85 schedule, depending on the outcome of the various rate cases that we were then in.

Q. Are you saying that the old schedule didn't require any more expenditures than the new schedule for the year 1980?

A. No, I said that, but I think I was mistaken. It did require \$20 million more in 1980 and \$18 million -- approximate \$18 million more -- in 1979.

Q. The current reason for postponement from the '83/'85 to the '85/'87 schedule is the revised Bechtel forecast, is that correct?

A. Would you mind repeating that?

Q. Is it PECo's position now that the reason for the postponement from the '83/'85 to the '85/'87 schedule is the revised Bechtel forecast?

A. The reason -- you mean the reason that we say now we can't keep the '83/'85 schedule?

Q. That's right.

A. I believe that's -- I think that is a question for Mr. Boyer, as to all the reasons for the current situation, which I'm not here to explain.

Q. Can you tell me whether Bechtel was made aware of Philadelphia Electric's problems with availability of funds or of Limerick's effect on Philadelphia Electric's reserve margin in the course of Bechtel's gathering data for its Forecast 5?

A. I do not deal directly with Bechtel, so I don't know exactly what was told or what wasn't told. I do know tha the Bechtel organization for many, many years has been told of the financial condition, apprised of the inadequate financial position of the company and that has been told many, many time

Q. Is it correct that right now Philadelphia Electric recognizes that Limerick will provide a cost savings to customers, regardless of its affect on capacity?

A. I can't say I agree that it's regardless of its affect on capacity. Of course, the savings of any generating unit depend on the capacity factor of the unit.

Q. I don't mean the capacity factor of the unit. I mea the effect on PECo's reserve capacity.

Let me restate the question for you. Is it correct that PECo's recognizes that Limerick will provide a cost savings to customers regardless of what it does to PECo's reserve margin?

A. Yes, I think that's generally true.

Q. Will this savings, as PECo understands it, be immediate, as soon as the plant goes into commerical operation or in the first few years of operations does PECo expect that the capital cost to customers will outweigh the fuel cost savings?

A. I believe that is an item for Mr. Lawrence, but as I remember, it does take one or two years for the savings, the fuel savings, to surpass the carrying charges on the investment; and then from then on the fuel savings -- net savings -- get bigger each year with the assumed escalation in the cost of alternative fossil fuels.

Q. So I should I direct that question to Mr. Lawrence?

A. That's right.

Q. Is it correct that none of the postponements for Peach Bottom II, Peach Bottom III, Salem I and Salem II were for the announced reasons of either reduced load forecasts or financial constraints?

MR. YOUNG: Mr. Examiner, I would object to that. I think that's outside the direct testimony of this witness, -- certainly, if not outside the scope of this entire proceeding.

MR. SAYRE: If it's outside this witness' capability

I don't mind being referred to another witness. As far as the scope of this proceeding goes, it's very clear from the Trial Staff's testimony that we are challenging some of the company's postponements and I think it's very relevant what postponements were caused to other plants during the same period of time when PECo was discussing the reasons why -- that PECo constructing the reasons that were stated for those postponements.

JUDGE KLOVEKORN: I will overrule the objection.

THE WITNESS: Which postponements, specifically, are you referring to?

BY MR. SAYRE:

Q My question is that for any postponement, all postponements, that were announced for Peach Bottom II and III or Salem I and II, is it not correct that none of the postponements were for either of the two reasons, reduced load forecast or financial constraints?

MR. YOUNG: Are you identifying particular postponements?

MR. SAYRE: No. I'm saying any of them.

MR. YOUNG: I don't think that the record shows there are any in this proceeding, so I don't see how we can speculate about postponements.

MR. SAYRE: All right, I will ask a background question and then return to the main one.

BY MR. SAYRE:

Q Isn't it correct that there were a number of postponements for each of those units during the course of their construction?

A I don't recall what the original schedule for the Peach Bottom construction was or for the Salem.

Q Are you saying that you don't know the answer to that main question?

A I'm not sure I know what the question is.

Q Can you refer to IR-2, question 7-30?

(Witness perusing document.)

Q That is part of Consumer Advocate Exhibit 1 and that has been marked for identification as such on the 25th of March.

Would you like the question again, Mr. Paquette?

A Can you give me a minute to look at your reference here?

(Witness perusing document.)

A Yes, I would appreciate the question again.

Q Is it correct that none of the postponements for Peach Bottom II and III and Salem I and II were for the announced reasons, either of reduced load forecasts or of financial constraints?

A In regard to the Peach Bottom schedule, which indicat of course that the unit was completed in 1974, which was a few years beyond its originally scheduled date, that plant was constructed over a period of time when the company was in a lot different and better financial, generally, shape than we have been during the construction schedule for Limerick. To my recollection, none of the Peach Bottom delays were due to specifically financial factors.

When the Arab oil embargo hit in 1973 and its effects on our prices began to show up in 1974, the unit was already, essentially, complete and there was no, at that point, no need or merit to even considering delaying a unit that was already complete. As a matter of fact, we put the unit in as fast as we could under the licensing requirements of the NRC and the minute that that unit went into operation, right from the start, it began to produce fuel savings greater than its carrying charges.

In regard to the Salem plant, the history of the Salem schedule was more determined by Public Service of New Jersey, since they were the ones responsible for the constructi schedule. Philadelphia Electric surveyed their construction management, but most of the decisions on the schedule were made by Public Service, who were the prime owners -- not the prime owners, but were going to be the operators in that they had the responsibility for building the unit. So there, to my recollection, none of the delays were due any of our financial or our load growth considerations. It was primarily constructic delays as opposed to those other two factors.

Q Am I correct that your prior answer is an explanati of a basic answer to my previous question, which is yes?

A. My answers were explanations of the question, yes.

Q At the bottom of page 11 of your Statement number 9 you are referring to the 1976 postponement, I believe.

A. Yes.

Q And you talk about short-terms costs to customers and possible long-term burdens.

A. Right.

Q Short-term costs that you are referring to are increased capital costs for the period of time after the plant would have come on line on the faster schedule, up until the date that the plant was due to come on line on the postponed schedule, is that correct?

A. That's correct.

Q In making the 1976 postponement, did the company evaluate what the long-term loss to the customers would be after that period of time due to the two year delay?

A. I don't recall that we made a specific study.

Q In the 1978 postponement, I gather from your statement at page 14, that you did make a special study and estimated that 1983 bills would be $190 million less but for each of, I guess, the next 35 or 40 years the bills would be $47 million higher per year?

A. That's correct.

Q. Did you do any kind of present value analysis, comparing the long-term benefits and burdens?

A. I'm not sure. It's possible that we did. We don't usually, but it's possible.

Q. You don't recall?

A. I don't recall.

Q. I'd like to go back to Table A now --

A. Table A?

Q. In your testimony, yes. It was in 1969 that the company made the decision to build Limerick, is that correct?

A. Yes.

Q. I gather from Table A that at that time your return on common equity and interest coverage ratios were declining?

A. That's correct.

Q. Isn't it correct that at that time PECo expected them to keep declining because PECo was in the process of building Peach Bottom?

A. No. We did not expect that our return on equity or our interest coverage ratio would continue to decline.

Q. Even though Peach Bottom was under construction at the time?

A. That's correct.

Q. Was PECo financially healthy in 1969, as you would define that term, when the decision was made to go forward to build Limerick?

A. Yes. I would say we were a relatively financially healthy company. There are all sorts of degrees of financial health, but with the conditions that existed at that time and the growth in business that we were experiencing, we and, I think, the investment community considered Philadelphia Electric a very high grade investment.

Q. But at that time your common equity return and earnings per share and coverage ratios were on the downturn?

A. That's correct. They had declined, right, but we anticipated that they would soon be restored to the levels that we felt were fair and adequate for the construction program that we had ahead of us.

Q. But as it turned out, at least through the next few years, that didn't materialize?

A. For the next at least 12 years it did not materialize

Q. Now, 1974 was the year the construction permit was issued, is that correct?

A. Yes -- you're talking about the Limerick construction permit?

Q. That's right.

And that is when PECo really started to sink a lot of money into Limerick as compared to prior years?

A. That is when the dollars start to be expended, yes.

Q. Now, would you agree that PECo's financial situation was bad in 1974?

A. It was probably the worst that we have experienced. It certainly was in terms of return on equity. It was 8.9 percent.

Q. Has PECo ever issued preference stock subordinate to preferred stock?

A. No.

Q. PECo didn't issue any preferred stock in 1975, is that right?

A. In the calendar year '75?

Q. Right.

A. That's correct, we did not.

Q. Are you aware that PP&L has a fair amount of preference stock subordinate to preferred?

A. I think I'm aware that they do have preference. I'm not sure as to the size of it.

Q. Is it correct that a company can issue preferred or preference stock even in circumstances where the mortgage indenture prohibits issuing more mortgage bonds?

A. Depending on the situation for the given company, it usually is true, yes.

Q. At the bottom of page four and the bottom of page five of your statement, you indicate, do you not, that your predictions in 1974 depended upon partly confidence in an improving economy and also partly on a promptly granted rate increase?

A. Yes.

Q. Is it fair to say that much of your financing program at that time depended on improvements in factors that were outside your control?

A. I think that is a fair assessment, yes; and not only since -- not just the year in question, but since that time we have had to put a lot of dependence on the Commission granting us prompt and adequate rate relief to attract the capital necessary for our construction program, and at the same time we have certainly been very adversely hit by the subsequent and substantial rise in the cost of money which is the other factor that is beyond our direct control.

Q. And it is fair to say that you consider that the factor of the Commission has not been particularly favorable to the company in that you have not been receiving prompt rate increases to which the company is entitled?

A. Yes, I would say in general the Commission's findings in our rate cases have been based on relatively fair rates of return, given the conditions of the money market. But the orders have been too much, too late, and also the orders have included factors such as deductions for excess capacity which have further eroded our ability to earn the rates of return that the Commission orders intended.

So that the delay, both in the outdated test year und the old law, the delay in getting an order and the rate base deductions such as excess capacity have been serious deterrents to our ability to earn the returns needed to adequately compensate our investors and at the same time attract the capital we need.

Q. In that last answer did you say, "Too much, too late," or did you mean too little, too late?

A. Well, too little, too late is a good way to summarize it.

Q. Let's go back to Table A now. In 1976, under its mortgage indenture, could PECo have issued more long-term debt? I'd like to expand that to 1975. In both of those years, under it's indenture, could PECo have issued more long-term debt?

A. Yes. We had at year end, we had additional capacity to issue mortgage bonds.

Q. Approximately how much for those two years, in rough figures?

A. I don't have the details with me.

Q. Would it be difficult to make that kind of computation for the years '75 through '78?

A. For '75 through '78?

Q. Yes.

A. Well, that can be done.

It would most likely be one number for one year, beca if you look up the excess coverage for 1975, and I guess what you are asking is if we had lowered the mortgage coverage ratio from 2.5 down to the minimum of 2 how much additional bonds would that have taken.

Once you've done that for '75, then that then lowers '76's ratio automatically because those bonds would be carried over. So you don't add '75 to '76. '75 will probably wipe out the excess we had in '76 and also, as you will see, will then have put 1979's ratio below two, so there would have to be an offsetting reduction sometime in '78 or '79 of bonds we couldn't have sold then because we, under your theory, would have sold more bonds in 1975.

We can work up that number for you.

Q. I would appreciate that. Thank you.

A. Am I correct in reading Table C that the 1976 postponement lowered the financing requirements from 1976 to 1978 by $56 million, $44 million and $76 million respectivel

A. That's correct.

Q. Would you agree that the 1976 to 1978 financial markets improved considerably over the 1974 to '75 situation?

A. You said the financial markets improved?

Q. Yes.

A. In those three years, as compared to '74?

Q. Compare '76 through '78 to '74 and '75.

(Witness perusing documents.)

A. It's perhaps true that the period '76 through '78 was somewhat more favorable in terms of the financial market than the '74 and '75 period. But overall, I would not characterize either period as being a terrific period in which to finance.

It appears as if long-term bond rates were just a little lowered in the '76 to '78 period as compared to the '74 to '75 period. It's true that our common stock price, on average, was probably a little bit higher in the '76 to '78 period than it was in the low period immediately following the ConEd dividend omission of '74.

Q. PECo actually sold common stock at greater than book value in 1977, didn't it?

A. In 1977?

Q. Yes.

A. Just slightly above book value, yes.

Q. What was the market to book ratio of that issue?

A. Well, on the total number of shares sold -- I don't have all the details -- it was probably one big issue plus shares sold under our dividend reinvestment and employee plan. The total amount of shares sold in 1977, the average price per share received by the company was $19.54. Our yearend book value as $19.26. So that would have given us a market -- a proceeds to book value of about 101, 102, I guess.

Q. About how much money was raised through the sale of common stock in 1977? Do you have that figure there?

(Witness perusing documents.)

A. In 1977 we raised almost $104 million through the sale of common stock.

Q. Is it correct that in early 1978 the market price of PECo's common stock was fairly stable?

A. Early 1978?

Q. Yes.

A. I will accept that subject to check.

Q. Is it correct that in 1978 PECo issued no common stock except for ESOP/ TRASOP dividend reinvestment stock?

A. Did you say early 1978?

Q. No, all of 1978.

A. All of 1978?

(Witness perusing documents.)

A. Yes, that's correct.

Q. Is it correct that the market to book ratio in 1978 was in the 90 to 92 percent range and that the limited amount of stock sold under those particular fairly small plans in 1978 was also in the price to book ratio of 90 to 92 percent?

A. Are you talking the early part of the year or the whole year?

Q. Now I'm talking about the whole year.

A. Well, the average proceeds we received for the shares we did sell in 1978 was $17.46 a share. The book value at yearend, 1978, was $19.28. That seems to be a much lower ratio than you are referring to. I don't know what is the basis for your figures.

Q. Can you break it down, then to --

A. Incidently, that would come to about a 90 percent ratio. Is that what you were quoting?

Q. Yes, 90 to 92 percent.

A. Okay. Then I will accept that. I agree with you.

Q. And the market to book in 1978 was also in that range, computed the same way?

A. Well, the market during the whole year fluctuated considerably. We started off the year -- we had a high, which I assume was in the beginning of the year, of $19.75 a share. It hit a low of $15, and it closed the year at $15.50.

Q. If you average it out, does that probably come pretty close to the 90 percent level?

A. Probably slightly under. I guess the average would be about -- well, I guess you're right, $17.50.

Q. It would be about 91?

A. We are talking about 90. Obviously, the second half of the year the price was severely depressed and down in the 15 area.

Q. Is it correct that the cost of debt capital in the market was declining in the period from 1974 to 1977?

A. I think I said earlier it was slightly, according to the figures I have, it was slightly lowered in the '76 to '78 period than it was in the prior two years, yes.

Q. PECo is not still spending money on the pre-1978 '83/'85 schedule is it?

A. Well, I believe we are now on a '85/'87 schedule.

Q. So is it correct that the 1981 budgeted expenditures are below the level that was scheduled for the '83/'85 completi

A. I don't believe that's true, but Mr. Boyer would -- you're talking about absolute dollars we are spending this year versus what was earlier projected for this year based on an '83/'85 schedule?

Q. Right.

A. I don't have that number. Perhaps Mr. Boyer could answer that question.

Q. Okay.

A. The whole world of inflation has changed considerably as compared to a couple years ago.

Q. Now, I'm going to walk into the jaws of what I trust will be a good trap for me, and ask you to explain the statement that you make on page 13 of your testimony.

On that page you refer to a message, which word that you put in quotation marks, from the Administrative Law Judge's decision in R.I.D. 438, which involved an excess capacity adjustment recommended by the ALJ and rejected by the PUC, is that right?

A. Yes.

Q Does PECo normally make or revise its plan involving construction projects of this size based on unapproved ALJ recommendations?

A. Well, no, and we didn't in this case either. But as I indicated here and elsewhere in my testimony this was one of the many factors that they took into consideration, as we always do. It's not a very simple thing when we make any decision -- big decision -- such as we did on the Limerick project as enumerated in my testimony.

It's not just one factor that we look at but many, many factors; the current ratings of the company, the prospect for improving our ratings, the prospect for inflation, the prospect for interest rates and the prospect, of course, for when the plant goes into service, for getting it promptly in the rate base so that we can overcome the attrition that's caused when AFUDC stops and we must get the plant in the rate base. We have had many delays in getting both the Peach Bottom and the Salem units into rate base with the Commission.

This seemed to be another factor that did weigh heavily on our thinking, because not only with the Administrati Law Judge but later on in one of the subsequent decisions, the last decision, the Commission did, in fact, reduce our rate base for excess capacity. So this was just another factor adding weight onto a whole mountain of evidence that brought us to come to the conclusion that we should delay Limerick until such time as it was necessary from a capacity standpoint, which was, in those years, the primary determinant that the company had followed in designing our system, that we should put equipment in at approximately the time that it's necessary to serve our customers from a capacity standpoint and not unreasonably before that and not unreasonably after that.

Q. During that period, is it your testimony that that was PECo's main analysis, not what would cost more or less in the long or the short-term for the rate payers?

A. We always try to build and design a system in the most economical fashion in conjunction with putting in capacity when it's needed for our customers. To take the point that you're leading to to its ultimate extreme, it would be most efficient and least costly for us to put all the capacity in now that we are going to need for the next 50 years, because we can certainly build it cheaper now than we can build it in the year 2000. But it would be crazy to put it in today because it isn't necessary to serve our customers. So you have to balance the need for the equipment, be it a turbine or be it a pole, to serve the customer with the economics of when it's most efficient to serve the customer.

Q. The bottom line economic question is, isn't it, what is going to minimize rates while maintaining an adequate level of capacity for contingencies over the long run?

A. Our number one objective is to provide the most reasonably priced service to our customers as they need the service in the most reliable fashion.

Q. Now, did PECo treat the PUC's failure in R.I.D. 438 to make an excess capacity adjustment as an opposite message to the message that you refer to on page 13? Was it --

A. It was half an opposite message.

Q. Let me finish the question.

A measure that the Commission wants the company to seek long-term savings even at the price of short-term increases in costs? Can you answer that question?

A. No, I did not interpret it as a clear signal to reduce costs in the long run because, as I recall, in that order, while they rejected the Administrative Law Judge's recommendation for a deduction from the rate base, they did put the company on notice that in the next filing we had to justify our load and capacity position, which as I recall we did do.

So they did raise the point that in the next case the company had better be on the defensive in terms of its, quote, excess capacity.

Q. In your opinion, is it automatically prudent for a utility such as PECo to do what the PUC suggests?

A. No, it's not automatically true for a utility to always do what the PUC suggests.

Q Now, on page 17 there is another statement that I would like to give you an opportunity to explain. You state that if you had somehow been able to finish Limerick on its 1979 to 1981 schedule the customers today would be seriously questioning the wisdom of that plant.

Isn't it your position today that Limerick will result in a savings, and a substantial savings, to the customer regardless of whether or not it's needed in terms of capacity planning, but because it provides substantial fuel cost savings?

A Well, our position is that when Limerick is scheduled to come in in 1985/'87, it will produce significant savings. I'm not sure that I've seen an analysis that said that if it were to go into service today it would be producing the same savings, but I believe it would.

Q If, for example, you had a two and a half billion dollar Limerick I cranking out power right now, that would be still more vaulable from a cost standpoint, wouldn't it?

A I don't know whether we have looked at the specifics of that two and a half billion cost versus today's cost of energy, but I will go along with you and assume that it would.

Q Now, I --

A But I still believe, though, even though we are producing net savings for our customers, I don't think the public, because of the way the whole issue gets presented by the media and newspapers, the public only looks at the one side that's adverse to them and that is that the company has to come in for a base rate increase to recover its capital charges while the fuel savings automatically flow through to the customer in the fuel adjustment.

We have been trying to correct that situation in the past by asking the Commission to correct the fuel adjustment so that the savings don't automatically flow through without some consideration of letting the utility retain some of the savings to support the carrying charges. If that happened, then the customer's bill would not be changed relative to the current proceedings, in the current way that the Commission administers the fuel adjustment, but the utility wouldn't be subject to all the adverse publicity of making us sound like we are terrible people, that we have to come in for a rate increase to support the carrying charges on an investment that produces long run savings for the rate payer.

Q. So that customer criticism that you hypothesize on page 17, that would not be well taken criticism?

A. You mean it would not be justified?

Q. That's right.

A. Yes, I believe it would not be justified. But it would still be blown all out of proportion, as every rate case is, by the newspapers.

Q On page 18 you state that even under the most cons
tive load forecasts, Limerick capacity is needed in this decade.

Isn't this statement true from a capacity standpoin if we leave aside the question of fuel cost savings? Isn't t statement true only if you retire a large amount of your oil generating capacity, as indicated in the forecast presente by Mr. Kasum?

A. Could I have a second?

Q. Sure.

(Pause.)

A. Would you please repeat your question?

A. Is it correct that your statement in the second sentence of the last answer on page 18 that the Limerick capacity is needed in this decade, isn't this statement true only if PECo retires a large amount of its oil generating capacity as indicated in Mr. Kasum's projections?

A. I think it's needed even if we didn't retire the capacity, because our reserve margins would still be, in a few years, in the low 30's, even if we don't retire the old capacity. But that old capacity is self-descriptive; it's old, it's unreliable and I think Limerick is needed for capacity purposes as well as for economy purposes.

Q. To a large extent you're talking about the combustion turbine retirement planned for 1985, and those aren't unreliable are they?

A. No, they are pretty reliable, but that is only 473 megawatts -- 475 megawatts -- out of a total capacity that will have close to 9,000. So that's only a small percentage of our total capacity.

I'm not talking about a big percentage of retirement and I would come to the conclusion that I think our customers need Limerick for capacity purposes in this decade whether we retire that capacity or whether we don't.

Q. At the end of 1990, if you don't retire your oil capacity --

A. Excuse me. Which year?

Q. 1990.

A. Okay.

Q. If you don't make the retirement of the oil capacity and you put Limerick in on schedule, what would your reserve margin be?

A. I guess the reserve margins would be in the -- about 40 percent or so.

But you can't just look at the absolute numbers. You have to also look at the kinds of capacity and the age of it and the kind of fuel that is utilized to make --

Q. That's the fuel savings argument.

A. No, no. I'm talking about dependability, the dependability of the source of the supply of the fuel. I would just take the position -- and I'm sure that Mr. Boyer and Mr. Kasum can discuss it more properly than I do -- but I would say that that capacity still is needed for our customers

Q. Now, I'd like to move back into your testimony at page five. At page five of your testimony you note in 1974 the increase on your fuel adjustment charge led to reductions in energy use by your customers.

Why did you expect this to be a temporary phenomenom?

A. We thought that after a short period of time that the customers would get adjusted to the higher prices and would then resume using energy in the same manner that they had before.

Q. So, basically, the company underestimated the price elasticity of demand, is that right?

A. I believe, quite frankly, at that time that we and a lot of others seriously doubted whether there was any elasticity, to be perfectly honest. We had not seen any evidence up to that time, despite somewhat rising prices of energy just due to inflation and not due to significant fuel price increases, we had not seen any abatement in the year to year increase in the average use per customer both in our territory and around the country.

When this phenomenom first appeared in the mid-'70's we did not think it was going to be a permanent change in lifestyle at that time.

Q PECo didn't expect the price of oil to return to the pre-embargo level, did it?

A. No, I don't think we did. We just thought that naturally, over time, if the oil prices stayed at that new, higher plateau eventually incomes would have caught up and the budgets of individuals would be readjusted and we thought that they would go back to the same living and energy consumin patterns that they had prior to the oil embargo.

Q Am I correct that you stated earlier that when Peach Bottom came on line that led to an immediate reduction in the customers' overall bills including the energy charge?

A. I don't recall whether I said that in this testimony

Q I believe you said it on cross-examination. I want to make sure that that's an accurate statement.

A. Peach Bottom -- well, I didn't say it reduced our customers' bills. Peach Bottom, by itself, its fuel savings paid for its carrying charges. Now, that, then, tended to hold down the rise in bills and offset the impact of inflation.

I think during that period when Peach Bottom started up for a few years the average unit revenue paid by our customers, including the fuel charge and base rates, was pretty flat from the period of '74 through '76, as I recall, which demonstrated the benefits of Peach Bottom.

We did not see an absolute reduction in the total cents per kilowatt hour paid by our customers.

Q. But when you refer, on page six, to a 1974 rate increase request to cover Peach Bottom II in rate base, it's correct, isn't it, that the decrease in the energy costs to the customers immediately more than offset the increase capacity costs?

A. Yes. As a matter of fact, the customers got a windfall then because the unit went in service, as I recall, in June of 1974. The fuel adjustment came down immediately and it wasn't until early in '75 when we got the base rate increase and the customers realized a fuel savings of, if I remember, something on the order of $50 million before base rates were adjusted for carrying charges.

Q. In 1974 and 1976, which two year delays in each of those two years were ordered by management, would those delays have been ordered if AFUDC would have been ceased for a two year period due to the delay? Would the company have made the same decision under those circumstances?

A. We probably would have had to make an even faster decision. If AFUDC had to terminate our earnings would have been eroded even further than they had been eroded at the time.

Q. So you're saying that you would still have, in your opinion, postponed construction even if that would have AFUDC for a period of years?

A. I think that would have been the event that absolu forced us to make that kind of decision, and probably even faster than we did make it, if the Commission had told us that we couldn't accrue AFUDC any longer.

Q. On page 11 -- I'm not sure if I picked this up the last time we were through this paragraph. It's the last paragraph on the page.

When you are referring to the short-term, that short term is just the period after Limerick would have come on line under the faster schedule, is that right, the period between the two scheduled dates of completion?

A. Well, it was generally that, but short-term, I'm just generally thinking of upwards of three to five years as compared to looking out 30 years.

Q. And if you had looked out 30 years, there would have been a net savings to customers?

A. Yes. As we later discussed and enumerated on page 14, about the short versus the long run penalties of a delay.

Q. In your opinion, has PECo's financial situation improved from the 1974 to the 1976 period compared to now?

A. You mean are we better off today than we were in '74 to '76?

Q. That's right.

A. It's a very difficult thing to assess because there are many, many factors that have to be evaluated. Our interest coverage ratio is certainly no better than it was in that period.

Q. A little worse, in fact, isn't it?

A. A little worse. I'm looking at an average of the year '74 and the year '76, and we are in about the same positi now that we were then.

Our SEC coverage is certainly lower today than it was then. Although our return on equity is higher, a much higher percent of our earnings are produced from AFUDC today than it was then, and therefore, I would say that probably overall the quality of our earnings have deteriorated.

We are no flowing through deferred taxes, state deferred taxes, today which we weren't flowing through then, so that's another indication of a lesser quality of earnings today.

Certainly, our debt ratings are lower today than they were in 1974 in general. Our earnings per share are higher, but again, there also a higher proportion of those are non-cash AFUDC earnings.

Our stock price, at 12 and a half today, is at the lower end of what it was in the '74 to '76 period.

So overall, I would say that as of this moment in time we are probably about the same as in the '74/'76 period.

Q. With particular reference to the mortgage coverage ratio and the bond ratings, would you agree with me that you in somewhat of a worse position now, from the point of view going to the capital markets for large amounts of financing, than you were in '74 and '76?

A. Well, in terms of going to the market and raising new capital, I could make an argument that we are better off than we were, and I think we are namely because as of this point in time our ratios appear to be about the same as they were then.

At the present time, we have a number of plus factors going for us which the investor and the rating agenci are attaching a lot of significance to. One is that our earnings, because of the rate increase we obtained last year, our earnings have been increasing since a low point was reach a year ago when we were below the dividend -- our earnings were below the dividend -- and our coverage was below the minimums.

As indicated on this table, we have at least pulled ourselves up above those minimums so we are now earning the dividend and we can finance again. We have a heck of a long way to go. At least we are heading in the right direction, whereas in some of these years we were headed in the wrong direction.

The other thing that is really a big plus is the fact that within the next week or so the Commission, hopefull will decide our last rate case and the rating agencies are counting on a significant rate increase to be able to continu that momentum through at least the next year so that we will have the earnings to attract the capital that is necessary.

So that being on the horizon adds a plus that I don't recall we had within the '74/'76 period.

Q. Do you have any --

A. So in terms of the outlook at this point, the investor is counting significantly on the Commission's decisio that will be made within the next couple of weeks.

Q. Do you have any information from the rating agencies that leads you to hope for an improvement in PECo's bond and preferred and equity ratings, based on what the Commission doe in the current rate case?

A. No. The best I can hope for is that if the Commissi give us no less than what the Administrative Law Judge has recommended, that we might be able to retain our present ratings. There is no immediate propect for an upgrading at the present time.

Q. And the present ratings are substantially worse tha they were in '74 and '76?

A. No. As a matter of fact, the Moody rating is exactly the same as it was in 1974; A. But the S&P rating is lower than it was.

Q. What about your preferred and common ratings?

A. Well, common doesn't normally get a rating, but preferred is also lower than it was. The S&P rating was, I believe, reduced to A-minus in 1975 on the mortgage bonds and that is now BBB-plus. So that is two small steps lower that it was.

But we are in danger of further downgrading unless as the rating agencies have expressed, the Commission grants us a significant rate increase.

MR. SAYRE: May I have just a minute, Your Honor?

JUDGE KLOVEKORN: Yes.

MR. SAYRE: No further questions, Your Honor.

JUDGE KLOVEKORN: At this point let's take a brief recess.

(Recess.)

JUDGE KLOVEKORN: We are back on the record.

Mr. Popowsky?

MR. POPOWSKY: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. POPOWSKY:

Q Mr. Paquette, my name is Irwin Popowsky. I am an attorney with the Office of the Consumer Advocate.

At page 8 of your testimony you refer to the delay in the Limerick schedule announced in the fall of 1974. You also refer to other changes --that is in the second paragraph of your first answer -- in your construction budget which allowed you to reduce your spending by about $600 million.

Could you clarify what those other changes were at that time?

A I believe that the other significant change was a corresponding delay in another nuclear generating station that we then had scheduled for after Limerick. It was called Fulton Plant. In 1974, when we rescheduled Limerick to an '81-'82 schedule we also moved Fulton to an '84-'86 schedule, which I believe was a two-year delay in that unit -- or in that plant schedule.

Then associated with both of those moves would have been delays in associated transmission facilities. I believe that would have been the major items involved.

Q What other major construction projects was the company working on during the time period that we are discussing here? Perhaps I should broaden the question to the entire period from the beginning of plans for Limerick in the early '70's; what were the other major projects that the company was expending large amounts of capital on?

A The ones that we actually were spending money on were only the Peach Bottom units and the Salem units and the Limerick units in the '70's.

Q How about the Eddystones?

A The Eddystones; you are absolutely right. There were two oil-fired units put into Eddystone, and also some combustion turbines that we completed in 1974 that were installed at Croydon.

I believe that is all of the capacity additions, but then associated with that would have been significant investments in transmission associated with all those units.

Q Did your expenditures for those projects which you have just mentioned, did they hamper your ability to construct Limerick on schedule -- on your original schedule?

A I don't believe that they had any signficant effect because most of the expenditures with the exception of the Salem plant, which the first unit came in in 1977 and then the second unit was originally scheduled for 1979, but we had spent the dollars before that -- all the other units we had essentially completed by mid 1974 when we then started up the Limerick project.

Q Did the company essentially seek rate relief as each of these plants came on line, the major plants that you have discussed; was the company required to seek base rate relief?

A Yes, in almost every instance, particularly the 1974 additions to rate base, which were the Peach Bottom 1 and 2 and the Eddystone No. 3 unit and the Croydon gas turbines, all came in service in 1974 and necessitated that big rate increase that is referred to in my testimony.

Q And these rate increases, I take it, did not help you in your Limerick funding in any way?

Q Well, it did from the respect that it provided us with cash earnings in lieu of AFUDC, provided us with cash flow and depreciation, and all of that. It certainly helped as opposed to not having a rate increase.

They were there primarily and justified primarily on the basis of earning a fair return on the investment then in service, and then providing service to our customers.

Q In fact, am I correct that in last -- shall we call it the current rate case that is currently before the Commission, you were asked on cross-examination by Mr. Johnson of the Trial Staff to detail exactly what rate increases the company did seek or receive during the 1970's is that correct?

A I sort of remember the question. I am not exactly sure who asked it.

Q Subject to check, was it your testimony overall that the company sought six rate increases in the decade of the 1970's for a total amount requested of $610 million, and of that amount you testified that you received approximately $477 million?

A You are talking about rate increases actually sought in the '70's versus what was granted from those rate increases in that ten-year period in the '70's?

Q Yes.

A Would you mind repeating the numbers on how much was sought and how much was granted?

Q $610 million and $477 million, which were the calculations made in the last case.

A That sounds essentially correct.

Q In your direct testimony in that case -- that is R.I.D. 1225, the current case -- I believe you testified tha the cost of debentures to the company, its most recent sale of debentures, was 14.65 percent; do you recall that?

A That sounds right.

Q You can check these at the break.

On cross-examination you stated that the yield on the most recent mortgage bonds sale by the company was

13.75 percent?

A I believe that is true. That is the one of last October, the bond sale of last October.

Q Yes, I believe that is correct.

A (Witness perusing documents.)

Yes.

Q Have those costs related to debentures and mortgage bonds decreased significantly since the time of your testimony; that is, to the extent that PECo itself has not had occasion to sell similar issues, has the market cost dropped significantly for other utilities?

MR. YOUNG: Your Honor, I object to the question. I don't really see how it is relevant to this proceeding. We are not concerned here with the rate of return as a specific item of proof, and certainly not with future rates of return as it is influenced by current bond costs. I have trouble seeing what value that has to this proceeding.

MR. POPOWSKY: Your Honor, I believe that the cost of money to PECo is a crucial determining factor. In, for example, Mr. Lawrence's testimony as to the cost of completing Limerick or the costs of alternatives, the bond prices that PECo will have to pay over the next five years could make differences of millions of dollars, I suspect, in the cost of Limerick.

MR. YOUNG: It is still not part of this witness' direct testimony. Nor do I think that any witness makes predictions about bond prices over periods of time other than as a basis for calculations, which are submitted and that witness could be asked that question.

MR. POPOWSKY: I could wait until Mr. Lawrence testifies. I think that as the financial officer of the company that Mr. Paquette would be more likely to inform Mr. Lawrence as to what he believes the bond prices to be than the other way around.

Could I ask that the objection be overruled at this time, and if I go too far afield and go into Mr. Lawrence questions I will cease at that time; I certainly believe that the bond prices are relevant, and I think that Mr. Paquette is probably the most knowledgeable witness that the company is offering.

JUDGE KLOVEKORN: I take it your question is: what is the cost of money today?

MR. POPOWSKY: That is the first question, yes. Have those costs decreased since he testified in the rate case

JUDGE KLOVEKORN: I will overrule the objection.

MR. POPOWSKY: Thank you.

THE WITNESS: The cost of money has increased significantly since last fall. If we were to issue mortgage bonds today with a maturity of around ten to fifteen years, my guess is that it would cost us today in the range of 15 to

15.5 percent for bonds; and upwards of 16 percent for debentures.

BY MR. POPOWSKY:

Q If you have no opinion, you don't need to answer; but do you have an opinion as to what the comparable prices are that you would anticipate in the next five to seven years?

MR. YOUNG: I would make the same objection to that question.

MR. POPOWSKY: I think that that is probably an input into Mr. Lawrence's financial analysis, and I would like to know whether Mr. Paquette is responsible for selecting that input, or whether he had any input into that input.

JUDGE KLOVEKORN: I will overrule the objection.

THE WITNESS: Based on forecasts made by published economists -- or economists who publish -- and in the judgment of our economist, we are looking for a downward trend in the cost of money over the next five-plus years, particularly if President Reagan's economic plan is successful and I believe Washington is forecasting some significant reductions in interest rates looking out three to four years. Not in the immediate couple of years, but looking out three to four years.

Our economist, I think, agrees that there will be a decrease, but maybe not as significantly lower as some people are predicting.

BY MR. POPOWSKY:

Q I take it from your answer that you are not the person responsible for selecting the bond rates to be used in the company's financial projections?

A Mr. Lawrence and the rate division in which he works consult with me in terms of what rates to use in economic evaluations, which are at the heart of his testimony those types of evaluations; so I do get involved in making the final decision as to what the input should be.

Q Do you know offhand what that number was that used in that case?

A I don't recall.

Q We can probably obtain these numbers; Mr. Lawrence has supplied us with copies of the financial output, and we will attempt to review that certainly before Mr. Lawrence testifies; and to the extent that when Mr. Paquette is back here on May 13 or whatever the date that Mr. Dasent intends to call him, there may be some carry-over questions from Mr. Lawrence to Mr. Paquette on those matters.

If initially I could just request just generally: in addition to long-term debt rates, are you also -- or were you also responsible in developing the short-term debt rate, the cost of preferred stock to be used, and the cost of common equity?

A Do you mean used in Mr. Lawrence's --

Q Yes.

A They consulted with me on all of those, not just the long-term debt.

Q Was there a particular market to book ratio that you advised Mr. Lawrence to use in the testimony?

A No, we approached the common stock from the viewpoint of a return on equity comparable to the 16 percent that we are requesting in the current rate case.

Q It was not necessary to assign a market to book value?

A That is right; of anything. In his approach he does not utilize market to book ratios.

Q Were you responsible for any criteria used as to mortgage coverages; that is, whether the revenue requirement produced by Mr. Lawrence's simulation met any particular requirements as to mortgage coverage, or any other requirement?

A I don't believe that Mr. Lawrence's analysis requires an assumption as to mortgage coverage, as I recall.

(Mr. Lawrence and Mr. Paquette confer.)

The model that Mr. Lawrence relies upon does print out the mortgage coverage ratio, and they do examine that to make sure that under all the various scenarios that they study they make sure that there is enough earnings to keep the ratio above 2. But they do not have any specified target number to be shooting for as long as it stays above 2.

Q Then can you agree that the mortgage coverage raio must be above 2, at least in the near term, in order for the company to issue more mortgage bonds in order to include the financing of Limerick?

A That is correct.

Q Did you advise Mr. Lawrence to include a component for the type of interest adjustments that you included in the current rate case or any type of CWIP in rate base?

A We discussed that, but the model was run on the basis of current accounting. In other words, no equipment rate base and no interest adjustment. We haven't factored in any potential changes.

Q And you indicated, I believe, in questioning by Mr. Sayre that if there were no such accounting changes by the Commission, that the company would require -- I believe you used the term "exceedingly high" -- return on equity in order to complete the financing of Limerick on its current schedule; is that correct?

A That is correct.

Q Do you know what that return on equity is in Mr. Lawrence's model?

A No, I don't know.

(Mr. Lawrence and Mr. Paquette confer.)

The answer is we do not know -- I do not know what is in the model.

Q Do you know whether it is an input or an output, the return on equity?

A The return on equity would be an output.

Q An output?

A The derived return on equity is an output of the model.

Q Let me apologize in advance for what may be repetitive cross-examination of probably Mr. Lawrence and probably Mr. Thompson on some of these matters, but I did want to try to clarify some of these matters with you first.

You also stated in your testimony in R.I.D. 1225 --

A Excuse me; is that the current one?

Q That is the current one -- that you were utilizing what you referred to as a conservative estimate of inflation of about ten percent. I believe that would have been through the period of 1982.

A Right.

Q Do you still consider that to be a conservative estimate of inflation?

A As an average for the two-year period, '81 through '82, yes, I would say that was conservative.

Q And for the extended period, it is your anticipatio that --

A Beyond '82 I would think that that number would be lower. I would hope that it would be lower.

Q And that inflation rate, whatever it is, would also be an input into Mr. Lawrence's model; is that correct?

A Inflation, right, is an input.

Q At page 10 of your testimony in the present case, you refer I believe to the weakened financial condition of the company. That is at the top of the page. And you state, I believe in response that one of the company's responses was to delay the construction of Limerick. Is that correct?

A I am not sure I understand your question.

Q Was the delay of construction of Limerick at that time a response to the company's weakened financial condition, or is that from a different time period?

A Well, on page 10 I am talking about the 1976 decision, which was primarily related to further reduction in our load growth; but as I indicated, it also helps from the financial standpoint because our financial condition had not improved relative to 1974. But we did not make it just because of the financial position of the company. It was primarily because the lower load growth indicated that we had less need for capacity in the mid '80's.

Q In light of the company's then-existing financial condition and load growth projections, did you recommend --

or did you personally or members of the financial department recommend any alternatives to the completion of Limerick at that time?

A Do you mean a complete other alternative, such as not even finishing Limerick?

Q Such as completion of Unit 1 only; completion of Unit 1 before work would begin on Unit 2.

A No. We were always in favor of completing Limerick but of bringing it in when it was needed for capacity purposes

Q Did you consider any of the alternatives that have been raised concerning reducing load growth -- attempting to reduce load growth even further by conservation measures at that time?

A We in the financial department?

Q Yes.

A Not that I recall. We were convinced, and we agreed with the engineering department that the temporary dip in load by our customers was going to be a temporary phenonenon, at least we thought at that time; and that we would need the capacity that we had under construction and we should go forward with it, but on an optimum schedule.

Q Did you consider at that time the possibility of joining with PP&L in either the Susquehanna project or the Limerick project from a financial viewpoint?

A Are you talking 1976 now?

Q Yes.

A I believe that we did. I am just hazy on my recollection of what was going on in 1976. The thing I am not sure about is what was Susquehanna's original schedule. Susquehanna was coming in earlier; it was supposed to come in earlier than Limerick. It wouldn't have made much sense for us in 1976 to attempt to join up with PP&L at that time and, in effect, buy into part of Susquehanna and get capacity earlier than Limerick was scheduled to come in, because it was obvious that everything that we were doing indicated that we didn't need capacity early; we needed it later.

So I would guess that we didn't actively consider joining with PP&L because we didn't need capacity early; we needed it later.

Beyond that my recollection is just hazy. Mr. Boyer, incidentally, might be able to shed light on that question.

Q I will limit my questions and I am sure you will limit your answers to the financial ramifications of these issues.

Are you or anyone within your department currently considering the possible financial benefits of the purchase of a portion of Susquehanna as opposed to completion of both Limerick units?

A As opposed to it?

Q Yes.

A I believe that we are --

(Mr. Lawrence and Mr. Paquette confer.)

-- in the process of evaluating that as one of the alternatives because I think it has been raised in this case.

Q Perhaps -- I don't want to misstate it -- shall I say: as opposed to the completion of either or both of the Limerick units, and I take it that your answer is that the company currently is conducting an analysis?

A Yes.

Q Can I ask that that analysis be shared with us when it is complete?

MR. POPOWSKY: I will make that in the form of a data request at this time. I suppose that the company is preparing that in the form of rebuttal testimony, but we would like to see that analysis whether or not it is included in the company's rebuttal testimony.

BY MR. POPOWSKY:

Q Based on the knowledge that you have to date, can you state whether the cancellation of Unit 2 and/or the purchase of output or capacity from the Susquehanna unit would reduce the company's financial needs -- or need for financing I should say, over the next five to seven years?

A When you say buying the Susquehanna, do you mean buying an equivalent amount of capacity; in other words, terminate the Number 2 unit which is 1,055 megawatts?

Q Let's just start with cancellation of Unit 2. If the company decided at this point to cease construction of the Unit 2, am I correct that the external financing of the company would be significantly reduced in the next five to seven years?

A They would be reduced. I think it is obvious that when you don't build something you don't have to spend money. But I think it would be a very unwise decision because, as I recall the numbers, the total cost to build jus the Number 1 unit alone with the common control facilities and other facilities in the plant would require an expenditur of approximately $3 billion, including AFUDC; and, therefore, the total dollars saved by not building the Number 2 unit would be $1 billion.

Looked at incrementally, it would be much wiser to continue building because you can get a pretty cheap 1,000 megawatt unit at $1 billion cost and get half the savings from the plant.

Q And that is assuming, of course, that the current Bechtel estimate of Unit 2's cost proves to be more accurate than the estimates of Unit 1's cost or the total cost to date

A I am not sure of the assumptions of Bechtel. I have not delved into those, but I do recall hearing from our engineering department that if we finish just the one unit, it is still going to cost us roughly $3 billion, but the assumptions behind that I am not familiar with.

Now, if we in turn -- if we stop construction on the Number 2 unit and, in turn, replace its capacity by buying the Susquehanna, we would be saving $1 billion on that system, but we would have to buy into roughly half of a plant that, as I understand it, is going to cost PP&L over $3 billion and maybe more. I think I just read in their annual report that the unit with another year's delay will be around $3.5 billion.

So we would pick up the equivalent amount of capacity at say $1.7 billion to $1.8 billion, assuming we bought in half of Susquehanna, so that wouldn't seem to be the equitable thing for us to do.

Q That's assuming you wanted to replace the entire output?

A Yes, if you wanted to replace the entire plant; then we have gone around the bush on whether the capacity is needed or not, and I think it definitely is because, as indicated by the numbers I was quoting this morning, we would have somewhere around 33 percent reserve margin with both Limerick units in service, and if you eliminate both units there would go about 20 percent of our capacity or 25 percent of our capacity; if you eliminate one unit, you are going to reduce our capacity by ten to twelve percent and put us down in the low 20's.

Q In line with that remark, am I correct that it was your testimony that despite the large reserve margin that would be produced by bringing Limerick on line in 1981, if that could have still been done --

A Bring it in today, yes.

Q Was it your testimony this morning that that would produce fuel savings which would exceed the capital costs of bringing the plant on line?

A I said we haven't made a study on it, but it wouldn't surprise me if we did that it would produced savings in excess of its carrying charges, but we have not studied that particular scenario that I think Mr. Sayre outlined of a plant costing $2.5 billion, as I remember from earlier, and today's fuel prices. We have not studied that.

Q Is it your testimony that -- in light of that testimony, could you state why it is that the company does not believe that -- or does the company believe that the fuel savings from its share of Salem 2 would not outweigh the capital costs of that unit?

A Could you go over that question again? Salem 2 you are on now?

Q Yes.

A What was the question again?

Q If it is correct that bringing Limerick on line in

1981 would produce fuel savings that would exceed the capital costs of that unit, why would the same not be true for the company's share of the Salem 2 nuclear unit?

A Well, it probably would, but if Limerick ended up with that situation, then Salem probably would to. But as I said, we haven't studied Limerick, but it wouldn't surprise me. The Salem Number 2, of course, is a different plant, constructed over a different time frame than Limerick will be and you have to just look at each situation individually for the given conditions.

It wouldn't surprise me if Salem in its first year would substantially carry its carrying charges given today's level of fuel prices and interchange prices.

Q But you have conducted no analysis of the Salem 2 sale to determine whether that is correct or not?

A We have conducted studies -- I think they were introduced into the last rate case -- of the relative economics of Salem Number 2 coming into service.

Q And what then are the distinguishing characteristics between Salem 2 and Limerick that might produce an advantage in the case of Limerick but not in the case of Salem 2?

A Mr. Sayre gave me a theoretical cost of Limerick, $2 billion-plus. I don't know how that compares to Salem's actual cost. I don't know what the expected -- I don't recall what the expected capacity factor of Salem is versus what we we would estimate for Limerick. There are two different locations, two different plants.

There are many factors that would have to be evaluated. I think I agreed with you earlier that if Limeri[ck] coming on line today would probably carry its own weight in terms of carrying charges, that Salem would also. But you would have to do a study, and we haven't done one of Limeric[k] and we haven't done a recent one of Salem.

Q At page 10 of your testimony you state that a consideration in the 1976 delay decision was the principle that a utility should not build additional facilities which would not be useful within a reasonable time following their completion. Is that correct?

A That is correct.

Q If anticipated load growth does not materialize in the next several years -- and this is in line with the last question -- would the company apply the same principle and delay completion of Limerick once again?

A If we can produce sufficient earnings to attract the capital, then I would say the answer is probably no, we would continue to build the plant as now scheduled, because what I was talking about here was the environment and the practices that we had followed and been urged to follow by the Commissions up until 1976, plus consideration of the basic economics that we face when we put a Limerick in servi[ce]

In those years, it was generally true that in putting a unit in service that it would take a few years before the savings would cover the carrying charges. But now as we project, Limerick will save more than its carrying charges. The fuel savings will be more than its carrying charges, so even if load growth is reduced from what we now anticipate, I would recommend, given the financial capability to do so, that I would recommend that we keep Limerick on its present schedule in order to achieve those net savings for our customers as soon as possible, and to bring the unit in at its lowest first cost.

Q Again, in line with Salem 2, isn't it correct that that plant will return to the PECo system in 1985 approximate at the same time that you plan to bring Limerick 1 on line?

A Well, the contract that we have written with Jersey Central calls for selling the output to Jersey Central through 1974 with the ability to bring it back to Pennsylvani ratepayers unless the two parties wish to continue the agreement further. There are provisions to continue it beyond 197 upon mutual agreement.

MR. SAYRE: Do you mean 1984?

THE WITNESS: Yes, 1984. Excuse me.

BY MR. POPOWSKY:

Q Is it your current plan to bring Salem 2 back onto the PECo system?

A I don't think we have really made up our minds. It would depend upon the situation at the time.

Q But at that time, if you did bring it back it would be on the assumption that the fuel savings at that point would be sufficient to warrant not only the addition of Limerick 1 to the PECo system, but also the return of Salem 2?

A Most likely, based on our assumptions of fuel escalation and the same capacity factor of in the range of the high '60's,that the fuel savings would be more than the carrying charges on the investment in 1985.

Q At page 11 of your testimony, in referring to the 1976 decision to delay completion of Limerick, you state that there was a risk perceived by the company that if the company brought Limerick on line as scheduled that plant might be subject to exclusion on the basis of excess capacity is that correct?

A Correct.

Q Nevertheless, was it your view that the Commission would permit the company to continue to accrue AFUDC during the delay?

A No, we didn't think that that would be allowed. It is not allowed by FERC. The Federal Energy Regulatory Commission are the ones that set the accounting standards on the accrual of AFUDC.

Q I think I might have misunderstood your answer. Are you saying that the company did not continue to accrue AFUDC on Limerick during this period?

A I thought your question related to what might happen in 1983 or 1985, depending on what year we were lookin out to. If the company brought the unit on line and it produced "excess capacity," we thought that there would be a possibility that the Commission would not allow all or part of the unit's cost in rate base.

Then you asked, "Did we consider the possibility that instead of that the Commission would allow us to accrue AFUDC?"

Q I am sorry; I misspoke then.

Am I correct that AFUDC did continue to accrue on these plants during that period, and that this AFUDC will, in fact, show up in the final cost of the plant when and if it is allowed in rate base?

A When you say "did continue during that period," what period do you mean?

Q Then let's just say during the entire construction period.

A We have never stopped accruing AFUDC in accordance with the Federal Energy Regulatory Commission accounting standards, and at a rate which is approved by this Commission

Q Then I guess it is a conceptual question: do you see a distinction between the accrual of AFUDC on plant under construction which would be excess if it were completed, and an excess capacity adjustment for plant that actually is brought on line prior to when it is needed?

A I just don't understand your question; I am sorry.

Q It was your opinion that the Commission would conceivably make an excess capacity adjustment if the plant were actually brought on line sooner than it was needed, but that the Commission would not make an adjustment when the plant did come on line to the AFUDC -- the additional AFUDC that accrued as a result of the delay.

A Yes, we did not anticipate that with the delay that the Commission would adjust the final cost of Limerick when we got around to requesting it in rate base because we were convinced then and we still are today that Limerick's final cost, which is now estimated to be $4.1 billion, would be what we could justify as a prudent investment or plant well-constructed under the circumstances; and that there would be no justification for disallowing part of its cost when we asked for it to be placed in the rate base.

Q Also at page 11 of your testimony you refer to the short-term benefits of the delay, which would result in the postponement of carrying charges for Limerick. Wouldn't those benefits be reduced under the company's proposal to move the interest expense of Limerick above the line?

A Yes, because at that time we weren't considering the interest adjustment. The interest adjustment was just something we proposed in the current case. But if then we had asked for it and the Commission had indicated yes, they would have approved of it, then it would have softened the impact considerably of the base rate increase required when we put the new unit in service; but the customer in the meantime would have had to pay the higher rates in order to support the interest adjustment. So the customer would have still, in effect, had to pay higher rates, but earlier than what we were then anticipating; but to his long-run benefit -- his or her long-run benefit.

Q You also go on at page 12 to cite a preference that you perceived the Commission has for short-term benefits even if they result in long-term costs. Am I correct that you are using as examples of that perception the Commission's refusal to include certain CWIP in rate base, and the refusal to normalize certain deferred state tax benefits?

A Those are just two examples. There are others.

Q In making that statement, is it your position that the Commission did not consider, for example, the time value of money involved in those proposed adjustments?

A I have not had the privilege to sit in on all of the Commission's deliberations when they made those decisions so I don't know what they did or did not consider. But readi it from our viewpoint -- and I think there were statements made on the record that the Commission preferred to do where it had the choice of lowering rates in the future, even though we knew that it meant higher rater -- lower rates in the short run even though we knew it meant longer rates -- higher rates in the long run.

Q At page 15 of your testimony you refer to the assumption made regarding the recovery of the sunk costs of Limerick, and I just wanted to know whether you had analyzed any other possible scenarios other than, as I understand it, inclusion of all the sunk costs in rate base for a return over the life expectancy of the plant. Have you, for example, analyzed the possibility of an amortization of the costs over a ten or a twenty year period?

A Well, I think that Mr. Lawrence's testimony does have that one option of abandoning -- one alternative of abandoning Limerick and collecting its costs over a 20 or 25 year period.

(Mr. Lawrence and Mr. Paquette confer.)

It has that one case of amortizing the sunk costs over roughly a 30-year period, and recovery thereby through rates; but we have not studied other alternatives.

Q Just for clarification, would you check to see if that does not include a return on the unamortized balance?

A It does include, as I understand it; it does include a return.

Q Then you haven't analyzed amortization over any period without a return on the unamortized balance?

A No, sir. I think it is very obvious that if we were not allowed to earn a return on $2 billion of capital, which represents approximately 40 percent of our outstanding capital today, you would be in effect wiping out 40 percent of the company's earnings today, and put us in a position of probably wiping out completely our common stock earnings.

Q Just to clarify that, that assumes the total inability of the company to write off any of those costs, am I correct; and that also assumes that you would cancel both plants as opposed to one plant, for example?

A Yes, we are talking about the $2 billion.

Q You then go on to say that you do not believe that a significant part of your investment could be utilized as tax write-off; is that correct, on page 15?

A Yes. Unless we have significant amounts of taxable income, the potential tax write-off wouldn't do any good.

Q Do you know whether that was considered in Mr. Lawrence's program?

A I believe in Mr. Lawrence's program the company would be generating enough taxable income to utilize the tax write-off.

(Mr. Lawrence and Mr. Paquette confer.)

For the one example that Mr. Lawrence does have in his testimony, he does have sufficient taxable income to write off for tax purposes the remaining investment, but he has not studied the other alternative that you may be asking about, that without getting rate base treatment for the unamortized costs, would we still have enough taxable income; we have not studied that.

Q So then based at least on that assumption, the assumptions used in Mr. Lawrence's study, there is available this tax write-off to the company; is that correct? At least under that program.

A His assumption is that we will collect the cost, the unamortized cost in rates. When we collect that in rates, that gives you the income to write it off.

Q So there wouldn't be a write-off under that scenario?

A There wouldn't be a loss of a write-off because you automatically are covering it with the revenue that his scenario provides.

Q Just to finalize that point, because you have not considered amortization without return on rate base, then you haven't analyzed what level of rates would be necessary under such a scenario in order to produce the income necessary to have the taxable income necessary to have that write-off?

A Yes, we have not done that.

Q You responded to some questions by Mr. Sayre this morning concerning whether the company would be able to comple the plant -- complete the Limerick plant as scheduled in the absence of either an exceedingly high rate of return or some change in the Commission accounting practices regarding, for example, CWIP in rate base. When did the company realize that it could not complete the construction of Limerick without such circumstances occurring?

Q Well, it has sort of been an evolving thing, and I don't recall when the precise determination was made, but it was primarily caused by the substantial rise in interest rates that occurred in 1979 coupled with the much higher rates of inflation that we then began to experience; and, of course, the continued lag in obtaining prompt and adequate rate relief, and then coupled with the impact that this had on the cost to raise capital, and Limerick's estimated cost, that it was roughly a year ago or maybe a few months before that time that we were putting together our new five-year forecast that we could see that if we continued to earn a rate of return in the area of only 10 to 11 percent, which had been our historic maximum for the last ten years as indicated on Table A, that that would not provide sufficient mortgage coverage for the significant amount of debt that we had to finance in the succeeding five years, and that we would need to improve our return on equity -- actually achieved return on equity -- well above 15 percent, as I remember at that time, which if you then say,"Okay, if we are going to earn 15 or 16," recognizing that there is always a regulatory lag, that the Commission would probably have to grant us returns close to 20 in order to earn 15, as I remember the relative numbers; that all that then came to a conclusion in the early part of 1980.

So it was at that point when we were starting to frame out next rate request that we decided that we had bette ask for some very important accounting changes because we did not think that the Commission -- that in today's environment that the Commission would be willing to grant us the rate of return equity of ten percent; and that we thought it would be much more acceptable to the Commission and to our customers to provide us with the needed interest coverage through something like the interest adjustmentment for CWIP in rate base for which the additional dollars would not flow through directly to our shareholders' account but would go tc reducing the future costs of Limerick, and that the sharehol then would get the benefit -- I mean the customer, excuse me the customer would get the benefit.

The customer, in effect, would be paying slightly higher rates until Limerick is finished, but then the custom would get the benefit through a lower AFUDC or something of that nature in the future.

Q Did you advise the Commission at any time during the prior rate case, that is 865, or any time prior to the filing of the current rate case that the company was in this situation such that it could not complete Limerick without the change in circumstances that you described?

A See, in the prior rate case, interest rates during the course of those hearing -- the interest rates had not yet risen. The rise in interest rates occurred in October of 1979 when Chairman Volker over that one weekend put in all those new reserve requirements for banks and for money market funds, etcetera; and the cost of long-term debt rose I believe from what we were expecting to be roughly 9 percent to 12.5 percent, and the reason I know is that we had a bond issue scheduled for the Tuesday after he made that dramatic move, and I think we were the first utility to come to market after, and we had to do a lot of soul searching as to whether this new level of interest rates that prevailed were going to prevail for a long time or whether it was just a temporary thing; and we went ahead with the issue and I am very glad we did; 12.5 percent is a very good interest rate to pay today.

So in that rate case which was then going on, the world was just not aware of this substantially higher level of interest rates that were going to prevail, and so we did not have the opportunity because we did not have the knowledg that under current ratemaking practices that we do that we wouldn't have the mortgage coverage, because in this rate case, the one that is now coming to a conclusion, I think we made it fairly evident and we put on a strong case that we had to have some new ratemaking innovation in order to continue and complete the construction of Limerick.

Q But you did in early 1980 -- the company through its legal representatives did continue to oppose any examination of the cost of Limerick or the need for Limerick or the delays in Limerick right up to the time at which the next rate case was filed; is that correct?

A We did oppose it in rate cases because we didn't think that that was the proper subject for rate cases becaus we were not asking for Limerick in those rate cases in rate base, and I think our opinion was sustained by both the Administrative Law Judge in that case and ultimately by the Commission, that it was not a proper subject for the rate cases.

Q But the Commission, am I correct, at that time in April, 1980 was not aware that the company was intending to include it in its next rate case, the interest adjustment for Limerick and certain other accounting changes directly related to improving the company's cash flow?

A That's right. In April, 1980 the Commission was not aware of that; that is correct.

MR. YOUNG: I think the record should show however that in every one of those cases starting back in the early '70's, the company as well as its counsel made extensive arguments to the Commission regarding the need for higher rates and a higher return on equity in order to achieve the levels of return being proposed by the Commission; and the company consistently failed to be allowed those, and it was certainly said throughout all of that that this was going to have its impact on the company's level of services, on its construction program and on its financial well-being.

BY MR. POPOWSKY:

Q If the company had received the full $123 million that it requested in the last case, would it have been necessary to make any proposals to the Commission in the present rate case for the type of accounting changes that were requested in the present case?

A Yes, I believe we still would have because the Commission did give us a rate increase of roughly $90 million as opposed to the $123 million that we had requested, so that was only -- I shouldn't say "only," but it was a disallowance of some $30 million; and as requested in this rate case, we feel that we should have for the accounting change a rate increase of approximately $80 million.

What we need is far greater than what they disallo in the last case.

Q In fact, am I correct that a total of $161 millio of the present rate case is attributable to accounting changes proposed by the company, which are designed to impro its cash flow and interest coverage ratios and the quality of its earnings?

A Right; but not all of the $161 million improves every one of those items. About $17 million was for spent fuel -- future spent fuel costs, and that improves cash flow but that does not improve interest coverage.

Of the remainder -- I believe all of the rest probably would fall in the category of improving interest coverage ratio, the remainder of the $161 million.

MR POPOWSKY: Your Honor, I have probably about 15 minutes more. Perhaps this would be a good time to take a break.

JUDGE KLOVEKORN: I want to ask what the company's pleasure is. Would the company prefer to continue without a luncheon recess?

MR. YOUNG: Do you mean all day without a luncheon recess?

JUDGE KLOVEKORN: I don't believe that we have that much more after this. We have two more questioners.

MR. SAYRE: Could we go off the record for a momen

JUDGE KLOVEKORN: Yes.

(Discussion off the record.)

JUDGE KLOVEKORN: Let's recess until 2:00.

(Whereupon, at 12:45 p.m. the hearing was adjourn to be reconvened at 2:00 p.m. this same day.)

AFTERNOON SESSION

(2:00 p.m.)

JUDGE KLOVEKORN: Let us resume.

Mr. Popowsky?

MR. POPOWSKY: I just have a couple more questions, Your Honor.

Whereupon,

JOSEPH F. PAQUETTE, JR.

having previously been duly sworn testified further as follows

CROSS-EXAMINATION (Continued)

BY MR. POPOWSKY:

Q You spoke earlier of the company's mortgage coverage requirement of 2.0; is that correct?

A That is correct.

Q How long has that been the relevant mortgage coverage test for this company?

A I believe it has been since the original mortgage which goes back into probably the '20's.

Q To the 1920's?

A I believe so.

Q At page 16 of your testimony, you refer to capital needs related to SO_2 removal equipment at Eddystone and Cromby.

A Right.

MR. POPOWSKY: I think I would like to make a data request, rather than ask you to supply the information now. Could you specify what those needs are, and give the dates of the plant expenditures for those projects.

That is all the questions that I have.

JUDGE KLOVEKORN: Thank you.

Ms. Zitzer?

CROSS-EXAMINATION

BY MS. ZITZER:

Q You mentioned that one of the other changes that enabled the company in 1974 to reduce their spending program was the delay at that time of the Fulton project, and I believe you said that at that point Fulton was delayed to a 1984 and 1986 schedule.

Could you tell me since then what additional delays and/or changes in the Fulton schedule been enacted by the company?

A Well, we have eventually just completely eliminate that altogether from our schedule. I believe it was official -- the plans were officially stopped probably in 1976 -- probably with the 1976 changes -- and then we -- yes, 1975 or 1976 -- one of the reasons being that the designer, General Atomics, was sort of phasing itself -- I believe Fulton was going to be an HTGR reactor, High temperature-gas cooled reactor, to be built by General Atomics.

At just about that time they were getting out of

COMMONWEALTH OF PENNSYLVANIA

PUBLIC UTILITY COMMISSION

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SECRETARY'S OFFICE PUBLIC UTILITY COMMISSION

Limerick Nuclear Generating Station Investigation

Further Hearing.

Docket Number I-80100341

Pages 3321 through 3430

Hearing Room 1
State Office Building
Broad and Spring Garden Sts.
Philadelphia, Pennsylvania

Wednesday, September 16, 1981

Met, pursuant to adjournment, at 10:00 a.m.

BEFORE:

JOSEPH J. KLOVEKORN, Administrative Law Judge

APPEARANCES:

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Harrisburg, Pennsylvania 17120
(For the Office of Consumer Advocate)

realize, not what they give you.

Q Independently of what the company earns -- actually earns on what rates the Commission gives it though, isn't it true that you will get better interest coverage for financing through common stock than through financing by debt?

A All other things being equal and not changing.

Q That's right.

A In theory, I think that is probably true.

Q Have you done any research or market analysis to determine whether additional common stock issues in 1976 through 1978 would have had a substantial impact on the market price of the stock?

A Have I personally done such an analysis?

Q Or are you aware of any?

A I am not aware of any particular analysis that was done that addresses that particular question. I am aware generally of the position of the company during those years, as cited numerous times through the hearing, and I believe summarized in some press releases before, that the long-term goal was to minimize financings until the condition of the company improved; so thereby indicating that, you know, I don't know in theory if "x" additional shares could have been issued, but the general understanding or the general position of the company, as expressed numerous times, was that we were in poor financial condition during those times, and that we wanted to minimize additional financings. That was one of the reasons.

Q Hasn't the company generally considered itself in its last few rate cases to have been in fairly poor financial condition continuously from then to the present?

A I don't think it has improved markedly, no.

Q But you don't know what either the short-term or the long-term probable effects would have been from additional common issues in 1976 and 1978?

A It would have raised rates immediately. I would think we would have had to go for more return. It would have been a short-term rate increase, at a minimum.

Q So that might have improved the situation somewhat?

A Yes.

Q Was that a "yes"?

A Yes. It would have given us additional coverage, if that is what you meant with that particular question. I would also have given us higher rates.

Q Do you agree that if construction hadn't been delayed by two years that the direct total construction expenditures to complete Limerick would have been less overall?

A Are you talking from 1983-85 to 1985-87?

Q Right.

A I think yes, that's true. It would have been less expensive.

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Trial Staff Statement No. DLB-1
Witness: Donald L. Birx

Before the

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK INVESTIGATION

I-80100341

Direct Testimony

of

Donald L. Birx

Concerning:

Adjustments to the Cost of Limerick
Funding Alternatives
Revenue Requirements

SUMMARY

The delays forced by management upon the construction schedule of Limerick have created soaring cost prospects for this plant which threaten a financial crisis for the Company and an onerous burden for the customers. If the plant is to be completed, the adoption of some form of customer financing could mitigate these problems.

PECO cannot avoid responsibility for the problem. The mammoth construction program undertaken by PECO in the 70's was void of the usual safeguards normally incorporated by prudent management resulting in the Company assuming an inordinate degree of risk. The cost consequences of these decisions should not now be underwritten by the customers.

This testimony considers a number of adjustments to the cost of Limerick which would be appropriate and compares the revenue requirements associated with various means of financing the remaining construction of the plant. The consequences of cancelling Limerick and replacing it with coal fired generation are also considered. Depending upon the scenario adopted, the savings to the customers can be as large as $10 billion over the life of the plant.

Q. Please state your name and the name and address of your employer.

A. Donald L. Birx. I am employed by the Pennsylvania Public Utility Commission, P. O. Box 3265, Harrisburg, Pennsylvania 17120.

Q. What is your position with the Public Utility Commission?

A. I am Supervisor of the Engineering Section in the Electrical Division of the Bureau of Rates.

Q. Describe briefly your educational background and professional qualifications.

A. My educational background and professional qualifications are presented in resume form, in the attached Appendix A.

Q. Describe your experience with the Pennsylvania Public Utility Commission.

A. I joined the Public Utility Commission in August 1977. I have conducted analyses in support of the Generic Electric Rate Structure Investigation and since the publication of the Final Report on 76-P.R.M.D.-7 in December, 1977, I have been involved with valuation studies in all electric rate cases coming before the Commission.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is as follows:

1. To demonstrate that PECO imprudently placed itself in a high risk position by embarking on a mammoth construction program in the 70's dependent solely on its own resources for support.
2. To point out that the Company's reaction to the drop in revenue growth following the Arab oil embargo, which was to delay the construction schedule 4 years, has caused the cost of Limerick to soar and has created the need for extraordinary funding by ratepayers if Limerick is to be completed.

3. To examine whether or not Limerick is still needed.
4. To provide a comparison of revenue requirements associated with various means of financing Limerick if it is to be completed and for a replacement coal plant if Limerick is cancelled.

Q. In the Trial Staff's prehearing memorandum it is stated that the Limerick Nuclear Station presents one of the greatest problems this Commission has ever had to face. Do you agree with this statement?

A. Yes, I do. The Limerick situation rivals the TMI problem in magnitude without the causitive feature of the accident. The only "accident" I have found associated with Limerick was the cut-back in usage of electrical energy following the Arab oil embargo. This has had a serious effect on PECO because of the high risk position they occupied at the time.

Q. Do you mean that the Limerick program was a high risk undertaking?

A. Yes. First of all the program, as originally planned, had to be conceived as being a high risk operation. Prior to the Limerick project, the Company had planned its nuclear construction program in reasonable steps, spreading the risks through joint ownership, e.g. Peach Bottom. With Limerick, however, PECO undertook the simultaneous building of two units, each the size of Peach Bottom--depending solely upon its own resources. Limerick of course, was not the only major construction program undertaken. During the same time frame, PECO was to complete Peach Bottom 2 & 3 and Eddystone 3 and 4 and Salem 1 and 2.

Furthermore, the site chosen for Limerick was without sufficient water to supply the needs of the station. The Atomic Safety Licensing Board warned of this situation at the time the construction permit was issued. The company, however, urged that the permit be issued "upon the basis of whatever volume of water Applicant can procure--even though Applicant is thereby abandoning the prospect of year round full power operations as first contemplated," (Appendix B).

The full operation of the station would depend on water piped from the Delaware, with associated reservoirs and from the time construction started until the present, PECO has not had full assurance that this would be permitted.

Q. When did problems with Limerick begin to surface?

A. I would place the date at the time of the Arab oil embargo in 1973. Kilowatt hour sales declined and growth in the peak usage of electrical energy ceased at that time and was destined to remain "zero" over the next six years. (Schedule 1). These events, it should be noted took place approximately in coincidence with the receipt of the construction permit for Limerick. Had PECO been wise enough to believe the indicators in 1974, Limerick would have been stopped at that time.

Q. How did PECO respond to this situation?

A. First of all, it took them approximately 2 years to accept the fact that the decline in usage was going to a long-term trend. In 1976 PECO responded by instituting a 2-year delay in the construction of Limerick. This was followed in 1978 by a second 2-year delay.

Q. Do you believe that this was a proper response?

A. No. In fact, Mr. Boyer testified in R.I.D. 438, p. 2 of Respondent's Exhibit B-5 that "new nuclear generating units should be added as scheduled since a delay would increase the long-run levelized costs, although short-run revenue requirement would be less." (Schedule 2).

Q. Then why were the delays ordered?

A. The reason for both these delays was cited by Mr. Paquette in R.I.D. 438 (TR

843 and TR 8426) as the same, namely lower projected load growth. Lately, the Respondent's testimony has been modified to include financial constraints in addition to reduced load forecasts as the reasons for the delays. Thus the testimony of Mr. Paquette in R.I.D. 438 was inconsistent with that of Mr. Boyer. The delays certainly were not in the best interest of the customer.

Q. How have the delay decisions affected the cost of Limerick?

A. Exactly in the way Mr. Boyer predicted. Schedule 3 is a plot of nuclear generating unit costs expressed in $/KW as a function of the in-service date. This plot was an exhibit of the Respondent in R.I.D. 438. I have extended it through 1992 based on supplementary cost predictions obtained recently. In particular, reference is invited to Appendix C which is a copy of a paper given by Mr. D. J. Kettler of EBASCO. In this paper Mr. Kettler provides an informed estimate of the cost of a nuclear plant coming on line in 1992 incorporating the modifications ordered by the NRC as a result of the TMI incident.

Superimposed on this curve are the cost estimates made periodically by PECO for Limerick together with the dates on which these estimates were made. It will be noted that the estimated cost for Limerick has been rising almost vertically since 1974. These rising cost estimates can all be attributed almost entirely to the delays.

Q. What could have been done to prevent this predicament?

A. Early detection is always the key to successful action. Had PECO come to the Commission in 1974, we would have been dealing with a $250 million problem. In 1975 the problem had grown to $321 million. Today, we are confronted with a $2.0 billion problem. The Commission Staff and various intervenors have attempted to bring the Limerick issue before the Commission in every rate case

Beginning in R.I.D. 438. In every case, PECO has argued successfully that Limerick was not an issue. As a consequence, we are now at a point where a solution may not be obtained without harm to both the Company and the ratepayers.

Q. Why do you believe the Company resisted an investigation of Limerick?

A. I don't know, unless they reasoned that with more money invested, cancellation would be more difficult. It is evident to me that there is a strong desire on the part of the Company to have the plant regardless of cost.

Q. If Limerick is completed, do you believe that the final cost will be \$4.12 billion as stated in PECO's latest estimate (Schedule 4).

A. No. It is apparent to me that no more confidence can be placed in the \$4.12 billion figure than in any of the other estimates made during the construction of the plant. An interrogatory, still outstanding at the time of this writing, attempts to examine the degree of confidence PECO has in this number.

Q. In your opinion, will Limerick still be of benefit to PECO's customers?

A. Probably, yes. PECO's analysis and our investigation (Trial Staff Statement JNG-1) show that if Limerick is able to maintain a reasonable capacity factor, the customers will, over time, benefit from the plant. However, the situation is similar to receiving a 1% raise in salary. One cannot deny that it would be of benefit, but it is ludicrously small in comparison with that which would be considered proper in terms of the size and risk of the project.

The delays and resulting cost overruns associated with Limerick have already eaten away much of the advantage the customers have a right to expect from such a plant, and this erosion is likely to continue in view of the fact that the Respondent apparently is unable to express any degree of confidence in the latest cost estimate. The benefit that still remains is primarily the result of the high cost generation with which PECO is saddled. Even though PECO has adequate generation (including reserves) for its system, the economics are such that even in off-peak periods 30 to 35% of the system energy require-

Trial Staff Exhibit No. DLB-1A
Witness: D. L. Birx

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK INVESTIGATION

I-80100341

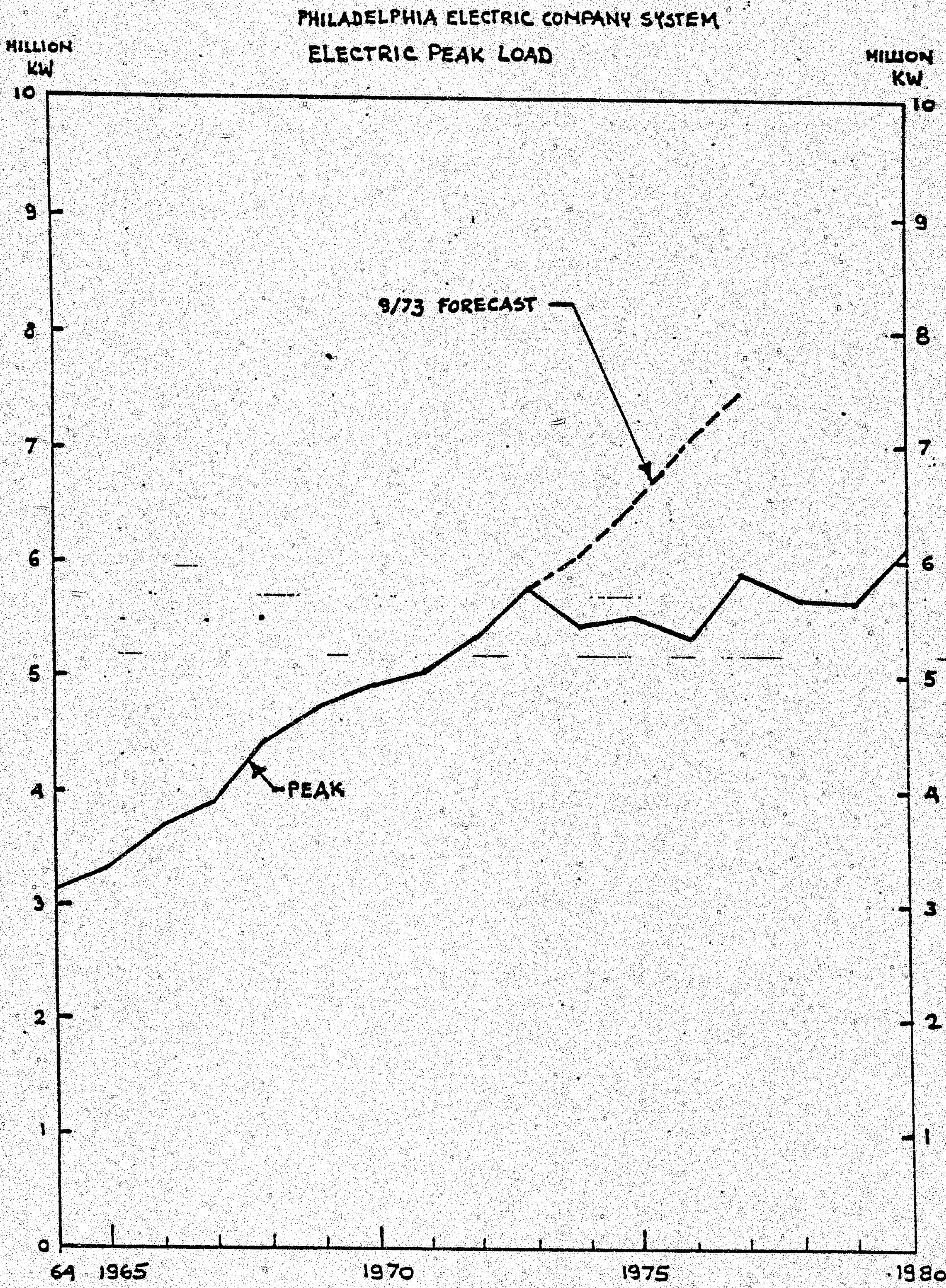
Exhibits to Accompany The

Direct Testimony

of

Donald L. Birx

Concerning:
Adjustments to the Cost of Limerick
Funding Alternatives
Revenue Requirements


PHILADELPHIA ELECTRIC COMPANY SYSTEM
ELECTRIC PEAK LOAD
MILLION KW
MILLION KW
10
9
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2
1
0
9/73 FORECAST
PEAK
64
1965
1970
1975
1980

Limerick

Date	Estimated Service Dates: Limerick #1	Estimated Service Dates: Limerick #2	Reason	Millions of Dollars: Booked Construction Costs Without AFC	AFC	Estimated Remaining Construction Costs Without AFC	AFC	Inflation Rate (%)	AFC Rate (%)
9/71	5/76	5/77	Revised Bechtel construction schedule	29	1	590	97	6.0	8.0
5/72	5/77	5/78	Construction permit not received	57	3	561	109	6.0	8.0
7/72	8/78	1/80	Construction permit not received	64	4	857	284	9.5	8.0
8/73	7/79	12/80	Construction permit not received	109	11	812	277	9.5	7.5
10/74	4/81	4/82	Financial constraints	223	26	774	270	9.5	7.75
5/75	4/81	4/83	Reduced load forecast & financial constr	284	37	958	461	9.5	8.0
5/76	4/83	4/85	Reduced load forecast & financial constr	417	65	1,185	657	7.8	8.2
5/78	4/85	4/87	Reduced load forecast & financial constr	720	161	1,147	1,090	6.5	7.1*
12/80	4/85	10/87	Revised Bechtel construction schedule	1,135	390	1,424	1,171	8.5	8.6*

*Reflects revised method of calculating AFC which is determined by dividing the after-tax cost of capital related to total CWIP base including prior AFC.

Schedule 4
Witness: D. L. Birx

~~275~~

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Trial Staff Statement No. REN-1
Witness: R. E. Nellis

Before the

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK GENERATING STATION INVESTIGATION

Docket No. I-80100341

Direct Testimony

of

Richard E. Nellis

Concerning:

Costs of Construction Delays
of Limerick Generating Station

to extend,

3) the construction remaining, in constant dollars,

4) the AFC rate, and

5) the inflation rate,

I have calculated the remaining construction costs and remaining AFC to be booked. By assuming alternative values for (1), and comparing the results, the rate base effects of delays were determined. In calculating the value of the remaining construction costs to be booked, I have recognized that inflation would be compounding on a diminishing amount, due to the fact that remaining construction is getting smaller as construction is carried on.

The calculation of the remaining AFC took into consideration the fact that AFC is computed monthly, and compounded semi-annually. General practice, and I understand PECO's practice, is to compute monthly AFC on

1) total costs, construction and AFC, booked at the end of the previous fiscal six-month period, plus

2) construction costs incurred from the beginning of the present fiscal six-month period to the end of the month prior to the present month, plus

3) one-half the construction cost incurred in the present month. I have also recognized that inflation is continuously escalating the cost of the remaining construction. The procedure is more fully described in Appendix B of this statement, and in a paper, co-authored with Professor Dunn, which I am scheduled to present at the annual meetings of the Eastern Economic Association in April.

Q. Please explain Schedule 2 of your exhibit.

A. Page 1 of the schedule enumerates the costs of each of the various construction delays from that of October 1974 through the latest at December 1980. For example, prior to October 1974, Unit 1 was scheduled for completion in July of 1979, and Unit 2 in December of 1980. In October of 1974 the Company decided to postpone the completion date of Unit 1 to April 1981, and Unit 2 to April 1982. This delay added approximately 130 million dollars to the construction costs of the plant, and approximately 218 million dollars in AFC, or a total of 348 million dollars. The following May, Unit 2 completion was rescheduled for a year later. This resulted in approximately 120.6 million dollars additional to the cost of the plant. The rest of the schedule is similarly interpreted.

Page 2 of Schedule 2 of my exhibit presents the incremental costs associated with two additional one-year postponements. As shown on the schedule, an additional year's delay would add about 344 million dollars to the cost, and a second year's delay would add another 372 million dollars to that.

Q. What is presented on Schedule 3?

A. Schedule 3 shows the approximate annual expenses associated with the individual construction delays shown on Schedule 2. The "Average Associated Return" is based on the 10.5% allowed by the Commission in R-79060865 applied to the average effect of the delay on rate base. "Annual Depreciation Expense" is calculated simply on a straight line basis over an assumed thirty-five year life span, for illustrative purposes.

Q. Please explain Schedule 4.

A. Schedule 4 is the supporting data for the estimated costs of the delays, presented on Schedule 2. Page 1 of Schedule 4 shows the estimated cost of Limerick as it is now contemplated, had no construction delays been ordered at October 1974 and subsequently. The data indicates that if the plant as presently designed had been completed by December 1980, the cost would have been approximately $2.5 billion dollars.

Trial Staff Exhibit No. REN-1A
Witness: R. E. Nellis

Before the

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK GENERATING STATION INVESTIGATION

Docket No. I-80100341

Exhibit to Accompany

the

Direct Testimony

of

Richard E. Nellis

Concerning:

Costs of Construction Delays
of Limerick Generating Station

Philadelphia Electric Company
Limerick Generating Station

Costs of Construction Delays
October 1974 through December 1980
($000)

	Delay	Completion[a] Unit 1 7/79	Unit 2 12/80	Costs[b] Construction	AFC	Total
1.	10/74	4/81	4/82	130,140	218,109	348,249
2.	5/75	4/81	4/83	39,311	81,318	120,629
3.	5/76	4/83	4/85	168,248	337,757	506,005
4.	5/78	4/85	4/87	188,887	407,894	596,781
5.	12/80	4/85	10/87	24,962	53,229	78,191
	All			551,548	1,098,307	1,649,855

a PECO response to Trial Staff Interrogatory IR-1, 1-8.

b Schedule 4, pp. 2-6.

Philadelphia Electric Company
Limerick Generating Station

Costs of Additional Construction Delays[a]
($000)

Additional Delays	Completion Unit 1 4/85	Completion Unit 2 10/87	Costs Construction	Costs AFC	Costs Total
First year	4/86	10/88	103,351	240,585	343,936
Second year	4/87	10/89	109,218	262,721	371,939

a Schedule 4, pp. 7-8.

Trial Staff Statement No. DHM
Witness: D. H. Muth
June, 1981

Before the

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK INVESTIGATION

I-80100341

Rebuttal Testimony

of

Donald H. Muth

to

Witness Joseph F. Paquette, Jr.

Concerning

The Financial Necessity for Delaying the

Limerick Project in 1976 and 1978

Q. ARE YOU THE SAME DONALD H. MUTH WHO PREVIOUSLY PRESENTED TESTIMONY IN THIS INVESTIGATION?

A. Yes. My previous testimony was contained in Trial Staff Statement No. DHM-1 and Exhibit No. DHM-1A.

Q. MR. PAQUETTE HAS TESTIFIED THAT PECO'S FINANCIAL DIFFICULTIES WERE A CONTRIBUTING REASON FOR THE 1976 AND 1978 DELAYS IN THE LIMERICK CONSTRUCTION SCHEDULE. DO YOU AGREE WITH HIS ANALYSIS?

A. No, I do not. It is clear from Mr. Paquette's testimony that the rescheduling was made primarily to match capacity additions with lower load forecasts. In regard to the 1978 announced delay, PECO continued to authorize and spend the additional dollars needed to maintain the 1983-1985 completion dates for units one and two. Financial difficulties obviously could not have been a reason for the announced delay.

In regard to the 1976 delay, it is my opinion that the capital could have been raised by PECO if it had desired to maintain the construction schedule.

Q. WHAT IS THE BASIS OF YOUR ASSERTION THAT PECO COULD HAVE RAISED THE NECESSARY CAPITAL IN 1976, 1977 AND 1978 IF LIMERICK HAD NOT BEEN DELAYED FOR LOAD GROWTH REASONS?

A. My reasons are summarized below:

- The revised construction expenditures as set forth by the Spring 1976 Forecast reduced the need for new financing by only $176,000,000 over the three year period 1976, 1977 and 1978.

- The economic and stock market conditions improved measureably during the period, 1976 to 1978, providing PECO with the opportunity to issue additional preferred and common stock.
- PECO'S mortgage indenture coverage provided some leeway to issue additional long-term debt during the period.

Q. HOW MUCH WAS THE NEED FOR NEW FINANCING REDUCED ON A YEAR TO YEAR BASIS AS A RESULT OF THE 1976 SPRING FORECAST?

A. Schedule No. 1 provides a summary of the change in new financing for each of the years 1976, 1977 and 1978. As shown by this schedule, new financing needs were reduced by $56,000,000 in 1976, $44,000,000 in 1977, and $76,000,000 in 1978.

Q. PLEASE EXPLAIN THE CHANGES WHICH TOOK PLACE IN THE ECONOMY DURING THIS PERIOD AND THEIR EFFECT ON THE CAPITAL MARKETS.

A. Schedule No. 2 is a reproduction of a page from the Business Conditions Digest showing business cycle activity as measured by various economic indicators. A review of this schedule reveals that the trough of the 1974-1975 recession occurred in March, 1975. Long-term interest rates remained at a high level during 1975 but began to decline in 1976. Schedule No. 3 shows monthly bond yields for Moody's A rated utility bonds for the years 1974 through 1980. This schedule demonstrates that long-term bond rates were at a lower level during the 1976-1978 period than in the preceding or subsequent period.

Schedule No. 4 provides a summary of inflation rates for the years 1969-1980. This schedule clearly shows that inflation decreased measureably during the period 1976-1978.

Q. WHAT IMPACT DID THE IMPROVED ECONOMIC CONDITIONS DURING THE YEARS 1976, 1977 AND 1978 HAVE ON PECO'S FINANCIAL CONDITION?

A. PECO'S financial performance did not materially improve during the period. As shown on Schedule No. 5, PECO'S earnings per share, return on common equity and interest coverage ratios remained relatively flat although they did show some improvement over the recession years of 1974 and 1975. However, despite a relatively flat earnings performance, PECO benefited from the general improvement in the economy and the financial markets. Schedule No. 6 demonstrates that PECO'S common stock increased in value during the years 1976 to 1978. PECO'S market to book ratio was 87.2% in 1976, 100.6% in 1977 and 91.8% in 1978. Schedule No. 8 is a summary of PECO's common stock issues for the period 1974-1980. This schedule shows that PECO was able to issue common stock at 88.1% of book value in 1976, 101.5% in 1977 and 90.6% in 1978.

Q. HOW COULD PECO HAVE FINANCED $176,000,000 OF ADDITIONAL CONSTRUCTION DURING 1976, 1977 AND 1978 IF THE LIMERICK PROJECT HAD NOT BEEN POSTPONED?

A. PECO could have financed the construction in a variety of ways. In 1976, PECO'S mortgage coverage ratio was 2.5 times. If PECO had not reduced its 1976 construction expenditures by $56,000,000 and had financed these additions with first mortgage bonds, its mortgage coverage ratio would have only been reduced to 2.4 times as calculated below:

Net Earnings Under the Mortgage Indenture at December 31, 1976	$314,571,000
Annualized Interest on Mortgage Bonds Outstanding	$125,308,000
Additional Interest from Issuing $56,000,000 of First Mortgage Bonds at 10%	5,600,000
Annualized Interest	$130,908,000
Times Interest Earned ($314,571,000 ÷ $130,908,000)	2.4

In fact, PECO could have issued approximately $320,000,000 of additional first mortgage bonds at a 10% interest rate and still maintained its two times interest coverage under its mortgage indenture.

PECO could also have financed the $56,000,000 of construction on an interim basis through short-term debt. As shown on Schedule 7, PECO reduced its short-term debt by $100,728,000 during 1976. There was only $7,226,000 of short-term debt outstanding on its balance sheet at December 31, 1976.

PECO could also have issued additional common stock during 1976. Although its common stock was still selling below book value at an average price of $16.68 per share, this price was substantially higher than the 10,886,340 shares it issued in 1975 at $12.31 per share.

Q. HOW WOULD PECO HAVE FINANCED THE ADDITIONAL $44,000,000 IN 1977 IF THE LIMERICK PROJECT HAD NOT BEEN DELAYED?

A. Preferably through the issue of additional common stock. However, this construction could also have been financed by first mortgage bonds or, on an interim basis, with short-term debt. In 1977, PECO issued 5,317,952 shares of common stock at an average price of $19.54, or 101.5%

of book value. If PECO had issued another 2,300,000 shares it would have had sufficient funds to cover the $44,000,000 of additional construction expenditures. Common stock issued in 1977 would have totaled 7,617,952 shares or substantially less than the 10,886,340 shares issued in 1975 (at $12.31 per share) or the 9,749,355 shares issued in 1980 (at $14.14 per share).

PECO's mortgage coverage ratio was 2.35 times in 1977. If PECO had issued an additional $44,000,000 of first mortgage bonds in 1977, its interest coverage would have been reduced to 2.28 times (assuming that the $56,000,000 of additional construction expenditures in 1976 had not been financed with mortgage bonds) as calculated below:

Net Earnings Under the Mortgage Indenture at December 31, 1977	$322,942,000
Annualized Interest on Mortgage Bonds Outstanding	$137,530,000
Additional Interest from Issuing $44,000,000 of First Mortgage Bonds at 9%	3,960,000
Annualized Interest	$141,490,000
Times Interest Earned ($322,942,000 ÷ $141,490,000)	2.28

The issuance of an additional $44,000,000 of first mortgage bonds in 1977 would therefore not have had a material effect on its interest coverage. Even if the 1976 and 1977 construction expenditures had both been financed with mortgage bonds, the mortgage coverage ratio would have only been reduced from 2.35 times to 2.2 times. However, as discussed on page 7, I believe the construction should more appropriately have been financed with equity capital.

PECO could also have financed the $44,000,000 of additional 1977 construction through short-term debt. As shown on Schedule No. 7, PECO only increased its short-term debt by $7,649,000 in 1977. There was only $14,875,000 of short-term debt outstanding on its balance sheet at December 31, 1977.

Q. PECO REDUCED ITS 1978 CONSTRUCTION EXPENDITURES BY $76,000,000 AS A RESULT OF THE 1976 SPRING FORECAST. HOW WOULD IT HAVE FINANCED THIS ADDITIONAL CONSTRUCTION IF THE PROJECT HAD NOT BEEN DELAYED?

A. It could have been financed by issuing additional common stock. PECO had no public stock offering in 1978. The 1,888,168 shares that it issued in 1978 were sold through its Dividend Reinvestment and Stock Purchase Plan, its Employee Stock Purchase Plan and its Tax Reduction Act Stock Ownership Plan as shown on Schedule No. 8. The stock issued through these plans was sold at an average price of $17.46 or 90.6% of book value. If PECO had held a public sale of stock during the first quarter of 1978, its per share price would have even been greater than $17.46, as shown on Schedule No. 6.

PECO's mortgage coverage ratio was 2.37 times in 1978. If PECO had issued an additional $76,000,000 of first mortgage bonds in 1978, its interest coverage would have been reduced to 2.26 times (assuming no additional mortgage bond issues in 1976 or 1977) as calculated below:

Net Earnings Under the Mortgage Indenture at December 31, 1978	$344,947,000
Annualized Interest on Mortgage Bonds Outstanding	$145,541,000
Additional Interest from Issuing $76,000,000 of First Mortgage Bonds at 9.25%	7,030,000
Annualized Interest	$152,571,000
Times Interest Earned ($344,947,000 ÷ $152,571,000)	2.26

If the postponed 1976 and 1978 construction of $56,000,000 and $76,000,000, respectively, had been financed with mortgage bonds and the 1977 construction of $44,000,000 with common equity, the 1978 mortgage coverage ratio would have been 2.18 times. As previously discussed, however, I believe that it would have been preferable to finance the construction with common equity because of the improved stock market conditions during this period.

Short-term debt outstanding at December 31, 1978, totaled only $16,129,000. This balance provided sufficient leeway for PECO to finance some or all of the $76,000,000 of 1978 postponed construction with short-term debt if it had chosen to do so.

Q. COULD PECO HAVE RAISED THE NECESSARY FUNDS IN ANY OTHER MANNER DURING THIS PERIOD?

A. Yes. It could have sold debentures which would not have affected its interest coverage under its mortgage indenture. It could have also sold additional preferred or preference stock. In 1977, PECO did not issue any preferred stock although it had issued $50,000,000 worth in each of the years 1976 and 1978 as shown on Schedule No. 7.

However, all of the capital needed to continue the construction program during 1976, 1977 and 1978 could have essentially been raised through common stock sales, had there been no delay. The sale of additional common stock during this period would have improved PECO's common equity ratio and preserved its interest coverage for future first mortgage bond issues.

Q. DOES THIS COMPLETE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.

Trial Staff Exhibit No. DHM-2A
Witness: D. H. Muth
June, 1981

Before the

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK INVESTIGATION

I-80100341

Exhibit to Accompany the

Rebuttal Testimony

of

Donald H. Muth

to

Witness Joseph F. Paquette, Jr.

Concerning

The Financial Necessity for Delaying the

Limerick Project in 1976 and 1978

Trial Staff Exhibit No. DHM-2A
Schedule No. 1

Philadelphia Electric Company
Construction and Financing Forecast
1976-1978

	Million $ 1976	1977	1978
Spring 1975 Forecast			
New Financing Required	$264	$279	$317
Spring 1976 Forecast			
Construction Expenditures	$437	$414	$390
Less: Internal Funds	229	179	149
New Financing Required	$208	$235	$241
Reduction in New Financing Required	$ 56	$ 44	$ 76

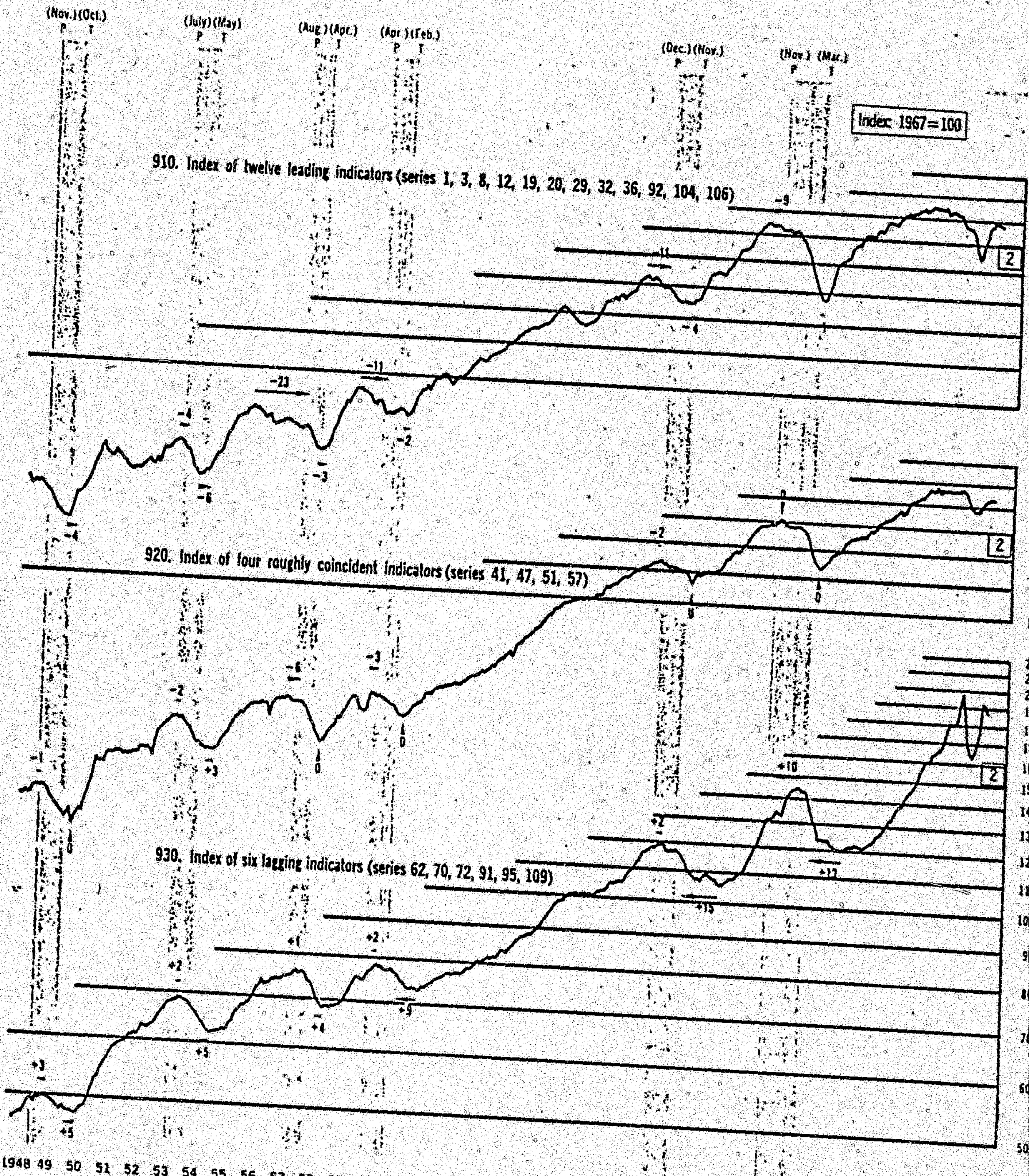
Source: PECO Statement No. 9, Table C.

Trial Staff Exhibit No. D
Schedule No. 2

A

COMPOSITE INDEXES AND THEIR COMPONENTS

Chart A1. Composite Indexes



NOTE: Numbers entered on the chart indicate length of leads (−) and lags (+) in months from reference turning dates.
Current data for these series are shown on page 60.

Trial Staff Exhibit No. DHM-2A
Schedule No. 3

Comparison of Moody's A Rated Utility Bond Yield Averages for the Years 1974-1980

Month (1)	1974 (2) %	1975 (3) %	1976 (4) %	1977 (5) %	1978 (6) %	1979 (7) %	1980 (8) %
	Calendar Years						
January	8.36	10.37	9.90	8.61	8.92	9.90	12.27
February	8.42	9.99	9.71	8.65	8.97	9.84	13.55
March	8.46	9.72	9.67	8.70	8.98	10.04	14.65
April	8.77	10.06	9.53	8.71	9.09	10.10	13.87
May	9.00	10.23	9.55	8.71	9.22	10.30	12.53
June	9.32	10.10	9.54	8.58	9.40	10.14	12.21
July	9.66	10.01	9.87	8.51	9.51	9.98	12.26
August	10.03	10.12	9.13	8.49	9.32	10.14	12.96
September	10.45	10.19	8.90	8.46	9.28	10.36	13.43
October	10.78	10.16	8.79	8.61	9.46	11.40	13.58
November	10.46	10.04	8.76	8.64	9.68	11.89	14.12
December	10.27	10.11	8.62	8.64	9.70	11.79	14.63
Average	9.50	10.09	9.33	8.61	9.29	10.49	13.34

Source: Moody's Bond Record

~~456~~ 117

Annual Rates of Inflation

Time Period (1)	As Measured by the Consumer Price Index (2)	As Measured by the Implicit Price Deflator of Gross National Product (3)
1969	5.4%	5.1%
1970	5.9	5.4
1971	4.3	5.0
1972	3.3	4.2
1973	6.2	5.7
1974	11.0	8.7
1975	9.1	9.3
1976	5.8	5.2
1977	6.5	5.8
1978	7.7	7.3
1979	11.3	8.5
1980	13.5	9.0

Source: Economic Report of the President, January, 1981
Economic Indicators, April, 1981

Trial Staff Exhibit DHM-2A
Schedule No. 8

Philadelphia Electric Company
Summary of Common Stock Issued for
the Calendar Years 1974-1980

	1974 (1) $	1975 (2) $	1976 (3) $	1977 (4) $	1978 (5) $	1979 (6) $	1980 (7) $
Public Sales			67,680,000	78,340,000	--	63,460,000	101,360,000
Dividend Reinvestment and Stock Purchase Plan			14,981,000	17,159,000	24,852,000	26,389,000	31,593,000
Employee Stock Purchase Plan			2,760,000	3,483,000	3,871,000	4,416,000	4,863,000
Tax Reduction Act Stock Ownership Plan			707,000	4,935,000	4,252,000	5,723,000	--
Total Proceeds	11,151,000	133,723,000	86,128,000	103,917,000	32,975,000	99,988,000	137,816,000
Number of Shares Issued	949,434	10,866,340	5,110,227	5,317,952	1,888,168	6,370,531	9,749,355
Average Price Received for New Common Stock	$11.74	$12.31	$16.85	$19.54	$17.46	$15.70	$14.14
Proceeds/Book Ratio	58.1%	64.6%	88.1%	101.5%	90.6%	82.4%	75.5%

Source: Annual Reports to Stockholders
Moody's Public Utility Manuals

~~175~~ 119

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

* * * * * * * *

Re: Limerick Nuclear Generating Station

Investigation, Docket No. I-80100341

* * * * * * * *

Direct Testimony of

Richard A. Rosen

on Behalf of The Pennsylvania Office of the Consumer Advocate

February 27, 1981

REVISED

May 5, 1981

E S R

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard A. Rosen. My business address is Energy Systems Research Group, Inc., 120 Milk Street, Boston, Massachusetts 02109.

Q. DR. ROSEN, PLEASE DESCRIBE YOUR BACKGROUND AND QUALIFICATIONS.

A. I am currently a senior research scientist at Energy Systems Research Group, Inc., as well as Executive Vice-President of the firm. ESRG is a non-profit organization specializing in research on energy-related issues, particularly research related to electric utilities such as demand forecasting, reliability modeling, demand curtailment modeling, and district heating. In May 1979, I completed directing an extensive critique of the New England Power Pool Electric Demand Forecasting Model under contract to the New England Conference of Public Utility Commissioners. I have also testified on demand forecasting in hearings on Case #19494 before the Massachusetts Department of Public Utilities, in Pa. PUC v. Philadelphia Electric Company, RID #438 (the 1978 rate case), before the Pennsylvania Public Utility Commission, and before the Michigan Public Service Commission in Case #U-5979. During 1979, I was project director for our work that led to Dr. D. Shakow's testimony on behalf of our firm regarding "Generation Planning and Reliability" in Pa. PUC v. Philadelphia Electric Company, R-79060865 (the 1979 rate case), before the Pennsylvania Public Utility Commission. During 1980 I was project director for the project that culminated in further testimony by Dr. D. Shakow regarding "Generation Planning and Reliability" in Case #EO-80-57 before the Missouri Public Service Commission. In addition, I have submitted extensive direct and sur-rebuttal testimony in Case No. I-79070315 and 317 (CAPCO Investigation) before the Pennsylvania Public Utility Commission on generation planning and reliability. I have testified on "Generation Expansion Planning Re: Consumer Power Co." in Case No. U-6360 before the Michigan Public Service Commission, and on generation planning in two cases before the Ohio Public Utilities Commission (80-141-EL-AIR and 79-427-EL-AIR). That work, as well as prior research, led to the development of the ESRG Electric System Generation Planning Model (ESGEM) under Dr. Shakow's and my direction. I have been principal investigator for a project intended to expand the ESGEM model which has been funded by the U.S. Department of Energy, Office of Utility Systems. I have also been principal investigator at ESRG for the "Electric Demand Curtailment Study" funded through Brookhaven National Laboratory by that same office at DOE. Appendix E consists of a copy of the 1980-81 ESRG brochure which describes the extensive analytical and modelling capability that exists at ESRG, and the project support staff. I received my Bachelor of Science Degree from M.I.T. in 1966 and my Master's Degree and Ph.D. in physics from Columbia University in 1970 and 1974, respectively. Before joining ESRG, I did research at the National Center for the Analysis of Energy Systems at Brookhaven National Laboratory on industrial energy conservation. In that capacity, I served as Principal Investigator on two projects involving industrial process energy modelling for the U.S. Department of Energy.

Q. FOR WHOM ARE YOU APPEARING?

A. I am testifying at the request of the Consumer Advocate of Pennsylvania.

Q. WHAT IS THE NATURE OF YOUR TESTIMONY?

A. In this testimony, I will up-date and expand previous work regarding the Philadelphia Electric Company analyzing:

1) The operating and capital costs associated with different power plant construction scenarios, including the Limerick Nuclear Generating Units and feasible alternatives.

2) Whether the Company's current estimates for the cost of Limerick are reasonable.

3) The extent to which lowering the demand growth rate through conservation can lower the future cost of electricity to ratepayers and replace Limerick.

Many technical issues in the area of generation planning were analyzed as part of my testimony. These will be discussed in detail below and in Appendices "A" through "G."

costs and oil consumption.

Q. IN LIGHT OF THE NUCLEAR AND COAL PLANT CAPITAL COSTS, O&M, AND CAPACITY FACTOR TRENDS THAT YOU HAVE IDENTIFIED IS IT LIKELY THAT PECO COULD HAVE REALIZED EARLIER THAT LIMERICK WAS NOT COST EFFECTIVE FOR RATEPAYERS?

A. Yes. I believe that better generation planning at least two years ago would have revealed that it was cost effective to ratepayers to cancel the Limerick 2 unit, and probably the Limerick 1 unit also. I say two years ago because by then much of the data I have relied on for analyzing capital and O&M cost trends was available to the utility industry. Similar capacity factor data comparable to that I have relied on was also available then. However, there are additional reasons why cancellation of Limerick may have been even more cost effective for ratepayers two years ago than it is now. First, much less money would have been spent on Limerick as of two years ago, so the penalty to ratepayers for cancellation as we have treated it here would not be so great. Secondly, if alternative coal plants to Limerick were planned two years ago, then they would have come on line two years earlier than indicated in our study here and would have conserved more expensive oil. The coal plants would also have had a significantly lower capital cost than the first two coal plants that we have used to substitute for Limerick. Finally, even as recent as 1978 oil prices were generally not forecasted to rise as fast by 1981 as they actually have. Thus, the then indicated replacement power from not having Limerick on line by 1985 and 1987 would not be so great as our analysis now indicates. Thus better generation planning by PECO over the past several yars could certainly have saved the ratepayers considerable future expense.

SUPPLY ALTERNATIVES TO CONSERVATION OR NEW POWER PLANTS

Q. IN ADDITION TO THE CONSTRUCTION OF NEW NUCLEAR OR COAL-FIRED POWER PLANTS AND THE IMPLEMENTATION OF VARIOUS CONSERVATION MEASURES, WHAT ARE SOME OF THE OTHER POTENTIALLY ECONOMIC GENERATION ALTERNATIVES AVAILABLE TO PECO THAT CAN REDUCE OIL CONSUMPTION WHILE MAINTAINING SYSTEM REALIABILITY?

A. One that I just mentioned, viz. the conversion of oil-fired plants to burning coal, or alternatively, a coal-oil mixture is a strategy which is being implemented or explored by many electric utilities.

Q. WHAT IS THE HISTORY OF PECO'S EXPLORATION OF THESE OPTIONS?

A. PECO, like most utilities, has done relatively little on its own initiative to fully explore these options. They have, however, been forced to respond to federal efforts to reduce petroleum consumption. The Energy Supply and Environmental Conservation Act (ESECA) enacted by Congress in 1974, and the Powerplant and Industrial Fuel Use Act (PIFUA) enacted in 1978, grant the Department of Energy (DOE) discretionary power to order the prohibition of the use of petroleum in power plants capable of being converted to coal. Recently, (as described

May 5, 1981

ERRATA SHEET
for
Direct Testimony Of Richard A. Rosen

Page No.	Line No.	Currently Reads	Should Read
4	21	0.9%	1.1%
	26	$729	$1149
5	3	$624	$637
	14	$231	$232
	16	$855	$869
	19	"both Limerick units"	"Limerick Unit No. 2"
	23	$3,350	$3,997
6	19	1.1%	0.9%
	19	0.9%	1.1%
12	9	"to 126.8 mills/kwh"	"to approximately 127 mills/kwh"
	10	"182.1 mills/kwh"	"182 mills/kwh"
14	21	"one or both Limerick units"	"at least Limerick Unit No. 2"
18	10	0.9%	1.1%
20	17	0.9%	1.1%
	20	$564	$887
	20	$729	$1,147
	24	"somewhat"	-deleted-
	26	$483	$493
21	1	$624	$637
	6	"roughly equal"	"closer"
	7-11	----------REPLACED----------	
	11-15	----------REPLACED----------	

Page No.	Line No.	Currently Reads	Should Read
21	20	"however"	"again"
	20	"Case 'N'"	"Case 'I'"
	20	"neither"	"only"
	21	"unit"	"Unit No. 1"
	22	\$309	\$560
	22	\$400	\$724
	24	"and \$245"	"but only \$138"
	25	\$317	\$178
	26	"completion of unit 1 only (Case "I").	"cancellation of both Limerick units (Case "N").
22	7	\$3,350	\$3,997
23	Table 1	——————REPLACED——————	
24	19	\$18,977,000,000	\$18,839,000,000
	20	"(program 'N')"	"(program 'I')"
	20	\$21,568,000,000	\$21,931,000,000
	22	"with Limerick can"	"with both Limerick units can"
	23	\$2,591	\$3,092
	24	\$3,350	\$3,997
25	2	"U"	"T"
	4	"25%"	"29%"
	10	"the Limerick units."	"at least Limerick Unit No. 2."
27	26	———	sentence added to footnote
36	6-8	——————REPLACED——————	
	9	6.3%	4.8%
	10	3.9%	3.3%

Page No.	Line No.	Currently Reads	Should Read
37	Table 3	——REPLACED——	
38	1	$390	$448
	3-8	——DELETED——	