IN THE COMMONWEALTH COURT OF PENNSYLVANIA

DAVID M. BARASCH, CONSUMER ADVOCATE, and UNIVERSITY OF PENNSYLVANIA/UTILITY USERS COMMITTEE, and PHILADELPHIA ELECTRIC COMPANY, Petitioners	:	NOS. 2248, 2269 AND 2279 C.D. 1986
vs.	:	
PENNSYLVANIA PUBLIC UTILITY COMMISSION, Respondent	:	

Advanced Form

BRIEF OF PETITIONER, UNIVERSITY OF PENNSYLVANIA/ UTILITY USERS COMMITTEE

Petition for Review of the Order of the Pennsylvania Public Utility Commission Dated June 27, 1986, Docket No. R-850152, R-850152C001-C0014

DO NOT REMOVE FOLDER

Mark P. Widoff, Esquire
Larry B. Selkowitz, Esquire
WIDOFF, REAGER, SELKOWITZ & ADLER, P.C.
127 State Street
Harrisburg, PA 17101
(717) 234-1383

Dated: December 22, 1986

DOCKETED
JAN 09 1986

Zori G. Ferkin, Esquire
Eleventh Floor
300 North Second Street
Harrisburg, PA 17101

Mildred E. V. Pitts, Esquire
Office of General Counsel
18th and F Streets, N.W.
Washington, D.C. 20405

Charles Rainey, Jr., Esquire
Assistant City Solicitor
City of Philadelphia
One Reading Center, 5th Floor
1101 Market Street
Philadelphia, PA 19107

Michael L. Browne, Esquire
Reed, Smith, Shaw & McClay
1600 Avenue of the Arts Building
Broad and Chestnut Streets
Philadelphia, PA 19107

Earle H. O'Donnell, Esquire
1666 K Avenue, N.W.
Washington, D.C. 20006

Senator Clarence D. Bell
State Capitol
Harrisburg, PA 17120

William T. Hawke
Malatesta, Hawke, McKeon & Morris
212 Locust St.
P. O. Box 12110
Harrisburg, PA 17108

Patricia J. Gustin, Esq.
Pennsylvania Public Utility
Commission
P.O. Box 3265
Harrisburg, PA 171 20

Hon. LeRoy Zimmerman
Attorney General
Office of Attorney General
16th Floor, Strawberry Square
Harrisburg, PA 17120

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STATEMENT OF JURISDICTION

The Commonwealth Court of Pennsylvania has jurisdiction over this Petition for Review, pursuant to Section 763 of the Pennsylvania Judicial Code, 42 Pa. C.S. Section 763(a)(1), as a direct appeal from a final order of the Pennsylvania Public Utility Commission.

ORDER IN QUESTION

CONCLUSION

In accordance with our resolution of the issues in this proceeding, we conclude that PECO is entitled to an opportunity to earn income available for return of $735,203,000 applicable to its electric operations. PECO is authorized to establish rates designed to produce $2,852,071,000 in annual electric operating revenues. The increase in annual operating revenues herein authorized is $350,797,000 which is to be phased-in over a three year period;

THEREFORE,

IT IS ORDERED:

1. That Philadelphia Electric Company not place into effect the rates contained in Supplement No. 15 to its Tariff Electric-Pa. P.U.C. No. 26, the same having been found to be unjust, unreasonable and, therefore, unlawful.

2. That Philadelphia Electric Company is hereby authorized to file tariffs or tariff supplements containing rates, provisions, rules and regulations, consistent with our findings herein, designed to produce annual operating electric revenues of not in excess of $2,852,071,000, exclusive of revenues to be derived from the State Tax

Adjustment Surcharge revenues; provided, however, that the $350,797,000 annual revenue increase herein authorized must be phased-in over a three year period, with deferred revenues being recovered in the fourth, fifth and sixth year.

3. That said tariffs or tariff supplements may be filed upon less than statutory notice, and, pursuant to the provisions of 52 Pa. Code Section 3.32(b), the tariffs or tariff supplements may be filed to be effective for service rendered on and after the date of entry of this Opinion and Order.

4. That the tax surcharge shall be computed in accordance with the State Tax Adjustment Surcharge Order of March 10, 1970, as revised.

5. That Philadelphia Electric Company shall file detailed calculations with the tariff filing which shall demonstrate to the Commission's satisfaction that the filed rates comply with this Opinion and Order.

6. That Philadelphia Electric Company shall comply with all other directives contained in this Opinion and Order which are not the subject of an individual directive in the proceeding Ordering Paragraphs, as fully as if they were the subject of a specific Ordering Paragraph.

7. That except as herein granted, the exceptions of all parties to the Recommended Decision are denied.

8. That the several complaints filed by various parties to this proceeding, including those which were consolidated with Docket No. R-850152, are granted or denied consistent with this Opinion and Order.

9. That except as herein modified, the Recommended Decision of Administrative Law Judge Matuschak is adopted as the decision of this Commission.

10. That upon the filing of tariff revisions acceptable to the Commission as being in compliance with this Opinion and Order and upon Commission approval of the tariff revisions, the inquiry and investigation at Docket No. R-850152, et al., shall be terminated and the record marked closed.

A copy of the relevant portions of the Commission's Opinion and Order is attached to the Brief of the Office of Consumer Advocate and is incorporated herein by reference. It is also in the Reproduced Record at R._____ through R. _____.

STATEMENT OF THE QUESTIONS INVOLVED

In addition to adopting by reference the Statement of Questions of Petitioner, Office of Consumer Advocate (hereinafter "OCA"), Petitioner Utility Users Committee and the University of Pennsylvania (hereinafter "UUC/UP") presents the following questions:

(1) Did the Pennsylvania Public Utility Commission (hereinafter "PUC") commit reversible error by refusing to consider or apply to this case the provisions of Act 114 of 1986, amending 66 Pa. C.S. Section 1323?

(2) Even if the failure of the PUC to consider Act 114 of 1986 in this case was not reversible error, did the Commission abuse its discretion and/or commit an error of law by failing to make any findings of fact or conclusions of law with respect to the testimony on the record that Limerick I was not "useful" within the meaning of the Public Utility Law, since its costs far exceed its benefits for the foreseeable future?

Not answered below.

STATEMENT OF THE CASE

Petitioner UUC/UP adopts by reference the statement of the Case of Petitioner OCA.

SUMMARY OF ARGUMENT

The General Assembly, in Section 19 of Act 114 of 1986, 66 Pa. C.S.A. Section 1323 note, evidenced a specific intent that the amendments to 66 Pa. C.S. Section 1323 "be applicable to all cases pending before the Commission." This case was pending before the Commission on July 10, 1986, the effective date of Act 114. Therefore, the PUC committed reversible error in refusing to consider or apply the new provisions of 66 Pa. C.S. Section 1323 to this case.

The testimony of all parties in this case indicated that Limerick I's cumulative costs would exceed its cumulative benefits until, at least, the beginning of the next century. Although several parties argued that this failure to produce economic benefits made Limerick I not "useful," within the meaning of the Public Utility Law, the PUC made no findings or conclusions on the issue and instead held that the issue was "not relevant." This failure to address a crucial issue in the proceedings was an abuse of discretion and/or an error of law and requires that this case be remanded to the PUC for appropriate findings and conclusions.

ARGUMENT

Petitioner UUC/UP hereby adopts by reference the Arguments made in the brief of Petitioner OCA. In addition, the following arguments are presented:

A. SECTION 1323 of the PUBLIC UTILITY CODE APPLIES TO THIS CASE.

Before the Court in this case is the question of whether the newly enacted Section 1323 of the Public Utility Code (66 Pa. C.S. Section 1323) is applicable to the Commission's decision herein. To be so applicable, the case must have been pending before the Commission on the date the section became law. This was July 10, 1986. The Commission did not apply this law, erroneously believing that it did not apply to this case. As petitioner UUC/UP will demonstrate below, this section of the law did indeed apply and the Commission has committed reversible error by failing to consider Section 1323 in its decision in this case.

> The relevant portion of Sectin 1323 reads as follows:
>
> 1323. Procedures for new electric generating capacity.
>
> (a) Excess capacity costs--Whenever a public utility claims the costs of an electric generating unit in its rates for the first time and the commission finds that the unit results in the utility having excess capacity, the commission shall disallow from the

> utility's rates, in the same proportion as found to be excess capacity:
>
> (1) the return on specific unit or units of any excess generating reserve;
>
> (2) the return on the average net original cost per megawatt of the utility's generating capacity; or
>
> (3) the equity investment in the new unit. In addition to the disallowances set forth in this subsection, the commission may disallow any other costs of the unit or units which the commission deems appropriate. For the purposes of this section, a rebuttable presumption is created that a unit or units or portion thereof shall be determined to be excess unless found to be needed to meet the utility's customer demand plus a reasonable reserve margin in the test year or the year following the test year, or, <u>if it is a base load unit, it is also found to produce annual economic benefits which will exceed the total annual cost of the plant during the test year or within a reasonable period following the test year.</u>
> (Emphasis Added)

As the instant case involved the inclusion of the Limerick nuclear power station, a base load plant, into the rate base of PECO, the requirements of this section would be applicable, provided the statute applies. We will discuss below the specific failure of the Commission to make the findings required by Section 1323. For now, we turn to the pivotal question of whether Section 1323 applied to the

Limerick rate case which is the subject of this appeal. To answer this question we must look at Section 19 of Act 114 of 1986, which, inter alia, included the amendments to the Public Utility case quoted above. This section reads as follows:

> Section 19. 66 Pa. C.S. Section 1323 (relating to procedures for new electric generating capacity) shall be applicable to all cases pending before the Commission. (emphasis added)

Thus, in order to determine whether Section 1323 should have been followed, this Court must first determine whether the case was pending before the Commission on July 10, 1986, the effective date of Act 114.

In analyzing this issue we must start with a determination of the legislature's intent in choosing this language; i.e., what did the legislature mean when it required the application of Section 1323 to all cases pending before the Commission? In answering this question, we must keep in mind that the PUC is performing a legislative function, in setting rates, Western Pennsylvania Water Co. v. PUC, 10 Pa. Comwlth. Ct. 533, 311 A.2d 370 (1973), and that it, therefore, has a special responsibility to adhere to legislative intent.

Our first step in determining the meaning of "pending" is to consult the Statutory Construction Act, 1 Pa. C.S.

Section 1901 et seq. As the word "pending" is not defined in Act 114 nor in the Public Utility Code, 1 Pa. C.S. Section 1903(a) is applicable. (See Barasch v. Pa. PUC, 490 A.2d 806, 507 Pa. 430 (1985). This section states, in relevant part, as follows:

> 1903. Words and phrases
>
> (a) Words and phrases shall be construed according to rules of grammar and according to their common and approved usage....

The word "pending", as commonly used and applied in legal proceedings, is understood to mean that a case is still under the jurisdiction of a particular agency or court and that the agency or court still has the power and authority to take action on the matter. See Black's Law Dictionary (5th Ed. 1979) at 1020-21.

From these common usage meanings it is clear that the legislature required the Commission to apply Section 1323 to the case at bar in that the case was still before the PUC, the PUC still had the power to act on the case, final rates had not been "decided or determined" and the Commision had full authority to take account of Section 1323 by merely extending its consideration of the case.

The Supreme Court of Pennsylvania has already approved this approach in a very similar context in the Barasch case cited above. See, in particular, 490 A.2d at 810. That case determined the applicability of an amendment to the Public Utility Code which was to be applied in any case pending before either the Commission or the courts at the time the Act took effect. (See Act No. 335 of 1982, Section 2, applied to 66 Pa. C.S. Section 1315). The Act was not passed until long after petitions for review had been filed, briefs had been submitted and the final order of Commonwealth Court was expected. Upon passage of the Act, the Consumer Advocate filed a supplemental brief raising the applicability of the new section to the case then before the Commonwealth Court. Commonwealth Court, despite the clear language of the statute, refused to apply it, even though it had authority and jurisdiction over the case. The Commission therein argued that the language above cited could not have been intended to apply the statute retroactively to a decision on rate levels which had already been reached and the Commonwealth Court agreed. The Supreme Court, however, reversed this conclusion citing the principle of statutory construction quoted above. The Supreme Court held that the clear language of the act

required that it be considered even though the case had long been briefed and the rates already put into effect during the consideration of the appeal.

The facts of the instant case are, of course, very similar. Hearings had been held, briefs filed and the Commission had taken its first step by approving a new revenue requirement for PECO. However, it had not yet taken its second and concluding step, that of reviewing and approving tariffs required to implement the collection of those revenues. (The significance of this fact will be explored in depth below.) Act 114 was passed and became effective on July 10 while the Commission was still considering both the acceptability of the compliance tariffs PECO wished to implement and Motions for Reconsideration filed by OCA and by this Petitioner. Thus, the Commission, like Commonwealth Court in Barasch, supra., had no discretion to ignore Section 1323. Having failed to consider it, the PUC was guilty of reversible error, and this Court should so find.

PECO, of course, will argue, as will the Commission, that the case was not pending before the PUC on July 10, because the Order determining the level of rates had already been entered. However, the existence of that order is not

determinative of whether the "case" was still within the province of the PUC. The determinative element is whether the PUC still had jurisdiction to exercise its authority to implement the directive from the legislature to apply Section 1323 to this case. The order itself determining those rates, as well as the later actions of the Commission with reference to these very rates, conclusively demonstrate that the Commission did have jurisdiction to act with regard to this case and, therefore, was required to take additional steps before the case could be concluded. Thus, as further explicated below, common logic, common usage and the procedures of the Commission itself irrefutably lead to the conclusion the Commission erred in not finding that Section 1323 was applicable to this case.

(1) The Commission had several additional bases for considering Section 1323 given the posture of the case on July 10, 1986.

(a) Logic suggests that the case was pending before the PUC.

First, as a matter of simple logic, this rate case, docketed at R-850152, had to be pending in some forum. The case began on September 27, 1985, when the Company filed for the increase. The Commission issued an order on June 27,

1986 resolving what the permissable revenues to be collected by PECO would be and directing it to file tariffs for the Commission's consideration intended to collect the permitted amount. As of July 10, 1986, the effective date of Section 1323 of the code, no party had filed an appeal to this Court, the appeal period had not expired, and final rates had not yet been approved by the PUC. In addition, several parties including this petitioner, had filed timely motions for reconsideration which were before the Commission as of July 10, 1986. These motions were resolved and the tariffs approved on July 24, 1986, two weeks after the section became effective. Thus, on July 10, 1986 the matter was still actively being considered by the Commission. Therefore, it is patently illogical for the Commission to conclude that the matter is no longer pending before the Commission for purposes of applying Section 1323, when it was still actively considering various aspects of the case on that date. Perhaps this can best be understood by asking this question: If the PUC had determined to consider and apply the provisions of the new section 1323 during this period, could anyone have successfully argued that the PUC had no legal authority to do so? Clearly the answer is in the negative.

Pennsylvania law generally supports this conclusion, as it is the long standing rule of this Commonwealth that a matter is pending until ultimately terminated. See Lukacho v. Mucerino, 159 A.2d 235, 192 Pa. Super. 4 (1960); Groff v. Township of Ulster, 65 Pa. Cmwlth. 584, 442 A.2d 1255 (1982). In Groff, this Court specifically held that:

> Pendency is the state of an action after it has been begun and before the final disposition of it. The action in the instant case had been finally disposed of and concluded on June 28, 1980, following the end of the appeal period applicable to the lower court's decree absolute of May 29, 1980.

(Emphasis added.)

The meaning of "final disposition," of course, must be judged by the context of the case with reference to the particular tribunal involved, its rules, legal authority, and the object of the proceeding in question. Petitioner believes that when these additional aspects of the instant case are studied, this Court will conclude that the matter of the rates to be charged by PECO docketed by the Commission at R-850152C001-C0014, was still pending before the Commission on July 10, 1986.

(b) The regulations and statutes by which the Commission sets rates demonstrate the pendency of this case before the Commission on July 10, 1986.

Our first step in understanding this approach to determining the pendency of this action is to note one critical feature regarding the status of the matter on July 10, 1986. As of that date, PECO was still legally prohibited from charging final, non-refundable rates that were different than those in effect on the day PECO filed its proposed rate increase. For PECO to begin to collect rates reflective of the levels of revenues to be permitted under the Commission's Order of June 27, 1986, required an additional action from the Commission: the approval of PECO's compliance tariff. If the Commission had rejected those tariffs, PECO could not have implemented them. Thus, the central object of the entire proceeding--the collection of new and higher rates--was still undecided, and the matter was still pending before the Commission.

That a case is still within the power of the PUC to act until the filing and approval of the final tariff supplements and revisions is clearly demonstrated by the Commission regulations on tariffs, found at 52 Pa. Code Section 53.1 et seq. These regulatory provisions cover a wide range of specific points all related to the filing and approval of "tariffs, revisions and supplements". These provisions cover a wide range of procedural and substantial

matters and include the size, type and form of the papers (Section 53.1), that they be in looseleaf form (Section 53.2), the manner in which changes are to be designated (53.3), the manner of designation and numbering (Section 53.7), and the proper content (Section 53.21 to 53.26). Section 53.31 requires public notice of any tariff changes and 53.42 requires that the tariffs be made available for public scrutiny at every utility office. Section 53.45 details how the notices of new tariffs and supplements are to be transmitted to a utility's customers. Section 53.51 emphasizes that the filing of new tariffs or supplements must comply with strict informational requirements or be rejected. Note that all of these sections are equally applicable to supplemental tariff filings as they are to original filings. (See 52 Pa. Code Section 53.1).

The Public Utility Code itself, which provides the authority for the promulgation of the Commission's regulations cited above, also emphasizes the importance of tariffs in the regulatory process. For example, Chapter Thirteen of the Code, entitled Rates and Rate Making, is the key section of the law directing the process of ratemaking for public utilities. (See 66 Pa. C.S. Section 1301 et seq.). The very first section of the chapter (Section 1301)

requires rates (as expressed in tariffs) to be "...just and reasonable, and in conformity with regulations or orders of the Commission." (Emphasis added.)

Section 1302 (66 Pa. C.S. Section 1302) reads in its entirety as follows:

> Under such regulations as the commission may prescribe, every public utility shall file with the commisison, within such time and in such form as the commission may designate, tariffs showing all rates established by it and collected or enforced, or to be collected or enforced, within the jurisdiction of the commission. The tariffs of any public utility also subject to the jurisdiction of a Federal regulatory body shall correspond, so far as practicable, to the form of those prescribed by such Federal regulatory body. Every public utility shall keep copies of such tariffs open to public inspection under such rules and regulations as the commission may prescribe.

(Emphasis added.)

Herein is contained the requirement that all tariffs for all rates to be collected or enforced must be filed with the Commission.

Section 1303 (66 Pa. C.S. Section 1303) states, in relevant part as follows:

> No public utility shall, directly or indirectly, by any device whatsoever, or in anywise, demand or receive from any person, corporation, or municipal corporation a greater or less rate for any service rendered or to be rendered by such

> public utility than that specified in the tariffs of such public utility applicable thereto. The rates specified in such tariffs shall be the lawful rates of such public utility until changed, as provided in this part.

It is self-evident, therefore, that the filing, review and acceptance of tariffs by the Commission is a serious, indeed critical step in the process of establishing rates for utility service and is a necessary precondition for the lawful collection of such rates from customers.

(2) The Commission's Order and closure letter underscore the pendency of this action.

A further fact which demonstrates that this case was pending before the Commision on July 10, 1986 is the language of the Commission's Order from which this appeal was taken. At page 168-69 (R_____a) the order states:

> That upon the filing of tariff revisions acceptable to the Commission as being in compliance with this Opinion and Order and upon Commission approval of the tariff revisions, the inquiry and investigation at Docket No. R-850152, et al., shall be terminated and the record marked closed.

As we have demonstrated above, this obligation of PECO to file and of the Commission to critically review the tariff is far more than some ministerial duty. It is a significant final step in the ratemaking process, for not

until these tariffs are approved can the utility begin to finally collect the rates set forth therein.

Apparently cognizant of its obligation to review and approve (or reject) these tariffs, the Commission issued a letter to PECO on July 24, 1986, stating as follows:

> The Commission in a public meeting on July 24, 1986, acted to accept Supplement No. 23 to Tariff Electric - PA PUC No. 26 which was filed in response to Commission order dated June 26, 1986. Therefore, supplement No. 23 to Tariff Electric - PA PUC No. 26 becomes effective June 27, 1986, and our investigation at R-850152 is hereby terminated.

Thus, by its own procedures, and through its own actions, the Commission has acknowledged that the case was still pending before the Commission at the time that Section 1323 became effective on July 10. As pointed out above, in the face of this overwhelming evidence, it is illogical for the Commission to conclude otherwise.

B. THE COMMISSION FAILED TO CONSIDER SECTION 1323.

Petitioner UUC/UP has demonstrated that Section 1323 should have been applied to the decision regarding Limerick's inclusion in rates by this Commission. We must now demonstrate that the Commission failed to consider the provisions of Section 1323 in its decision and, therefore, committed reversible error.

First, it could not have explicitly considered Section 1323 during its revenue determination in that this Section did not officially "exist" until July 10. Of course, the Commissioners knew, and we believe this Court can take notice of the fact that the amendments to the Public Utility Code known as Act 114, including Section 1323, were pending before the legislature while the Commissioners were deliberating the revenue level for PECO and indeed, the final passage of the bill came on June 26, 1986, one day before the PUC vote on rate level. All of the above events were widely followed in the media, and the Commission can be presumed to have known that the legislature, of which it is an arm, intended for the Act to apply to Limerick.

Second, the portions of the rate level order which address the question of excess capacity (pages 34-37, R _____) utterly fail to address the question of Limerick's

annual net economic benefits. Indeed, the decision discussed only briefly the issue of life-cycle economics, (the cost-benefit over the total expected life of the plant) and, as discussed below, held the issue to be "irrelevant". To have complied with Section 1323 the Commission would have to have specifically made findings and conclusions regarding the annual benefits of the plant as required by Section 1323(a)(3). There are no such findings in the order setting rates in this case. Thus, the Commission did not properly consider Section 1323 and this case must be remanded for such a consideration.

PECO and the PUC may argue that the Commission's decision denying this Petitioner and the OCA reconsideration regarding, in part, Section 1323, was sufficient to meet the requirements of that Section. This is plainly wrong. The Commission did not provide any reasoned findings or analysis explaining how it reached its bald conclusion. Indeed, as explained below, PECO's own economic analysis in this case showed that no cumulative net economic benefit could be expected until at least the beginning of the next century. Any summary comments the majority Commissioners included in the denial of reconsideration attempting to address the annual benefits of the plant are mere surplusage and cannot

be a substitute for the proper consideration of Section 1323 requirements as imposed by the legislature. Clearly, given the importance of the issue and the hundreds of pages of testimony on it, the summary comments denying reconsideration cannot serve as reasoned findings on the requirements of Section 1323.

In summary, this case must be remanded to the Commission for consideration of Section 1323. The Commission has both refused to recognize its obligation to consider Section 1323 and has not otherwise properly considered and adjudicated the annual economic costs and benefits of Limerick. We, therefore, ask that this case be remanded to the Commission for proper consideration of Section 1323 of the Public Utility Code.

C. THE FAILURE OF THE PUC TO MAKE FINDINGS AND CONCLUSIONS WITH RESPECT TO WHETHER LIMERICK I IS "USEFUL" WITHIN THE MEANING OF THE PUBLIC UTILITY LAW, BECAUSE ITS COSTS FAR OUTWEIGH ITS BENEFITS FOR THE FORESEEABLE FUTURE, IS REVERSIBLE ERROR.

Irrespective of the specific requirements of the new provisions of 66 Pa. C.S. Section 1323, the PUC has committed an abuse of discretion and/or an error of law in refusing to make findings or conclusions with respect to the hundreds of pages of testimony regarding the issue of whether Limerick I is "useful" within the meaning of 66 Pa. C.S. Section 1310(c).

In recent years, the "used and useful" test, developed by the Courts and reflected in the language of 66 Pa. C.S. Section 1310 has been highlighted in the context of "excess capacity" because of the introduction of large electric generating plants that substantially increased the available generating capacity for many electric utility companies. See, e.g., Pa. Power and Light Co. v. Pa. P.U.C., ___ Pa. Comwlth. Ct. ___ , 516 A.2d 426 (1986). In that recent PP&L rate case (as in several others cited in the Opinion), a finding was made that, even after allowing for reasonable reserve margins, the electric utility company had significant "excess capacity," i.e., more generating capacity than could reasonably be expected to be necessary

to meet customers' needs. In this context, the PUC has interpreted the word "useful" to mean:

> The plant and its associated capacity contribute no more than necessary to system reliability in the accepted technical sense. In other words, the question is whether the Company's total capacity, including the plant in question, is commensurate with the requirements for peak demand plus a reasonable reserve margin relative to the Company's own system and to its PJM obligation.

Pa. Power & Light Co., v. Pa. PUC, ___ Comwlth. Ct. ___, 516 A.2d 426, 430 (1986).

In this case, the PUC has made a determination that PECO does not have "excess capacity" within the definition quoted. In its adjudication, the PUC made a finding that the early retirement of hundreds of megawatts of cheap and useable generating capacity (for which the ratepayer had already paid (see R. _____)) had sufficiently reduced PECO's electric generating plant so as to eliminate any "excess capacity." (See Commission Opinion, pp. 34-37.) While this Petitioner disagrees with that finding and joins with Petitioner OCA in its arguments relating to this finding, it raises before this Court the question of whether the PUC may use its definition of "excess capacity" as the exclusive means of determining whether Limerick I is "useful" within the meaning of the law. For that is precisely what the PUC has done.

In refusing to make findings or conclusions with regard to the hundreds of pages of testimony by several witnesses representing numerous customer interests on the issue of whether Limerick I is so costly as to make it not "useful" in the public service, the PUC has violated the plain meaning of the law, its own precedents and clearly established public policy. Yet the PUC determined that the analyses of the cost/benefit of Limerick I presented by the parties are "not directly relevant" because the PUC had already determined that Limerick I was not "excess" based on its definition. Commission Opinion, p. 37. (It is interesting to note here that the PUC actually stated that Limerick I was "needed" (p.37) because it was not "excess." As we shall see immediately below, this is a logical fallacy. It does not at all follow that a plant that is not "excess" is always "needed.")

The issue raised by several parties in the proceeding below, which the PUC determined to be "not directly relevant" and simply refused to analyze, discuss or make findings upon is this: Can a utility spend any amount, no matter how high, to provide a service, even when the service can be provided at a much lower cost? Thus, for example, supposing a utility determines to install Persian rugs in

all its offices, it being conceded that some floor covering is reasonable and necessary, must the ratepayer bear the cost of the Persian rugs? Clearly, neither the PUC nor this Court would sanction charging ratepayers for the purchase of a shipment of rugs from Persia. See, e.g., Duquesne Light Co. v. Pa. P.U.C., ___ Comwlth. Ct. ___, 507 A.2d 1274 (1986).

Yet, in this case, that is precisely the issue that the PUC has refused to consider. PECO has determined to build an electric generating plant of unprecedented cost resulting in a rate increase of unprecedented size. The increase in rate base reflects the addition of $3.82 billion as PECO's requested cost of Limerick I. See R. _____ (Rev. Schedule TEK-4 and TPH-2, C-2). It should be noted that the total rate base request of PECO for all its capital assets in this case was $6.9 billion - Limerick I thereby contributing roughly 55% of the requested rate base total of all capital assets accumulated by PECO. See R. _____ (Rev. Schedule TEK-1 and TEK-4). Yet, Limerick I represents only 13.4% of PECO's generating capacity. See, e.g., R. _____ (UCC/UP Statement No. 1, Table 2.1.).

As stated by UUC/UP Witness Chernick:

> The mere fact that PECO chooses to replace one type of plant with another does not imply that

> the basic function could not have been performed by the original plant, nor that the replacement was necessary. PECO could, for example, purchase a fleet of Cadillacs for its meter readers, and sell off its existing cars. It could hardly be argued that the investment in the Cadillacs was required to allow for orderly billing, or that they avoid the cost of taxicabs to transport the meter readers. Even though the Cadillacs perform both those functions (probably quite well), the old fleet served those same ends, at lower costs. The transportation benefit of the Cadillacs is the sale price of existing cars: the cost of the new fleet above that transportation benefit is either justified by a completely different kind of benefit (e.g., improved labor relations), or not at all.

(R. _____ UUC/UP Statement No. 1, pp. 9-10. See also, R. _____ OCA Statement No. 6, p. 42.)

In a nutshell, the issue that the PUC has held, as a matter of law, to be irrelevant is whether a plant is "useful", within the meaning of the "used and useful" doctrine, when its cost is so high that it cannot be cost effective for many years and alternatives exist that are significantly more cost effective. Thus, Limerick I may not be "excess" by the PUC's definition, but, we submit, the PUC has made a clear error of law and committed an abuse of discretion in determining that Limerick I was "needed". In fact, the PUC could not make such a determination without making findings on the issue of whether the costs of Limerick I were or were not so excessive, given the alternatives, that it is or is not "useful." In that respect, the

testimony of record, not analyzed by the PUC, was striking. As witness Chernick testified:

> Even without discounting the cash flow, Limerick I would increase rates for PECO customers as a whole until 2001. By 1994, the first year the plant would cost less than it saved, consumers would have paid out almost $3 billion extra. Discounting the costs and benefits, even at just 10%, makes the situation much worse, pushing discounted breakeven to 2009. Thus, based on PECO's own assumptions, Limerick I does not have positive present value benefits until well into the next century.

R. _____ (p. 32).

In determining whether Limerick I is or is not "used and useful" within the plain meaning of that phrase, we believe it is self-evident that the PUC must determine whether, by some rational measure, the plant's cost is justified by its benefits. This is precisely the study that several highly qualified expert witnesses provided and what the PUC determined was not relevant. In this repect, the PUC termed the process of determining these questions "speculative" (Opinion, p.37) without ever making a finding with respect to all of the cost-benefit studies, including PECO's, that no net economic benefit from Limerick could be projected by anyone, before the 21st century.

Further, the PUC provided no rational analysis of why such a cost benefit analysis (now required by Act 114 of

1986 in specific statutory language) is speculative or how or why it was rejecting without discussion the detailed testimony of three highly qualified expert witnesses that Limerick, because of its unprecedented costs, would never provide economic benefits to the customers of PECO. See R. _____ (PAIEG Statement No. 1, esp. p. 32: "...Limerick I is not a cost effective addition for PECO..."), (UUC/UP Statement No. 1, esp. p. 41: "It is clear from the analysis Limerick I will be very expensive in its early years, as compared to its benefits, and that plausible projections of plant performance, of operating cost levels and trends, and of operating benefits would prevent Limerick I from ever saving money for PECO's customers." (Emphasis added)) and (OCA Statement No. 6, esp. p.7: "...on a net discounted present-worth basis, Limerick I will cost ratepayers between $2.6 and $2.0 billion over its 30-39 year life.")

Thus, the PUC has, without analysis or discussion, dismissed as "irelevant" the findings of three experts that the ratepayers would be much better off now, in the foreseeable future, and forever if Limerick I had never been built. The PUC has held, as a matter of law, that because Limerick I passes the "excess capacity" test, that it is

"used and useful" regardless of whether the same electricity could be provided at a fraction of the cost by alternative means. Yet, that was precisely the testimony of record by the three witnesses rejected as irrelevant by the PUC. It must be stated, with all due respect, that the PUC has stated a principle of law that is shocking in its disregard for the basic purpose of public utility regulation - namely to assure public service at a reasonable cost. See, e.g., Pennsylvania Electric Co. v. Pa. PUC, _____ Pa. _____, 502 A.2d 130 (1985); Appeal Dismissed _____ U.S. _____, 106 S. Ct. 2239 (1986). Further, the failure to consider or make specific findings on the critical question of whether Limerick I's costs are so excessive as to make it not "useful" is an error of law and/or an abuse of discretion. See, e.g., Boughter v. Dept. of Public Welfare, 55 Pa. Comwlth. Ct., 521, 525, 423 A.2d 806, 809 (1980); Morgan Drive Away, Inc. v. Pa. PUC, 12 Pa. Comwlth Ct. 5, 7, 315 A.2d 889, 890-891 (1974); Philboro Coach Corp. v. Pa. PUC, 55 Pa. Comwlth Ct. 46, 51, 423 A.2d 751, 753 (1980).

The asserted principle of law, moreover (i.e., that a plant is "used and useful" regardless of how unreasonable its cost may be or how cheap the alternatives, if it is not "excess"), is directly contrary to the rule enunciated by

the General Assembly and signed into law on July 10, 1986. That statement by the legislature must be of some value in determining what the phrase "used and useful" means. In this respect, it is respectfully requested that the following testimony (rejected as irrelevant) be noted by this Court:

> Q. Do the reliability benefits of Limerick I, as you have estimated them above, justify charging ratepayers $800 million for Limerick I in 1986?
>
> A. No. Reliability considerations, standing alone, would justify 1986 cost recovery for Limerick I of no more than about $30 million, based on the value of the unit to PJM, and certainly no more than $37 million, even based on its inflated value to PECO under the PJM agreement.

R _____ (UUC/UP Statement No. 1, p. 26).

Thus, the PUC has determined that because Limerick I is "needed" for reliability, its customers must pay hundreds of millions of dollars <u>each year</u> for Limerick, when the same electric service reliability can be purchased for $30-37 million per year.

We respectfully submit that the holding of the PUC that cost of a generating plant, no matter how outrageous, is irrelevant in determining its "useful" nature in the public service is manifestly incorrect and must be reversed. In fact, we submit that the PUC itself does not truly mean to

establish such a principle in this case. For in Pa. P.U.C. v. Pennsylvania Power & Light Co., R-842651 (April 25, 1985), recently affirmed by this Court in Pa. Power and Light Co. v. Pa. P.U.C., _____ Pa. Cmwlth. Ct. _____, 516 A.2d 426 (1986), the PUC stated in clear and unequivocal language that an economic analysis is relevant to determination of "used and useful":

> (T)he Company's arguments relative to the economic benefits of Susquehanna are premised upon its own study which clearly overstates the economic benefits over time. (PP&L Ex. WFH-3; R.D., p. 44). Nevertheless, as noted by ALJ Klovekorn:
>
> > ..., it is clear that under the company's base case the Susquehanna plant will not start producing net savings for ratepayers until the end of this decade and that the plant will not produce cumulative net benefits until the mid 1990's at the earliest....
> >
> > The bottom line, however, of all these studies is that the ratepayers would be better off without Susquehanna from an economic standpoint now and for the foreseeable future. (R.D., p. 44).
>
> This conclusion is further supported by the fact that under the Company's own economic analysis, the net economic benefits of Susquehanna Unit 1 are directly affected by a number of highly likely alternative assumptions, which make those benefits speculative in nature. (OCA Stmts. Nos. 4 and 4A, Main Brief pp. 27-42, Ex. RAR-2; MI Ex. No. SS-1).
>
> In the final analysis, the ALJ properly concludes that while the economic viability studies are

> unsupportive of the inclusion of the excess capacity in rate base, these studies clearly support the ultimate conclusion that from an economic perspective the Company indeed has excess capacity.

Id. at p. 20.

Pa. PUC v. Pennsylvania Power & Light Co., R-842651 (April 25, 1985) at p. 15.

It is, thus, perfectly clear that the PUC has departed from the clear meaning of the phrase "used and useful," from its own precedents and from public policy in dismissing as "irrelevant" the crucial testimony on the Record in this case regarding the cost-benefit of Limerick I. The PUC should, therefore, be instructed by this Court to review the significant testimony relating to this issue that was presented on the record and to make appropriate findings and conclusions.

CONCLUSION

For the reasons stated above, Petitioners UUC/UP respectfully request that this Honorable Court remand this case for suitable findings of fact and conclusions of law.

Respectfully submitted

WIDOFF REAGER SELKOWITZ & ADLER, PC

By: _____
Mark P. Widoff, Esquire

_____
Larry B. Selkowitz, Esquire
127 State Street
Harrisburg, PA 17101
(717) 234-1385

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the foregoing document on behalf of Utility User's Committee/ University of Pennsylvania ("UUC/UUP) to be placed in the United States Mail, first class, postage prepaid, to the individuals listed below:

Honorable Joseph P. Matuschak
Administrative Law Judge
Pennsylvania Public Utility Commission
Room 1212, Pittsburgh State Office Bldg.
Pittsburgh, PA 15222

Marlane R. Chestnut, Esquire
Veronica Smith, Esquire
Daniel P. Delaney, Esquire
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17120

Jack Jerrett, Esquire
Morgan, Lewis & Bockius
2000 One Logan Square
Philadelphia, PA 19103

David M. Kleppinger, Esquire
McNees, Wallace & Nurick
100 Pine Street
P.O. Box 1166
Harrisburg, PA 17108

Irwin A. Popowsky, Esquire
Scott Rubin, Esquire
Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, PA 17120

John Hanger, Esquire
Community Legal Services
3638 North Broad Street
Philadelphia, PA 19140

Alan R. Squires, Esq.
Greenstein, Gorelick,
Price, Silverman & Laveson
900 Two Penn Center Plaza
Philadelphia, PA 19102

Stephen Bosch, Esq.
450 Carnell Hall
Broad St. & Montgomery Ave.
Philadelphia, PA 19122

Bernard A. Ryan, Jr., Esq.
Dechert Price & Rhoads
800 N. Third Street
Harrisburg, PA 17102

Nancy Schuster, Esq.
1 Pond Street
Bristol, PA 19007

Wayne L. Emery, Esq.
Kenneth R. Pepperney, Esq.
Rafael Caminero, Esq.
600 Grant Street, Rm. 1580
Pittsburgh, PA 15230

Martha Bush, Esq.
237 S. Melville Street
Philadelphia, PA 19139

Roger Clark, Esquire
Governors Energy Counsel
300 North Second St.
Harrisburg, PA 17101

Larry B. Selkowitz, Esq.

Dated: December 22, 1986

IN THE
COMMONWEALTH COURT OF PENNSYLVANIA

PHILADELPHIA ELECTRIC COMPANY, Petitioner	:	
v.	:	No. 2279 C.D. 1986
PENNSYLVANIA PUBLIC UTILITY COMMISSION, Respondent	:	

ADVANCED TEXT OF BRIEF FOR PETITIONER PHILADELPHIA ELECTRIC COMPANY

In support of its Petition for Review of the Orders of the Pennsylvania Public Utility Commission, entered January 21 and June 27, 1986 at Docket No. R-850152.

Robert H. Young
Walter R. Hall, II
Jack E. Jerrett
Michael A. McGrail

Counsel for Philadelphia Electric Company

OF COUNSEL:

Edward G. Bauer, Jr., Esq.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, PA 19101

MORGAN, LEWIS & BOCKIUS
2000 One Logan Square
Philadelphia, PA 19103
(215) 963-5700

DOCUMENT FOLDER

DOCKETED
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I. STATEMENT OF JURISDICTION

Philadelphia Electric Company's Petition for Review of the Orders of the Pennsylvania Public Utility Commission entered January 21 and June 27, 1986 in proceedings docketed at R-850152 was filed pursuant to Section 5 of the Act of April 28, 1979, P.L. 202, No. 53, known as the Judiciary Act Repealer Act (2 Pa.C.S. §701(a)). Jurisdiction is conferred upon this Court by Section 10(8) of the Judiciary Act Repealer Act (42 Pa.C.S. §763(a)).

II. ORDERS IN QUESTION

The first Order in Question, entered by the Pennsylvania Public Utility Commission on January 21, 1986 at Docket No. R-850152, states as follows:

> "1. That the material question for which Philadelphia Electric Company seeks PUC review, pursuant to 52 Pa. Code §5.302, is answered in the affirmative.
>
> 2. That the ruling of Administrative Law Judge Joseph P. Matuschak on the Motion in Limine filed by Trial Staff is affirmed.
>
> 3. That the Petition of Philadelphia Electric Company for a stay of the Ruling of Administrative Law Judge Joseph P. Matuschak is denied."

The second Order in Question, entered by the PUC on June 27, 1986 at Docket No. R-850152, provides as follows:

> "1. That Philadelphia Electric Company not place into effect the rates contained in Supplement No. 15 to its Tariff Electric - Pa. P.U.C. No. 26, the same having been found to be unjust, unreasonable and, therefore, unlawful.
>
> 2. That Philadelphia Electric Company is hereby authorized to file tariffs or tariff supplements containing rates, provisions, rules and regulations, consistent with our findings herein, designed to produce annual operating electric revenues of not in excess of $2,852,071,000, exclusive of revenues to be derived from the State Tax Adjustment Surcharge revenues; provided however, that the $350,797,000 annual revenue increase herein authorized must be phased-in over a three year period, with deferred revenues being recovered in the fourth, fifth and sixth year.
>
> 3. That said tariffs or tariff supplements may be filed upon less than statutory notice, and, pursuant to the provisions of 52 Pa. Code §3.32(b), the tariffs or tariff supplements may be filed to be effective for service rendered on and after the date of entry of this Opinion and Order.

4. That the tax surcharge shall be computed in accordance with the State Tax Adjustment Surcharge Order of March 10, 1970, as revised.

5. That Philadelphia Electric Company shall file detailed calculations with the tariff filing which shall demonstrate to the PUC's satisfaction that the filed rates comply with this Opinion and Order.

6. That Philadelphia Electric Company shall comply with all other directives contained in this Opinion and Order which are not the subject of an individual directive in the preceding Ordering Paragraphs, as fully as if they were the subject of a specific Ordering Paragraph.

7. That except as herein granted, the exceptions of all parties to the Recommended Decision are denied.

8. That the several complaints filed by various parties to this proceeding, including those which were consolidated with Docket No. R-850152, are granted or denied consistent with this Opinion and Order.

9. That except as herein modified, the Recommended Decision of Administrative Law Judge Matuschak is adopted as the decision of this PUC.

10. That upon the filing of tariff revisions acceptable to the PUC as being in compliance with this Opinion and Order and upon PUC approval of the tariff revisions, the inquiry and investigation at Docket No. R-850152, et al., shall be terminated and the record marked closed."

The full text of the Orders entered on January 21 and June 27, 1986, as well as relevant portions of the PUC's accompanying Opinions have been attached hereto as Appendices C and D, respectively.

III. STATEMENT OF THE QUESTIONS INVOLVED

1. Was it not error and a violation of due process of law for the PUC to hold that its 1980 Investigation Order had finally determined that PECO's 1976 and 1978 Limerick 1 completion deferral announcements were imprudent despite a Pennsylvania Supreme Court determination to the contrary?

Answered in the negative by the PUC.

2. Was it not error for the PUC to hold that PECO's deferral announcements were imprudent without a reasoned analysis and substantial evidence to support such a conclusion?

Answered in the negative by the PUC.

3. Was it not error for the PUC to hold that PECO's deferral announcements caused a 27-month delay in Limerick completion and a $368.9 million increase in plant cost: 1) where the evidence decisively refutes this conclusion and there is no substantial evidence and reasoned supporting analysis that supports it; 2) where the Commission has further failed to recognize a substantial offsetting cost increase of $200 million due to increased financing costs had a 27-month earlier schedule been attempted; and 3) where unrefuted evidence establishes that a 27-month completion delay, even had it occurred, would not have increased costs borne by ratepayers?

Answered in the negative by the PUC.

IV. STATEMENT OF THE CASE

Philadelphia Electric Company ("PECO") is a regulated utility which provides electric, gas and steam service to the public in southeastern Pennsylvania and northeastern Maryland.[1/] The latest major addition to PECO's electric system is the Limerick Nuclear Generating Station Unit 1 ("Limerick 1").[2/] The decision to construct Limerick 1 was made in approximately 1970, and construction began on June 19, 1974 when a construction permit was received from the Atomic Energy Commission.

During the mid to late 1970's, PECO announced several deferrals in the projected completion dates for the plant. In September 1974, PECO announced that the projected completion date of April 1979 would have to be extended two years to April 1981. In May 1976, PECO again announced a deferral of two years, or until April 1983. In May 1978, a final two year extension to April 1985 was announced. Limerick 1 construction was completed and PECO received a low power license and commenced fuel loading

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1/ PECO's service territory encompasses 2,475 square miles and has a population of approximately 3.7 million. PECO's electric transmission system consists of 12 generating stations, of which 8 are wholly owned, plus combustion turbines, thousands of miles of transmission and distribution lines, and numerous substations and general facilities necessary for the supply of electric service. (PECO St. 14, pp. 4-5; R. ___).

2/ This unit is the first of a 2-unit nuclear plant situated on an approximate 600 acre site, most of which is located in Limerick Township, Montgomery County. Limerick 1 contains a 1055 Megawatt turbine generator designed to operate at 1,800 rpm and is served by its own nuclear steam supply system - a single cycle, forced circulation, boiling water reactor system ("BWR") (PECO St. 1, p. 4; R. ___).

on October 26, 1984, and the unit began commercial operation in February 1986.

In October 1980, the Pennsylvania Public Utility Commission (the "PUC" or "Commission") initiated an investigation principally to determine whether the continued construction of the Limerick Station was in the public interest (the "1980 Investigation"). In its final Opinion and Order in that proceeding, entered August 27, 1982, the PUC concluded that the construction of Limerick 1 was in the public interest and that it should be completed as quickly as possible. Re Limerick Nuclear Generating Station, 56 Pa. P.U.C. 47 (1982), aff'd, 501 Pa. 153, 460 A.2d 734 (1983). The PUC's Opinion also contained certain statements criticizing PECO's announcements of completion deferrals in 1976 and 1978 (the "1976 and 1978 deferral announcements"). (App. F, at 60-61).

On September 27, 1985, PECO filed Supplement No. 15 to its Tariff Electric - Pa. P.U.C. No. 26 to become effective November 27, 1985. Supplement No. 15 requested a net increase in rates designed to yield approximately $670.6 million in additional annual revenues, based upon a future test year ending June 30, 1986. The principal reason for the requested rate increase was to reflect the increased capital and operating costs, and decreased energy production costs, associated with Limerick 1 and 100% of Common Plant. In support of this filing, PECO presented extensive evidence demonstrating the need for Limerick 1 and the reasonableness of its cost.

The PUC instituted an investigation into the lawfulness, justness and reasonableness of the proposed rate levels at its

Public Meeting of October 31, 1985. Supplement No. 15 was thereafter suspended by operation of law for the seven-month period provided by Section 1308(d) of the Public Utility Code (66 Pa.C.S. §1308(d)), or until June 27, 1986. A total of 14 Complaints were filed against the proposed rate levels, all of which were consolidated with the PUC's investigation for purposes of hearing and decision.3/ On November 20, 1985, the PUC's Trial Staff filed a Motion in Limine which sought to preclude litigation of the reasonableness of PECO's 1976 and 1978 deferral announcements on the ground that these actions were found to be unreasonable by the PUC in the 1980 Investigation, and that this finding was conclusive in the rate proceeding under Section 316 of the Public Utility Code (66 Pa.C.S. §316).

The Administrative Law Judge ("ALJ"), at the December 20, 1985 hearing, granted the Motion in Limine and ordered that certain undefined testimony relating to the prudence of the deferral announcements would be stricken from the record (Tr. 1306-1375; R. _____). The ALJ's ruling was subsequently memorialized in a January 17, 1986 Memorandum Opinion and Order (R. _____). In response to a subsequent Motion to Strike filed by the Trial Staff, the ALJ issued an additional Order on March 10, 1986 which held that all evidence relating solely to the issue of the reasonableness of the 1976 and 1978 deferral

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3/ A Prehearing Conference attended by all active parties was held, followed by 33 days of evidentiary hearings and 4 public input sessions. The voluminous record in the investigation, which included over 170 written statements prepared by 79 witnesses, 5200 pages of transcripts and 217 exhibits, was closed on March 17, 1986, and Initial and Reply Briefs were filed thereafter.

announcements was stricken from the record. (R._____)

On December 26, 1985, PECO filed a Petition seeking interlocutory review by the PUC of the ALJ's ruling. The PUC entered an Order on January 21, 1986 (the "January 21 Order") granting interlocutory review pursuant to Section 5.302 of the PUC's Regulations (52 Pa.Code §5.302). The PUC affirmed the ALJ's ruling on the grounds that the PUC's prior criticism was a "finding" that PECO's 1976 and 1978 deferral announcements were unreasonable and that this finding was conclusive in this proceeding.4/ In its Initial Brief filed with the ALJ and its Exceptions filed with the PUC, PECO explicitly stated its disagreement with those rulings, that in its view no binding "findings" or "legal conclusions" as respects the prudency of the 1976 and 1978 deferral announcements were made in the 1980 Investigation Order and preserved its right to present this issue to this Court for appellate review (PECO Initial Brief, pp. 4-1

4/ On January 31, 1986, PECO filed a Motion with the PUC for certification of the January 21 Order for interlocutory appeal to the Commonwealth Court, pursuant to Section 5.633 of the PUC's Regulations (52 Pa.Code §5.633). Following the PUC's failure to act upon this Motion, on February 20, 1986, PECO filed a Petition for Review which requested that this Court assume Pa.R.A.P. Ch. 15 jurisdiction over PECO's interlocutory appeal. On March 6, 1986, the PUC adopted and entered an Order which denied PECO's Motion for Certification of the January 21 Order on the grounds that the conclusion of the January 21 Order was "clearly a conclusion and an issue which may be appealed in the normal course upon the issuance of the final Opinion and Order in the instant rate proceeding". On March 7, 1986, the PUC filed with this Court a Motion to Quash or Dismiss PECO's interlocutory appeal. In response, PECO filed a Motion with this Court on March 21, 1986 which noted that its right to appeal the PUC's January 21 Order was preserved until a final Order was issued and requested that its Petition for Review be discontinued. PECO's Motion was granted by this Court by Order dated March 26, 1986.

to 4-2; Exceptions pp. 8-9; R._____).

On May 14, 1986, the ALJ issued a Recommended Decision which found that PECO was entitled to $358 million of its proposed increase in rates (App. E, at 187).[5/] The PUC entered its final Order in the rate proceeding on June 27, 1986 (the "June 27 Order") approving the imposition of rate levels designed to increase total annual revenues by $351 million to be phased in over a three-year period. In reaching this decision, the PUC held that the 1976 and 1978 deferral announcements unreasonably increased the cost of Limerick 1 by $368.9 million and that PECO's rate base claim should be reduced by this amount (App. D, at 33-34). The effect of the Commission's action is to reduce PECO's revenues by approximately $80 million per year.

On July 25, 1986, Petitions for Review were filed by the Pennsylvania Office of Consumer Advocate ("OCA") and the University of Pennsylvania/Utility Users Committee, Inc., challenging PUC determinations respecting excess capacity and rate structure matters. The instant appeal was initiated by a Petition for Review filed by PECO on July 28, 1986. PECO's Petition seeks to set aside both the PUC's January 21 Order and that portion of its June 27 Order which disallowed a portion of PECO's investment in Limerick 1 as a result of the 1976 and 1978 deferral announcements.

5/ The Recommended Decision as originally issued was later discovered to contain calculation errors necessitating a correction in the additional revenue allowed which was issued May 15, 1986, to approximately $270 million.

V. SUMMARY OF ARGUMENT

A PUC Order is to be reversed where it is contrary to law, is unsupported by substantial evidence or violates constitutional rights. The two PUC Orders which are the subject of this appeal transgress upon each of these criteria, and in doing so impose a severe confiscation of PECO's property in violation of its constitutional rights, an injustice which demands correction by this Court.

The PUC held that PECO's decisions to announce deferrals in the completion of Limerick 1 had been found imprudent in a 1982 Order issued in an earlier, general investigatory docket. It denied PECO the right to submit testimony in the rate case docket to establish the prudence of those decisions. However, the 1982 Order clearly contains no imprudence findings or conclusions, the statements relied upon by the PUC having been specifically declared to be "mere advisory criticism" by the Pennsylvania Supreme Court. Moreover, that earlier investigation was noticed by the PUC as being but a general fact finding and not an adjudicatory investigation. The rendering of a final decision of imprudence in that proceeding, which denies PECO the ability to earn a return on or of a $368.9 million investment, violates due process of law.

If a determination was properly made in the 1982 Order, that determination is not supported by substantial evidence or necessary findings and reasoned analysis. The PUC's Order states that the deferral announcements were caused by financial constraints, but it attributes these financial difficulties to the magnitude of the construction program, an obvious non-

sequitur unless the PUC is saying that Limerick construction should have been terminated in 1976 or 1978. But there is no such finding by the PUC nor any recitation of facts to support such a finding. PECO presented unrefuted evidence in the proceeding that the plant's completion was both needed to meet service requirements and to provide low cost service. No opposing witness seriously proposed that Limerick 1 be cancelled in those years. Indeed, the PUC itself recognized that savings associated with completion of the unit existed, and that its completion was in the best interests of ratepayers. The PUC's 1982 analysis is a series of unreasoned contradictions, is not supported by substantial evidence and should be reversed by this Court.

The PUC held that the deferral announcements caused a 27-month delay in Limerick 1 completion and a $368.9 million cost increase. The PUC adopted a flawed schedule and quantification analysis whose many errors were admitted by the analysis' authors. The errors included a total failure to explain how admitted financial constraints could have been overcome. They also include a failure to reflect in the analysis the schedule and cost effects of actual construction events and NRC-imposed plant design changes which are not alleged to be imprudent and certain of which the PUC has affirmatively held to be prudent. The PUC has also simply ignored unrefuted evidence that even if a 27-month schedule delay occurred, that delay did not impose any additional costs upon ratepayers and that there would have been substantial additional financing related costs which would offset any savings from attempting a 27-month schedule advancement.

VI. ARGUMENT

The scope of this Court's review of an Order of the PUC is set forth in Section 704 of the Administrative Agency Law, 2 Pa.C.S. §704:

> "After hearing, the court shall affirm the adjudication unless it shall find that the adjudication is in violation of the constitutional rights of the appellant, or is not in accordance with law, or that the provisions of Subchapter A of Chapter 5 (relating to practice and procedure of Commonwealth agencies) have been violated in the proceedings before the agency, or that any finding of fact made by the agency and necessary to support its adjudication is not supported by substantial evidence."

See also, City of Philadelphia v. Pa. P.U.C., 73 Pa. Cmwlth. 355, 458 A.2d 1026, 1029 (1983); United States Steel Corp. v. Pa. P.U.C., 69 Pa. Cmwlth. 134, 139, 450 A.2d 1073, 1075-76 (1982).

A. The PUC's 1980 Investigation Order Does Not, And Cannot Consistent With Due Process, Contain A "Finding" Or "Legal Conclusion" That PECO's Deferral Announcements Were Imprudent.

The PUC's January 21 Order is predicated on the conclusion that the reasonableness of the 1976 and 1978 deferral announcements was the subject of a final and binding factual finding or legal conclusion in the 1980 Investigation (App. C, at 9-11). This conclusion is factually and legally incorrect.

1. A Legal Conclusion Or Finding Regarding The Reasonableness Of The Deferral Announcements Was Not Rendered In The 1980 Investigation.

First, the ALJ in the 1980 Investigation was clearly of the view that no binding determination on these issues would be made. After reviewing the facts presented by the parties, the ALJ concluded that a determination of the reasonableness of the deferral announcements should be made in the later rate proceeding in which Limerick cost recovery was claimed:

> "[T]his proceeding is a fact gathering one. For purposes here, it is sufficient to note that the decisions to postpone Limerick were, in part, the result of management's discretion as well as financial circumstances. In a subsequent proceeding consideration can be given to the extent to which these delays were caused by financial and other external constraints and the extent to which management's fear of Commission sanctions entered into these decisions. Such a proceeding would also be an appropriate forum to quantify the effects of these delays. Such a record does not exist at the present time." (App. G, at 54-55)

Indeed, the ALJ several times emphasized that the Investigation was initiated only "so that information can be gathered" and its sole purpose was "to gather facts for the Commission" (App. G, at 1 & 5). The ALJ further emphasized that the principal focus of the Investigation was upon whether construction of the Limerick Project should be continued (App. G, at 5-6).6/

6/ The ALJ had made similar statements respecting the nature of the proceeding at the prehearing conference prior to the initiation of hearings (P-H Tr., 12/10/80, pp. 3 & 27; R._):

> "The Commission, at its public meeting of October 9, 1980, decided that an investigation should be opened regarding (continued)

The ALJ's position derives from the following substantive passage from the Commission's October 10, 1980 Order initiating the Limerick Investigation:

> "We are opening this investigation proceeding so that information can be gathered in an orderly and expeditious manner, before PECO seeks to include Limerick in its rate base as used and useful property. This approach will enable us to proceed without the pressures of time associated with rate cases.
>
> We realize, of course, that Limerick is under construction and that it represents a major, and controversial undertaking by PECO. However, although we agree with the OCA that a Limerick proceeding should be opened, we do not agree that the Rule to Show Cause requested by the OCA is appropriate. We must first proceed to gather facts. We can then reach conclusions and enter whatever orders we deem to be appropriate."

In a subsequent Secretarial letter of November 12, 1980, the Commission, based upon a Motion by then Chairman Susan M.

> certain issues concerning the Limerick Nuclear Generating Station.
>
> The Commission, in its order, stated its desire that this investigation be held for the purpose of gathering information in an orderly and expeditious manner, without the time pressures associated with rate cases.
>
> The issues that the Commission wished addressed focus on the need for and economy of the Limerick plant as it affects the rates charged the Philadelphia Electric Company's customers. [The ALJ then continued to list the issues stated in the November 12, 1980 secretarial letter]...
>
> With respect to the filing of testimony in this case, I will just state initially that my view of this proceeding is that it is a fact finding one. I believe that facts can best be obtained in an atmosphere as non-adversarial as possible. I believe that concurrent filings can best achieve this end."

Shanaman presented at the Public Meeting of October 30, 1980, expanded and restated the issues to be addressed during the Investigation as follows (R._____):

> "That an investigation be and is hereby undertaken to determine the need for and economy of the Limerick Nuclear Generating Station. The investigation shall address, but not be limited to, the following issues:
> (a) The cost of construction delays at Limerick and whether those delays were reasonable.
> (b) The escalation of cost estimates for Limerick and whether those costs for the plant were reasonable.
> (c) The eventual impact of Limerick on PECO's capacity and reserve margins and the reasonableness thereof.
> (d) What alternatives PECO considered at the time the decision was made to build the plant and the projected cost of each alternative.
> (e) Could any currently available alternate sources of energy, conservation/load management activities, improvements in existing power plants' performance, etc. replace Limerick at a lower cost to the consumer assuming that:
> (1) expended costs are amortized over a reasonable period; or
> (2) expended costs are not amortized or collected from ratepayers; or
> (3) expended costs are shared among stockholders and ratepayers.
> (f) The potential of large electric consumers directly buying the capacity and/or energy associated with Limerick."

In its final Opinion and Order, the PUC similarly referred to the proceeding as "this fact finding investigation" and noted that its principal focus had been on whether continuation of the project was economically justified (App. F, at 49 & 62). Consistent with this fact finding focus, the deferral announcements are not mentioned in the PUC's Order (App.

F, at 67-68, 70-71), and are not mentioned in the summary of its findings and conclusions stated at the beginning of its Opinion (App. F, at 51). Each of these latter "findings" and "conclusions" and the entirety of the PUC's Order, relates to the need for and financial feasibility of Limerick 2 construction, and an alternative conservation program which the PUC directs be undertaken. Only in the body of its Opinion did the PUC discuss and criticize the deferral announcements, asserting that "PECO management did not exercise judgment sufficient to meet our reasonable man standard" (App. F, at 61). This criticism, however, is stated as a mere "opinion", and not as a "finding" or "conclusion".

Recognizing that some party might in the future attempt to ascribe conclusive effect to the PUC's criticism, PECO specifically appealed that portion of the PUC's Opinion to the Pennsylvania Supreme Court. PECO explained the purpose for this appeal as follows:

> "It is PECO's position that this Honorable Court should likewise decline to review these determinations, because the PUC's statements and directive do not constitute a final adjudication and have no res judicata effect. PECO does request that this Court, unlike the Commonwealth Court, expressly hold in its Order that each of these determinations is at present not reviewable and without res judicata effect. An explicit statement to this effect is essential to avoid future pointless controversy over the meaning of these statements....
>
> Clearly, the PUC's criticisms of PECO's 1976 and 1978 deferral decisions are not presently reviewable. The PUC has neither determined whether PECO should be penalized for its actions nor what the form or magnitude of any such penalty should be. Rather, it has explicitly held that the controversy is not ripe for its decision, much less that of this

Court. The PUC has thus not rendered a final judgment as to any legally cognizable matter." (PECO S.Ct. Brief, pp. 68, 70-71; R. ___) (emphasis added).

In response to PECO's argument (i.e., as first presented to the Commonwealth Court), the PUC expressly noted in its Brief before the Supreme Court that neither an adjudication nor any conclusive finding or determination had been made:

> "The PUC further agreed with the ALJ that this proceeding was not appropriate for resolving the total amount of the increases in the construction costs brought on by the delays, or for determining whether or not PECO could later recover those increases.... The PUC also reserved judgment on PECO's right to recover the costs of delay-induced increase until PECO actually seeks reimbursement in a subsequent proceeding." (Commission S.Ct. Brief, pp. 11-12; R. ___) (emphasis added).7/

Based on the PUC's representations, the Supreme Court characterized this portion of the PUC's Opinion as follows:

> "[T]he opinion accompanying the PUC's order contained criticism, of an advisory nature, directed at PECO's decisions in 1976 and 1978 to defer completion of the Limerick facilities. Such mere criticism, however, does not constitute an adjudication and cannot be reviewed on appeal." Pa. P.U.C. v. PECO, 501 Pa. 153, 460 A.2d 734, 739 n.7 (1983).

"Mere criticism" which is "of an advisory nature," and where no mention of the subject matter is made in the PUC's Order

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7/ It should be noted however, that the PUC's Brief inconsistently speaks of its statements respecting the deferral announcements as "findings". More significantly, it also states that its position on this issue is identical to the ALJ's, though the ALJ expressly stated that he was making no final determination (Commission S. Ct. Brief, pp. 11, 76-77; App. G, at 54-55). Indeed, the PUC's Order itself recognizes this fact, stating that: "[T]he ALJ concluded that PECO's 1974 delay was reasonable and that the 1976 and 1978 delays may have been unreasonable." (App. F, at 59) (emphasis added).

or its own explicitly stated summary of its "findings" and "conclusions", does not constitute a legal conclusion or finding as to which conclusive effect can be given. The Court should note that, as described in Section B-1, infra, a utility is entitled to recover only prudently incurred costs. Accordingly, when the PUC's Brief to the Supreme Court, states that it has not determined "whether or not PECO could later recover the costs of delay" nor "PECO's right to recover the costs of delay induced increase", it admits that no prudency finding or conclusion has been made. Thus, the Supreme Court expressly found that a final determination or finding as to the reasonableness of the 1976 and 1978 deferral announcements was not made. Indeed, the only final adjudication regarding those announcements was the Supreme Court's conclusion that the PUC's discussion of this issue was not a finding or legal conclusion.

In an attempt to circumvent the Supreme Court's determination, the PUC now asserts that its criticism of the 1976 and 1978 deferral announcements is conclusive and binding because the 1980 Investigation was essentially a bifurcation of the current rate proceeding. This argument, which was raised for the first time during oral argument on the Motion in Limine, sua sponte by the ALJ, is clearly incorrect. A "criticism" is not converted to a "finding" by alleging bifurcation. Moreover, no notice was ever given of an intent to bifurcate the deferral announcement issue, i.e. by determining prudence in the 1980 Investigation and quantification in the subsequent rate case; nor were procedures to effectuate bifurcation established in the October 10 Order or the November 12 Secretarial Letter.

The PUC's October 10 Order and November 12 Secretarial Letter initiating the 1980 Investigation list a number of issues as to which the PUC states that the Investigation will serve to gather facts. They do not define issues to be conclusively resolved in the Investigation or to be saved for the rate proceeding, nor do they set up procedures for the implementation of such an issue bifurcation (R. ___).[8/] It would be fundamentally unfair and a violation of due process to adopt after the hearing and argument process is completed, a procedure for conclusively determining certain issues but not others within the context of a general fact finding investigation.

2. Section 316 And The Doctrines Of Res Judicata And Collateral Estoppel Are Not Applicable To Mere Advisory Criticism.

The PUC also seeks to apply Section 316 of the Public Utility Code to support its position. Section 316 deals with the effect to be given a PUC "finding, determination or order in separate proceedings." However, under general principles of administrative agency law, it is well-established that an agency determination or order is the equivalent of an adjudication. See

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8/ During oral argument on the Trial Staff's Motion, a concern was raised that, if PECO's position were adopted, the 1980 Limerick Investigation would be rendered meaningless (Tr. 1332-1335; R. __). There is simply no basis for this view. The 1980 Limerick Investigation was conducted principally to determine whether the Limerick Station should be completed, and based upon the record developed in that proceeding the PUC made an adjudication that Limerick 1 should be completed and that Limerick 2 construction should be temporarily suspended (App. F, at 67). A clearly lesser function of the 1980 Limerick Investigation was to begin gathering facts in preparation for the Limerick 1 base rate proceeding. These efforts had the beneficial effect of fully defining the deferral issues and focusing the parties presentations in the rate case.

2 Pa. C.S. §§101, 504; Allegheny Ludlum Steel Corp. v. Pa. P.U.C., 501 Pa. 71, 459 A.2d 1218 (1983); Schanz v. Bureau of Corrections, 52 Pa. Cmwlth. 300, 415 A.2d 978 (1980). Likewise, an administrative finding refers to formal agency action which resolves a particular matter, and such findings comprise and are made through an agency's adjudication. See 2 Pa. C.S. §507; Mack Trucks, Inc. v. Unemployment Comp. Bd. of Review, 77 Pa. Cmwlth. 74, 465 A.2d 87 (1983); Tate v. Antosh, 3 Pa. Cmwlth. 144, 281 A.2d 192 (1971); Thomas v. Unemployment Comp. Bd. of Review, 144 Pa. Super. 369, 19 A.2d 488 (1941). In view of the Supreme Court's holding that an adjudication was not issued, the PUC clearly has not rendered a "finding" or "determination" within the meaning of Section 316. As described above, the PUC's Order does not address the deferral announcements.

Moreover, it has been repeatedly held that Section 316 can be applied only to preclude collateral attack of a final, appealable PUC Order where a party has failed to properly exercise its right to appeal the matter at issue. See, e.g., Allegheny Steel Co. v. N.Y. Cent. R. Co., 324 Pa. 353, 188 A. 322 (1936); N.Y and Pa. Co. v. N.Y. Cent. R. Co., 281 Pa. 257, 126 A. 382 (1924), rev'd on other grounds, 271 U.S. 124 (1926); City of Erie v. Pa. P.U.C., 60 Pa. Cmwlth. 106, 430 A.2d 1037 (1981); Philadelphia Suburban Water Co. v. Dept. of Transp., 36 Pa. Cmwlth. 8, 387 A.2d 501 (1978); accord, Pa. Petroleum Ass'n v. Pa. Power and Light Co., 32 Pa. Cmwlth. 19, 377 A.2d 1270 (1977), aff'd., 488 Pa. 308, 412 A.2d 522 (1980); York Teleph. and Teleg. v. Pa. P.U.C., 181 Pa. Super. 11, 121 A.2d 605 (1956). Since PECO has exercised its right to appeal and the Supreme Court has

held that the PUC's discussion of the deferral announcements are mere advisory criticism only, Section 316 does not apply.

Finally, a review of the above cases indicates that Section 316 merely codifies the doctrines of res judicata and collateral estoppel, which doctrines are relied upon by the PUC as the final basis for its January 21 Order. An essential requirement for each of these doctrines, and thus also for Section 316, is that a prior final adjudication on the merits must have been rendered. Where a controversy is not the subject of a final Order and is thus not ripe for appellate review, there can be no res judicata or collateral estoppel effect. See, e.g., Lawlor v. Natural Screen Serv. Corp., 349 U.S. 322 (1955); Bearoff v. Bearoff Bros., Inc., 458 Pa. 494, 327 A.2d 72 (1974); Gallery v. Municipal Authority, 432 Pa. 307, 243 A.2d 385 (1968); Safeguard Mut. Ins. Co. v. Williams, 463 Pa. 567, 345 A.2d 664 (1975); Schuback v. Silver, 461 Pa. 366, 336 A.2d 328 (1975); Fincher v. Middlesex Twp., 64 Pa. Cmwlth. 355, 439 A.2d 1353 (1982); Restatement (Second) of Judgments §27 (1982). Since the Supreme Court held that a final and appealable order or adjudication was not rendered as respects the deferral announcements, res judicata, collateral estoppel and Section 316 clearly have no application.

In its January 21 Order, the Commission, nonetheless, concludes that §316 is applicable as follows (App. C, at 10):

> "The Supreme Court's mention of the subject findings regarding the prudence of the 1976 and 1978 construction delays was, at most, mere dicta. We interpret the Court's language as merely a recognition by the Court that since no rate claims had been made for the Limerick Generating Unit No. 1 and that since the Commission could not quantify the

> rate aspects of such a claim at that time, the matter was not appealable. However, regardless of our interpretation of footnote 7, it is clear that the Court did not modify the subject findings, and it did not adjudicate any issue regarding the findings. Simply stated, it is as if the findings issue had never been before the Court. Therefore the factual findings are conclusive on the parties because they have not been disturbed on appeal."

This conclusion is in error. It is correct that the Supreme Court affirmed the Commission's adjudication respecting the need for, economics and financial infeasibility of concurrent Limerick 1 and 2 construction, which, as described above, was the matter to be "determined" by the Investigation under the November 12 Secretarial Letter and which was the sole matter addressed in the Commission's Order and in its summary of "findings" and "conclusions". However, the Supreme Court did not ignore the Commission's criticism of the 1976 and 1978 deferral announcements. Rather, at the specific request of PECO and consistent with the Commission's own characterization of its statements in its Brief to the Court, the Supreme Court explicitly and deliberately established the import of these statements as mere "advisory criticism". "Advisory criticism" cannot constitute a "finding", and clearly cannot be held to be a binding "legal conclusion" or "finding" under Section 316 or otherwise, on a matter with an import of $368.9 million. The Court's failure to review or modify the Commission's statements about the deferral announcements is entirely the result of its determination that they are not "findings" or any other legally cognizable form of determination.

3. The PUC's January 21 Order Causes A Violation Of Due Process Of Law.

Acceptance of the PUC's prior "criticism" of the deferral announcements as a final and binding determination of this issue in the rate proceeding constitutes a denial of due process of law. Due process requires notice that a specific issue will be finally resolved in a proceeding, an opportunity to be heard prior to such final resolution and a final resolution based on appropriate evidence and reasoning. These fundamental due process rights were explained in Smith v. Pa. P.U.C., 192 Pa. Super. 424, 432, 162 A.2d 80, 84 (1960), as follows:

> "Those who are brought into contest with the Government in a quasi-judicial proceeding aimed at the control of their activities are entitled to be fairly advised of what the Government proposes and to be heard upon its proposals before it issues its final command."

See 2 Pa. C.S. §§101, 504; Morgan v. U.S., 304 U.S. 1, 58 S.Ct. 773 (1938); Allegheny Ludlum Steel Corp. v. Pa. P.U.C., 501 Pa. 71, 459 A.2d 1218 (1983); Duquesne Light Co. v. Pa. P.U.C., ___ Pa. Cmwlth. ____, 507 A.2d 433 (1986); Schanz v. Bureau of Corrections, 52 Pa. Cmwlth. 300, 415 A.2d 978, 982 (1980).

As the PUC did not render a finding or legal conclusion on the prudence of PECO's deferral announcements in its 1982 Order, and as it refused to review the evidence and render such a determination in the rate case, the PUC has never rendered a due process determination on this matter despite its having denied PECO recovery of a return of and on $368.9 million of Limerick investment. Clearly, this constitutes an extreme confiscation of property and violation of due process of law (see discussion Section B-1 infra).

The PUC's effort to recharacterize the 1980 proceeding also violates due process. In its October 10, 1980 Order initiating the Investigation, as amended by Secretarial Letter dated November 12, 1980, the PUC stated that the primary purpose of the Investigation was to "determine the need for and economy of the Limerick Nuclear Generating Station," and was only secondarily to gather information in order to facilitate a future determination of the reasonableness of Limerick costs when claimed in a future rate proceeding. In other words, the PUC's notice to the parties of the scope of the Investigation limited the proceeding as to the deferral announcements to a fact gathering function. The ALJ's Initial Decision, the PUC's position on appeal, and the Supreme Court's decision demonstrate beyond any doubt that the PUC was merely gathering facts and that only in a future proceeding would both the prudency and the quantification of the delays be determined.

The PUC's belated bifurcation theory attempts to transform this preliminary fact-gathering investigation into a final determination or adjudication. Several appellate courts have recognized the clear distinction between a fact-gathering investigation and an adjudication. For example, in Atchison, T.& S.F. Railway Co. v. Kansas Comm. on Civil Rights, 215 Kan. 911, 529 P.2d 666, 673 (1974), the Kansas Supreme Court explained:

> "It is important to distinguish between an 'Investigation' and a 'hearing' or 'adjudication.' The term 'hearing' is appropriate to quasi-judicial proceedings while 'investigation' is appropriately used with regard to nonjudicial functions of an administrative agency and the seeking of information for future use rather than proceedings in which action is taken against someone. An

> 'investigation' is nonadversary and contemplates a procedure much less formal and more flexible than applies even to an administrative hearing." (citations omitted).

Accord Hannah v. Larche, 363 U.S. 420, 80 S.Ct. 1502, 1515 (1960); Bowles v. Baer, 142 F.2d 787, 788-789 (7th Cir. 1944).

Thus, it is fundamentally unfair and a denial of due process to apply criticisms from a fact-finding investigation to preclude later adjudication of an issue. The Supreme Court has expressly stated that PECO was not afforded an adjudication on the prudency of its deferral decisions in the 1980 Investigation. Due process clearly requires that PECO should have been permitted its constitutional right to a full adjudication in the current rate proceeding. See Norwood v. Pennsylvania State Horse Racing Commission, 16 Pa. Cmwlth. 219, 328 A.2d 198, 204 (1974).

B. The PUC's Asserted Determination That PECO's Deferral Announcements Were Imprudent Is In Error.

1. The Prudence Standard.

Pennsylvania appellate courts have held that the PUC cannot deny recovery of an expense or return upon a capital investment absent a finding, based upon record evidence, that the utility's management abused its discretion and that this abuse caused the utility to incur an unreasonable cost.9/ These

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9/ This principle was not overturned by the Court's decision in Duquesne Light Co. v. Pa. P.U.C., ___ Pa. Cmwlth ___, 507 A.2d 1274 (1986). In that case, the utilities were provided an opportunity to recover all their costs prospectively. The PUC merely established a pricing mechanism whereby the cost of coal produced from the utilities' affiliated mine was included in rates at a level that was normalized relative to the prevailing market price for comparable coal supplies.

requirements were succinctly expressed by this Court in Metropolitan Edison Co. v. Pa. P.U.C., 62 Pa. Cmwlth. 460, 467, 437 A.2d 76, 80 (1981):

> "The PUC's authority to interfere in the internal management of a utility company is limited. [citations omitted]. The PUC is not empowered to act as a super board of directors for the public utility companies of this state . . .
>
> "It is also fundamental that the PUC has an ongoing duty to protect the public from unreasonable rates while insuring that utility companies are permitted to charge rates sufficient to cover their costs and provide a reasonable rate of return. Commonwealth v. Duquesne Light Co., 469 Pa. 415, 366 A.2d 242 (1976). Recognizing the PUC's duty to the public and the utility's right of self-management, our courts adopted the further proposition that it is not within the province of the PUC to interfere with the management of a utility unless an abuse of discretion or arbitrary action by the utility has been shown." Accord Nat'l Fuel Gas Distr. Corp. v. Pa. P.U.C., 76 Pa. Cmwlth. 102, 128-134, 464 A.2d 546, 559-561 (1983).

This "prudence" standard has been a fundamental principle of utility ratemaking for decades. In Missouri ex. rel. Southwestern Bell Telephone Co. v. Missouri Public Service Commission, 262 U.S. 276, 289 (1923), Justice Brandeis stated:

> "The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown." (dissenting opinion), (emphasis added).

The prudence standard requires the PUC to assess the reasonableness of utility management's decision-making based on

the information available at the time decisions had to be made, and without reliance upon after-discovered facts. Hindsight is prohibited. City of Pittsburgh v. Pa. P.U.C., 370 Pa. 305, 319, 88 A.2d 59, 64 (1952) ("... no abuse of discretion ... can be inferred based solely upon hindsight"); Nat'l Fuel Gas Dist. Corp. v. Pa. P.U.C., supra, 76 Pa. Cmwlth. at 128, 464 A.2d at 559.

Closely allied to this prohibition against hindsight is the prudence standard's rejection of an "outcome" test, which would find imprudence merely because an intended result was not achieved. Prudence is different from perfection of action, and reliance upon the latter is entirely contrary to proper application of the prudence standard. UGI Corp. v. Pa. P.U.C., 49 Pa. Cmwlth. 69, 87, 410 A.2d 923, 932 (1980); Park Towne v. Pa. P.U.C., 61 Pa. Cmwlth. 285, 301, 433 A.2d 610, 618 (1981). In reviewing the prudence of a particular investment, a utility is presumed to have acted in good faith and to have exercised reasonable and prudent judgment absent substantial evidence to the contrary. Southwestern Bell, supra, 262 U.S. at 289; West Ohio Gas Co. v. Public Utilities Comm'n, 294 U.S. 63, 72 (1935); Alabama Public Service Comm'n v. Southern Bell Tel. & Tel. Co., 253 Ala. 1, 42 So.2d 655, 674 (1949); Boise Water Corp. v. Idaho Public Utilities Comm'n, 99 Idaho 158, 578 P.2d 1089, 1091 (1978); City of Norfolk v. Chesapeake & Potomac Teleph. Co., 192 Va. 292, 64 S.E.2d 772 (1951).

The PUC recently defined the components of the prudence standard, and, in so doing, strictly adhered to the long-established principles described above:

> "Prudence is that standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made. In determining whether a judgment was prudently made, only those facts available at the time judgment was exercised can be considered. Hindsight review is impermissible.
>
> Imprudence cannot be sustained by substituting one's judgment for that of another. The prudence standard recognizes that reasonable persons can have honest differences of opinion without one or the other necessarily being 'imprudent'. (Emphasis in original). (R.D., pages 6-7)." Pa. P.U.C. v. Philadelphia Electric Co., Energy Cost Rate No. 8, 70 PUR4th 568, 574 (1985).

Where a particular investment in property devoted to the public service is prudent, a utility is entitled to an opportunity to earn a fair return on this investment. Failure to allow such fair return is unlawful confiscation of utility property, and cannot be upheld. See, e.g., Ben Avon Borough v. Ohio Valley Water Co., 271 Pa. 346, 114 A. 369 (1921); Keystone Water Co. - White Deer District v. Pa. P.U.C., 19 Pa. Cmwlth. 292, 339 A.2d 873 (1975) aff'd, 477 Pa. 594, 385 A.2d 946 (1978); Beaver Valley Water Company v. Pa. Pub. Serv. Comm'n, 76 Pa. Super. 255, aff'd, 271 Pa. 385, 114 A. 373 (1921). See also Alabama Power Co. v. Alabama Pub. Serv. Comm'n, 422 So.2d 767 (Ala. 1982).

In the 1980 Investigation Order, the PUC expressly acknowledged the limits imposed by the prudency standard on its ability to disallow PECO's investment in the Limerick project (App. F, at 58-59). As will be described below, the PUC has nevertheless entirely failed to apply or has improperly applied the standard in this case.

2. The PUC's Asserted Determination That The Deferral Announcements Were Imprudent Is Not Supported By Reasoned Analysis Based Upon Substantial Evidence.

The Commission's opinion in the 1980 Investigation contains the following discussion regarding the 1976 and 1978 deferral announcements (App. F, at 60-61):

> "Turning to the 1976 and 1978 extensions, we note that at the time of these decisions, PECO had two and four years of additional information indicating that the decline in demand was continuing, and, despite increases in rates approved by us, further deterioration of PECO's financial condition had occurred.
>
> The ALJ has found that the 1976 postponement was 'made without careful analysis of the impact of such delay on ratepayers' and that '[c]ustomers should not be expected to pay for delay which results [from] a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest.' To the ALJ's finding of imprudence PECO has excepted, arguing that the Initial Decision fails to provide an assessment of the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion, in addition to disregarding the evidence of PECO's precarious financial condition during the 1974-80 period and evidence that the reduced load growth permitted delaying completion of Limerick without threatening service reliability.
>
> It appears, from the record before us, that PECO's 1976 and 1978 construction delays were caused by PECO's financial difficulties, which in turn were caused by its ambitious construction program and its ever decreasing load growth; conditions similar to those causing the 1974 delay. While it is true that PECO's financial condition deteriorated from its 1974 levels, we are of the opinion that, at the least, PECO's ambitious construction plans exacerbated its financial difficulties. We are convinced that PECO's financial difficulties, proffered as a reason for delaying construction, would have been less acute if construction at Limerick had been terminated.

PECO now argues that one of the prime considerations in delaying construction was a continued reduction in PECO's load growth. Although PECO's spring 1976 load forecast projected a lower load growth than earlier anticipated, it appears that even this projection was overly optimistic. We note that in PECO's 1977-78 rate proceeding, PECO reduced its forecasted growth rate from 5% to 3%. Pennsylvania Public Utility Commission v. Philadelphia Electric Company, 52 Pa. P.U.C. 772, 31 PUR4th 15 (1979). Apparently, this 1978 reduction was an acknowledgement that the trend evidenced in 1974 was continuing. Despite this now obvious trend, PECO delayed construction in the hope that load would improve.

PECO's final argument, that the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion favored delay, is unpersuasive. We find that argument curious in light of the fact that PECO stresses that, because load growth has declined, the Limerick Units' main purpose is to replace oil fired generating capacity. If Limerick can be economically justified when compared to a combination of alternative sources of power and the retirement of oil fired plants, which by now have been extensively depreciated, the relative benefit to current ratepayers would have been greater if the oil capacity, and their associated costs, had been retired earlier by way of compressing rather than expanding the construction schedule. Further, as the nation as a whole experienced a period of double digit inflation and rising interest rates, delaying the necessary financing did and will continue to increase the ultimate costs of the plant financing.

Considering the foregoing, we are of the opinion that PECO management did not exercise judgment sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976 and 1978." (emphasis added).

In its January 21 Order (App. C, at 7-9), the PUC reiterated the above quotation as the basis of its asserted determination that the 1976 and 1978 deferral announcements were imprudent. It is essential to analyze this language carefully.

Note that it recites the ALJ's comments, but does not adopt them.10/ Indeed, as described in footnote 7 supra, the PUC expressly recognizes that the ALJ made no imprudency determination. A discussion of the errors in the ALJ's comments as respects the announcements is nevertheless provided in Appendix A. The PUC acknowledges that PECO's deferral announcements were caused by financial difficulties assertedly resulting from its "ambitious" construction program and declining load growth. No determination of imprudence is evidenced by these comments.

The first negative suggestion is the expressed conviction that the financial difficulties would have been less acute if Limerick construction had been terminated. One can

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10/ Pennsylvania law clearly requires that a PUC imprudency determination be reviewed only on the "express terms" of the Commission's order. National Fuel Gas Distribution Corp. v. Pa. P.U.C., supra, 464 A.2d at 562. Thus, the ALJ's findings, which were not expressly adopted by the PUC, cannot form the basis for the latter's imprudency determination and cannot be considered by this Court in reviewing the Commission's Order. However, to assure that the Court is thoroughly advised of the facts related to this proceeding, PECO has provided in Appendix A a discussion of the errors in the ALJ's statements on this subject, even though such statements are not relevant to a review of the PUC's Order. Further, and as noted above, the ALJ was absolutely clear in stating that his criticisms of PECO's decisions did not constitute a "final decision" of imprudency (App. G, at 54-55):

> "Trial Staff, although arguing that some adjustment is warranted as a result of PECO's decision to postpone Limerick in 1976 and 1978, recommends that no final decision on this subject be made by the Commission... I agree with Trial Staff that any decision now would be advisory only. This Commission cannot bind the future Commission that must decide PECO's claim for rate base treatment of these plants when they become commercially operable. Further, this proceeding is a fact gathering one".

hardly argue with this conclusion, but it establishes no basis for an imprudence finding, absent evidence and findings that Limerick should have been terminated. The opinion, order and record are devoid of any such finding. Indeed, the need to complete Limerick 1 is at the heart of the PUC's opinion.11/ Further, unrefuted evidence that this need was equally as great in 1976 and 1978, is described below. Also, the PUC itself makes the same decision in 1982 and as to Limerick 2, as did PECO as to the entire Station in 1976 and 1978, i.e. that in light of its economic benefits and need to meet service requirements, deferral is an appropriate alternative course of action in the face of recognized financial constraints.

The next paragraph deals with the decline in PECO's load growth and its impact on the deferral announcements. But the paragraph provides no imprudence determination. Declining load growth was a fact faced by PECO and all other electric companies in the late 1970's (PECO Ex. 37, Tab 5, pp. 17-21; App. F, at 60; R. ___). Moreover, what could be more sensible or prudent than

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11/ The PUC states:

> "As of this point in time, customer savings associated with the completion of the units still do exist, albeit smaller in magnitude than if the original construction schedules had been adhered to....
>
> In reaching this conclusion [i.e. that Limerick 1 construction should be 'timely' completed], we are driven by the desire to retain for ratepayers the lower future revenue requirements and customer savings which both the Company and the OCA have identified in their various computer models relative to any plausible alternative, including continued reliance on fossil fuel fired capacity." (App. F, at 67-68)

to avoid financial disaster by announcing deferral of capital attraction for completion of a generating unit which would not be needed at an earlier date (PECO Ex. 37, Tab 6, pp. 8-13; R. ___). The PUC does not refute this logic. Indeed, it urged PECO in the same Order to defer completion of Limerick 2 for precisely the same reasons.12/

The last paragraph is a strange amalgam of economic comment, much of it based upon facts developed long after 1976 and 1978. The entire concluding discussion about Limerick 1 as an economic replacement for oil reflects conditions in the oil markets prevalent from 1979 to 1982, not in 1976 and 1978. (PECO Ex. 37, Tab 6, p. 14; Tab 5, pp. 23 & 27; T.S. Ex. 41, pp. 2-3; R. ___) The opening sentence simply says the PUC is unpersuaded by PECO's view that ratepayers would benefit by not having a plant on line before it was needed. The PECO view reflected historic utility thinking (PECO Ex. 37, Tab 6, p. 10; R.___). But even if the PUC in 1982 was unpersuaded, that is not an imprudence finding.13/

12/ In fact, the PUC relies upon the same financial concerns as expressed by Mr. Paquette in his testimony and cross-examination as necessitating the 1976 and 1978 deferral announcements. Mr. Paquette specifically testified that PECO's financial condition in 1974 and 1976 was at least as poor, and in some respects worse, than its financial condition in 1982, upon the basis of which the PUC required the temporary suspension of Limerick 2 construction (PECO Ex. 37, Tab 19, Tr. 523-526; R. ___). Mr. Paquette reiterated this financial comparison in the 1986 record, providing numerous Company financial indicators for 1976, 1978 and 1982. (PECO St. 3, pp. 37-39 and Table 16; R. ___). This testimony, however, was excluded from consideration by the PUC pursuant to the January 21 Order (see note 18 infra).

13/ The burden of additional depreciation expense associated with oil units whose life was extended by the deferral (continued)

Section C of this Brief covers the Commission's conclusion that the 1976 and 1978 deferral announcements caused a 27 month delay in completion and a $368.9 million increase in plant cost. But such a conclusion is totally inconsistent with an opinion that PECO's deferral announcements were caused by financial difficulties which would have been less acute if construction had been terminated. As will be described in Section C, the PUC provides no findings or reasoning as to how PECO would overcome its PUC recognized financial difficulties to complete the project 27 months earlier. The PUC simply never addresses this issue.14/

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decisions, cited by the PUC, is simply nonexistent. First, the capital costs and thus depreciation expense associated with those units is very small. (PECO Ex. AW-2; R. ___). Second, under PUC ratemaking principles of the period, PECO would have been permitted to recover its unrecovered original cost through an amortization allowance from ratepayers even had the units been retired early. See Pa. P.U.C. v. Western Pa. Water Co., 53 Pa. P.U.C. 81, 28 PUR4th 87 (1979); Pa. P.U.C. v. PECO, 54 Pa. P.U.C. 220, 239 (1979); UGI Corp. v. Pa. P.U.C., 49 Pa. Cmwlth. 69, 410 A.2d 923, 930-31 (1980). The PUC comment respecting "double digit inflation" and "rising interest rates" is also irrelevant to any imprudency determination. These events, which resulted in part from the Iranian Oil crisis, from national and world economic conditions and from specific Federal Reserve policies during the period 1979 to 1982 were clearly not forseeable by PECO in 1976 and 1978. Accordingly, it would be impermissable hindsight to employ them as the basis of an imprudency determination.

14/ The only testimony presented in the record which suggested that PECO could have attracted more capital was by Trial Staff (T.S. Ex. 41, pp. 106-119; R. ___). However, PECO demonstrated that the amount of capital which could be attracted employing Trial Staff's program was small and not nearly sufficient to permit any significant advancement in Limerick construction (PECO Ex. 37, Tab 14; R. ___). In its Order, the PUC, as does the ALJ, describes both PECO's and Trial Staff's evidence, without adopting the Trial Staff position. Indeed, given the PUC's conclusion that "financial constraint" was the cause of the deferral announcements, Trial Staff's position was clearly rejected.

Such inconsistent and conflicting reasoning and findings are clearly not a supportable basis for affirmance of a PUC Order. In National Fuel Gas Dist. Corp. v. Pa. P.U.C., supra, the Commission held that a utility was imprudent for purchasing synthetic natural gas, when less expensive alternatives were available. 464 A.2d at 557. This Court reversed, holding that the Commission could not simply point to alternatives to allegedly imprudent action, but was required to provide detailed findings and conclusions demonstrating why the chosen course was imprudent and the alternatives prudent, given conditions knowable at the time the decisions were made. 464 A.2d at 555-563. The Court relied on §703 (e) of the Public Utility Code, 66 Pa. C.S. §703(e).15/ The Court declared that remand to the Commission was required

> "where the adjudication subject to review is insufficiently detailed to permit the Court to assess the sufficiency of the evidence to support the Commission's findings and to evaluate the Commission's resolution of the controverted legal issues ... A remand is also required in cases involving the Commission's exercise of its discretion where the Commission's statement of what it believes to be the controlling facts is inaccurate or inadequately supported by the record even if the erroneous statement is arguably gratuitous and is unnecessary to support the decision. Philadelphia Suburban Water Co. v. Pa. PUC, 425 Pa. 501, 511, 229 A.2d 748, 752 (1967)."

This requirement has repeatedly been invoked by this Court in remanding PUC imprudency determinations. For instance,

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15/ "After the conclusion of the hearing ... the Commission shall make and file its findings and order with its opinion, if any. Its findings shall be in sufficient detail to enable the Court on appeal, to determine the controverted question presented by the proceeding, and whether proper weight was given to the evidence."

in Park Towne v. Pa. PUC, supra, the PUC's disallowance of a portion of PECO's investment in the Salem 1 nuclear plant was reversed and remanded because the Commission had failed to provide detailed findings as to the precise cost items which had resulted from imprudence, and a thorough description of the considerations leading to the imprudency determination. See also UGI Corporation v. Pa. P.U.C., supra; Noerr Motor Freight v. Pa. P.U.C., 180 Pa. Super. 62, 118 A.2d 248 (1956); Pa. P.U.C. v. Commonwealth, Dept. of Transportation, 18 Pa. Cmwlth. 165, 335 A.2d 541 (1975), appeal after remand, 21 Pa. Cmwlth. 415, 346 A.2d 376.16/

While the absence of any finding that Limerick 1 should have been cancelled should be dispositive of the issue here, it may be worth noting that this record would not have sustained such a finding in any event. PECO witness Boyer testified that, during the period 1974 to 1978, "the Company has continuously conducted such analyses [i.e. comparative generation economics studies.]" As Mr. Boyer explained (PECO Ex. 37, Tab 4, p. 5; R. ___):

16/ This requirement is also mandated under the Administrative Agency Law, 2 Pa. C.S. §507:

> "Where an administrative agency, pursuant to delegated power, promulgates an order, definitive, basic findings of fact are essential to the validity of its action, and such findings must be sufficiently specific to enable the court in reviewing that action to pass upon questions of law ... Failure to make the requisite findings is a violation of due process." Begis v. Industrial Board, 9 Pa. Cmwlth. 558, 308 A.2d 643, 646, (1973). See also McKinley v. State Board of Funeral Directors, 5 Pa. Cmwlth. 42, 288 A.2d 840 (1972); D'Anjolell v. State Board of Funeral Directors, 3 Pa. Cmwlth. 64, 280 A.2d 123 (1971); Water and Power Resources Board v. Jones, 70 Dauph. 284 (1957).

"At least one review of the comparative economics of nuclear and fossil generation was made in each of the years 1974, 1975, 1976 and 1977. Both oil and coal-fired generation were compared to nuclear. The analyses were both prospective (i.e. comparing Limerick or generic nuclear to a hypothetical coal plant for installation in the same time period) and retrospective (i.e. comparing experienced Peach Bottom costs with costs from a hypothetical coal unit installed in place of the Peach Bottom nuclear units). Each of these studies indicated that nuclear capacity was more economic than fossil for both present and future service periods."

Mr. Boyer also presented studies and statements by independent organizations, including the National Academy of Science, the Department of Energy and others, each of which concluded that the economic benefits of nuclear energy exceeded that of fossil plants as measured during the 1974 to 1980 time period (PECO Ex. 37, Tab 4, p. 5 & Tab 11, pp. 10-12; R. ___).

As opposing parties will hasten to point out, the above studies establish that a nuclear plant is the preferred generation alternative on economic grounds, but only if additional generating capacity is required. PECO witness Kasum addressed this need issue and explained (PECO Ex. 37, Tab 5, pp. 23 & 24; R. ___):

"Limerick has remained necessary to supply the forecast annual peak demands even though forecasts have been continually reduced. Tables VI, VII and VIII show the 1974, 1976 and 1978 peak load and capacity forecast. ... As shown by these comparisons, Limerick's capacity was required to supply the forecast annual peak loads. In addition, as explained more fully by Mr. Boyer, our economic analyses at the time of these forecasts also indicated that the plant's installation was desirable.

Although still required to meet long term capacity needs (See Table II), the principal necessity for the plant's completion currently is economics. . . . As I have previously

> noted, our analyses indicate that completion of Limerick will save our customers at least $3.98 billion over just the plant's initial ten years of operation."

Indeed, Mr. Kasum's data showed that, without completion of Limerick, PECO's generating reserve percentage would have declined to negative levels in the early 1980s as estimated in 1976, and to less than 10% in the mid-1980s as estimated in 1978. (PECO Ex. 37, Tab 5, Tables VII & VIII; T.S. Ex. 41, pp. 2-3; R. ___).[17] This is well below PUC required levels. See App. D, at 34-37.

17/ The only criticisms attempted by opposing parties before the PUC against PECO's demonstration of the continued need and economics of Limerick completion in 1976 and 1978 are that PECO's peak load estimates were too high and that PECO did not perform a particular form of computer analyses which opposing parties prefer. As respects PECO's load growth estimates in 1976 and 1978, these were reviewed by the Commission in a 1979 rate order and, although found to be higher than actual load growth, were held to be consistent with load forecasts of other utilities and independent forecasters and thus to have been prudent. See Pa. P.U.C. v. PECO, 52 Pa. PUC 772, 31 PUR4th 15, 26-27 (1979). As stated by the Commission:

> "Though the forecast track record of the Company has been very poor, we cannot conclude, under all of the circumstances and in view of the industry-wide forecast record, that such erroneous forecasts were the result of imprudent management policies."

As respects the use of computer analyses, while this is certainly one method for determining the need or continued need for capacity additions, Mr. Boyer testified that it was not the only acceptable method. Where the need to add additional capacity to meet load growth was clear, such as shown by the data of Mr. Kasum, and where a particular type of capacity is shown to be clearly less costly, as demonstrated by the studies presented by Mr. Boyer, computer studies are not required. (PECO Ex. 37, Tab 13, p. 11; R. ___) In any event, PECO performed computer studies in 1974, 1979 and 1980, each of which demonstrated the economic superiority of continued construction. PECO Ex. 37, Tab 4, p. 5; PECO St. 1, pp. 12-14; R. ___; see also Pa. P.U.C. v. PECO, Recommended Decision, pp. 57-74, Order, 54 Pa. P.U.C. 220, 227 (1980). Most importantly, the PUC did not adopt any of these opposing party arguments, and thus they are not relevant to appellate review of its decision.

In opposition to this PECO evidence, the record contains absolutely no credible expert opinion supporting Limerick cancellation as the prudent alternative in either 1976 or 1978. No expert witness proposed cancellation of either unit in 1976. Only OCA witness Rosen proposed cancellation of Limerick 2 in 1978, and "probably" Limerick 1 also. This proposal, however, was not supported by any specific, detailed study of the economics of Limerick completion or cancellation based on data available in those years. Rather, the purpose of the OCA's testimony was to criticize PECO for failing to have performed the type of study which OCA believed was necessary to determine the correct answer, rather than to present affirmative evidence as to what that answer was (T.S. Ex. 41, pp. 120-135; R. ___).

Witness Rosen's thesis was that completion of Limerick was not economically desirable based on data available in 1981, and that this data or data trends was knowable by PECO as early as 1978. Witness Rosen also specifically criticized the Company's comparative generation economics studies of this time period. However, the Commission rejected Mr. Rosen's position that Limerick completion was not economically desireable in 1981 (i.e. would not produce net of cost savings for ratepayers) (App. F, at 64; App G, at 238-240; R.___). Instead, the Commission found that "savings still do exist" from the completion of Limerick, and, as noted above, greater savings would have existed had the plant been completed upon the earlier projected schedules (App. F, at 67-68). This constitutes a complete rejection of the Rosen thesis. Finally, PECO demonstrated that witness Rosen's views as to when data trends and data were knowable with respect

to the economics of Limerick completion and his criticisms of the Company's comparative generation economic studies were all based upon clear misunderstandings of the data or studies or were otherwise grossly in error (PECO Ex. 37, Tab 13, pp. 4, 11-12; Tab 15; R. _____).18/

18/ The Court should also note that, as a part of the 1986 rate case record, PECO presented Dr. William H. Hieronymus, a noted economist and Director of Putnam, Hayes and Bartlett, a well known economic consulting firm, who evaluated the reasonableness of PECO's load forecasting and capacity planning studies as compared to similar industry and government studies performed during the 1976-1980 time period. Dr. Hieronymus found that PECO's load forecasts were consistent with those of other utilities and independent forecasters during the 1975-80 period. (PECO St. 15, pp. 68-78; Ex. Nos. WHH-10 & 11; R. ___). In addition, Dr. Hieronymus closely examined the Company's economic generation studies and concluded that they reasonably supported Limerick completion, and were comparable to those of other organizations (PECO St. 15, pp. 78-109; Ex. Nos. WHH-12 to WHH-20; R. ___). Also, Dr. Lewis J. Perl, a Senior Vice President of National Economic Research Associates, a preeminent consulting firm specializing in the economics of energy use and development, performed independent analyses of the economic benefits of completing Limerick in the late 1970's. He concluded that, based on the data available in those years, Limerick was the "least cost expansion plan" as of 1973, 1976, 1978 and 1980, even assuming zero load growth, based on both incremental and total cost. Second, Dr. Perl concluded that from 1975 through 1980 Limerick was substantially more economic than either coal or oil generation. In 1975, the benefit of Limerick completion over a coal plant was $9.7 billion, while in 1980 Limerick remained $6.9 billion more cost advantageous than construction of a coal plant. In comparison with use of oil-fueled generation, the benefits of Limerick are even more striking; from $10.8 billion in 1975 to a full $19.5 billion in 1980. (PECO St. 11, pp. 10-23, and Schs. 3-6; R. ___). This testimony's employment here to challenge the PUC's 1980 Investigation Order is improper if the Court affirms the PUC's determination that a final and binding adjudication was entered in that Order under paragraph 2 or 3 of the ALJ's March 10 Ruling on the Trial Staff's Motion to Strike Testimony, and further concludes that that determination must be reviewed solely on the basis of the 1980 Investigation Record. This evidence is described here to demonstrate the substantial prejudice of the PUC's belated bifurcation directive.

The PUC also ignores the fact that the utility industry in general was in a depressed financial state at this time. National economic conditions in the mid to late-1970s placed severe strain on utility resources and the ability to raise the necessary capital for plant construction (PECO Ex. 37, Tab 6, pp. 4-7; App. G, at 50, App. F, at 54, 59-60; R. ___). It is simply unfair for the PUC to penalize PECO for its particular financial difficulties, when those difficulties were the result of national economic and generic industry problems. PECO also presented an NRC study which listed a full 21 construction projects, a substantial majority of those then existing, which were deferred at this time because of financial constraints and reduced load growth (PECO Ex. 37, Tab 4, p. 10 & Table A; R. ___). By refusing to give any weight or to even acknowledge this evidence, i.e. evidence that the majority of other utility executives were making the same decisions as PECO, the PUC fails to apply its own articulated "reasonable man" standard.

In summary, the PUC either made no "finding" or "legal conclusion" of imprudence as to PECO's deferral announcements in its 1980 Investigation Order or its reasoning and the evidence of record fails to provide a basis for such a finding.

C. The PUC Erred In Holding That The Deferral Announcements Caused A 27-Month Limerick Completion Delay And A $368.9 Million Cost Increase.

Based on its January 21 Order, the PUC directed that the focus of the rate proceeding would be to quantify the alleged cost and schedule impact of the deferral announcements. PECO submitted extensive and unrefuted evidence demonstrating that the

1976 and 1978 deferral announcements did not significantly extend the construction schedule or increase the cost of completing Limerick 1.

The PUC, for the most part, simply ignored this overwhelming evidence and, instead, adopted a purported schedule analysis presented by OCA witnesses James J. O'Brien and Stephen H. Hanauer (App. D, at 26-27). The OCA's analysis concluded that Limerick 1 would have been completed in July 1982, or 27 months sooner than it actually was, if the 1976 and 1978 deferral announcements had not occurred. In addition, the PUC largely accepted the OCA's quantification of the costs of this alleged 27-month delay.[19/] As a result, the PUC concluded that the 1976 and 1978 deferral announcements unreasonably increased the costs of Limerick 1 by $368.9 million (App. D, at 34).

As discussed further below, the PUC's Order should be reversed for three principal errors. First, it adopts an OCA proposed cost and schedule analysis which contains numerous clear errors admitted by the authors themselves. These errors are extensively described in Section 4 below, and are summarized in Section 2. Of greater significance, however, the PUC adopts this OCA analysis though its authors admit that they performed no evaluation of whether PECO could have attracted the capital needed to construct Limerick to their proposed schedule. This

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19/ However, the PUC held that the OCA analysis had improperly ignored two cost offsets: (1) additional capitalized Public Utility Realty taxes; and (2) increased costs associated with post-commercial capital additions which would have been incurred as a result of the deferred implementation of NRC design requirements if the plant had been completed 27 months earlier as assumed (App. D, at 32-33).

matter is addressed in Section 2 below.

Finally, and on the same point, the PUC's 27-month Limerick advancement conclusion is inconsistent with its 1980 Investigation Order, which Order it relies upon for its asserted imprudency determination. In that Order, the PUC, as noted above, acknowledged that the 1976 and 1978 delay annoucements were attributable to financial constraints. In addition, the 1980 Order concluded that Limerick 2 construction should be temporarily suspended in 1982 because of PECO's "precarious" financial condition at that time. Indeed, the 1980 Investigation Order next concludes that a 1985 in-service date for Limerick 1 is, in light of the financial evidence, appropriate (App. F, p. 67, n. 21). This is, of course, substantially later than the November 1983 in-service date proposed by the OCA and adopted by the PUC to obtain the 27-months of purported delay adopted in this proceeding. Thus, the PUC's rate case quantification analysis is directly inconsistent with the 1980 Investigation Order upon which it purportedly relies.

1. The Legal Requirement Of Causation.

As noted above, property may not be excluded from a utility's rate base absent a determination supported by substantial record evidence that such an investment was unreasonable or imprudent. However, even where the utility's actions are found to be imprudent, no disallowance is lawful unless there is also substantial evidence demonstrating that the imprudent conduct was the direct and proximate cause of some injury to ratepayers. As this Court held in Metropolitan Edison Co. v. Pa. P.U.C., 62 Pa. Cmwlth. 460, 437 A.2d 76, 80 (1981):

> "...[I]f there has been an abuse of managerial discretion and the public interest has been adversely affected thereby, then the PUC is empowered to intervene." (emphasis supplied).

See also Park Towne v. Pa. P.U.C., supra at 295; Pike County L.&P. Co. v. Pa. P.U.C., 77 Pa. Cmwlth. 268, 465 A.2d 735 (1983).

This principle has also been recently recognized by the PUC. In Pa. P.U.C. v. PECO, 70 PUR4th 568, 574 (1985), which involved an investigation into the reasonableness of certain replacement power costs incurred as a result of outages at PECO generating facilities, the PUC stated:

> "Cost disallowance based on imprudence is not permitted unless the alleged imprudence is the real and proximate cause of some injury. Thus, for example, if the alleged imprudent conduct did not cause an extension of outage time, such conduct could not be the basis for denying a utility's recovery of replacement power costs."

Under these well-established principles, even if the PUC were correct in concluding that the 1976 and 1978 deferral announcements were the result of imprudent management (which it clearly was not), a rate base disallowance is lawful only if there is evidence demonstrating that these announcements were the direct and proximate cause of increased schedule duration and project costs. In Park Towne v. Pa. P.U.C., supra, this Court reversed and remanded a PUC rate base disallowance based upon imprudence because the PUC failed to demonstrate that its ordered disallowance was the direct result of any management imprudence. Similarly, the PUC in the instant appeal should not be permitted to impose upon the Company a major disallowance which has not been demonstrated to be the direct result of the 1976 and 1978 deferral announcements.

2. Summary Of Evidence Establishing That PUC Erred.

The 1976 and 1978 deferral announcements did not significantly delay completion of Limerick 1 construction for two principal reasons. First, during the late 1970's and early 1980's, a tremendous number of unanticipated new licensing and design requirements were imposed upon the project by the Nuclear Regulatory Commission ("NRC"). The adverse effect of these changes was very severe. The implementation of these changes significantly disrupted critical construction and engineering activities and substantially increased the amount of time that it took to complete the project and obtain an operating license, even had the deferral announcements never occurred.

Second, as the PUC expressly recognized in its 1980 Investigation Order (App. F, at 60-61, 65-67), PECO's financial condition necessitated the announcements and precluded it from entering the capital markets to raise the significant additional capital that it would have taken to meet a July 1982 completion date. Nevertheless, and despite this adverse financial climate, PECO took all available steps and, at least until 1980, always provided what it believed to be sufficient funds to achieve completion by October 1982. The nature and significance of these steps are described further in sub-section 3(a) below.

In analyzing the impact of regulatory changes upon the project, the Company submitted several independent but related analyses which were prepared by PECO management personnel and expert consultants who have had extensive nuclear power plant

construction and licensing experience.[20] The first such analysis contained several comparisons of the cost and schedule duration for Limerick 1 with those achieved at other contemporaneous nuclear units. Although employing several different methodologies, these comparisons uniformly indicated that the total cost and schedule duration achieved at Limerick 1 was approximately equal to the average for other comparable nuclear units.[21] The analyses indicate that the 1976 and 1978 deferral announcements had no significant impact upon the project as compared to other similar plants. Instead, a variety of factors generic to the industry, such as NRC design changes and capital attraction constraints caused virtually all of the cost and schedule growth at Limerick (PECO St. 4, pp. 36-43 and Sch.

20/ PECO management personnel who prepared these analyses included managers who were directly responsible for Limerick design and construction, including the implementation of NRC design changes. (PECO St. 1, pp. 1-2, 26; St. 2, pp. 1-4, 37-45 and Schs. 5, 6, 7; St. 4, pp. 1-2; St. 4A, pp. 1-20; St. 5; St. 5A; St. 6; St. 6A; R. ____). In addition, Dr. Roger J. Mattson, a former NRC official, assisted in the preparation of these analyses (PECO St. 9, pp. 52-53; St. 9A, pp. 38-39; R. ___). Dr. Mattson has had over 17 years experience (i.e. from 1967 through 1984) with both the AEC and NRC in the development and implementation of nuclear power plant safety regulations. In his capacity as the NRC's Director of Systems Safety and then as Director of Systems Integration, Dr. Mattson directly managed the development and implementation of regulatory requirements from 1974 to 1984, was responsible for most of the NRC's Staff's technical licensing review of the Limerick and other plants and directed the NRC's regulatory reform efforts following the accident of TMI-2 (PECO St. 9, pp. 1-2 and Sch. 2; R.___).

21/ Specifically, these analyses indicated that the cost of Limerick 1 ranged from 21% below to 4% above the average cost of comparable plants and had a schedule duration which falls between three months shorter to just five months longer than for these comparable units (PECO St. 4A, pp. 19-20 and Sch. 3; PECO St. 11, pp. 5-8 and Schs. 1-2; St. 15, pp. 57-63; R. ___).

2; St. 4A, pp. 19-20 and Sch. 3; St. 11, pp. 5-8, Schs. 1-2; St. 15, pp. 57-63 & Exs. WWH-3 to WWH-9; R. ___).

The Company also presented two detailed schedule analyses of the impact of major NRC regulatory and licensing requirements which affected the Limerick project, principally during its latter stages. The first of these was an "earliest possible" critical path licensing schedule analysis for Limerick 1. This analysis demonstrated that, because of safety concerns due to the high population surrounding Limerick, the NRC required that a Probabilistic Risk Assessment ("PRA") be prepared for use in the licensing process. Such an analysis was used to determine if the risk of injury to the surrounding population met a predetermined level of safety, and had never before been imposed as a condition for receipt of an operating license. This was a unique requirement, and when coupled with the high level of intervention in the licensing process at Limerick, resulted in the NRC requiring more complete and earlier implementation of major NRC design requirements at Limerick than was the case at other plants. The necessity to prepare and litigate this study, as well as the many contentions advanced by intervenors, precluded receipt of an operating license prior to May 1984 (PECO Ex. RJM-1; St. 1A, pp. 3-4, 12-13; St. 9A, pp. 38-39; R. ___).

The second analysis focused on whether implementation of certain individual NRC design requirements could have been accelerated or deferred until a subsequent refueling outage in order to meet a July 1982 completion date. This analysis demonstrated that because of the risks identified in the Probabilistic Risk Assessment, the high level of licensing

intervention at Limerick, and the late timing of NRC-required engineering and construction changes, several major regulatory requirements i.e. most particularly the ATWS and equipment qualification requirements could not have been completed any earlier or deferred beyond the receipt of an operating license. As a result, the Company would not have been able to complete construction and receive an operating license prior to when these activities were actually completed in October 1984 (PECO Ex. 2, Section III; St. 5; St. 1A, pp. 11-12; St. 5A, pp. 1-17; St. 6A; R. ___).

An additional multi-stage critical path construction schedule analysis was also prepared in order to develop an "earliest possible" construction completion date. The basis for this analysis was a 1974 schedule developed for the Limerick project, which was then adjusted to reflect all prudent and unavoidable as-built conditions except for the possible effects of the 1976 and 1978 deferral announcements. This analysis demonstrated that the 1976 and 1978 deferral announcements had no significant impact upon the schedule, and that because of unanticipated increases in work scope due to regulatory requirements and other factors, as well as practical limitations on the level of craft manpower which could be employed in critical plant areas, construction of Limerick 1 could not have been completed prior to July 1984 (PECO Ex. JJC-1/JRC-1; Ex. JJC-2/JRC-2; St. 1A, pp. 8-12; St. 4A, pp. 10-16; St. 4C; St. 33; St. 33A; R. ___).

These analyses, which are described in detail in Appendix B, clearly demonstrate that construction of Limerick 1

could not have been completed substantially sooner, even if the Company had not decided to announce construction deferrals in 1976 and 1978. Stated differently, these analyses affirmatively show that the deferral announcements were not the real and proximate cause of increased project costs or schedule duration. These analyses were largely unchallenged by opposing parties, and neither the ALJ nor the Commission provided any critical examination of the record in this case which demonstrates why these analyses were rejected. For this reason, the Commission's determination is clearly unsupported by the record, arbitrary and capricious and should be reversed.

PECO also submitted substantial evidence as to the impact of financial conditions upon project completion. Specific analyses were performed comparing PECO's financial indicators during the 1970's with statistics for comparable electric utilities, as well as analyzing the uncertainties surrounding PECO's financial condition at that time (PECO St. 8, pp. 264-271; R. ___). On the basis of these analyses, it was demonstrated that PECO's financial condition was poor during that period. PECO Witness Paquette explained that, as a result, PECO would not have been able to raise the substantial additional capital required to meet a mid-1982 completion without substantial rate relief which could not be obtained. In other words, the financial markets would have precluded the Company from raising sufficient capital to permit completion of Limerick 1 by July 1982 even if the construction deferrals had not been announced (PECO Ex. 37, Tab 6, pp. 16-17; PECO St. 3, pp. 13-24, 46-47; St. 10, pp. 19-30; R. ____).

Moreover, the OCA witnesses admitted that they had simply failed to make any evaluation of whether PECO could have attracted the capital necessary to fund their proposed Limerick construction schedule (Tr. 3100; PECO Ex. 10, IR-PECO-OCA-3-56; R. ___).[22/] This is a very significant additional error in the OCA analysis in light of the PUC's recognition of PECO's debilitated financial condition in its 1980 Investigation Order, and that this weak financial condition was the principal cause for the deferral announcements. As noted, PECO witnesses testified that the Company did not have the financial strength to achieve a July 1982 schedule (PECO St. 3A, pp. 11-19 & Tables 3-7; St. 35, pp. 3-8; R. ___).

PECO also demonstrated additional numerous and egregious errors in the OCA's analysis which totally invalidate its use as a means for quantifying the impact of the 1976 and 1978 deferral announcements. These errors flow principally from the fact that the OCA's schedule analysis is based on a 1974 project schedule which was not properly adjusted to reflect prudent and/or uncontrollable events unrelated to the deferral announcements. For example, the OCA's witness failed to adjust the schedule to

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22/ As witness O'Brien stated in response to an Interrogatory request (PECO Ex. 10, IR-PECO-OCA-3-56):

> "56. Please explain the basis of and supply all data that was relied upon by Mr. O'Brien in making the assessment that PECO could have raised sufficient capital to provide the cashflow for Limerick 1 and Common assumed as needed for a July 1982 completion date as shown on Exhibit JJO B-17, page JJO B-17.4.
>
> 56. No such assessment is contained at OCA Statement No. 1. PECO's ability to raise capital was not a subject addressed by Mr. O'Brien."

reflect the actual duration required to perform startup and testing activities despite admitting that the full extent of this duration was not reflected in the 1974 schedule, was not excessive or imprudent, and would clearly not have been affected by the deferral announcements (PECO St. 4A, pp. 8-9; St. 33, pp. 9-10; St. 8A, p. 32; Tr. 3139-3140; R. ___). This error alone unreasonably shortened the OCA's schedule by six months.

Similarly, the OCA's analysis admittedly failed to fully reflect actual project conditions prior to the 1976 deferral announcement. Since the 1976 announcement did not occur until May 1976 and since this was the first PECO action allegedly found imprudent by the PUC in the 1980 Investigation, the OCA's analysis should have reflected actual construction progress through May 1976 (PECO St. 4A, pp. 3-4; 8A, pp. 24-25; St. 33, p. 14; Tr. 3111-3117, 3120-3121; PECO Exc., pp. 23-24; R. ___). As a result of its failure to do so, the OCA's 27-month schedule adjustment was overstated by an additional 5 months. Finally, other errors in the OCA's schedule analysis included the failure to reflect the full impact of NRC design changes, failure to consider practical construction restraints in critical plant areas, the use of assumed cash flows which are totally inconsistent with the physical requirements of a mid-July 1982 completion schedule and the failure to properly reconstruct the project's critical path. These and other errors are described in greater detail in Section 4 below.23/

23/ These conclusions were confirmed by a detailed construction schedule analysis performed by Theodore Barry and Associates ("TB&A"), a management consulting firm, which demonstrates that, as a result of changing regulatory requirements and (continued)

What is particularly disturbing about the PUC's June 27 Order is that it accepted the OCA's analysis despite the fact that the above-referenced errors were either expressly admitted or not challenged by the OCA's witnesses and, if corrected, would demonstrate that very little, if any, delay was caused by the 1976 and 1978 deferral announcements. The PUC has provided absolutely no rationale for its action. Such a determination is clearly arbitrary and capricious and must be reversed.

3. PUC Criticisms of PECO's Schedule Analyses Are In Error

Notwithstanding the overwhelming evidence described above, the PUC concluded that the 1976 and 1978 deferral announcements did in fact cause a 27-month schedule extension and thereby unreasonably increased the cost of completing Limerick 1 (App. D, at 27-34). In support of this conclusion, the PUC relies on the following: (1) evidence of reductions in PECO's construction expenditures during the 1976-1980 time period; (2) prior PECO statements that delays, in and of themselves, can affect the cost of Limerick; (3) general criticism of PECO's

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other factors, the project could not have been completed prior to 1984 (PECO St. 8A, pp. 18-20 and App. A; R. ___). TB&A had originally been retained by PECO to perform a comprehensive review of project management at Limerick and was thus well qualified to perform such an analysis (PECO St. 8, pp. 13-18; R. ___). In addition to its review of Limerick, TB&A has acquired extensive experience in the area of nuclear power plant construction by virtue of its performance of 12 retrospective reviews of the construction of nuclear power plants. This firm has also testified in a number of proceedings on evaluating the prudence of management decisions in constructing nuclear facilities (PECO St. 8, pp. 1-9; R. ___). Specifically, in Pennsylvania, TB&A was retained by the PUC itself to perform a management and operations review of General Public Utilities following the accident at TMI-2 (PECO St. 8, p. 6; R. ___)

construction, licensing and regulatory change analyses as being "as-built" analyses which assume past facts as they occurred; and (4) a comparison of the total cost and schedule duration achieved at Limerick 1 and Susquehanna 1 presented by the OCA.

(a) PECO Completed Limerick 1 Within The Shortest Duration And At The Lowest Cost Despite Financial Constraints.

The PUC cites various reductions in construction expenditures during the 1975-1980 period as evidence that the deferral announcements were intended to and in fact did delay the project (App. D, at 25).[24/] The general thrust of these statements is that PECO did not complete Limerick 1 sooner because it did not intend to do so, as evidenced by the deferral announcements and funding reductions. This conclusion, however, ignores the clear and uncontroverted record in this proceeding, and misrepresents the actual impact of the 1976 and 1978 deferral announcements.[25/]

24/ The PUC notes that in 1976 PECO reduced its construction expenditures by $150 million per year and in the 1978-1980 period by a total of $50 million. As explained elsewhere, this $50 million dollar reduction over a three-year period was in non-critical path expenditures whose deferral would not extend the schedule (PECO St. 1, pp. 18-19; St. 3, p. 36 & Table 15). The $150 million reduction achieved in 1976 did not reflect solely a reduction in Limerick expenditures, but reflected to a greater extent the deferral in cancellation of nuclear and coal units which had been planned to follow Limerick (PECO Ex. 37, Tab 5, p. 20; PECO St. 3, pp. 47-48, Table 17; R. ___). As noted elsewhere, Limerick expenditures during the 1975 to 1980 period actually significantly exceeded those planned in the original forecasts (see note 24 infra).

25/ The PUC asserts that PECO has characterized the actions taken in 1976 and 1978 as "deferral announcements" rather than decisions to delay the project in an attempt to minimize the importance of these events and in order to further support its position that these actions did not actually delay the project (App. D, at 24). This is (continued)

It is undisputed that PECO's financial condition during the 1970s was poor. This fact was conclusively demonstrated by a comparison of PECO's financial indicators with those of the utility industry in general and other utilities which deferred construction on nuclear projects, as well as an assessment of the substantial uncertainties surrounding PECO's financial position at that time (PECO St. 8, p. 265-271; St. 3, pp. 15, 21-24; R. ____). Indeed, as described above, the PUC itself agrees that this was so (See Section B, supra). The evidence clearly shows that, absent very substantial rate relief which was clearly not obtainable, attracting all of the capital needed to achieve the PUC's adopted July 1982 completion date was simply not possible.

Despite PECO's precarious financial condition, a number of steps were taken in an attempt to obtain additional funding to permit earlier completion of Limerick 1, including the use of available, non-traditional financing vehicles and unsuccessful requests for additional rate relief from the PUC (PECO St. 3, pp. 29-31; R. _____). Available funding was also applied in order to maximize overall schedule progress, and projected completion dates were deferred only after every effort was made to meet the earlier completion schedule (PECO St. 1, p. 16; R. ____). For example, PECO continued engineering and design activities despite reductions in construction funding in order to maintain

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incorrect. PECO's repeated reference to "deferral announcements" in 1976 and 1978 was to distinguish between the announcements of deferrals and the actual project delay which may (or may not) have occurred as a result of these announcements. The characterization of these events as "construction delays" would simply assume the conclusion in answering the question of whether the announcements did in fact result in project delay.

engineering sufficiently ahead of construction to insure that when full construction activities resumed, the impact of the funding reductions would be minimized (PECO St. 8, p. 230; R. _____). More importantly, however, PECO applied all available cash resources to critical path activities required to maintain overall schedule progress during the cash constrained period, while reducing only the amount of funds applied to certain non-critical activities (i.e. such as cooling tower construction) and, therefore, delaying the completion of only these activities until later in the project (PECO St. 8, p. 231; R. _____).

Further, during the 1976-1980 period, actual funding was applied to the project at a level which was believed to be sufficient to permit construction completion by October 1982 or earlier (PECO St. 1, pp. 17-21; PECO St. 3, p. 36; R. _____). Indeed, in March 1979, special funding was requested and obtained from the Board of Directors to maintain construction on the 1982 completion schedule (PECO St. 1, p. 19; R. _____). Finally, PECO employed construction target schedules that were always earlier, during the mid to late 1970s, than the publicly announced schedules so as to place pressure on project personnel to maximize construction progress, and to maintain an active effort in overall schedule acceleration (PECO St. 8, pp. 230, 231-232; St. 1C, pp. 5-6; R. _____).26/

PECO's efforts in managing its limited financial

26/ Indeed, between 1975 and 1981, actual expenditures on the Limerick project totalled $1.2 billion, as compared to the $1.0 billion which Forecast 1 projected would be spent during this period based on an anticipated completion date of April 1979. Thus, the actual PECO funding levels were significantly greater than was originally anticipated. (PECO St. 3, pp. 47-48 and Table 17; R. ___).

resources were expressly recognized in the 1980 Limerick Investigation. As expressed by the ALJ in that case (App. G, at 44-45):

> "In May 1978 PECO announced a decision to schedule Units I and II from 1983-85 to 1985 87. PECO Witness Mr. Paquette testified that PECO did not in fact change the critical path of the construction schedule from 1978 through 1980, and that in those years PECO authorized and spent the additional dollars to maintain the 1983-85 service dates in the event that it became desirable to complete the units earlier than 1985-1987 (PECO Statement No. 9, p. 12; Tr. 495). The record shows, however, that PECO reduced its direct expenditures from 1978-1980 from the budgeted amount of $529 million to $479 million (OCA Exh. 23, Tr. 7). PECO explains, however, that it funded all major construction activities required to maintain the earlier completion dates, but not activities of lesser importance (PECO Reply Brief, p. 96, fn. 7)."

A similar statement was made by the Commission (App. F, at 57-58).

Nevertheless, and despite these and other measures taken by PECO to complete the project as soon as possible, a number of uncontrollable factors, including in particular new and revised regulatory requirements, combined to preclude such completion (PECO St. 1, pp. 17-21; St. 3, p. 36; St. 8; pp. 230-232; St. 1C, pp. 5-6; R. ___). The impact of these factors as well as PECO's recognition in 1980 that earlier completion was not possible was also noted in the 1980 Limerick Investigation, as follows (App. G, at 46):

> "In 1980 PECO abandoned its options of maintaining the earlier 1983/1985 completion dates. This was made necessary when it became obvious that manpower availability and labor productivity in the installation of bulk commodities such as conduit and pipe were not meeting the target values. The manhours necessary to install the seismic design of

pipe hangers and restraints turned out to be greater than estimated, and interferences introduced by these hangers to duct work and cable trays also required additional manhours to resolve. In addition, the NRC action items resulting from Three Mile Island were issued, adding additional manhours of job effort (PECO Statement 1B, p. 7)."

Clearly, the record in the 1986 Rate Case and the PUC's discussion of this matter in the 1980 Investigation conclusively established that PECO made every effort to complete Limerick on the fastest schedule permitted by financial constraint.

(b) Prior PECO Statements Regarding The Potential Impact Of Delay Do Not Support The PUC's Decision.

The PUC further attempts to support its decision by citing prior PECO statements which indicate "PECO's concern that delays, in and of themselves, can affect the cost and economics of Limerick" (App. D, at 25). Such general statements about the potential impact of project delay do not support the specific conclusion that the 1976 and 1978 deferral announcements actually caused an unreasonable increase in cost and schedule, i.e. an increase associated with a 27-month schedule extention. Indeed, the fact remains, as demonstrated above, that the overwhelming record evidence in this proceeding shows that the 1976 and 1978 deferral announcements did not result in any delay or increased costs.

(c) PECO's Licensing, Regulatory Change And Construction Schedule Analyses Do Not Simply Reflect As-Built Historical Facts.

The only significant criticism of PECO's licensing, regulatory change and construction schedule analyses advanced by the PUC is the very general assertion that these analyses represent merely a recitation of historical data, assuming facts

as they occurred and "regulatory approvals as they were granted" (App. D, at 25). The thrust of this criticism is that PECO's analyses reflect nothing more than "as-built" information, which presumably also includes the alleged impact of the 1976 and 1978 deferral announcements, and therefore, cannot be relied upon in determining the earliest possible completion date if the deferral announcements had not occurred. This criticism is simply and clearly wrong.

PECO admits that its schedule analyses are based on a detailed and comprehensive evaluation of the facts as they occurred on the Limerick project. Such a thorough analysis of as-built information was essential in order to fully understand the circumstances as they existed on the project and to determine if an earlier completion could have been achieved (PECO St. 5C, pp. 3-4; St. 4C, pp. 1-2; R. _____). However, the analysis of as-built information was only the first step. PECO also applied educated judgment, based on the experience of several highly qualified and experienced experts, to determine a realistic and accurate earliest possible schedule for Limerick 1.

Indeed, a closer examination of PECO's analyses reveals that PECO is not simply reciting as-built historical facts but rather has relied upon conservative and well-documented assumptions based on circumstances as they existed during the project. For example, a principal component of PECO's construction schedule analysis, as detailed in Appendix B, was the maximum sustainable manpower density limitations assumed for critical path activities in the containment, which were obtained from the most recent Forecast for Limerick 2 and were based on

actual experience at Limerick and at other nuclear power plants (PECO St. 4A, pp. 5-6, 12-13; St. 33, pp. 11-15; R. ___). These assumed limitations do not simply reflect as-built conditions at Limerick. Rather, they represent the maximum sustainable staffing levels which, in PECO's judgment, could be achieved on a sustained basis under realistic construction conditions (PECO St. 4A, pp. 12-13; St. 33, pp. 11-15; Ex. JJC-2/JRC-2; R. _____). Indeed, these assumptions exceeded sustainable manpower limitations actually experienced at Limerick.

Similarly, PECO's construction analysis assumed the use of a two-thirds second shift in critical plant areas, which exceeds the actual experience at Limerick and at other contemporaneous nuclear plants (PECO St. 4A, pp. 14-15; St. 33, p. 15; R. _____). This assumption clearly was not simply a reflection of as-built circumstances. PECO's regulatory change and licensing analyses also did not simply assume NRC regulatory approvals "as granted" as the PUC apparently believes. For example, PECO conceded that implementation of certain regulatory changes initially identified in its analysis, such as Mark II modifications, security requirements, ASME Section III requirements, high and moderate energy line break modifications, as-built pipe inspection requirements and seismic design changes, could on an individual basis have potentially been accelerated or deferred in order to meet a July 1982 completion date (PECO Ex. 2, Section III; St. 5A, pp. 1-17; R. ___).

Moreover, PECO's analyses of the eight regulatory and licensing items identified as precluding an earlier completion were not simply a recitation of historic data. For example, as

noted in Appendix B with regard to ATWS requirements, PECO concluded that earlier or deferred implementation was not possible because of a letter from the ACRS in 1980 stating that these changes were required to obtain a license, the extensive complexity and first time nature of the design changes, and the fact that ATWS was the subject of an intervenor contention and was identified as needed in the Limerick PRA (PECO St. 5A, pp. 3-10; R. ____). A similar conclusion was reached with respect to fire protection modifications, which were also expressly required to be completed by the NRC Staff prior to licensing, were the subject of an intervenor contention and were also preceived to be of high safety significance as demonstrated by the PRA (PECO St. 6A, pp. 6-7; R. _____). PECO's analysis of fire protection was further supported by the fact that repeated attempts to defer fire protection requirements were expressly denied by the NRC Staff (PECO St. 6A, pp. 7-8; R. _____). Similarly, in the licensing analysis, PECO explicitly assumed the earlier completion of certain critical activities, such as the filing of PECO's operating license permit application in September 1978 as opposed to the actual date of March 1981, and the acceleration of certain hearings on PRA contentions (PECO Ex. RJM-1, pp. 27-31; R. ____).

Clearly, the PUC's assertion that PECO's engineering and licensing analyses merely reflect "as-built" conditions is not supported by the record and should be rejected.

(d) The PUC's Reliance On A Comparison Between Limerick 1 And Susquehanna 1 Is In Error.

The PUC cites with approval a comparison presented by

the OCA of the construction schedule durations of Limerick 1 and Pennsylvania Power & Light Company's ("PP&L") Susquehanna 1 nuclear unit (App. D, at 26-27). Noting similarities between the plants, the PUC accepts the OCA's conclusion that Limerick 1 should have been completed by July 1982 merely because Susquehanna 1 was completed by that date. This position is not supported by the record as it ignores evidence demonstrating significant differences between the plants which were caused by factors beyond PECO's control and which account in large part for the differences in schedule duration achieved at each plant.

A principal reason why PECO could not meet Susquehanna 1's schedule was because substantially greater quantities of commodities had to be installed at Limerick 1 (PECO St. 5A, pp. 17-20; R. _____). Commodities are the bulk materials used to construct a nuclear plant, i.e. piping, steel, concrete, etc. Where greater amounts of commodities are required, more manhours must be expended in their installation and, if these commodities are on the critical path, the project duration will be extended. PECO submitted unchallenged evidence demonstrating that Limerick 1 exceeded Susquehanna 1 in ten out of fourteen major commodity groups. Many of these differences were significant and, more importantly, four of the ten commodity groups that were greater at Limerick (i.e. concrete, large pipe, large pipe hangers and small pipe) substantially affected critical path activities in the containment dry well and/or reactor building and, therefore, directly contributed to the greater schedule duration at Limerick 1 (PECO St. 5A, pp. 19-29; R. _____).

By ignoring the commodity differences between Limerick 1 and Susquehanna 1, the OCA's analysis also failed to consider the significant design differences between the plants as well as the different licensing environments (PECO St. 5A, pp. 17-20; St. 9A, pp. 27-39 & Schs. 1-5; R. _____). Due to the high population density surrounding Limerick and the highly contested nature of its licensing proceeding (factors which were not present at Susquehanna 1), more stringent and different regulatory and licensing requirements were imposed at Limerick in order to obtain an operating license, than were required at Susquehanna.

For example, a PRA was required at Limerick but not Susquehanna. The PRA was used by the NRC to identify specific regulatory requirements which had to be fully implemented to obtain an operating license at Limerick, even though these same requirements were not imposed at Susquehanna 1, and further significantly delayed Limerick licensing proceedings (PECO St. 9A, pp. 28-35; R. _____). Limerick also had a much more highly contested licensing process, as demonstrated by the fact that 89 days of hearings were required for Limerick to obtain an operating license as compared to only 7 for Susquehanna 1 and that the NRC expended 58% more hours reviewing Limerick's operating license application than they did at Susquehanna 1 (PECO St. 9A, p. 31; R. _____). As a result, Limerick 1 was required to essentially complete ATWS, fire protection and equipment qualification programs before receiving an operating license, whereas similar requirements were not imposed at Susquehanna 1 (PECO St. 5A, pp. 3-12; St. 6A, pp. 6-10; St. 9A, pp. 35-39; R. ____).

A final difference completely ignored in the OCA's comparison was the differing financial conditions impacting the construction of each plant. During the mid to late 1970s, PP&L consistently earned higher returns and was generally in a better financial position than PECO (PECO St. 3, p. 20; R. ____). The principal reason for this was that during this period, PECO was a net purchaser while PP&L was a net seller of power to the Pennsylvania-New Jersey-Maryland Interconnection. As a result, under the prevailing PUC approved rate mechanisms, PECO had substantially more limited budgetary constraints on its construction program, which further restricted its ability to complete the plant by an earlier date (PECO St. 3, p. 20; R. ___).

In summary, the OCA's comparative analysis of Limerick 1 and Susquehanna 1 ignores the many substantial and prudent differences between the plants which explain why Limerick 1's schedule and final costs were higher. Evidence of these differences was not criticized in any way and was completely ignored by both the ALJ and the PUC. Indeed, the unreasonableness of the PUC's position is demonstrated by the fact that if Limerick 1 had been completed by July 1982, its construction duration would have been 97 months (as measured from construction permit to fuel load, the most often employed standard for measurement) as compared to 103 months for Susquehanna 1 (PECO St. 5A, pp. 3-12; St. 6A, pp. 6-10, St. 4A, p. 19; R. _____). Thus, the PUC would require PECO to have completed Limerick 1 approximately 7 months <u>sooner</u> than Susquehanna 1, a position which is clearly unrealistic given the

substantial construction, licensing and financial differences between the plants.

4. The PUC Adopted Schedule Analysis Is Severely Flawed And Its Adoption Constitutes An Arbitrary And Capricious Abuse Of Administrative Discretion.

The PUC adopted a purported schedule analysis presented by OCA witnesses O'Brien and Hanauer in an attempt to quantify the amount of schedule delay allegedly associated with the 1976 and 1978 deferral announcements. There are two principal reasons for the severe errors in the OCA's analysis: 1) its reliance upon a 1974 construction schedule without proper adjustment to reflect prudent and/or unavoidable events unrelated to the deferral announcements which extended the project schedule; and 2) its failure to make any demonstration that PECO had or could have obtained the financial capability to have funded Limerick 1 construction to a July 1982 completion schedule. This latter failing of the OCA analysis is described in Section 2 above.

The first error was Witness O'Brien's alleged attempt to adjust the 1974 schedule to reflect the construction impact of the 1974 construction deferral announcement occurring in October 1974, which announcement was stated to be prudent by the PUC in the 1980 Investigation (OCA St. 1, pp. 2-3; R. ____). Since the 1976 deferral announcement did not occur until May 1976 and since this was the first PECO action allegedly found imprudent by the PUC in the 1980 Investigation, Witness O'Brien should have reflected the actual cash constrained condition of the project and construction progress through May 1976 (PECO St. 4A, pp. 3-4; St. 8A, pp. 24-25; R. _____). However, as Witness O'Brien admitted (Tr. 3111-3117, 3120-3121; R. ___), because of his

reliance on a 1974 schedule, actual pre-June 1976 conditions were not reflected in the analysis, and more rapid than actual construction progress was assumed beginning January 1, 1975, or only two months after the 1974 deferral announcement occurred (OCA St. 1, Ex. JJO'B-17; R. ___). The effect of this error alone was to improperly increase Witness O'Brien's proposed 27-month schedule adjustment by approximately five months (PECO St. 4A, pp. 3-4; St. 8A, pp. 24-25; R. __).

A second error in the OCA analysis, again resulting from overreliance on the 1974 schedule, was the failure to accurately reflect actual start-up activities and duration (PECO St. 4A, pp. 8-9; St. 8A, p. 32; R. ____). As noted previously, it was uncontested that the actual 27-month startup duration at Limerick was the shortest achieved among comparable nuclear plants, thus indicating that this phase of the project was completed in an extremely prudent and efficient manner (PECO St. 2, pp. 21-23; St. 4A, pp. 8-9; R. ___). It was also uncontested that the time required to complete startup activities substantially increased over that which was projected in the 1974 MSCS schedule utilized by Witness O'Brien, principally as a result of changing regulatory requirements, and therefore could not have been avoided even if the deferral announcements had not occurred (PECO St. 4A, pp. 8-9; Ex. 2, Section III, pp. 19-21; R. ___). Nevertheless, Witness O'Brien admitted during cross-examination that he used a 21-month duration for startup without adjustment for the effects of regulatory changes (Tr. 3139-3140; R. ___). Thus, the July 1982 schedule adopted by the PUC fails to reflect an additional 6 months duration (i.e. 27 months less 21 months)

that could not have been avoided by PECO (PECO St. 4A, p. 8; St. 8A, p. 32; R. _____).

A third error was the failure to accurately reflect the total quantities of commodities which had to be installed in order to complete Limerick 1 construction (PECO St. 4A, pp. 1-2; Exc., p. 25; R. _____). Witness O'Brien recognized on cross-examination that the level of commodities required at Limerick grew, in large part, because of the substantial increase in new and revised regulatory requirements issued since 1974 (Tr. 3085; R. ___). This increase in commodities, in turn, required substantially more manhours to install and thus contributed heavily to the lengthening of the schedule duration (PECO St. 2, pp. 37-45; St. 4, pp. 28-36; St. 8, pp. 237-241; Ex. 2, Section III; R. ___). In addition, Witness O'Brien also admitted that his schedule ignored the substantial engineering and construction restraints resulting from numerous late-imposed NRC design changes which, as described in Appendix B, prevented project completion prior to 1984 (Tr. 3093-3096, 3111-3115; PECO St. 4A, p. 9; St. 8A, pp. 22-23; R. ____).

A fourth error in the OCA analysis was the failure to consider practical limitations on the ability to use manpower during construction (PECO St. 4A, pp. 5-6; Exc., pp. 25-27; R. ____). As Witness O'Brien admitted on cross-examination (Tr. 3104-3108; R. ____), because of the limited space conditions, congestion and design complexity in critical plant areas, such as the containment drywell, there is a limit on the number of workers, i.e. maximum manpower densities, which can be employed over a sustained period (PECO St. 4A, p. 5; R. ____). Failure to

consider these limits will result in the development of an unrealistically short schedule because a higher level of manpower will be assumed to be applied than was physically possible. Although recognizing that the completed project was far more complex than was projected in the 1974 MSCS schedule used as the basis for his analysis, Witness O'Brien nevertheless admitted that manpower densities were not considered in the analysis and that he simply assumed without analysis that the density limitations at Limerick could have been sufficiently high to permit a July 1982 completion date (Tr. 1304, 1308; PECO Ex. 10, IR-PECO-OCA-5-1; R. ____).

In order to demonstrate the effect of Witness O'Brien's failure to reflect maximum sustainable manpower density limitations, PECO prepared a specific analysis as part of its construction schedule analysis (i.e. Case 1). The Case 1 analysis recreated Witness O'Brien's July 1982 schedule while holding the end date constant, and adjusted it to reflect the actual level of mechanical and electrical commodities required to complete the project, actual construction progress through May 1976 and the actual startup logic and duration (See Appendix B). This analysis demonstrated that the maximum sustainable manpower density levels required to meet a July 1982 schedule were more than 50% percent greater than achievable levels for the containment drywell, the project's actual critical path (PECO St. 4A, p. 6; St. 33, pp. 11-12; Ex. JJC-1/JRC-1, Section 3, p. 3-1; Ex. JJC-2/JRC-2, p. 5; R. ___). This analysis, which has not been rebutted, provides proof that it would have been physically impossible to achieve the accelerated schedule adopted by the

PUC.[27] The effect of these last two errors was to improperly shorten Witness O'Brien's proposed schedule by approximately 14 months (PECO St. 4A, p. 6; St. 8A, pp. 29-30, Sch. 6; Exc., pp. 26-27; R. ____).

Witness O'Brien's schedule analysis also omits or substantially understates the durations of numerous activities which were actually on the critical path at Limerick. The reason for this, again, was because of the OCA's reliance on a 1974 schedule, which was issued at a time when all project activities could not have been anticipated principally because of later imposed NRC design requirements. For example, Witness O'Brien's schedule reflects only 3 of the 20 activities actually on the critical path prior to June 1976 which, as described above, clearly should have been reflected (PECO St. 8A, p. 27, App. A; St. 4A, pp. 3-5; R. ___). Similarly, out of the 36 activities on the critical path in and after June 1976, only 6 of those are reflected in Witness O'Brien's schedule (PECO St. 8A, p. 27, App. A; R. ___). With regard to these latter activities, since PECO always fully funded critical path activities despite its cash constrained condition, these activities and their durations were clearly not affected by the 1976 and 1978 deferral announcements

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[27] In an attempt to discredit PECO's analysis, Witness O'Brien criticized PECO's maximum density level assumptions as being inconsistent with recent forecast data and presented an alternative staffing pattern in the form of a handwritten exhibit submitted in the last day of hearings (OCA St. 1B, pp. 16-21; Ex. JJO'B-32; Tr. 5102-5148; R. ___). These OCA positions were, however, thoroughly refuted by unchallenged PECO testimony (PECO Ex. JJC-2/JRC-2; Ex. JJC-3 (revised); TR. 5155-5165; R. ___). Indeed, that testimony demonstrates that Witness O'Brien's assertions were based entirely upon a misinterpretation of the data which he advanced.

and, therefore, should have been fully reflected in the OCA's analysis (PECO St. 4A, p. 4; PECO St. 8C, p. 26; R. ____).

A further error identified was the inconsistency between Witness O'Brien's cash flow assumptions and the requirements of his proposed July 1982 schedule (PECO St. 4A, pp. 9-10; R. __). In order to arrive at a realistic schedule, cash flow requirements must be developed from the projected levels of staffing and material acquisition required in order to assure that sufficient financial resources are available to fund the required level of effort. However, Witness O'Brien admitted that he performed no analysis of the cash flows required to meet his schedule, nor did he prepare any analysis of whether PECO could have raised sufficient capital to meet a July 1982 completion date (PECO Ex. 10, IR-PECO-OCA-3-56; Tr. 3100; R. ___). Witness O'Brien admitted during cross-examination that his proposed schedule and quantification are fatally inconsistent (Tr. 3122-3126; R. ___).

In summary, OCA Witness O'Brien has prepared an extremely superficial analysis which admittedly contains numerous errors and completely fails to reflect practical constraints upon construction activities at Limerick which, if corrected, would indicate that little or no project delay was caused by the deferral announcements. In contrast, PECO's construction schedule analysis is supported by detailed resource loading, which includes Limerick-specific analyses of commodity and manhour growth, unit rates, craft staffing levels, overtime, manpower density limits and cash flow requirements that are consistent with scheduled construction activities (PECO St. 4A,

pp. 1-17; St. 33, pp. 5, 6-19; R. ___). In adopting the OCA's proposal, the PUC has ignored PECO's analysis, has provided no rationale for its rejection and has failed to explain why the OCA's analysis should be accepted in light of the significant errors described above. This PUC determination is thus clear error and should, therefore, be reversed.

Equally unsupportable is the PUC's apparent acceptance of the conclusion of OCA Witness Hanauer, offered in support of Witness O'Brien's schedule analysis, that major NRC regulatory changes which PECO believes delayed the project could have been deferred until after commercial operation in order to permit construction completion by July 1982 (OCA St. 2, p. 46; St. 2A, p. 4; R. ___). This conclusion is based solely upon a number of broad, unsupported assertions by Witness Hanauer regarding the NRC licensing process (OCA St. 2, pp. 46; St. 2A, pp. 3-6, 10-26; PECO St. 1A, pp. 3-5, 10-17; St. 5C, pp. 1-9; St. 9A, pp. 27-39; St. 9B. pp. 1-3, 5-21; R. ____). Indeed, Witness Hanauer repeatedly admitted that his conclusion was not based upon any independent factual analysis of the Limerick project (PECO Ex. 5, IR-PECO-OCA-4-6, 18 and 19; Tr. 2820-2829, 4919-4920; R. __).

In contrast to Witness Hanauer's unsupported assertions, PECO presented, as discussed in Appendix B, thorough and well-documented regulatory change and licensing analyses, which were based on a comprehensive and detailed evaluation of Limerick specific conditions and circumstances as set forth in contemporaneous project documentation. These analyses demonstrate that because of the timing of new and revised regulatory requirements, the high population density surrounding

the Limerick site and the highly contested nature of the licensing proceeding, construction could not have been completed and a license received by July 1982. Moreover, Witness Hanauer expressly recognized and accepted the major positions supporting PECO's analyses (OCA St. 2A, pp. 19-25; R. ___).[28/]

For these reasons, the PUC's acceptance of the OCA's analysis is clear error and should be reversed.

5. The Deferral Announcements, Even If They Did Cause A 27-Month Limerick Completion Delay, Did Not Cause Any Injury To Ratepayers.

In calculating the $368.9 million disallowance, the PUC adopts, with certain adjustments, the quantification analysis proposed by the OCA (App. D, at 28-34). However, the OCA's analysis measures only the difference in capital costs which would have been incurred if the plant had been completed in July 1982 as opposed to the actual date of October 1984 (PECO St. 18D , pp. 19, 28, 31-32; R. ___). As a result, this analysis does not reflect all costs which would have been imposed on ratepayers as a result of achieving an earlier completion date.

It is well established under tort and regulatory

28/ The Court should note that the OCA's witnesses possess suprisingly little expertise in the areas of nuclear power plant licensing and construction. Witness Hanauer's sole NRC licensing experience occurred during a few months in early 1978 and 1979 or immediately prior to the TMI-2 accident, and even during this early, unrepresentative period he did not participate in the negotiation of deferrals and regulatory items in contested licensing proceedings (PECO St. 9B, p. 6; R. ____). Likewise, Witness O'Brien has had no experience in managing the engineering, construction or licensing of a nuclear power plant (PECO St. 33, pp. 1-2; Tr. 3075-3078; R. ____). The Court should carefully compare this lack of expertise with the substantial expertise and extensive experience of PECO's witnesses, sponsoring the analyses described in Appendix B.

prudence case law, that the actual injury sustained is to be used as the measure for damages. See, e.g., Metropolitan Edison Co. v. Pa. P.U.C., supra; Kirby v. Carlisle, 178 Pa. Super. 389, 116 A.2d 222 (1955). Thus, in order to accurately assess the alleged impact of the deferral announcements, all costs imposed upon PECO's ratepayers, as well as any benefits derived, must be considered. Such net costs will be borne by PECO's ratepayers through PECO's electric rates, which are based on PECO's allowed electric revenue requirements. As such, the appropriate quantification method for assessing all costs and cost savings associated with the 27-month delay is an analysis of the difference in total PECO revenue requirements associated with two alternative capacity scenarios, one based on Limerick 1's actual in-service date and one in which Limerick 1 achieves completion in July 1982 (PECO St. 18D, pp. 18-30; R. ___).

In such an analysis, all revenue requirement impacts, including all capital, operating and financing cost impacts, of the two alternative plans must be evaluated over a consistent time frame. These revenue requirements must then be restated on a present worth basis to a single year so that they may be compared (PECO St. 18D, pp. 25-26; R. ___).

In measuring the impact of these additional cost items, PECO presented a comprehensive present value revenue requirements analysis of the 27-month delay allegedly associated with the deferral announcements. This analysis compared all revenue requirement impacts associated with Limerick 1 entering service 27-months earlier on November 1983, and operating for a 39-year projected life until July 2022, with total PECO revenue

requirements associated with Limerick 1 entering service in February 1986 and operating until October 2024. PECO's analysis also reflected in the accelerated alternative the additional financing costs which would have been incurred to raise sufficient capital to meet this earlier completion, as discussed further below. The resulting revenue requirements under each alternative were then placed upon an equivalent present worth basis (i.e. 1986 year) through application of basic financial analysis techniques, using a discount rate equal to PECO's after tax cost of capital of 9.7% (PECO St. 18D, p. 25; R. ___).

In contrast to the OCA's quantification analysis, when all cost impacts are considered, PECO's analysis revealed that the 27-month delay allegedly associated with the 1976 and 1978 deferral announcements, even if accurately measured by the OCA analysis, resulted in a net benefit to PECO's ratepayers (PECO St. 18E, p. 5; R. ___). A major reason for this net benefit despite the increase in capital costs is that the delay also extends the time period when those capital costs must be paid back by ratepayers (PECO St. 11A, p. 17; St. 18D, p. 29; R. ___). Because PECO and its customers attribute a material time value to money, any rise in the nominal booked cost of Limerick 1 due to delay will be reduced by the present worth of the deferred charges designed to recover the capital cost of the plant. (PECO St. 18D, p. 29-30; R. _____). By considering this and other cost factors omitted from the OCA's analysis which are routinely reflected in life cycle revenue requirements comparisons of alternative capacity plans, PECO's analysis demonstrates that its ratepayers would not have incurred any additional costs even if

it were true that a 27-month delay resulted from the deferral announcements (PECO St. 11A, p. 17-18; St. 18D, pp. 26-28; St. 18E, pp. 1-5; R. ____).

Like the majority of its evidence submitted in this proceeding, PECO's revenue requirements analysis was virtually uncontested. Only the Trial Staff submitted any evidence challenging this analysis and, in doing so, raised only six minor objections (Staff St. RAR-2, pp. 5-8; R. ____). Two of these objections were specifically withdrawn by Trial Staff (Tr. 4703, 4707; R. ____), and correction for the remaining objections still results in a net benefit of delay (PECO St. 18J, pp. 2-9; R. ___). Thus, PECO's revenue requirements analysis stands as uncontroverted evidence demonstrating that ratepayers will incur no additional costs as a result of the 1976 and 1978 deferral announcements, even assuming they did cause construction completion delays which, as demonstrated above, they clearly did not.

In its June 27 Order, the PUC fails to even address PECO's revenue requirements analysis. Thus, the Court is provided with absolutely no findings or reasoning upon which it could sustain the PUC on this matter. The ALJ concluded that the PUC, in asserting that the 1976 and 1978 deferral announcements were imprudent in the 1980 Investigation, also characterized PECO's argument that analysis of the relative costs and benefits to ratepayers favored delay as "unpersuasive", and therefore rejected any cost offset in the quantification of the impact of the announcements (App. E, at 57). This simply is not true. The PUC was not presented with any quantification analyses in the

1980 Investigation, rather it was presented only with analyses concerning the reasonableness of the 1976 and 1978 deferral announcements (App. F, at 56-57; see also App. C, at pp. 8, 13). Indeed, the PUC expressly declined to make any findings quantifying the effects of the deferral announcements on the grounds that the record below had not been developed on the issue of quantification and that any decision concerning quantification would be premature (App. F, at 56-57).

Even assuming that the PUC's quantification analysis is appropriate (which it clearly is not), there is, at a minimum, one additional cost offset which should have been considered. In order to perform the additional work required to meet a July 1982 completion date, PECO would have had to raise substantial additional capital in order to fully fund the project (PECO St. 3A, Table 4; R. ___). However, because of PECO's weak financial condition during the 1975-1983 period, it would have been impossible to raise this additional capital without substantial additional rate relief. (PECO St. 3A, pp. 17-19; St. 18D, pp. 21, 26; St. 18E, p. 4; St. 35, pp. 3-8; R. ___).

Mr. Paquette presented a study which calculated the additional revenues which would have been required during the 1975-1983 period from ratepayers to raise sufficient capital to meet the OCA's proposed 1982 completion date (PECO St. 3A, p. 11-19; R. ___). Specifically, Mr. Paquette developed a financing plan and an associated revenue requirement level which PECO would have required in order to obtain this additional capital. This revenue requirement level was based on the criterion that PECO would have maintained its historical financial condition during

the 1975-1983 period as measured by its actual mortgage indenture coverage ratios and earnings per share (PECO St. 3A, pp. 12-13; R. _____).29/

This analysis demonstrated that additional revenues totalling $339 million would have been required from ratepayers in order to meet the earlier completion date (PECO St. 18E, p. 4-6; R. ___). This revenue requirement translates into an additional $200 million in capital costs associated with a July 1982 completion which, at a minimum, should have been reflected as an offset to the PUC's rate base adjustment (PECO St. 18E, p. 6; pp. R. ___). If properly reflected, this adjustment would have reduced the PUC's disallowance to not more than $168.9 million, or by more than half.

The PUC rejects this cost offset by asserting that PECO's analysis is "too speculative" since it assumed that financing requirements associated with the accelerated completion of Limerick 1 would have been "incremental to other actual financing" and that PECO would not have "reordered its financing priorities had it a desire to complete Limerick 1 on a timely basis" (App. D, at 31). These assertions are themselves mere speculation.

Essentially, the PUC asserts that PECO's analysis maintained four aspects of its actual operating or construction budget which could have been changed in order to allow earlier Limerick 1 completion without the incurrence of additional

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29/ This is perceived as equitable and realistic since shareholders interests in the financial condition of the Company are maintained at the level actually achieved pursuant to PUC rate allowances.

financing costs (App. D, at 31; OCA Reply Exceptions, pp. 33-34; R. ___): (1) Limerick 2 would be constructed and completed only 2 years after Limerick 1 and not further delayed; (2) PECO would retain 100% ownership of both Limerick units; (3) PECO would retain its ownership interest in the Salem 2 nuclear unit; and (4) actual wage increases, number of employees and other non-Limerick construction expenditures would have been maintained.

The first assertion, that PECO assumed only a 2-year gap between the completion of Limerick 2 and Limerick 1, is factually incorrect. PECO's analysis did not assume a 2-year duration between completion of these units; rather it assumed the current date of schedule completion for Limerick 2 of 1990 (Tr. 4863; R. ____). Moreover, no evidence was presented demonstrating that the undefined proposals for revision to PECO's budget or operating plans were feasible. PECO also submitted unchallenged testimony that throughout the 1970s and early 1980s, Limerick 1, Limerick 2 and its share of Salem 2 were needed to meet the capacity needs of its system (Tr. 4864; R. ____). Further, Mr. Paquette testified that efforts to sell portions or energy from these units during this period were not successful (PECO St. 3C, pp. 6-7; R. ____). In short, the position adopted by the PUC is completely without record support, constitutes mere speculation and should, therefore, be reversed.

6. Summary of PUC Errors On Causation.

The PUC states its overall conclusion based upon its review of the record as follows (App. D, p. 26):

> "The Company would have us believe that its deferral announcements of 1976 and 1978 had virtually nothing to do with the approximate four year delay in the completion of Limerick

> 1. Such an argument is preposterous on its face and would require a great deal of proof to sustain. The Company has failed to supply that proof. PECO's contention that other factors, in particular NRC mandated revisions and approvals, served to prolong the Limerick construction schedule, has some merit. However, the Company's attempt to pin the entire balance for the delay on such factors, in view of the public announcements to delay completion of the plant, cannot be accepted."

Moreover, the PUC states that, although it recognizes that the OCA's quantification analyses "is flawed", it nevertheless provides "the best estimate of the cost impact of those delays". (App. D, p. 33). In this manner, the PUC seeks to support its conclusion as being based upon PECO's burden of proof obligation and the acceptance of a flawed, but reasonably accurate analyses.

On the other hand, the PUC states as follows in rejecting Trial Staff's alternative delay cost quantification (App. D, p. 28):

> "Something more than a simple mathematical calculation is needed here. Resolution of this issue requires an analysis of the Limerick 1 construction schedule to determine, as accurately as possible, the direct cost impact of the 1976 and 1978 delay decisions."

The PUC is correct in stating that: "Something more than a simple mathematical calculation is needed here" (see discussion Section C-1). The PUC, however, errs in its failure to recognize that that fatal defect applies to both the OCA and the Staff's analysis in this case. As the above extensive discussion of the evidence demonstrates, the OCA's quantification calculation is every bit as much "a simple mathematical calculation as is the Staff's." Its presentation as a schedule analysis is a masquerade only. As described in Section 4, the

analysis is based on a 1974 Project schedule, i.e. prepared substantially in advance of the numerous additional work efforts imposed upon the Limerick and other nuclear plant construction projects as the result of NRC design requirements, which failed to reflect a multitude of critical events extending project schedule duration and as to which no imprudence is or could be alleged.

Moreover, these errors are not "minor", merely a necessary incident of after-the-fact quantification, as the PUC implies, but rather account for the near totality of the OCA's quantified 27-month schedule delay. Indeed, two of these errors show this most clearly: 1) the failure to reflect full critical path time for start-up activities, though Limerick 1's start up is one of the three shortest of the modern generation of nuclear plants; and 2) the failure to reflect the critical path effects through May 1986 of the 1974 schedule extension stated by the PUC to be prudent (See discussion Section 4). These two errors alone account for 11 months or nearly half the OCA's total proposed schedule adjustment. Clearly, these and the other equally significant errors of the PUC's accepted analysis as described in Section C-4 cannot be accurately characterized as minor. As Section C-4 demonstrates, the OCA's purported schedule analysis is nothing more than "a simple mathematical calculation".

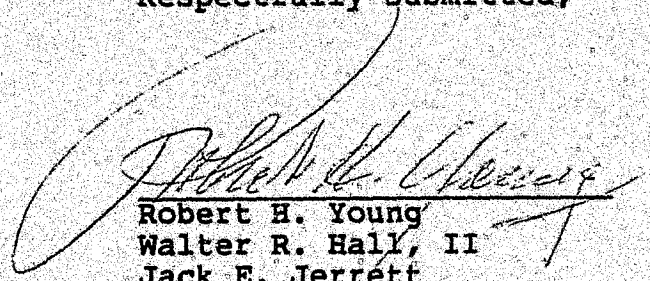
This Court should apply the PUC's own criteria, and by doing so reverse the PUC's proposed rate base adjustment as not being supported by reasoned analysis and substantial evidence. Moreover, as described throughout the Section above, the PUC has simply ignored much of the evidence and certain of the issues

presented in this record. It has thus failed to provide this Court with any findings or reasoning as to these matters which can be the basis of appellate review. Thus, for the reasons described in Section B of this Brief, the PUC's Opinion and Order as to this matter should be reversed.

VII. CONCLUSION

For the reasons stated above, the Orders of the Pennsylvania Public Utility Commission entered January 21 and June 27, 1986 at Docket No. R-850152 should be reversed as unsupported by the evidence, based on errors of law, and in violation of PECO's constitutional rights.

Respectfully submitted,



Robert H. Young
Walter R. Hall, II
Jack E. Jerrett
Michael A. McGrail

Counsel for Philadelphia Electric Company

OF COUNSEL:

Edward G. Bauer, Jr., Esq.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, PA 19101

MORGAN, LEWIS & BOCKIUS
2000 One Logan Square
Philadelphia, PA 19103

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APPENDIX A

ERRORS IN ALJ CRITICISMS OF DEFERRAL ANNOUNCEMENTS

Appendix A
Errors in ALJ Criticisms of Deferral Announcements

Although expressly stating that his Initial Decision contained no imprudence determination, the ALJ did tentatively criticize the two deferral announcements as follows: 1) failure to adequately consider ratepayers interests prior to announcing the deferrals,[30] and 2) the decisions may, in part, have been due to the fear of an excess capacity adjustment.[31] The errors of the ALJ's position are briefly described below.

The criticism that PECO did not consider the interests of ratepayers prior to announcing the construction deferrals is simply wrong. First, as the ALJ acknowledges (App. G, at 51; R. _____), PECO prior to the 1978 deferral announcement performed a specific economic study of the revenue requirement effect on ratepayers of project delay. This study demonstrated that a one-

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30/ "PECO's decision in the Spring of 1976 to delay Limerick for another two years might well have been reasonable, had it been based on a thorough evaluation of economic consequences, not only to it but also to its ratepayers. The record, however, indicates that no such thorough evaluation was made. . . .

In 1978 PECO did analyze the effect of its schedule extension on ratepayers and computed that a one-year postponement would reduce revenue requirements by $190 million for the first year, but would increase bills by $47 million per year the second year and each year thereafter for the life of the plant. Whether this was a good bargain for ratepayers is subject to discussion" (App. G, at 50-51; R. _____).

31/ "It appears . . . that PECO's decision to postpone construction was influenced in part by the fear of an excess capacity adjustment by the PUC in a subsequent rate case. Rather than run the risk of such a revenue loss, the Company chose to delay construction while at the same time continuing to accrue AFUDC on this plant costs that will eventually be borne by the ratepayers" (App. G, at 53; R. _____).

year delay would reduce revenue requirements for ratepayers in the first year of Limerick operation by $190 million. This net benefit to current ratepayers would continue for approximately five years, before customers would see a cumulative penalty offsetting the first year of savings. This estimate of delay benefit was extremely conservative, since it did not consider current ratepayer savings due to reduced embedded capital costs, reduced equity cost allowances or avoidance of cash flow relief (i.e. CWIP) during the plant construction period (PECO Ex. 37, Tab 6, p. 11, 17-18; PECO St. 3, p. 41; R. ____).

In addition to the 1978 study, PECO performed a number of other analyses of the revenue requirement impact of delay in the 1976-1978 period. Mr. Paquette testified that a similar though less formal financial analysis was performed prior to the 1976 deferral announcement (PECO Ex. 37, Tab 6, pp. 9-11; Tab 19, Tr. 547-548; R. ____). Mr. Paquette summarized the results of this earlier analysis.

> "It was clear that the cost to the customers would be greatly reduced in the short term from a postponement of Limerick since they would not have to pick up the carrying costs for the plant in 1981 and 1983 but would have these costs postponed for at least two years. In other words, the delay decision involved clear short-term benefits to customers offset by possible long-term burdens, although the exact amount of those long-term burdens could not be precisely determined at the time." (PECO Ex. 37, Tab 6, p. 11)

Based on these analyses, PECO concluded in both 1976 and 1978, that schedule deferral was in the best interest of ratepayers due to the net benefit of delay for the first several years of project operation. Thus, the ALJ's finding that the impact of

project delay on ratepayers was not considered as to either announcement is clearly erroneous.32/

Moreover, the ALJ has completely ignored an additional concern addressed by Mr. Paquette which is important to an evaluation of the effects of the deferrals upon ratepayers. As Mr. Paquette testified, and as the PUC found, PECO's deteriorated financial condition was the predominant reason for its decision to make the deferral announcements (App. F, at 60; R.). Indeed, that concern was of such a magnitude, and given the uncertainties of the financial markets and of requested rate relief essential to maintain the Company's capital attraction ability, that the Company was concerned that it would be shut out of the capital markets if it attempted to financially overextend itself by adopting an accellerated construction pace (PECO Ex. 37, Tab 6, pp. 9-10, 13, 17-18; Tab 12, p. 6 and Sch. 2A; Tab 18, Tr. 2950-2952; R. ____). As described by Mr. Paquette, and as explained at length by the PUC in its determination that construction at Limerick 2 should be temporarily suspended, if PECO were to be shut out of the capital markets with a major uncompleted investment program such as the Limerick Station, the impact upon ratepayers would be quite severe (App. F, at 65-67). Not only would the availability of future reasonable cost service be precluded, but current service operations could be

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32/ The Court should note that Mr. Boyer provided two additional similar studies of ratepayer impact of project deferral for the 1986 record, one of which was performed in early 1977 and the other in fall 1977. (PECO St. 1, pp. 17-18; R. ___). This data, however, is subject to the Motion in Limine restrictions described in note 18, supra.

significantly disrupted and cost would be substantially increased. See App. F, at 66. The ALJ completely ignores this important ratepayer cost/benefit consideration.33/

33/ In his testimony provided for the 1986 record, which testimony is subject to the Motion in Limine restrictions described in note 18, supra, Mr. Paquette further elaborated on the financial and ratepayer cost benefit concern which persuaded the Company to make the defferal announcements (PECO St. 3, pp. 23, 39-40; R. ___):

> "With the facts and uncertainties that existed, in our judgment, it was not prudent to press to the financial limit, i.e. to unreasonably deplete our financial reserves. Also, of paramount importance during these difficult times was the serious concern that our access to the capital markets would "dry up" and we would be left with a partially completed plant, unable to be completed, if we overextended our financial resources by attempting too ambitious a construction schedule
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> ....
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> "In making each announcement, we gave much consideration to the interests of our ratepayers. As I have explained, a major contributor to our decision to reduce our construction budgets in 1976 and 1978 was the need to reduce financial pressures in order to maintain our security ratings. The net effect of this was to benefit our ratepayers by reducing capital attractions costs and thus rate levels, by avoiding impairment of our ability to raise capital and by maintaining our securities' value. A second consideration to our analysis was the recognition that Limerick's capacity was not needed as early as originally projected and that completion on the early schedule could cause premature increases in rates for customers
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> ....
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> If Limerick were placed in commercial operation and added to the rate base before it was needed to meet service requirements, customers would have to bear the resulting increase in rates before service needs made that necessary. Also, as I describe below, our review of Commission orders convinced us that the preferred public policy choice was to avoid short-term rate effects, even though long-term costs could be increased. In evaluating these considerations, as well as those described above, we were considering the (continued)

Finally, Mr. Boyer, Mr. Paquette and PECO witness Mr. Kob testified to two analyses of the effects of deferring completion of the Limerick Station upon total Station costs and ratepayers. Based upon this analysis, they testified that the additional cost of an extended construction period as compared to construction on a maximum efficient schedule resulted in an increase of but approximately $140 million in Station cost.

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interests of ratepayers."

Mr. Paquette also provided copies of statements made by security rating agencies and investment analysts noting their view that a reduction in PECO capital attraction levels was necessary to maintain its financial condition and capital attractions capability (PECO St. 3, pp. 33-35; R. ____). Mr. Paquette pointed out that, during substantial periods in the 1970's, PECO was unable to attract debt and equity capital in the amount that it desired. Also, during this period the Company experienced substantial capital attraction needs at its existing, in-service nuclear and coal generating units which had to take precedence over Limerick expenditures in order to permit assurance of present low-cost, reliable service (PECO St. 3, pp. 13-14 & 23-25; R. ____). Finally, as Mr. Paquette pointed out, the deferral announcements were successful as the Company's security ratings were maintained throughout the late 1970's. (PECO St. 3, p. 35 & Table 12; R. ____). This provided significant savings for ratepayers as the result of reduced capital attraction costs.

In addition, PECO presented Mr. William A. Abrams, a Group Vice President for Duff & Phelps, Inc. whose business it is and was during the mid-1970s to independently advise investors upon security investment decisions. Mr. Abrams testified (PECO St. 10, pp. 21 & 30; R. ____):

> It was not uncommon for utilities to reduce construction expenditures during the 1970's. This was especially true of companies that were financially strained and/or where load growth forecast changes suggested later need for the plant....
>
> As I explain further below, it is my and Duff & Phelps' opinion that the investor climate for utilities and the financial fundamentals of PECO during the 1974 to 1980 period necessitated this action [i.e. the deferral announcements].

Given the financial difficulties experienced by the Company and the additional costs to ratepayers of expedited construction of the Station (i.e., $150 million in additional rate increases during the 1974-1979 period), these witnesses testified that the 1976 and 1978 scheduling decisions were reasonable and prudent (PECO St. 1B, p. 10; PECO St. 14; PECO St. 9, pp. 10-11, 14 & 17). Neither the ALJ nor the Commission even acknowledge the existence of this significant evidence, much less refute it.

The second major criticism by the ALJ of the deferral announcements is that they were made, in part, because PECO feared an excess capacity adjustment in a subsequent rate case. This conclusion rests solely upon the ALJ's misinterpretation of Mr. Paquette's testimony quoted at length at pages 51-53 of the Initial Decision (App. G; R. _____). As discussed above, prior to both the 1976 and 1978 deferral announcements, PECO carefully considered the economic impact on ratepayers of delayed plant completion and its inability to raise the capital necessary to maintain project schedule.

This ratepayer cost/benefit determination was based on three primary considerations: (1) reductions in load growth which created a lack of need for Limerick completion in the early years; (2) the functional basis of the excess capacity principle, i.e. that a utility should not complete plant prior to the need for it and thus burden ratepayers with a requirement to pay for that plant; and (3) specific PECO studies of the short-term economic benefits to ratepayers of Limerick deferral, which studies, however, recognized the associated long-term costs. In support of the second of these principles, PECO cited PUC excess

capacity decisions and other actions as examples of a public policy established by the PUC which favored short-term benefits. In light of its precarious financial condition and the substantial burden on current ratepayers of early completion, PECO determined that there was no basis for rushing to complete a plant which was clearly not needed on the accelerated schedule.

Mr. Paquette's ALJ statement simply chronicled the PUC's determinations which reenforced this "balance of interest" determination in favor of lessening costs borne by current ratepayers though future cost levels may be increased. This is certainly no statement that "excess capacity adjustments" or fear that they would be repeated in the future was a substantial basis of PECO's decision-making, nor can any such statement be fairly implied. The reduced load growth in the 1976-1978 period merely permitted PECO to make the prudent decision to announce plant deferral, in light of all the economic and financial considerations discussed above.

The proper context of Mr. Paquette's testimony - that PECO based its decisions on a balancing of current and future ratepayer costs and consideration of its precarious financial condition, and viewed reduced load growth as merely allowing it to make the prudent economic and financial decision to announce project deferral - is illustrated in his cross-examination. In response to a question from opposing counsel as to the effect of the ALJ's recommended excess capacity adjustment in R.I.D. 438 on PECO's decision-making, Mr. Paquette responded (PECO Ex. 37, Tab 19; Tr. 513-515; R. _____):

"[T]his [i.e. the PUC's policy on excess capacity] 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 PECO 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.

....

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. . . [I]t 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.

....

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."

Also see PECO Ex. 37, Tab 19, Tr. 547-548; R. _____.

Mr. Paquette's point, and the extent to which the Initial Decision has misstated his testimony, is further made clear by examining this PUC's rate actions during this period which uniformly favored the creation of short-term cost savings to current ratepayers as compared to the reduction of long term cost levels. The PUC in its R.I.D. 129 Order in early 1975, although recognizing its authority to approve "major project CWIP," declined to do so even though such an allowance was

requested to ease the financial burden of PECO's construction program including Limerick. Pa. P.U.C. v. PECO, R.I.D. No. 129, Order entered March 25, 1975, mimeo. at 38-40.

In R.I.D. 438, the PUC directed that flow-through accounting be employed for the tax reductive benefits of accelerated depreciation, another decision that reduces short-term costs at the expense of long-term cost increases. Pa. P.U.C. v. PECO, R.I.D. 438, 31 PUR4th 15, 74-76 (1978). As noted by Mr. Paquette: "Each of these PUC actions produced lower rates in the short-term, but higher rates in the long-term and delay of Limerick seemed to fit in with this concept" (PECO Ex. 37, Tab 6, p. 12; R. ____). Clearly, this is Mr. Paquette's point, i.e. that extension of the Limerick construction schedule - thus reducing near-term costs while increasing long-term costs - was consistent with the comparable policy selections made by the PUC at that time in its rate and other decisions, not that fear of an "excess capacity adjustment" substantially contributed to PECO's decision-making.34/

Finally, and most importantly, the record evidence of PECO's actions during this period are entirely inconsistent with the ALJ's theory of unconcern for ratepayer economics and excess capacity adjustment fear. For example, in its 1979 rate case, though as the PUC has recognized its load growth had declined

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34/ Also, as further evidence of this PUC policy, the Court should note that in its Rate Application at Docket No. R-79060865, PECO requested additional revenues to permit it to implement the 1983-1985 Limerick completion dates. The PUC denied this request. (Pa. P.U.C. v. PECO, Docket No. R-79060865, 54 Pa. P.U.C. 220, 227 (1980).

even further from its 1978 level and thus deferral of Limerick was even more desireable from an excess capacity viewpoint (Pa. P.U.C. v. PECO, Docket No. R-79060865, 54 Pa. P.U.C. at 225, PECO requested additional specific rate relief to permit it to complete Limerick on the earlier 1983 schedule. It did so because of the increase in oil prices due to the Iranian crisis which, as described above, had reversed the economic detriment of early Limerick completion, rendering it an economic benefit (PECO St. 3, p. 42; PECO Ex. 37, Tab 19, Tr. 548; R. _____)

This PECO action refutes the ALJ's tentative criticisms for two reasons. First, as described above, it shows PECO taking action to advance Limerick completion in complete disregard of the excess capacity adjustment consequences of that action. Thus, an excess capacity adjustment fear was clearly not a guiding force of Company decision making as respects Limerick during this period. Second, this action shows that, again contrary to the ALJ's tentative criticisms, PECO decision making respecting Limerick during this time period was clearly grounded in consideration of ratepayer economics. The effort to obtain Project completion advancement resulted entirely from a change in the perceived economics of early completion to ratepayers.

A second action taken by the Company, this time in early 1978 and 1979, contemporaneous with the deferral announcements, further illustrates this point. As Mr. Paquette testified in 1978, the Company adopted a policy of funding all critical path activities at Limerick so as to be in a position to complete the unit in 1983, even despite having publicly announced a 1985 completion date. It is not seriously controverted on the record

and was accepted as true by the ALJ and PUC in their 1980 Investigation Order that this policy was adopted and that no funding reduction on critical path activities occurred in 1978 (App. G, at 45; App. F, at 57). However, this policy is, as was the 1979 funding request, inconsistent with the ALJ's excess capacity adjustment fear and failure to consider ratepayer economics thesis. This early completion option was preserved solely to obtain, if at all possible given the Company's poor financial condition, the benefits that might accrue to ratepayers from early plant completion in the event that alternative fossil fuel prices, as they ultimately did, increased (PECO Ex. 37, Tab 6, pp. 13-14; R. ____). Clearly, therefore, the objective facts entirely disprove the ALJ's tentative criticism.

APPENDIX B

THE DEFERRAL ANNOUNCEMENTS DID NOT CAUSE A 27-MONTH LIMERICK COMPLETION DELAY

Appendix B
The Deferral Announcements Did Not Cause A 27-Month Limerick Completion Delay.

PECO submitted several detailed schedule analyses which demonstrate that Limerick 1 project costs were not significantly increased and that there was no significant schedule delay caused by the 1976 and 1978 deferral announcements. These analyses indicate that changing regulatory requirements imposed by the NRC and other factors beyond PECO's control, including the Company's weak financial condition as recognized by the PUC, would have precluded completion of Limerick 1 at a significantly earlier date or lower cost even if the deferral announcements had not taken place.

(1) Licensing Schedule Restraint Analysis.

This analysis focused on the licensing process at Limerick. The licensing of a nuclear power plant proceeds in two stages. First, the owner utility must obtain a construction permit to begin significant construction activities (PECO St. 9, pp. 4-5; R. _____). Second, the utility must obtain an operating license in order to begin producing electricity once plant construction has been completed (PECO Ex. RJM-1, p. 2; R. _____). During each of these stages, numerous reviews are conducted by the NRC Staff, the Advisory Committee for Reactor Safeguards ("ACRS"), the Atomic Safety and Licensing Board ("ASLB") and the Atomic Safety and Licensing Appeal Board ("ASLAB") to determine whether the plant meets all NRC environmental and safety requirements (PECO Ex. RJM-1, pp. 2-10; R. _____).

The undisputed evidence demonstrates that several

factors substantially extended the licensing process at Limerick. The first factor, which affected the licensing of all nuclear plants of the same vintage as Limerick 1, was the March 1979 accident at Three Mile Island Unit 2 ("TMI-2"). The immediate result of this accident was a licensing moratorium and backlog in the NRC's review of new operating license applications, which lasted from March 1979 to August 1980 (PECO St. 9, pp. 40-41; St. 9B, pp. 9-10; R. ___).

In addition, special circumstances surrounding Limerick rendered the licensing process substantially more difficult, time-consuming and costly than at other plants. One such circumstance was the high population density surrounding the Limerick plant (PECO St. 9A, p. 13; R. ___). Because of its concern with the potential risk to high population areas, the NRC was much more strict in its review of Limerick and, as a result, imposed various licensing and regulatory requirements which were not required at all, to the same degree or with as early an implementation schedule as was the case at other nuclear plants (PECO St. 9A, pp. 34-35; R. ____). A second circumstance was the fact that the Limerick licensing process was more highly contested by determined intervenors than were many other licensing proceedings (PECO St. 9A, p. 31; R. _____). This also caused the NRC to be extremely prescriptive in the imposition of design safety requirements at Limerick, and to require earlier and more complete implementation of several major requirements than was required at other plants (PECO St. 9, pp. 49-51; R. __).

With this background in mind, PECO witness Dr. Roger J. Mattson, a prior NRC official with extensive licensing

experience, developed an "earliest possible" critical path licensing schedule analysis for Limerick 1 (PECO Ex. RJM-1, pp. 15-31; St. 9A, pp. 38-39; St. 1A, pp. 12-13; R. ____).35/ Dr. Mattson's analysis was developed from an extensive review of NRC and PECO licensing documentation and scheduling information, through discussions with appropriate PECO managers involved with the Limerick licensing process and through Dr. Mattson's extensive knowledge of that process arising from his NRC Staff management role during the period that Limerick 1 was being licensed (PECO St. 9A, p. 39; St. 1A, p. 13, St. 5A, p. 17; R. ___). On the basis of this analysis, it was determined that a low power license could not have been received sooner than mid-May 1984, or only approximately five months earlier than the actual date (PECO St. 9A, p. 39; Ex. RJM-1, pp. 27-31; R. _____).

The principal reason that an operating license could not have been obtained earlier was the NRC's requirement that a Probabilistic Risk Assessment ("PRA") be performed as part of the licensing process at Limerick. Such an analysis required the use of state-of-the-art probabilistic techniques to determine whether the design at Limerick met a pre-determined minimum level of risk to society associated with a severe accident, i.e., a reactor core meltdown (PECO Ex. RJM-1, pp. 15-26; R. _____). This

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35/ The term "critical path" generally refers to the longest sequence of events or activities which must be performed in order to achieve a desired result, i.e. project completion and licensing (OCA St. 1, pp. 8-9; R. ____). Since it is comprised of those activities which required the most time to complete, the critical path controls the overall project length and must be the focus of any analysis of whether the project could have been completed sooner.

requirement, which was not communicated to PECO until 1980, was imposed because of Limerick's high population density and was unique to the Limerick project since no other nuclear unit then under construction (and only two which had already been completed) had been previously required to perform a PRA in order to obtain a license (PECO Ex. RJM-1, pp. 15-26; R. _____). The Limerick PRA indicated that an acceptable risk level would be achieved only if certain major design changes were fully implemented prior to receipt of a license, even though they were not required to the same degree at other plants (PECO St. 9B, pp. 19-20; R. _____).

To ensure that the analysis accurately depicted the earliest possible licensing schedule regardless of the deferral announcements, PECO employed a number of conservative judgments described in the note below.36/ These specific assumptions were

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36/ First, it was assumed that PECO would have filed an operating license application with the NRC on September 1978, or approximately two years earlier than actually occurred in the absence of the deferral announcements. This reflected the schedule developed by PECO management immediately prior to the 1976 deferral announcement, which projected a mid-1982 completion (PECO Ex. RJM-1. p. 27; R. _____). Second, it was assumed that all non-PRA licensing proceedings would have required the same 39-month duration as actually occurred. This assumption was unrealistically conservative because it did not account for the fact that the licensing proceedings, if commenced in late 1978, would have been delayed by the moratorium imposed after TMI-2 and that the highly contested licensing proceedings at Limerick would have resulted in additional litigation concerning the implementation of certain regulatory requirements which PECO would have been forced to defer beyond fuel load in order to meet a mid-1982 completion date (PECO Ex. RJM-1, pp. 27-28; R. _____). Third, PECO assumed that completion of the PRA would require 10 months as actually occurred, a very conservative assumption in view of the fact that this was substantially shorter than the recommended duration established by NRC guidelines, this was a first of a kind analysis, there was very little NRC guidance on how to prepare (continued)

not challenged, nor did the PUC or any opposing party specifically criticize or provide any factual basis for rejecting these judgments.

(2) NRC Design Requirements Analysis.

A second analysis was prepared to determine the schedule effect of specific NRC design requirements imposed during the construction of Limerick 1. This analysis was prepared jointly by several PECO witnesses who have had extensive experience in nuclear design, construction and licensing at Limerick and at other nuclear plants. Like the licensing restraint analysis, this analysis was based on an extensive review of project documentation and extensive discussions with experienced project personnel (PECO St. 1, pp. 25-26; St. 2, pp. 37-41; St. 4, pp. 29-30; St. 5A, pp. 1-7; St. 6A; Ex. 2, Section III, pp. 19-48; R. ____). In order to ensure a proper treatment of the effects of NRC design requirements, the results of this analysis were reviewed for accuracy and reasonableless by Dr. Mattson (PECO St. 9, pp. 52-59; St. 9A, pp. 36-39).

The initial focus of the design requirements analysis was to identify those new or revised regulatory requirements which were imposed at Limerick and when the engineering and construction activities required to implement these changes were or could have been completed (PECO Ex. 2, Section III, pp. 19-20; St. 4, pp. 29-30; R. _____). The specific NRC requirements

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the PRA, there was a lack of qualified NRC personnel to review the Limerick PRA once it was completed, and there was substantial uncertainty as to how the NRC would ultimately use the PRA in the licensing process at Limerick (PECO Ex. RJM-1, pp. 19-24; R. _____).

addressed in this analysis included anticipated transients without scram ("ATWS") modifications; Mark II modifications; mechanical and electrical equipment qualification; control room panel modifications; various TMI-2 modifications, such as the emergency response facility, safety parameter display system ("SPDS"), radiological and meteorological monitoring system ("RMMS"), post-accident sampling system ("PASS") and SRV position indication; seismic requirements; fire protection; high and moderate energy line break requirements; as-built pipe and pipe hanger review; masonry walls and ASME Section III requirements (PECO Ex. 2, p. 19; R. ____).

This analysis demonstrates that the volatile regulatory environment in which the Limerick plant was constructed significantly affected the timing of project completion and receipt of a low power license. Many of the regulatory requirements were imposed during the 1979-1984 time frame, or after substantial engineering and construction had been completed. As a result, significant additional construction activities had to be performed during the latter stages of the project, when startup and preoperational testing activities were on the critical path (PECO Ex. 2, p. 20; R. ____). In this regard, Dr. Mattson explained (PECO St. 9, pp. 46-49; R. _____):

> "By constantly adding and revising the licensing requirements, the NRC was forcing PECO to design the Limerick Station to a moving target. PECO would receive a new requirement and incorporate it into the design. Sometime later, the NRC would revise this requirement, PECO would change the Limerick design, and, in some instances, PECO would rework a system or component at the plant. Schedule 10 is a chronology of Limerick Unit No. 1 from the December 1970

> cost estimate to issuance of the OL. It lists the major NRC requirements cited by PECO as sources of cost escalation. What this table shows is that, during the construction process, the plant was constantly subject to design change. New design features were added, and some of those already included in the plant were changed. Sometimes features were changed on a yearly basis.
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> * * * *
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> Compliance with these new requirements was difficult and expensive because of their late imposition. . . . There are [several] examples of where changes in regulatory requirements caused the plant design to become more complex, the layout to become more congested, and the construction work to be performed out of sequence or repetitively. One example is provided by the changes in seismic design basis, seismic analysis methods, and seismic qualification methods imposed on Limerick after the CP was issued. These led to new pipe hangers, cable trays, ceilings, snubbers, etc. Some of them had to be installed several times. Fire protection and electrical separation are other examples. While Limerick was under construction, the Browns Ferry fire led NRC to toughen its fire protection requirements and to backfit them to Limerick. Then, very late in the construction, NRC became quite inflexible in allowing deviations from the new fire protection requirements. This led to rework of completed construction at Limerick. These and other examples cited by PECO in Exhibit 2 were typical of the indirect effects of backfitting that were experienced at all other plants under construction in the time period from 1974 to 1984."

PECO's analysis demonstrates that engineering required for ATWS, control room panel modifications, equipment qualification and various TMI requirements (i.e. SPDS, RMMS, PASS and SRV indication) was not completed until early to mid-1983 and construction required to implement these requirements was not completed until mid to late-1984. These and other requirements resulted in the expenditure of substantially more engineering and

construction manhours than originally anticipated in order to design, procure and install new systems, and to design new systems in existing plant areas affected by these changes. The cumulative effect of these requirements was to preclude completion of engineering, construction, and startup testing at a significantly earlier date than that that was actually achieved (PECO St. 4, pp. 30-31; Ex. 2, pp. 19-21 & Sch. 2; R. _____).

As a result of an initial screening process, eight of the sixteen regulatory change items described above were identified as likely schedule restraints and were analyzed in further detail (PECO St. 5A, pp. 1-17; St. 6A, pp. 1-18; R. ___). This further analysis indicated that three items (i.e. ATWS, electrical equipment qualification, and control room panel modifications) could not have been completed substantially before the actual fuel load date of October 1984, two additional items (i.e. RMMS installation and fire protection modifications) could not have been completed before mid-1984, and several other regulatory changes (i.e. mechanical equipment qualification and various TMI electrical items) could not have been completed prior to mid-1983 (PECO St. 5A, p. 3; R. ____). These changes all had to be completed prior to receipt of a low power license principally because of the perceived level of risk to the surrounding population if they were not implemented, and because they were the subject of contentions filed by intervenors in the licensing process (PECO St. 5A, pp. 3-4; St. 9B, p. 19; R. __). This further analysis also demonstrated that although implementation of certain of the regulatory items could have been accelerated somewhat, their cumulative effect substantially

precluded completion of construction and startup testing much before that which was actually achieved (PECO St. 5A, p. 3; R. _____).

An example of the type of detailed analysis performed is illustrated by the ATWS requirement, which PECO concluded could not have been completed before October 1984. ATWS refers to a sequence of events in which the control rods fail to insert into the reactor in order to control and terminate a nuclear chain reaction during accident conditions (PECO Ex. 2, pp. 37-38; R. _____). The most complicated alternative to mitigate the effects of ATWS (i.e. Alternate 4A) was suggested as a licensing condition at Limerick on April 16, 1980 by the ACRS (PECO St. 5A, pp. 7-8; R. _____). Prior to 1980, the appropriate modifications required to prevent an ATWS were the subject of debate within the NRC and nuclear industry, and no specific requirements had been imposed as part of the licensing process (PECO Ex. 2, p. 38; St. 5A, p. 8; R. _____). Thus, PECO could not have known of this requirement prior to receipt of the ACRS letter.

Engineering to implement ATWS modifications began immediately, although on a less complicated design (i.e. Alternate 3A) which was ultimately accepted by the NRC. Procurement and field installation activities were started at the earliest possible dates allowed by the design process and were not completed until mid-1984 (PECO St. 5A, p. 9 & Sch. 1; R. _____). Given the complexity of the required modifications and the first time nature of the design, engineering and construction activities could not have been completed any sooner (PECO St. 5A, pp. 8-9; R. _____). Despite the use of an

expedited schedule, ATWS modifications had a significant disruptive effect upon the completion of construction activities and startup testing (PECO St. 5A, p. 9; Ex. 2, Section III, p. 39; R. _____).

Moreover, full implementation of ATWS modifications was required prior to receipt of a low power license for two reasons. First, the PRA identified ATWS events as having a high safety significance to the population surrounding Limerick, and therefore, ATWS design changes had to be fully implemented prior to fuel load (PECO St. 5A, pp. 5-6; R. _____). Second, a contention was filed on this issue during the licensing proceedings (PECO St. 5A, p. 27). As such, PECO would not have been able to complete the plant and receive an operating license in the time period achieved unless the ATWS modifications were completed.

Similar analyses were prepared with respect to the remaining regulatory change items. These analyses demonstrate that implementation of several regulatory changes were required for licensing and would have delayed fuel load until October 1984, even if there had been no announced deferrals and the plant had been completed sooner. The specific assumptions and factual circumstances which formed the basis for these analyses have not been challenged and the PUC has provided no specific basis for their rejection in this proceeding.

(3) Construction Schedule Analysis.

A third analysis presented by PECO was a multi-stage computerized critical path schedule analysis to determine the earliest possible date that Limerick 1 construction could have

been completed if the 1976 and 1978 deferral announcements had not occurred (PECO St. 4A, pp. 1-16; St. 33, pp. 1-19; Ex. JJC-1/JRC-1; R. _____). This analysis was developed jointly by PECO Witnesses James J. Clarey and James J. Coughlin.[37/] The starting point for the construction schedule analysis was the 1974 Management Schedule and Control System ("MSCS") construction schedule, which was the first comprehensive construction schedule prepared for Limerick (PECO St. 4A, p. 11; St. 33, p. 6; R. ____). This 1974 schedule also formed the basis for the analysis presented by the OCA and ultimately adopted by the PUC (OCA St. 1, p. 10; R. _____). This schedule was then adjusted in three stages, labeled as Case 1, Case 2 and Case 3, to reflect all unavoidable, as-built conditions other than the alleged impact of the 1976 and 1978 deferral announcements.

The primary purpose of Case 1 was to demonstrate the unreasonableness of the analysis presented by the OCA. This was accomplished by holding the plant completion date constant at July 1982 as proposed by the OCA, and then making two adjustments to reflect unavoidable as-built conditions which were not reflected in the 1974 schedule. First, an adjustment was made to reflect the as-built startup and preoperational testing logic and duration which was not accurately reflected in the 1974 schedule (PECO St. 33, p. 10; R. ____). Schedule logic generally refers to the sequence in which construction activities are performed

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37/ Mr. Coughlin has had over 17 years of experience with Bechtel Power Corporation in the area of nuclear power plant cost and schedule control and, since 1978, has been the principal Bechtel cost and schedule control manager at the Limerick project (PECO St. 33, pp. 1-2; R. ___).

and, on a nuclear project, typically involves the following order: civil/structural activities, mechanical/electrical activities and startup/ preoperational testing activities ending with fuel load (PECO St. 33, p. 9; R. _____). It is uncontested that the actual startup duration at Limerick was 27 months as compared to the 21 months reflected in the 1974 schedule, that this duration was among the shortest in the industry, and that it was not affected by the 1976 and 1978 deferral announcements (PECO St. 4A, pp. 8-9; R. _____). Moreover, these as-built conditions were not challenged as being unreasonable in this proceeding. As such, the schedule was properly adjusted to reflect the actual startup duration.

Second, an adjustment was made to resource load into the 1974 schedule the actual level of construction manhours for all electrical and mechanical activities (PECO St. 33, pp. 10-11; R. ____). Since 1974, a large number of unanticipated design changes were imposed by the NRC at Limerick, which substantially increased the quantity of materials (i.e. pipe, pipe hangers, structural steel, etc.) to be installed on the project and greatly added to the design complexity and congestion in critical plant areas. This in turn greatly increased the amount of time required to complete construction activities over that which was reflected in the 1974 schedule, even assuming the deferral announcements never occurred (PECO St. 33, pp. 10-11; R. _____). These additional quantities and manhours were not challenged as being unnecessary, excessive or avoidable and, accordingly, were properly added to the schedule. Holding the end date in Case 1 constant at July 1982 while adding the

unavoidable and prudent as-built conditions described above, demonstrated that an unrealistic level of manpower would have been required to meet the July 1982 completion schedule accepted by the PUC.

In Case 2, the end date was permitted to float and four additional adjustments were made to the Case 1 scenario. First, all as-built schedule and cash conditions prior to June 1, 1976 were added to the schedule by incorporating as-built civil/structural logic and activity durations for this period (PECO St. 33, p. 14; R. ____). This adjustment was required because the 1976 deferral announcement did not occur until May 1976 and, therefore, any delays in the schedule experienced prior to that time but not included in the 1974 schedule were not even alleged to be imprudent (PECO St. 4A, pp. 3-4; R. ____).

A second adjustment was made to reflect reasonable manpower density limitations. A major factor affecting the time required to perform construction activities is that the configuration, congestion and available work space in critical plant areas restricts the optimum level of manpower which may be used to perform work in an efficient and effective manner (PECO St. 4A, p. 5; R. _____). Thus, failure to account for manpower density limitations may unreasonably result in a level of work assumed for a given period being greater than actually could have been achieved. In order to develop an estimate of actual sustainable manpower density limitations for critical plant areas, i.e. primarily the reactor building and containment drywell, PECO relied upon a specific construction schedule study performed for Limerick Unit 2 which was based on experience at

Limerick 1, detailed walk-downs of the plant and density limitation data obtained from other plants (PECO St. 4A, pp. 12-13; St. 33, pp. 11-15; R. _____). The density limitations used in Case 2 were conservative in that they exceeded the maximum density levels actually achieved at Limerick on a sustained basis.

A third adjustment was to reflect a reasonably sized second shift of workers available in critical plant areas (PECO St. 33, p. 15; R. _____). The adverse schedule effects of manpower density limitations, reduced productivity and other factors resulting from the imposition of NRC design changes can be avoided to some extent by the use of more than one shift of workers. Based on PECO's experience at Limerick and at other projects, a second shift equal to two-thirds of the first shift was assumed for critical plant areas (PECO St. 4A, pp. 14-15; R. _____). The conservatism of this assumption is illustrated by the fact that PECO and other utilities have generally been unable to maintain even a two-thirds second shift on a sustained basis (PECO St. 4A, p. 15; R. _____).

The final adjustment made in Case 2 was to separate the containment, which was treated as a single schedule activity in the 1974 schedule, into its two component parts, i.e. the dry well and wet well, and treat these as separate activities (PECO St. 33, p. 15; R. _____). The larger work scope and more congested design of the dry well resulted in a lower manpower density and thus a longer construction duration than for the wet well (PECO St. 33, pp. 15-16; R. ____). This adjustment was necessary because treatment of these activities on a combined

basis would have resulted in a higher composite density limitation being applied to dry well activities which were the true critical path on the project, and thereby result in an unrealistically short schedule (PECO St. 33, p. 16; R. _____).

As described above, Case 2 included a number of adjustments to reflect realistic construction conditions which would have extended the schedule even if the 1976 and 1978 deferral announcements had not occurred. As a result of these factors, Case 2 demonstrates that the project critical path was in fact controlled by activities in the containment dry well and that the earliest fuel load date which could have been achieved from a physical construction standpoint, notwithstanding the deferral announcements, was July 2, 1984 (PECO St. 4A, p. 12; St. 33, p. 18; Ex. JJC-1/JRC-1, Section 4; R. _____).

Finally, in Case 3, the level of cash flows assumed in Case 2 were constrained to the level of expenditures which were foreseen by project management during the 1975-1979 time period as required in order to complete the project by 1982 or earlier (PECO St. 33, p. 18; R. _____). The assumed cash requirements were derived from project forecasts and other contemporaneous documentation, and reflected only cash estimates unaffected by PECO's financial limitations (PECO St. 1A, pp. 9-10; R. ____). This analysis indicated that dry well activities still controlled the project and that the plant, therefore, would have been completed on approximately July 2, 1984 despite these cash flow restrictions. However, if the foreseeable cash flow levels were applied without the maximum sustainable manpower density limitations (which as stated above is clearly an unreasonable

assumption), the end date would still have extended beyond July 1982, thereby further confirming the unreasonableness of the PUC's determination (PECO St. 33, pp. 18-19; R. _____).

In summary, PECO's construction schedule analysis demonstrated that the earliest date that construction could have been completed was July 2, 1984, even assuming that the deferrals in 1976 and 1978 were never announced. Again, the assumptions and results of these analyses were not significantly challenged by opposing parties and the PUC provided absolutely no specific rationale whatsoever for their rejection.

APPENDIX C

THE COMMISSION'S JANUARY 21, 1986 ORDER IN DOCKET NO. R-850152

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17120

Public Meeting held January 17, 19

Commissioners Present:

Linda C. Taliaferro, Chairman
Frank Fischl
Bill Shane

Pennsylvania Public Utility Commission
v.
Philadelphia Electric Company R-850152

OPINION AND ORDER

BY THE COMMISSION:

Before the Commission for consideration is a Petition filed by Philadelphia Electric Company (PECO) on December 26, 1985, pursuant to Section 5.302 of the Commission's Regulations, 52 Pa. Code §5.302, which seeks Commission review and answer of a material question which has arisen as a result of a ruling by Administrative Law Judge (ALJ) Joseph P. Matuschak granting a Motion in Limine filed by Commission Trial Staff (Trial Staff). The ALJ's ruling would exclude the introduction in this proceeding of certain PECO testimony regarding the prudence of PECO in delaying construction in 1976 and 1978 of Limerick Generating Unit No. 1.

The material question for which PECO seeks Commission review and answer is the following:

> Whether, [contrary to the determination of the Pennsylvania Supreme Court in Pa. P.U.C. v. Philadelphia Electric Company, 501 Pa. 153, 460 A.2d 734 (1983),] the [criticism of] findings concerning the Company's 1976 and 1978 deferral announcements in the 1980 Limerick Investigation constituted a final adjudication which precludes the submission of any evidence on the prudence of such

action in the current proceeding, other than quantification of the consequences thereof.[1/]

Brief History of Proceedings

On September 27, 1985, PECO filed with the Commission Supplement No. 15 to its Tariff Electric-Pa. P.U.C. No. 26, designed to produce an increase in annual electric revenues, in a gross amount of approximately $949 million based on estimated sales for a future test year ending June 30, 1986. A major issue in the instant proceeding is the proposed inclusion in rates of the capital and operating costs of the Limerick Nuclear Generating Station Unit No. 1 and 100% of Common Plant.

In the Motion in Limine filed on November 20, 1985, Trial Staff requested ALJ Matuschak to make a preliminary determination of the nature of the evidence that may be admitted into the record regarding the 1976 and 1978 delays in the construction of the subject generating unit.

ALJ Matuschak granted Trial Staff's Motion in Limine which thereby would exclude certain PECO testimony, in the instant proceeding, regarding the prudency of the 1976 and 1978 construction delays.

Trial Staff Argument

In support of its Motion, Trial Staff argued:

1. The Commission has previously considered the prudence of the Company's construction of the Limerick Station in Re Limerick Nuclear Generating Station, 56 Pa. P.U.C. 47 (1982) aff'd 501 Pa. 153, 460 A.2d 734 (1983); and that among the issues considered by the Commission was the prudence of the Company's decision to delay construction of the Limerick Station in 1976 and 1978.

2. The Commission stated, in the prior proceeding "[W]e are of the opinion that PECO management did not exercise judgment sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976, and 1978." (56 Pa. P.U.C. at 61).

1/ The bracketed words have been deleted from the question framed by PECO. Our restatement of the material question more accurately reflects the question before us for review.

3. The Commission refused to quantify the cost of the delays to the ratepayers since it had not, at that point, been presented with a claim for recovery of any costs associated with the construction of the plants.

4. The Commission's determination concerning the reasonableness of the 1976 and 1978 Limerick construction delays was not set aside, annulled or modified by the Pennsylvania Supreme Court in its affirmance of the Commission's Limerick Investigation Order.[2/]

5. The Commission's prior finding of the unreasonable nature of the 1976 and 1978 Limerick construction delays meets the requirements of Section 316 of the Public Utility Code[3/], and therefore is prima facia evidence of the facts found regarding the prudence of the 1976 and 1978 construction delays, and is therefore conclusive upon the parties to the present proceeding.

6. All of the parties in the prior Limerick investigation received a full and fair opportunity to present evidence directed to the issue of whether PECO was prudent

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2/ The Court described the Commission's delay in construction conclusion in footnote 7 to its Opinion, where it stated:

> Further, the opinion accompanying the PUC's order contained criticism, of an advisory nature, directed at PECO's decision in 1976 and 1978 to defer completion of the Limerick facilities. Such mere criticism, however, does not constitute an adjudication and cannot be reviewed on appeal.

501 Pa. at 161, 460 A.2d at 739.

3/ Section 316 of the Public Utility Code, 66 Pa. C.S. §316, provides that:

> Whenever the commission shall make any rule, regulation, finding, determination or order, the same shall be prima facie evidence of the facts found and shall remain conclusive upon all parties affected thereby, unless set aside, annulled or modified on judicial review. (Emphasis added).

(66 Pa. C.S. §316).

when it decided to delay Limerick construction in 1976 and 1978, and no useful purpose would be served by relitigating this issue in the present case.

7. Only the quantification of the effects of the 1976 and 1978 construction delays should be examined in the instant proceeding.

PECO Argument

PECO contends that the material question, supra, for which it seeks Commission review should be answered in the negative for, inter alia, the following reasons:

1. PECO raised this issue in the appellate proceedings which followed the 1980 Limerick Investigation in order to avoid any res judicata or other conclusive status for the imprudence discussion and was told by the Pennsylvania Supreme Court that the PUC opinion was "advisory" and that such "mere criticism" did not constitute an adjudication and could not be reviewed on appeal.

2. To make the PUC's imprudence "criticism"[4/] a binding finding of fact in this case in the face of the Supreme Court's decision causes substantial prejudice to PECO whose due process rights are violated by (a) ruling that a "criticism" it could not appeal is final and binding, and (b) excluding evidence which forms the basis for a critical PECO position in this proceeding developed in reliance upon the Commission's prior statements and the Supreme Court decision.

3. Exclusion of major evidence on the prudence of the 1976 and 1978 Limerick deferral announcements will prejudice PECO by creating an incomplete record, certain to be reversed on appeal, in the opinion of PECO, with the need to add the excluded evidence at a later date, contrary to the orderly conduct of proceedings in which rates are to be established for the future.

4/ The term "criticism" is taken from the Pennsylvania Supreme Court's footnote 7, supra, not from the Commission's prior Opinion and Order which contained findings directed to the issue of whether PECO was prudent when it decided to delay construction in 1976 and 1978, and which Opinion and Order was affirmed by the Court.

Discussion

The material question concerning which PECO seeks this Commission's answer thereto comes before us pursuant to the Interlocutory Review sections of our Rules and Regulations, specifically Sections 5.301 and 5.302, 52 Pa. Code §5.301 and §5.302, which provide in pertinent part:

> Subchapter C. INTERLOCUTORY REVIEW
>
> § 5.301. Interlocutory review generally.
>
> (a) The Commission will not permit interlocutory review of rulings of presiding officers, made during the course of proceedings, except upon petition alleging extraordinary circumstances and as specified in this subchapter.
>
> (b) Subsection (a) supercedes 1 Pa. Code §35.190 (relating to appeals to agency head from rulings of presiding officers).
>
> § 5.302. Petition for Commission review and answer to a material question.
>
> (a) During the course of a proceeding, a participant may submit a timely petition to the Secretary requesting the Commission's review and answer to a material question which has arisen or is likely to arise. The petition shall be in writing with copies served on all participants and the presiding officer and shall state, in not more than one page, the question to be answered and the compelling reasons why interlocutory review will prevent substantial prejudice or expedite the conduct of the proceeding. (Emphasis added).

We will review the material question since we view the issue raised by the question as constituting extraordinary circumstances which will expedite the conduct of the proceeding when resolved.

Before discussing the material question presented for review, we consider it appropriate to state the entire ruling of the ALJ on the Motion in Limine filed by Trial Staff as set forth in ALJ Matuschak's Interim Order of December 20, 1985:

We render the following Interim Order:

It is ordered, first, that the Motion in Limine by Trial Staff that we make a preliminary determination of the nature of the evidence that may be admitted into the record in this rate proceeding at R-850152 is hereby granted.

Two, that the record at I-80100341, insofar as it relates to the decisions of Philadelphia Electric Company to initially construct the Limerick nuclear generating station and to delay construction of Limerick in 1974, 1976 and 1978, are incorporated by reference into the record of this proceeding.

Three, that Trial Staff's motion that we determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions in 1976 and 1978 to delay Limerick construction were unreasonable are conclusive upon the parties in this proceeding is hereby granted.

Four, that sua sponte, we further determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions intially to construct the Limerick nuclear generating station and to delay the Limerick construction in 1974 were reasonable are likewise conclusive upon the parties in this proceeding.

Five, that the evidence heretofore admitted in this proceeding insofar as it relates to the reasonableness or unreasonableness of Philadelphia Electric Company's initial decision to construct the Limerick nuclear generating station and its decisions to delay Limerick construction in 1974, 1976 and 1978, is hereby stricken and that further evidence relating thereto shall not be admissible in this proceeding. (Tr. 1374-1375).

Our Opinion and Order in Limerick Nuclear Generating Station Investigation, Docket No. I-80100341 (August 27, 1982) set forth the following discussion and findings regarding the 1976 and 1978 construction delays or extensions:

> Turning to the 1976 and 1978 extensions, we note that at the time of these decisions, PECO had two and four years of additional information indicating that the decline in demand was continuing, and, despite increases in rates approved by us, further deterioration of PECO's financial condition had occurred.
>
> The ALJ has found that the 1976 postponement was "made without careful analysis of the impact of such delay on ratepayers" and that "[c]onsumers should not be expected to pay for delay which results [from] a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest." To the ALJ's finding of imprudence PECO has excepted, arguing that the Initial Decision fails to provide an assessment of the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion, in addition to disregarding the evidence of PECO's precarious financial condition during the 1974-80 period and evidence that the reduced load growth permitted delaying completion of Limerick without threatening service reliability.
>
> It appears, from the record before us, that PECO's 1976 and 1978 construction delays were caused by PECO's financial difficulties, which in turn were caused by its ambitious construction program and its ever decreasing load growth; conditions similar to those causing the 1974 delay. While it is true that PECO's financial condition deteriorated from its 1974 levels, we are of the opinion that, at the least, PECO's ambitious construction plans exacerbated its financial difficulties. We are convinced that PECO's financial difficulties, proffered as a reason for delaying construction, would have been less acute if construction at Limerick had been terminated.

PECO now argues that one of the prime considerations in delaying construction was a continued reduction in PECO's load growth. Although PECO's spring 1976 load forecast projected a lower load growth than earlier anticipated, it appears that even this projection was overly optimistic. We note that in PECO's 1977-78 rate proceeding, PECO reduced its forecasted growth rate from 5% to 3%. Pennsylvania Public Utility Commission v. Philadelphia Electric Company, R.I.D., 438 (February 5, 1979). Apparently, this 1978 reduction was an acknowledgement that the trend evidenced in 1974 was continuing. Despite this now obvious trend, PECO delayed construction in the hope that load would improve.

PECO's final argument, that the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion favored delay, is unpersuasive. We find this argument curious in light of the fact that PECO stresses that, because load growth has declined, the Limerick Units' main purpose is to replace oil fired generating capacity. If Limerick can be economically justified when compared to a combination of alternative sources of power and the retirement of oil fired plants, which by now have been extensively depreciated, the relative benefit to current ratepayers would have been greater if the oil capacity, and their associated costs, had been retired earlier by way of compressing rather than expanding the construction schedule. Further, as the nation as a whole experienced a period of double digit inflation and rising interest rates, delaying the necessary financing did and will continue to increase the ultimate costs of the plant financing.

Considering the foregoing, we are of the opinion that PECO management did not exercise judgment sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976 and 1978. Having so found, we are requested by Staff and the OCA to quantify the cost of the delay to ratepayers. We are of the opinion that to do so at

> this time is inappropriate. We have not been presented, in this proceeding, with a claim for recovery of any of the costs associated with the construction of the plants. Consequently, we can make no adjustment to any claim. Further, should PECO sell all or part of the Limerick plant or its capacity to other utilities, the deduction of all or part of the costs of delay from PECO's claim, if any, would be materially affected. We therefore find it unnecessary to quantify, at this time and in this proceeding, the costs associated with the 1976 and 1978 delays. (Emphasis added).

ALJ Matuschak concluded that this Commission recognized in the earlier Limerick investigation that the construction delay issues were of such magnitude that we could not, because of time constraints, properly address these issues solely in a rate proceeding; and it was therefore necessary to hold a separate investigation in order to obtain facts regarding the construction delays. The ALJ has correctly recognized our concern, expressed at that time, which was that there would be insufficient time during a rate investigation to obtain all the facts in an orderly and expeditious manner, regarding, inter alia, the 1976 and 1978 construction delays.

Our agreement with the ALJ's interpretation of our intent to bifurcate the construction delay issues is best evidenced by our incorporation into this Opinion and Order of his conclusion in this regard:

> It is apparent that the Commission, recognizing that these issues could not be adequately addressed with all the other issues involved in a rate case, when PECO would seek to include Limerick in rate base, as a pragmatic procedure, directed that such issues be determined in an independent proceeding in the nature of a bifurcation or as an ancillary or in-aid aspect of this rate case.
>
> These issues were addressed in the Limerick proceeding in an open and full hearing in which Trial Staff and all the other parties, including PECO, had a full opportunity to develop the record on this (sic) issue.

> In the Limerick proceeding, the Commission found that the initial decision of PECO to construct Limerick and the decision to delay the in-service dates of Limerick in 1974 were prudent; and that PECO's decisions in 1976 and 1978 to further delay the in-service dates of Limerick were imprudent or unreasonable. (Tr. 1372-1373).

We will now address the question of whether Section 316 of the Public Utility Code, 66 Pa. C.S. §316, is pertinent to the issue before us for consideration. Trial Staff contends that Section 316 supports its position that our findings in the prior Limerick investigation regarding the prudence of PECO's decision to delay construction of the generating unit in 1976 and 1978 are binding upon the parties in the instant proceeding because such findings were not set aside, annulled or modified on judicial review.

In our view, Section 316 clearly provides that whenever the Commission makes any finding, determination or order, that finding shall be prima facie evidence of the facts found and shall remain conclusive upon all parties affected thereby unless set aside, annulled or modified on judicial review. No reasoned interpretation of this Section would lead to the conclusion that such a finding would not remain conclusive unless or until appealed. Such findings are conclusive on the parties unless set aside, annulled or modified on judicial review. The Pennsylvania Supreme Court affirmed the Commission's Opinion and Order in the Limerick investigation at 501 Pa. 153, 460 A.2d 734 (1983). The Court did not set aside, annul or modify any findings, including the imprudence finding concerning the 1976 and 1978 construction delays.

The Supreme Court's mention of the subject findings regarding the prudence of the 1976 and 1978 construction delays was, at most, mere dicta. We interpret the Court's language as merely a recognition by the Court that since no rate claims had been made for the Limerick Generating Unit No. 1 and that since the Commission could not quantify the rate aspects of such a claim at that time, the matter was not appealable. However, regardless of our interpretation of footnote 7, it is clear that the Court did not modify the subject findings, and it did not adjudicate any issue regarding the findings. Simply stated, it is as if the findings issue had never been before the Court. Therefore the factual findings are conclusive on the parties because they have not been disturbed on appeal.

Section 316, however, provides that the Commission's findings or determinations shall be prima facie evidence of the facts found and shall remain conclusive upon all parties; therefore, the factual findings of the Commission are conclusive. Our ultimate conclusion in the prior Limerick investigation that PECO was imprudent in deciding to delay construction of the generating unit in 1976 and 1978 was a legal conclusion, as distinguished from a factual finding. This ultimate legal conclusion precludes litigation of the issue of PECO's prudence in the instant rate proceeding under the doctrine of res judicata See Philadelphia Electric Company v. Pa. P.U.C., 61 Pa. Commonwealth Court 325, 433 A.2d 620 (1981), or collateral estoppel See Edward H. Fincher, Appellant v. The Township of Middlesex et al., Appelles., 64 Pa. Commonwealth Ct. 355, 439 A.2d 1353 (1982).

Conclusion

In accordance with our prior discussion, and after reviewing the various pleadings of the parties, including briefs, and the pertinent transcript sections, we conclude that: (i) the material question presented is properly before the Commission for review; (ii) the material question is answered in the positive, and (iii) the ruling of ALJ Matuschak on Trial Staff's Motion in Limine is affirmed; THEREFORE,

IT IS ORDERED:

1. That the material question for which Philadelphia Electric Company seeks Commission review, pursuant to 52 Pa. Code §5.302, is answered in the affirmative.

2. That the ruling of Administrative Law Judge Joseph P. Matuschak on the Motion in Limine filed by Trial Staff is affirmed.

3. That the Petition of Philadelphia Electric Company for a stay of the Ruling of Administrative Law Judge Joseph P. Matuschak is denied.

BY THE COMMISSION,

Jerry Rich
Secretary

(SEAL)

ORDER ADOPTED: January 17, 1986

ORDER ENTERED: January 21,1986

APPENDIX D

THE COMMISSION'S JUNE 27, 1986 ORDER IN DOCKET NO. R-850152

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17120

Public Meeting held June 26, 1986

Commissioners Present:

Linda C. Taliaferro, Chairman
Frank Fischl
Bill Shane dissenting (opinion attached)

Pennsylvania Public Utility Commission, et al.
v.
Philadelphia Electric Company

R-850152
R-850152C001-
R-850152C0014

APPEARANCES

Robert H. Young
Jay H. Calvert, Jr.
Walter R. Hall, II
David B. MacGregor
Jack E. Jerrett
Michael A. McGrail
John F. Stillmun, III
Stuart W. Fraser
Thomas T. Loder
Morgan, Lewis & Bockius
For: Philadelphia Electric Company

Marlane R. Chestnut
Veronica A. Smith
Daniel P. Delaney
For: Commission Trial Staff

Scott J. Rubin
David Wersan
Susan Perkins Weston
Irwin A. Popowsky
For: David M. Barasch, Consumer Advocate

OPINION AND ORDER

BY THE COMMISSION:

I. INTRODUCTION AND HISTORY OF THE PROCEEDING

On September 27, 1985, Philadelphia Electric Company ("PECO" or "Company") filed Supplement No. 15 to its Tariff Electric - Pa. P.U.C. No. 26 to become effective November 27, 1985. The Supplement was designed to produce an annual base rate increase of $681,760,000, based upon an adjusted level of operations using a historic test year ended June 30, 1985, and a future test year ending June 30, 1986.

The proposed net increase of $681.8 million is comprised of two components - an $893 million increase in rates to reflect additional plant in service and increased operating expenses, and a $207.5 million rate decrease to reflect the reduction in energy costs occasioned by the operations of Limerick Unit No. 1 ("Limerick 1"), if operated at a certain capacity level. Limerick 1 is one unit of a nuclear electric generation station composed of Limerick 1 and Limerick 2. Limerick 1 went into actual commercial operation in February 1986. Limerick 2 is still under construction. A common plant will be utilized by both units.

By Order entered November 1, 1985, we allowed Supplement No. 15 to be suspended by operation of law, pursuant to Section 1308 of the Public Utility Code, 66 Pa. C.S. §1308, until June 27, 1986, and instituted an investigation, at Docket No. R-850152, into the lawfulness, justness and reasonableness of the proposed rates and of existing rates. The matter was assigned to Administrative Law Judge ("ALJ") Joseph P. Matuschak.

I. 1976 and 1978 Decisions to Delay Construction of Limerick

PECO received its permit in 1974 to begin constructi of the Limerick Nuclear Generating Station, which consists of two 1055 MW turbine generator units, each served by its own boiling water reactor (BWR) system (PECO St. 1). The Company made a decision in 1976 to delay completion of the first unit, or Limerick 1, from April 1981 to April 1983. In 1978 PECO decided to further delay construction of Limerick from 1983 to 1985.

At the conclusion of an investigation at Docket No. I-80100341, we determined that PECO's delay decisions in 1976 and 1978 were imprudent and unreasonable, but did not find it appropriate to attempt to quantify the ratemaking impact of those decision at that time. In our Final Order relative to that investigation, we stated:

> . . . we are of the opinion that PECO management did not exercise judgment sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976 and 1978. Having so found, we are requested by staff and OCA to quantify the cost of the delay to ratepayers. We are of the opinion that to do so at this time is inappropriate. We have not been presented, in this proceeding, with a claim for recovery of any of the costs associated with the construction of the plants. Consequently, we can make no adjustment to any claim. . .
>
> (56 Pa. P.U.C. at 61).

In this proceeding, in a Bench Ruling made December 2 1985, upon a motion by Trial Staff, ALJ Matuschak held . . . "t Staff's motion that we determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions in 1976 and 1978 to delay Limerick construction were unreasonable are conclusive upon the parties in this proceeding is hereby granted." (Tr. 1384).

On January 21, 1986, we affirmed the ALJ's Bench Ruling on interlocutory review. As a consequence, the issue in this proceeding is not the prudence or reasonableness of the Company's actions, but rather to determine if the decisions made in 1976 and 1978 to delay completion of Limerick 1, resulted in an unreasonable escalation in the cost of that unit. If we find that unreasonable costs were incurred as a result of the construction delays, we then have the task of quantifying the impact of those imprudent-management actions upon the Company's customers.

The Company's position is that there are no additional costs for Limerick 1 which are attributable to the 1978 and 1978 "deferral announcements" (PECO Initial Brief, p. 4-178).

The Trial Staff and the OCA insist that there are significant and excessive costs which relate directly to PECO's decisions to delay Limerick 1 construction, and they have attempted to quantify, through differing techniques, an appropriate adjustment to the Company's claim. Other parties have adopted one or the other, and, in some instances both, of the positions advanced by Trial Staff or the OCA (R.D., p. 53).

We do not find it necessary to provide a complete description of the various parties positions on this issue. We find that ALJ Matuschak has provided a comprehensive and accurate review in this area and, to that extent we adopt his account as our own (R.D., pp. 45-71). We will, of course, touch on those elements which we consider key to our discussion and final determination.

PECO issued its initial Capital Authorization for Limerick in December 1970. At that time the estimated direct cost for Limerick 1 and common plant was approximately $344 million (PECO Initial Brief, pp. 3-20 and 3-22). The

final cost of Limerick 1 and common plant as claimed in this proceeding is $3.8 billion.

The Company maintains that the escalation in the cost of Limerick 1 was due primarily to external forces, such as NRC requirements, beyond the Company's control, and had virtually nothing to do with the decisions to delay construction. In fact, PECO, in an effort to minimize the importance of those two events, insists upon characterizing the action taken in 1976 and 1978 as "deferral announcements" rather than actual construction delays. According to PECO, it tried hard but failed to maintain a construction pace and funding level which would permit completion of Limerick 1 in 1983 even after the deferral announcements were made.

The main thrust of PECO's position is that forces other than the decisions of 1976 and 1978, conspired to delay completion of Limerick 1. Chief among these were changes and new requirements mandated by the NRC, but other elements, such as "estimate refinement" and "unanticipated escalation" also contributed to the problem (PECO Initial Brief pp. 3-27 and 3-28).

In summary, the Company contends that its deferral announcements were not really decisions to delay construction, and, in any event, Limerick 1 could not have been completed before February 1986.

ALJ Matuschak rejects PECO's arguments as unpersuasive and not supported by the evidence of record. He is not convinced that PECO's deferral announcements had no impact on Limerick 1 construction. The ALJ states:

> We are not convinced that such "deferral announcements" were mere harmless press releases for public and investor consumption, with no intention to actually delay construction of Limerick 1; PECO's

subsequent reduced financial commitments to Limerick 1 construction show otherwise.

(R.D., p. 50)

The ALJ observes that PECO lowered its five-year construction program in 1976 by $150 million per year, on average, and that it reduced its direct expenditures from budgeted amounts by approximately $50 million for the period 1978-1980.

ALJ Matuschak also rejects PECO's arguments that the delay decisions did not cause any escalation in the cost of Limerick 1 since the real reasons for the increased cost were factors, such as NRC requirements, which were beyond the Company's control. The ALJ cites the testimony of a PECO Senior Vice President, in this proceeding and in earlier proceedings and presentations before the Commission, which serves to illustrate the Company's concern that delays, in and of themselves, can affect the cost and economics of Limerick (R.D., pp. 54-55). As for the impact of revisions and approvals mandated by the NRC, the ALJ states:

> It may be true that regulatory approvals as granted would have prevented earlier completion of Limerick 1 construction, if one takes the dates of such approvals as a given. But there is no reason to conclude that regulatory approvals would not have been implemented in timely fashion had construction been completed without delay.

(R.D., p. 59)

The ALJ concludes that the record does not support the Company's position on this issue and he finds that the decisions of 1976 and 1978 to delay completion of Limerick 1, in fact, significantly increased the cost of that plant.

We agree completely with the reasoning and conclusion of ALJ Matuschak on this issue. The Company would have us believe that its deferral announcements of 1976 and 1978 had virtually nothing to do with the approximate four year delay in the completion of Limerick 1. Such an argument is preposterous on its face and would require a great deal of proof to sustain. The Company has failed to supply that proof. PECO's contention that other factors, in particular NRC mandated revisions and approvals, served to prolong the Limerick construction schedule, has some merit. However, the Company's attempt to pin the entire balance for the delay on such factors, in view of the public announcements to delay completion of the plant, cannot be accepted. On this point, we mention with approval the OCA's comparison of the Limerick 1 construction schedule with the schedule followed by Pennsylvania Power & Light Company in building the Susquehanna 1 nuclear unit. Regarding PECO's claim that it could not have completed Limerick 1 at an earlier date the OCA states:

> Indeed, PECO's neighbor utility, PP&L, did just that at Susquehanna 1. In fact, as the OCA noted in its Main Brief, Limerick 1 construction was actually ahead of Susquehanna 1 during the early years of its schedule. OCA M.B. at III-52. It was only after PECO began stretching out the Limerick schedule that Susquehanna construction caught up with Limerick and finished earlier and at a substantially lower cost.
>
> As the evidence in this case shows, Susquehanna is very similar to Limerick. Both plants are GE BWR Mark II designs, of approximately 1055 MW, with cooling towers, built by Bechtel, located in Pennsylvania, subject to the same PUC regulation, in the same NRC Region, in the same craft labor and wage market, and subject to the same NRC regulations. TR. 1146-1150. Susquehanna

> entered commerical operation on June 8, 1983, more than 5 months before the OCA's suggested commerical operation date for Limerick 1, of November 20, 1983 and more than 32 months before Limerick 1's actual commerical operation date of February, 1986.

(OCA Reply Exceptions, p. 7)

In summary, we find that PECO has failed to demonstrate that its decisions of 1976 and 1978 to delay completion of Limerick 1 did not escalate the cost of that unit. We conclude that those decisions did, in fact, raise the final cost of Limerick 1 to an unreasonable level, and our task now is to quantify the impact of those decisions.

We noted earlier that both Trial Staff and the OCA have attempted, through different methods, to calculate the additional costs of Limerick 1 caused by the imprudent delay decisions of 1976 and 1978.

Adoption of Trial Staff's position would result in a rate base disallowance of $1.12 billion. ALJ Matuschak describes Trial Staff's proposal as follows:

> Staff's delay and calculation is based on a comparison of actual to-date project expenditures as of October 31, 1984, when fuel load commenced, to its own computation of project costs if the unit had been both completed and in service in April 1981.
>
> . . . Trial Staff took the cost of the unit as actually built -- including all actual quantities of material and labor manhours -- and priced it to remove the escalation in costs caused by inflation during the delay period. In other words, Staff recommends that the Commission

recognize the 1984 plant, which incorporates all NRC-mandated design changes, at a 1981 cost level.

(R.D., pp. 59-60)

According to the ALJ, the Trial Staff's analysis is seriously flawed in that it assumes a hypothetical in-service date of April 1981 for Limerick 1, and "fails to establish any causal relationship between the imprudent deferral decisions and the costs which it seeks this Commission to disallow" (R.D., pp. 62-63).

The ALJ recommends that Trial Staff's proposal be rejected and we agree. Something more than a simple mathematical calculation is needed here. Resolution of this issue requires an analysis of the Limerick 1 construction schedule to determine, as accurately as possible, the direct cost impact of the 1976 and 1978 delay decisions. We cannot assume, as Trial Staff's method does, that Limerick 1 would have or could have been completed in April 1981, if the Company had not made imprudent construction deferrals.

The OCA determined the cost of the imprudent construction delays to be $652.4 million for Limerick 1 and 50% of common plant.[3/] The ALJ does not recommend adoption of the full amount of the OCA's proposed adjustment, but he does endorse the technique by which it was developed and which he describes as follows:

3/ The ALJ incorrectly states that the OCA's proposed adjustment is $610.4 (R.D., p. 70). However, the OCA points out that this figure includes the effects of its Mark II adjustment, which the ALJ has rejected. The correct figure, excluding the Mark II effects, is $652.4 million (OCA Exceptions, p. 23).

> The delay analysis presented by the OCA witness is based upon a specific critical path schedule analysis of Limerick 1. In developing this reconstruction, certain facts or conclusions were accepted by the OCA. First, the analysis started with the Commission's finding in the Limerick Investigation that the 1974 delay in construction of the plant was reasonable. (OCA St. 1, at 11). Second, the analysis accepted that certain engineering or design constraints to construction completion, such as the resolution of the Mark II redesign, had to be recognized. Finally, the impact of NRC regulatory requirements which could delay fuel load and commercial operation was reviewed.
>
> * * *
>
> A critical path analysis, as presented by Mr. O'Brien, focuses on those activities which limit or determine the progress toward completion of a job. These activities are important to or affect the construction schedule and, therefore, the duration of a project.

(R.D., pp. 66-68)

The OCA analysis indicates that, but for the 1976 and 1978 delays in construction, Limerick 1 could have loaded fuel in July 1982, and entered commerical service by November 1983. This would have been 27 months earlier than the actual in-service date.

According to ALJ Matuschak, the calculation of OCA's proposed disallowance was achieved in the following manner:

> The quantification of the costs of delay has two components. The first component is identification of actual work as expenditures that would not have occurred if commerical operation had occurred 27 months earlier. These costs are the result of what is commonly

called Indirect Costs. Indirect Costs are the costs required to support construction as it proceeds over time. For Limerick 1, these costs are incurred by both PECO and Bechtel.

* * *

The second component of the costs of the 27-month delay is the increased escalation and AFUDC which incurred due to the longer period over which construction continued.

(R.D., p. 69)

The results of the OCA's calculation is a proposed disallowance of $223.6 million in indirect costs for both PECO and Bechtel, and direct costs associated with cost escalation and AFUDC in the amount of $428.8 million, for a total rate base adjustment of $652.4 million.

ALJ Matuschak finds that the OCA has overstated the indirect costs which PECO could have avoided by $55.5 million. He agrees with the Company that these charges are associated with startup and operating activities and would have been incurred regardless of when the plant was completed. As a consequence, the ALJ reduces the OCA's proposed adjustment and would recommend that $596.9 million be deducted from PECO's claimed rate base to account for the imprudent construction delays of 1976 and 1978.[4/]

4/ The ALJ actually recommended a disallowance of $554.9 million. However, as noted earlier, the OCA proposal on which the ALJ bases his recommendation includes the impact of the OCA's Mark II adjustment which the ALJ has rejected.

PECO offers three significant arguments in opposition to the OCA's quantification of the impact of the imprudent Limerick 1 delays as recommended for adotpion by the ALJ.

First, the Company contends that OCA's calculation fails to factor in the additional revenue that would have been necessary to satisfy the financing requirements of the OCA's proposed construction schedule. PECO estimates the capitalized value of the additional revenue requirement to be $200 million (PECO Exceptions, pp. 17-18).

We find the Company's reasoning too speculative on this point. We agree with the OCA's rebuttal arguments that:

> PECO's analysis, however, improperly assumed that had Limerick 1's construction schedule been advanced, PECO would not have made <u>any</u> other changes to its operating or construction budgets or priorities.
>
> * * *
>
> Obviously, if PECO assumed that all additional earlier Limerick 1 financing was <u>incremental</u> to other concurrent actual financing, the Company's total financing costs would increase. There is no dispute that PECO was having some financial difficulties in the late 1970's, due primarily to its ambitious multi-plant construction projects and particularly to simultaneous construction of Limerick 1 and 2. PECO's hypothetical assumptions, however, are completely unrealistic. The OCA submits that PECO could have reordered its financing priorities had it desired to complete Limerick 1 on a timely schedule.

(OCA Reply Exceptions, pp. 33-34)

PECO also asserts that the OCA failed to include in its calculation the additional PURTA taxes associated with the base cost of capitalized overheads and taxes actually incurred during the years 1975 through 1983. According to the Company, correction of this "error" would reduce the recommended disallowance by $38.9 million (PECO Exceptions, p. 20).

Our review of the evidence indicates that PECO is correct on this issue. It appears that the OCA has included only the incremental capitalized PURTA taxes resulting from the additional direct costs in its calculation, thereby reflecting only a portion of the PURTA taxes which would have been incurred. We will adjust our final disallowance accordingly.

PECO also contends that the OCA's quantification assumes that certain NRC safety design requirements could be postponed until after Limerick 1 was placed in service, but that it fails to incorporate the increased cost associated with implementing such design features in a plant which is in commerical operation. The Company, argues that:

> The OCA's analysis is predicated on the assumption, for which absolutely no support is offered by OCA witnesses, that PECO could implement NRC design requirements during regularly scheduled outages, and at the same cost at which they were actually implemented during Limerick's construction (PECO Initial Brief, pp. 4-105 to 4-108). However, as PECO witness Helwig demonstrated, based on the complexity and number of the required changes, additional outage time (i.e., in excess of regularly schedule outages) of at least 10-12 months, at a replacement power cost of $150 to $180 million, would be required under the OCA proposal. This range represents the average daily replacement power cost of $500,000 over the required 10 to 12-month period (PECO Initial Brief, pp. 4-106 to

4-107). The equivalent capital cost effect of these additional replacement power costs borne by ratepayers is $88.8 million to $105.9....

In addition, the difficulty of implementing such design and equipment changes in a commercially operating plant under OCA's hypothetical proposal would require additional expenditures of approximately $100 million (Id.). Specifically, Mr. Helwig explained that this is because many of the requirements imposed by the NRC during the 1979-1981 time frame required extensive work in vital plant areas that would be subject to severe space and congestion constraints while the plant was in commercial operation. Further, numerous functions affecting an operating facility not applicable to a plant under construction, such as added procedural controls, access limitations, and blocking requirements would increase the cost of implementing regulatory changes in Limerick 1's design under the OCA's proposal.

(PECO Exceptions, pp. 18-19).

We find the Company's reasoning and analysis to be persuasive on this point. We agree that the OCA should have attempted to calculate the cost impact of post-commercial design changes at Limerick 1. In addition, we note that the OCA has not attempted to rebut the Company's position here in its Reply Exceptions. Accordingly, we find it appropriate to adjust the ALJ's recommended disallowance downward by $189 million, which represents a capital cost effect of replacement power in the amount of $89 million, and $100 million for additional expenditures relating to design and equipment changes.

In summary, we agree with ALJ Matuschak that, although it is flawed, the OCA's quantification regarding the imprudent construction delays provides the best estimate of the cost impact of those delays. We assess the value of

the OCA's errors to be $228 million in addition to the $55.5 million correction recommended by the ALJ. We will therefore reduce the overall adjustment to be deducted from PECO's claimed rate base to $368.9 million.

J. Excess Capacity

A number of parties to this proceeding contend that, with commerical operation of Limerick 1, PECO has more generating capacity than it requires, and they urge the Commission to make various adjustments to disallow such excess capacity. The OCA, with support from GEC, would have the Commission deny an equity return on at least 450 mw of generating capacity. UUC/UP recommends a rate base reduction in the approximate amount of $3.5 billion. Finally, PAIEUG would disallow 962 mw of generation as excess capacity (R.D., p. 71).

The central premise for these Complainants' position on the issue of excess capacity is that certain fossil fuel units have been, or are about to be retired prematurely by the Company. They assert that if it were not for the placing in service of Limerick 1, these units, or some portion of them, could have been retained for a longer period. The identification and generating capacity of the units in question are, Southwark 1 and 2 at 338 mw, Richmond 9 at 166 mw, and leased combustion turbines (CTs) at 458 mw. The OCA's position and proposed adjustment is predicated upon the leased CTs.

The thrust of all of the Complainants' arguments is that PECO had to accelerate the retirement of all or part of these fossil fuel units in order to justify the introduction of Limerick 1 capacity into its system. PAIEUG and

XI. CONCLUSION

In accordance with our resolution of the issues in this proceeding, we conclude that PECO is entitled to an opportunity to earn income available for return of $735,203,000 applicable to its electric operations. PECO is authorized to establish rates designed to produce $2,852,071,000 in annual electric operating revenues. The increase in annual operating revenues herein authorized is $350,797,000 which is to be phased in over a three year period; THEREFORE,

IT IS ORDERED:

1. That Philadelphia Electric Company not place into effect the rates contained in Supplement No. 15 to its Tariff Electric-Pa. P.U.C. No. 26, the same having been found to be unjust, unreasonable and, therefore, unlawful.

2. That Philadelphia Electric Company is hereby authorized to file tariffs or tariff supplements containing rates, provisions, rules and regulations, consistent with our findings herein, designed to produce annual operating electric revenues of not in excess of $2,852,071,000, exclusive of revenues to be derived from the State Tax Adjustment Surcharge revenues; provided however, that the $350,797,000 annual revenue increase herein authorized must be phased-in over a three year period, with deferred revenues being recovered in the fourth, fifth and sixth year.

3. That said tariffs or tariff supplements may be filed upon less than statutory notice, and, pursuant to the provisions of 52 Pa. Code §3.32(b), the tariffs or tariff supplements may be filed to be effective for service rendered on and after the date of entry of this Opinion and Order.

4. That the tax surcharge shall be computed in accordance with the State Tax Adjustment Surcharge Order of March 10, 1970, as revised.

5. That Philadelphia Electric Company shall file detailed calculations with the tariff filing which shall demonstrate to the Commission's satisfaction that the filed rates comply with this Opinion and Order.

6. That Philadelphia Electric Company shall comply with all other directives contained in this Opinion and Order which are not the subject of an individual directive in the proceeding Ordering Paragraphs, as fully as if they were the subject of a specific Ordering Paragraph.

7. That except as herein granted, the exceptions of all parties to the Recommended Decision are denied.

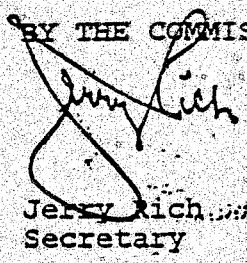
8. That the several complaints filed by various parties to this proceeding, including those which were consolidated with Docket No. R-850152, are granted or denied consistent with this Opinion and Order.

9. That except as herein modified, the Recommended Decision of Administrative Law Judge Matuschak is adopted as the decision of this Commission.

10. That upon the filing of tariff revisions acceptable to the Commission as being in compliance with this Opinion and Order and upon Commission approval of the tariff revisions, the inquiry and investigation at Docket

No. R-850152, et al., shall be terminated and the record marked closed.

BY THE COMMISSION,



Jerry Rich
Secretary

(SEAL)

ORDER ADOPTED: June 26, 1986

ORDER ENTERED: June 27, 1986

APPENDIX E

THE ADMINISTRATIVE LAW JUDGE'S RECOMMENDED DECISION IN DOCKET NO. R-850152

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	
Philadelphia Area Industrial Energy Users Group (a)	R-850152
David M. Barasch, Consumer Advocate	R-850152C001
Consumer Education and Protective Association, International, Inc.	R-850152C002
United States General Services Administration	R-850152C003
City of Philadelphia	R-850152C004
Utility Users Committee of Philadelphia, Inc. and Board of Trustees of The University of Pennsylvania	R-850152C005
National Railroad Passenger Corporation	R-850152C006
Southeastern Pennsylvania Transportation Authority	R-850152C007
Pennsylvania Business Utility Users Group (b)	R-850152C008
SAGE (Senior Action Group Endeavor)	R-850152C009
Temple University - of Commonwealth System of Higher Education (c)	R-850152C010
Pennsylvania Food Merchants Association	R-850152C011
United State Steel Corporation	R-850152C012
Pennsylvania Energy Ratepayers Coalition, Institute for the Study of Civil Values, Krestin Dawkins and Gwen Stallsworth	R-850152C013
	R-850152C014
v.	
Philadelphia Electric Company	

Governor's Energy Council - Intervenor
Occidental Chemical Corporation - Intervenor
Scott Paper Company - Intervenor

(a) Allied Fibers & Plastics
Boeing-Vertol Company
BP Oil, Inc.
Budd Company - The Hunting Park Plant

RECOMMENDED DECISION

Before

Joseph P. Matuschak
Administrative Law Judge

I. HISTORY OF THE PROCEEDING

On September 27, 1985 Philadelphia Electric Company (PECO or Company) filed Supplement No. 15 to its Tariff Electric - Pa. P.U.C. No. 26 to become effective November 27, 1985. Supplement No. 15 is designed to produce an increase in the Company's annual electric revenue of approximately $670.7 million or 28.2% of test year revenues, based on budget sales for a future test year ending June 30, 1986.

The proposed net increase of $670.7 million is comprised of two components - an $878.2 million increase in rates to reflect additional plant in service and increased operating expenses, and a $207.5 million rate decrease to reflect the reduction in energy costs occasioned by the operation of Limerick Unit No. 1 (Limerick 1) if it operated at a certain capacity level. Limerick 1 is one unit of a nuclear electric generating station composed of Limerick 1 and Limerick 2. Limerick 1 went into actual commercial operation in February 1986. Limerick No. 2 is still under construction. A Common Plant will be utilized by both units.

Absent the projected performance by Limerick 1, the estimated savings would not materialize, or, if the performance was greater than projected, the savings could be greater. In any event, however, the savings are not guaranteed by PECO.

PECO contends that if such reclassification is required to bring the Company's accounting records into conformity with the Uniform System of Accounts, we should approve an expense amortization allowance of these expenses to enable the Company to recover these costs since they were never included in any test year data on which the Company's rates were set. This position is without merit, since we agree with Trial Staff that it is contrary to basic ratemaking, which does not require dollar for dollar matching of revenue collected and revenue requirement established and approved. The items claimed in this Adjusting Entry should have been claimed as an expense instead of a capital item. It would be a violation of standard ratemaking concept to go back and expense such items and seek to recover them through rates. This would constitute retroactive ratemaking which is precluded.

Accordingly we adopt the recommendation of Trial Staff and reduce PECO's rate base on this account by $15,334,430.

H. 1976 and 1978 Decisions to Delay Construction of Limerick 1

We have not independently reviewed the reasonableness or prudency of PECO's decision in 1976 to delay construction of Limerick 1 from April 1981 to April 1983, and its decision in 1978 to further delay construction of Limerick 1 from 1983 to 1985. We herein adopt the findings of the Commission at I-80100341 regarding the imprudency and unreasonableness of such delay decisions. We have incorporated so much of the record at I-80100341 as relates to such matter. We permitted the parties to submit an exhibit containing the portions of I-80100341 they

consider as relating to the 1976 and 1978 delay decisions. (See PECO Ex. 37; Trial Staff Ex. 41).

In Re Limerick Nuclear Generating Station, I-80100341, 56 Pa. P.U.C. 47 (1982), the Commission had determined that PECO's delay decisions in 1976 and 1978 were unreasonable and imprudent:

> . . . we are of the opinion that PECO management did not exercise judgment sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976 and 1978. Having so found, we are requested by staff and OCA to quantify the cost of the delay to ratepayers. We are of the opinion that to do so at this time is inappropriate. We have not been presented, in this proceeding, with a claim for recovery of any of the costs associated with the construction of the plants. Consequently, we can make no adjustment to any claim. . .
>
> (56 Pa. P.U.C. at 61).

Thus adopting the Commission's finding at I-80100341, we find that PECO was unreasonable and imprudent in its 1976 and 1978 delay decisions.

In ruling upon Trial Staff's Motion in limine, by our December 20, 1985 Bench Ruling, we held, inter alia,

> . . . that Staff's motion that we determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions in 1976 and 1978 to delay Limerick construction were unreasonable are conclusive upon the parties in this proceeding is hereby granted.
>
> (Tr. 1384).

On interlocutory review, the Commission affirmed our Bench Ruling on January 21, 1986.

In discussing the effect of our Bench Ruling, as affirmed by the Commission, at a hearing held on January 22, 1986, we cited three issues that we considered relevant in the quantification of the impact on ratepayers of the 1976 and 1978 Limerick delays in construction costs of Limerick 1 in this proceeding:

> JUDGE MATUSCHAK: Well, I think its quite evident that it appears that there are at least three categories that could be discussed here:
>
> First is the cost, the additional cost of the construction of Limerick caused by the decisions;
>
> Second, external matters which affected the construction; and
>
> Third, any offsetting matters that could be used in evaluating the cost effect of those decisions.
>
> (Tr. 2044).

In the discussion at the hearing immediately proceding our listing of the issues for litigation, the issue of whether financial constraints were contained in the category of external factors was discussed in the following colloquy:

> MR. WERSAN:
>
> . . . The Company has referred to the financial constraints as an externally imposed condition and that, I think, is a key area of disagreement, certainly, that we have.
>
> The Commission's decision was made in 1982. They had been aware of the company's financial condition through a number of rate cases ----
>
> JUDGE MATUSCHAK: Not only that but that matter was litigated in that investigation and I don't have the decision before me, but I believe that the Commission

determined that the company was able to finance construction as originally planned. We think that clearly is out of the purview of our quantification issues.

(Tr. 2041; Emphasis added).

By our order dated March 10, 1986, on Trial Staff's motion to strike testimony, we said, in part:

2. That to the extent that any testimony submitted by Philadelphia Electric Company which relates solely to the issue to the reasonableness of the Company's 1976 and 1978 decisions to delay construction of Limerick 1 is hereby stricken and may not be relied upon by the parties. For clarification, such stricken testimony shall include, but not be limited to:

(a) Testimony relating to the financial constraints and the impact of such alleged constraints on the Company's 1976 and 1978 decisions, as fully litigated at I-80100341.

(b) Testimony as to load growth, capacity needs, excess capacity concerns, fear of Commission sanctions, and economic benefits of the Company as resulting in the Company's 1976 and 1978 delay decisions, as fully litigated at I-80100341.

(c) Testimony relating to Company's concern for ratepayers' interests and extent of rate relief granted as related to the reasonableness of the Company's 1976 and 1978 delay decisions.

(d) Any other testimony to supplement the record at I-80100341 regarding the reasonableness of 1976 and 1978 delay decisions.

(Ruling on Commission Trial Staff Motion Dated January 6, 1986, To Strike

Testimony of Philadelphia Electric Company. Mimeo at 6; emphasis in original).

At the time of the Company's receipt of its Construction permit in 1974, the estimated total cost of Limerick 1, Limerick 2 and Common Facilities was $1.738 billion. (Limerick 2 Investigation (December 5, 1985) at 66). The final cost of Limerick 1 and 100% of Common Facilities alone is $3.8 billion. (PECO Ex. AW-3 at A5).

Section 1308(f) of the Public Utility Code, 66 Pa. C.S. §1308(f) places a specific burden of proof upon PECO to prove that the costs of Limerick 1 in excess of the Company's original estimate were necessary and proper. This specific burden of proof on the prudent cost of the plant is in addition to the general burden of proof with which all of PECO's claims in this case are reviewed under Section 315, 66 Pa. C.S. §315. Thus, PECO has the burden in this case to prove that the costs of Limerick 1, and in particular, the costs incurred due to the construction delays are reasonable and prudent.

Both Trial Staff and OCA had presented considerable testimony in their respective proposals for an adjustment to PECO's rate base to reflect a quantification of the cost of the delays in Limerick 1 construction as found imprudent by the Commission.

The Pennsylvania Supreme Court has long recognized, even before the enactment of Section 1308(f), that the burden to establish the value of utility plant is by statute placed on the utility. Berner v. Pa. P.U.C., 382 Pa. 622, 116 A.2d 738 (1955).

In assessing the possible long-term effects upon huge construction programs, it is necessary to differentiate between prudent and imprudent management. Some of the same ills befall both classes, but

the latter category will have created an environment that can hasten adverse conditions, snowballing them into disastrous losses for the company's security holders and/or back-breaking rates for the consumers.

The Commission had already in I-80100341 determined the imprudency of PECO's 1976 and 1978 delays in construction of Limerick 1. In this proceeding we have the difficult duty to quantify the costs of such imprudent management actions upon the ratepayers.

While the Company throughout its testimony, and in its briefs, refer to the 1976 and 1978 "deferral announcements," as having no substantial effect upon the Limerick 1 construction, we are not convinced that such "deferral announcements" were mere harmless press releases for public and investor consumption, with no intention to actually delay construction of Limerick 1; PECO's subsequent reduced financial commitments to Limerick 1 construction show otherwise.

In our CAPCO - Report of Investigation, I-79070315 and I-79070317 (1982) we said:

> Absent the protection afforded by the competitive market, the captive utility customers must be protected from imprudent or unreasonable management decisions, resulting in inefficiency, unnecessary expenses, or excessive rate requirements.
>
> (Mimeo, p. 24).
>
> * * *
>
> There is no question that the efficiency, the prudence and the reasonableness of a utility's construction program, in all respect, has an impact upon current as well future rates to its ratepayers.
>
> (Mimeo, p. 25).

It follows, then, that the Commission has the responsibility, in its balancing of the interests of both the Company's shareholders and ratepayers, to disallow construction costs of utility plants in its rate base which have been imprudently or unreasonably incurred. As the Public Service Commission of New York recently observed:

> The disallowance of imprudently incurred costs is fundamental to the law of utility regulation as traditionally practiced in the United States, and we regularly deny recovery of costs that have resulted from imprudent actions. These disallowances are a fundamental part of our responsibility to set just and reasonable rates and are necessary to protect the public from being victimized by the monopoly power of a public utility. If a competitive enterprise tried to impose on its customers costs from imprudent actions, the customers would take their business to a more efficient provider. A utility's ratemakers have no such choice. A utility's motivation to act prudently arises from the prospect that imprudent costs may be disallowed. We, therefore, have an obligation to impose such disallowances when warranted.
>
> Case 27563, Proceeding on Motion of the Commission to Investigate the Cost of Construction of the Shoreham Nuclear Generating Facility. (Issued December 16, 1985, Mimeo at p. 4).

In Pa. P.U.C. v. Philadelphia Electric Co., 52 Pa. P.U.C. 772 (R.I.D. 438, 1978), in finding that the Company has been imprudent in supervising the construction of Salem Unit No. 1, this Commission said:

> . . . we can hold regulated utilities accountable for abuse of discretion or imprudent management in the rate-making process.
>
> (52 Pa. P.U.C. at 787).

Addressing the issue of the underlying reasons for PECO's delays in construction of Limerick 1, as stated by ALJ Klovekorn at I-80100341, OCA witness Knudsen stated, in part, the rationale for the OCA's adjustment in the present case, as follows:

> The ALJ concluded that PECO may have essentially attempted to hedge its bet on Limerick #1 - at ratepayer expense - by delaying the unit and thus avoiding the excess capacity adjustment that might have been imposed. The Company could finesse the issue of excess capacity simply by delaying the unit and accruing AFUDC during the delay.
>
> If this approach is not challenged, then the Company will escape the brunt of an excess capacity adjustment which could have applied in 1982/83, run up additional cost for the customers to pay back at a future period, and, in a real sense, receive a reward, or at least be held harmless for the delay.
>
> (OSA St. 7 at 20; Emphasis added).

There is no question that the delays have significantly increased the cost of the plant.

Our task is to determine what additional costs resulted from the Company's imprudent management decisions in 1976 and 1978 to delay the construction of Limerick 1. Like "all the king's horses and all the king's men," we cannot reconstruct or replay with exactness the construction of Limerick 1 over the years, so as to arrive at dollar precision of the costs arising out of PECO's imprudent delays which the Company would impose upon ratepayers. At best, we must exercise reasonable judgment, based on our review of all the evidence, in the quantification of such costs for disallowance in rate base.

PECO has taken the position that the 1976 and 1978 decisions of the Company had no effect upon the cost of Limerick 1 construction.

On the other hand, Trial Staff and OCA presented evidence proposing to quantify the additional cost of Limerick 1 resulting from the Company's 1976 and 1978 imprudent delay decisions. Other parties have adopted one or other, or both, of the positions of Trial Staff or OCA. In approaching their attempt to quantify the additional cost of Limerick 1 resulting from the Company's 1976 and 1978 delay decisions, Trial Staff and OCA utilized different methodologies. We shall review each in turn.

The company, in this proceeding, would distinguish between the prudency of its 1976 and 1978 "deferral announcements," and the prudency of its Limerick construction. In effect, PECO is saying, that while it still disputes the Commission finding of imprudency of the 1976 and 1978 delay decisions, even if these "deferral announcements" could be held to be imprudent, its construction of Limerick 1 was not. We cannot so isolate these two to conclude that the "decisions to delay" had no effect upon the construction delays. PECO not only made the decisions to delay, it implemented such decisions by its curtailment of the means for the expeditious completion of Limerick 1 by reducing its financial commitments for such construction in aid of that objective. We take the Company at its word. When it said that it was going to delay construction of Limerick, it meant just that -- and it did just that.

In the spring of 1976, PECO lowered its five-year construction program by about $750 million, or an average of $150 million a year. PECO reduced its direct expenditures from 1978-1980 from the budgeted amount of $529 million to $479 million.

As OCA witness O'Brien observed: ". . . the simple fact is that Limerick was not completed sooner because PECO did not try to complete it sooner." (Tr. 5050).

At all stages, PECO had recognized that delay in construction would result in increasing the cost. In this connection, PECO's Senior Vice President for Nuclear Power, Mr. Boyer said (Tr. 5052):

> The engineering Department's view was always that the quicker we could get the plant completed, the capital costs would be the least amount, since AFUDC is an overriding cost.

Further, in PECO's rate case at R.I.D. 438 (1978), Mr. Boyer presented testimony regarding the costs of delaying the completion date of Limerick 1. In that testimony, Mr. Boyer made a number of statements, both qualitative and quantitative, regarding the cost of delay. Concerning delays both at Salem and Limerick 1, he stated:

> All three have been delayed from their original service date. Further delay in the installation of these units would be uneconomical.
>
> (OCA Ex. 56 and Tr. 1049); Emphasis added).

In supplemental testimony in that proceeding, Mr. Boyer said:

> The completion of the generating units [Limerick and Salem] on a timely schedule insures the lowest possible construction cost for the unit because the equipment can be purchased at a lower cost and there would be less AFUDC if the schedule is not delayed.
>
> (OCA Ex. 56 and Tr. 1050).

In a presentation Mr. Boyer made to Commission Staff on July 20, 1980, he discussed:

> Additional economic studies . . . made to . . . further demonstrate the advantage of completing Limerick as soon as possible.
>
> (OCA Ex. 57).

The Company has presented several analyses which compare the achieved cost and schedule of Limerick 1 to the costs and schedules at other contemporaneous nuclear generating units as evidence to dispel any allegation that Limerick 1 has been an unreasonably costly plant or experienced long time for its construction; and as a basis for measuring what, if any, effect the 1976 and 1978 deferral announcements had upon Limerick's cost and schedule. It performed adjusted plant cost and schedule comparisons performed by its witnesses, Dr. Hieronymus and Dr. Perl, with 12 BWR plants in the country, and again as against 5 northeast plants. These studies purported to show that the cost of Limerick 1 was 12% lower than the 12-plant average costs, and 21% less than the 5 northeast plants, by kilowatt. On the basis of such studies, Drs. Hieronymus and Perl concluded that the Limerick 1 cost and schedules were reasonable and that its schedule does not appear to have been delayed by the 1976 and 1978 deferral announcements. (PECO St. 11, p. 4, 9; PECO St. 15, p. 63). Dr. Perl formulated his regression analysis based on his judgment, experience and knowledge of nuclear plant cost and schedule causation. (Tr. 864). On the other hand, Dr. Hieronymus, in order to show that he was not biased in his study, used the computer to select "predictive characteristics" and "avoided using his common sense." However, Dr. Hieronymus admitted that there was a flaw in his technique in having the computer select such predicted characteristics:

> The principal flaw I see in it is that it is mindless. That is the flip side of being biased. . .
>
> If you let the computer, which is very stupid, do the selection for you, it may select some things that, at least in my opinion, may not make any sense . . ." (Tr. 700).

On the basis of his delay cost analysis, Dr. Perl concluded that:

> Based upon reasonable assessments of financial markets in 1977 and 1978, PECO believed that attempting to raise sufficient funds to build the project on the fastest possible track would adversely affect its bond rating and thereby its ability to attract capital at reasonable interest rates. If this were the case, my analysis suggests that it was clearly economic to delay the project because it would result in lower costs to consumers. Moreover, even if the Company's assessment was wrong and the more rapid construction schedules could have been achieved without any interest rate effect, the delay had no significant impact on consumer costs.
>
> (PECO St. 11, pp. 23-24).

Evidently the best defense is a good offense ---. Dr. Perl calculated that when increased financing impacts were considered, the 1976 delay would result on a $105 million benefit to consumers, while the 1978 delay resulted in a $136 million benefit. (PECO St. 11, p. 26).

Based on such testimony, the Company contends that the economic effect on system revenue requirements was shown to be de minimus. We reject such conclusion as not being supported by the

evidence. We agree with the Commission's conclusion in the Limerick Investigation, 56 Pa. P.U.C. at 61:

> PECO's final argument, that the relative economic benefits and detriments to rate payers and shareholders of earlier versus later plant completion favored delay is unpersuasive.
> (Emphasis supplied).

The comparison study evidence submitted by PECO is not necessarily conclusive. Both Dr. Hieronymus (PECO St. 11, p. 58) and Dr. Perl (Tr. 879-881) admitted that such comparison with the cost and schedules of Limerick with other plants do not, in themselves, establish a particular utility's prudency or imprudency. And the Commission, in Pa. P.U.C. v. Philadelphia Electric Co., 52 Pa. P.U.C. 772 (R.I.D. 438, 1978) commented on value of nuclear power plant surveys when examining construction prudency issues:

> In our view, the evidence presented by TB&A shows a lack of prudent management in connection with the construction of Salem No. 1. Philadelphia Electric Company offered no testimony through PSE&G to rebut TB&A's findings. Instead, in defense, PECO offered evidence of a comparison of the Salem No. 1 per kilowatt cost to other nuclear projects in Northeast United States, as proof that the overall installed costs per kilowatt generated by Salem No. 1 were within the range of other comparable plants. Theodore Barry & Associates admits that Salem No. 1 costs are in a line with other Northeast plants, but avers that such comparison does not provide the best evidence of the appropriate and proper cost for Salem No. 1. While such comparable evidence submitted by the company has some probative value, it is not sufficient weight to override the TB&A evidence. Such comparison do not reflect unique costs of environment protection, labor, and other variable aspects in building a particular nuclear plant.

(52 Pa. P.U.C. at 787; Emphasis supplied).

If it were intended that the "imprimatur" of Theodore Barry and Associates (TB&A) -- which previously in other rate cases had been engaged by OCA and Trial Staff, and which submitted testimony against PECO at R.I.D. 438 (1978) -- to the Company's construction management of Limerick 1 would allay problems with the additional cost effect of PECO's 1976 and 1978 Limerick 1 construction deferrals, such intention fell short of its mark.

Initially, in this connection, TB&A presented its Independent Assessment of the Prudence and Reasonableness of Limerick 1 and Common Plant Project Management as an "introspective" analysis. We agree with Trial Staff that TBA's appearance in this proceeding was solely in PECO's behalf, whose business it solicited, at a fee of almost $2 million (Staff Ex. 23; Tr. 5184-85; Tr. 1257). TBA's role in this case is exactly the same as that of any other expert, and is subject to the same scrutiny as any other testimony adduced in this proceeding. While neither Trial Staff nor we question the ethics of TBA's witnesses, we cannot consider such testimony as that of an impartial "independent" witness.

We find TBA's conclusion and that of PECO's other construction witnesses that Limerick 1 construction could not have been completed and placed in operation prior to February 1986 as unpersuasive.

TBA and PECO construction witnesses rely heavily on as-built analyses. An as-built analysis incorporates the impact of all delays regardless of their cause, including those caused by unreasonable and imprudent decisions, management or a discretionary action. TBA and PECO

construction witnesses conclude that regulatory changes that had occurred during the course of construction at Limerick 1 project had a major impact on construction costs and schedules at the plant. It may be true that regulatory approvals as granted would have prevented earlier completion of Limerick 1 construction, if one takes the dates of such approvals as a given. But there is no reason to conclude that regulatory approvals would not have been implemented in timely fashion had construction been completed without delay.

The insistence of PECO that its 1976 and 1978 deferrals of the construction of Limerick 1 were in no way contributions to the extension of Limerick 1 construction period are not borne out by the record.

PECO's testimony, including that of TBA, largely attempts to relitigate financial constraints and other matters which were litigated and rejected by the Commission at I-80100341.

Staff's Proposed Adjustment

Trial Staff, through its witnesses Dougherty and Rosenthal, propose a $1.12 billion rate base disallowance based on its quantification of additional costs of Limerick and Common Plant allegedly incurred as a result of the project not meeting an April 30, 1981 in-service date.

Staff's delay and calculation is based on a comparison of actual to-date project expenditures as of October 31, 1984, when fuel load commenced, to its own computation of project costs if the unit had been both completed and in service in April 1981.

Staff emphasizes that its recommended adjustment:

(1) Does not purport to establish when Limerick 1 should have been completed or in service; and

(2) Does not represent the cost of a plant that would have been completed and in service at April 1981.

Rather, Trial Staff took the cost of the unit as actually built -- including all actual quantities of materials and labor manhours -- and priced it to remove the escalation in costs caused by inflation during the delay period. In other words, Staff recommends that the Commission recognize the 1984 plant, which incorporates all NRC-mandated design changes, at a 1981 cost level.

Trial Staff recommends that PECO be permitted to completely recover:

(a) All costs (direct and AFUDC) incurred prior to April 30, 1981;

(b) The reasonable, de-escalated direct costs incurred from April 30, 1981 through October 1984 as associated AFUDC; and

(c) All direct costs (unadjusted) incurred after October 1984.

In short, Trial Staff recommends that PECO recover all its investment except for the escalation in costs that occurred as a result of inflation during the delay period of April 30, 1981 through October 1984.

Finally, Trial Staff urges that should the Commission not choose to adopt Staff's recommendation, that it adopt OCA's proposed adjustment.

Trial Staff's quantification analysis is grounded on the assumption that Limerick would have been simultaneously completed and in

service in April 1981, absent the 1976 and 1978 deferral decisions. (T.S. St. DPD-1, pp. 2-3).

While such an approach, in view of PECO's burden in this proceeding, may have been acceptable as a starting point, Trial Staff could not properly persist in blindly refusing to go forward to meet PECO's evidence tending to show the impossibility of the April 30, 1981 in-service date.

Trial Staff's approach does not comport with the Commission's direction in this proceeding to quantify the costs resulting from PECO's 1976 and 1978 delay decisions -- and the consequent effect of the implementation of those decisions in the construction of Limerick 1 -- upon the Company's ratepayers.

In Pa. P.U.C. v. Philadelphia Electric Co., Energy Cost Rate No. 8, M-840375, et al, Order pp. 9-10 (October 30, 1985) this Commission held:

> Cost disallowances based on imprudence is not permitted unless the alleged imprudence was the real and approximate cause of some injury. Thus, for example, if the alleged imprudent conduct did not cause any extension of outage time, such conduct could not be the basis for denying a utility's recovery of replacement power costs.

Staff witness Dougherty admitted that neither he nor any of the auditors who performed Staff's quantification analysis are qualified to determine whether Limerick 1 could actually have been completed and in service by April, 1981. (T.S. St. DPD-1, p. 3). Moreover, Mr. Dougherty has admittedly performed no analysis to make such as investigation. (Tr. 2665).

Mr. Dougherty's original position was that the Commission at I-80100341 (1982) "determined that the Company did not act prudently when it delayed construction in 1976 and 1978, and that without these delays, Unit 1 would have been completed in April 1981." (T.S. St. DPD-1, p. 2). However, on cross-examination, he acknowledged that nowhere in the Commission's Order was there a conclusion that the Company could actually have completed or placed Limerick 1 in service in April, 1981. (Tr. 2668-2671). In addition, Staff witness Rosenthal, when questioned by us, admitted that the Commission at I-80100341 Order did not make any finding at all as to when Limerick 1, absent the 1976 and 1978 deferral decisions, could have been completed or in service. (Tr. 4723-4725).

Thus, Trial Staff's assumption of an April 1981 in-service date, which is the foundation for its entire quantification analysis, is neither based on an independent evaluation nor supported by any determination of the Commission. In fact, Trial Staff counsel stated that:

> . . . the question of a potential completion date for Limerick other than the February 1986 [actual] date is not relevant. We are not saying the plant could have been done in April 1981.
> (Tr. 4727).

Trial Staff's quantification analysis is thus clearly based on an in-service date which is completely hypothetical and unrelated to when Limerick 1 should or could have been placed in service.

Trial Staff's attempt at quantification of the 1976 and 1978 delay decisions upon ratepayers is a simplistic mathematical computation based on an assumed hypothetical in-service date of Limerick 1. As such, it fails to establish any causal relationship between the

imprudent deferral decisions and the costs which it seeks this Commission to disallow.

The quantification of the costs associated with the 1976 and 1978 deferral decisions is impossible without a thorough analysis and demonstration of the schedule and cost impact of those decisions, i.e., when Limerick 1 could have been completed and in-service absent the deferrals. Staff's analysis admittedly and designedly does not include such a demonstration and is, therefore, not meaningful to the quantification determination which the Commission directed to be made in this proceeding.

Further, in cross-examination, Staff witness Rosenthal stated that Trial Staff's $1.12 billion adjustment is not necessarily based on the actual costs of the 1976 and 1978 deferrals, but is at least a "penalty" for those imprudent actions. (Tr. 4710-4719). Such penalty is not involved in our quantification of the intended construction delays.

As we indicated in our March 10 Ruling, p. 7 (Tr. 4726-4721) the extraneous factors which would have prolonged the project schedule beyond April 1981 and which impacted completion independent of the deferral decisions, go to the heart of the quantification issue.

We find that Trial Staff's recommendation of a disallowance of $1.12 billion in rate base inclusion of Limerick 1 is unfair, improper and without any legal or rational support. Accordingly, this recommendation of Trial Staff is rejected.

OCA Adjustment

The OCA's analysis in this proceeding concludes that, but for the 1976 and 1978 delays, Limerick 1 could have been completed and ready for loaded fuel by July, 1982, and could have been in commercial operation by November, 1983, representing a 27 month delay.

The OCA submits that these dates are reasonable and could have been achieved had PECO sought to finish Limerick 1 as expeditiously or prudently possible. The substantial costs incurred by PECO due to the delays in construction are not properly chargeable to ratepayers.

The OCA has presented two technical experts on the cost quantification of the 1976 and 1978 delays, James J. O'Brien and Dr. Stephen H. Hanauer.

Mr. O'Brien, who presented the actual construction schedule and cost analysis, is Chief Executive Officer of O'Brien Kreitzberg and Associates (OKA). He is a registered professional engineer in the states of Pennsylvania, New Jersey, New York and Georgia. He is an expert in the field of critical path management CPMP and is the author of several management books.

Dr. Stephen H. Hanauer has spent 35 years in the field of nuclear engineering, including 12 years with the NRC and its predecessor the Atomic Energy Commission.

Underlying the construction delay cost quantification and ratemaking adjustment proposed by the OCA in this proceeding is the discussion presented by ALJ Joseph H. Klovekorn in his Initial Decision in the Limerick Investigation, 56 Pa. P.U.C. 47 (1982). In his concluding paragraphs on the issue of PECO's delays in construction, ALJ Klovekorn stated as follows:

It appears therefore that PECO's decision to postpone construction was influenced in part by the fear of an excess capacity adjustment by the Commission in a subsequent rate case. Rather than run the risk of such a revenue loss, the company chose to delay construction while at the same time continuing to accrue AFUDC on this plant costs that will eventually be borne by the ratepayers.

In the past this Commission has held that there should be some sharing of the risk associated with bringing large plants on line and the resultant excess capacity which typically results. See Pa. P.U.C. v. Pennsylvania Power Co., R-77110521; Pa. P.U.C. v. Philadelphia Electric Co., R-79060865. This risk should not be effectively placed entirely on the ratepayer by permitting a utility [to] delay the commercial operation of a plant until the optimal time, while still allowing the company to earn a return, albeit non-cash, on its investment during this interregnum.

In summary, it appears that the company's action in postponing Limerick in 1976 and 1978 was made without careful analysis of the impact of such delay on its ratepayers.

In addition, the record shows that a factor in these decisions was the potential impact of Limerick on the company's capacity and reserve margins and the adverse effect this would have on the company's rate allowances. Consumers should not be expected to pay for delay which results from a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest.

(Initial Decision at 53-54; emphasis added).

We note that if Limerick were in service in 1981, PECO would have a summer reserve margin of 66%. (PECO St. 9, p. 18).

With respect to the 1978 delay, ALJ Klovekorn stated:

> The reasons for announcing a delay in 1978, according to PECO witness Paquette, were similar to those which were involved in the 1976 decision. In other words, by 1978 there were two more no-growth years. PECO's load forecasters lowered peak load estimates from 5% to 3% per year. In addition, PECO claims, the Commission permitted inadequate rate relief during this period. One important factor in this decision to postpone was apparently the recommendation of Administrative Law Judge Joseph Matuschak at R.I.D. 438 that an adjustment be made to PECO's rate base for "excess capacity." This was viewed as a message to the company not to optimize installed capacity but to minimize current costs and rates.
>
> (Initial Decision, at 44-45; emphasis added).

The OCA has presented an analysis that the 1976 and 1978 delays in construction of Limerick 1 materially delayed the commercial operation date and significantly increased the cost of Limerick 1. Based upon the testimony of OCA witnesses O'Brien and Hanauer, the OCA submits that but for the 1976 and 1978 delays, Limerick could have loaded fuel in July, 1982, and entered commercial operation by November, 1983. This would have been 27 months sooner than actually occurred. OCA places the cost of the delay for Limerick 1 and 100% of common facilities at $792.7 million and for Limerick 1 and 50% of common facilities at $652.7 million. (OCA St. 1B at 35; OCA Main Brief at III-2 and III-16).

The delay analysis presented by the OCA witnesses is based upon a specific critical path schedule analysis of Limerick 1. In developing this reconstruction, certain facts or conclusions were accepted by the OCA. First, the analysis started with the Commission's finding in the Limerick Investigation that the 1974 delay in construction of the

plant was reasonable. (OCA St. 1, at 11). Second, the analysis accepted that certain engineering or design constraints to construction completion, such as the resolution of the Mark II redesign, had to be recognized. Finally, the impact of NRC regulatory requirements which could delay fuel load and commercial operation was reviewed.

Mr. O'Brien stated the purpose of his analysis as follows:

> The primary task of OKA's analysis became the determination of when Unit 1 could have been completed, had PECO not delayed the project unnecessarily. For the purpose of this testimony, I have accepted the completion of Unit 1 as a given condition as PECO's management did. Once that decision was made, however, it must be recognized that a large component of the final cost of the plant would be time related, i.e., these costs would continue to accrue until plant completion but would be independent of the level of construction activity. Examples of these kinds of costs, generally called "overheads," are taxes, legal, security, accounting, document and drawing control, and Project Management. Escalation and AFUDC would also have a significant impact on the final cost of the plant. Further, delayed completion would increase exposure to regulatory (and Owner) changes and/or fine tuning and financial pressure.
>
> (OCA St. 1 at 6-7).

Mr. O'Brien expended upon this during cross-examination, as follows:

> It was an attempt to identify the escalation costs, the AFUDC increases and other delay-related costs in what we perceived to be a 27-month overrun.
>
> * * *
>
> We did not attempt to then go out and say: could the company have found this money, could they have avoided building

> their new headquarters; could they have done this,that or the other thing. We didn't get into that all.
>
> (Tr. 3136).

A critical path analysis, as presented by Mr. O'Brien, focuses on those activities which limit or determine the progress toward completion of a job. These activities are important to or affect the construction schedule and, therefore, the duration of a project. Mr. O'Brien discussed the use of a critical path analysis as follows:

> The logic network is a construction road map for scheduling when things will be done and why, and also for monitoring the project's status during construction.
>
> The overall duration of the project is fixed by computing the longest continuous string of activities from start to finish, and this route is defined as the Critical Path. With complex networks, computers can start and finish dates for each activity. Parallel paths of shorter overall duration are termed to have a certain amount of "float," or scheduling flexibility. Clearly, delays suffered in progressing critical path work extend the project's duration, while problems in other cases do not, as long as they are resolved before the available float evaporates.
>
> (OCA St. 1 at 9).

Dr. Hanauer concluded that if the Limerick plant had been completed in April 1982, and met all non-Mark II requirements, then the Mark II problem could have been resolved by mid-1982. He also concluded that the NRC requirements would not have prevented Limerick 1 from meeting the July, 1982 schedule.

The OCA compared Limerick's cost and schedule to those of Susquehanna and LaSalle, also GE Boiling Water Reactors with a Mark II

pressure suppression containment design. Susquehanna loaded fuel in July, 1982 and entered commercial operation in June, 1983. LaSalle loaded fuel in April, 1982, and entered commercial operation in January 1984. Both plants cost considerably less than Limerick 1. PECO witness Clarey (PECO St. 4, Sch. 2) shows a total direct cost excluding AFUDC for LaSalle of $1,043 million, for Susquehanna $1,611 million, and for Limerick 1 $2,357 million.

The quantification of the costs of delay has two components. The first component is identification of actual work as expenditures that would not have occurred if commercial operation had occurred 27 months earlier. These costs are the result of what is commonly called Indirect Costs. Indirect Costs are the costs required to support construction as it proceeds over time. For Limerick 1, these costs are incurred by both PECO and Bechtel. Mr. O'Brien estimated Bechtel's share of these costs as $171.9 million for Limerick 1 and 100% of common facilities, including AFUDC on those costs; and $140.6 million including AFUDC on those costs for Limerick 1 and 50% of common facilities. For PECO, he estimated the indirect costs for Limerick 1 and 100% common facilities at $101.5 million, including AFUDC; and $83.0 million, including AFUDC for Limerick 1 and 50% common facilities.

The second component of the costs of the 27-month delay is the increased escalation and AFUDC which incurred due to the longer period over which construction continued. Mr. O'Brien estimated the direct costs for Limerick 1 and 100% common facilities at $552.4 million; and for Limerick 1 and 50% common facilities at $445.7 million. (OCA St. 1B Sch. JJO'B-30, 30.1).

Mr. O'Brien, adjusting for Bechtel and PECO indirect costs, found the direct imprudent costs of the delay for Limerick 1 and 50% of common plant to be $428.8 million. (OCA St. 1B, Sch. JJO'B-30.2).

OCA in its Main Brief, at page III-16 and 30, found the effects of imprudent delays in the cost of Limerick 1 and 50% of common plant, as calculated by Mr. O'Brien, to be $652.4 million. ($428.8 million direct costs plus indirect costs of $140.6 million for Bechtel and $83 million for PECO).

Further, Mr. O'Brien, in adjusting for the disallowance of the Bechtel and PECO indirect costs and Mark II rework, found the imprudent direct costs for Limerick 1 and 50% common plant to be $386.8 million. OCA in its final accounting calculations, by utilizing such estimate of $386.8 million, plus alleged Bechtel and PECO indirect costs, arrives at a $610.4 million reduction to the costs of Limerick 1 and 50% of commoon plant for reduction to rate base.

However, PECO witness Clarey (PECO St. 4C, pp. 6-8) claims that Mr. O'Brien had overstated PECO's direct costs in his calculations. The claimed indirect PECO costs include costs for public notification, training, plant/startup staff, and maintenance. Mr. Clarey stated that his research of historical costs to determining the timing of actual expenditures for alleged PECO indirect costs considered by Mr. O'Brien, showed that only about 10% of such indirect costs were expended prior to July 1982. He computed the PECO indirect costs to be $33.6 million for Limerick 1 and 100% of common plant, rather than the $101.5 million computed by Mr. O'Brien. For 50% of common plant, we computed and find that the correct PECO indirect costs are $27.5 million, rather than the

$83 million computed by Mr. O'Brien. Further, we find no imprudency by PECO in its re-working of Mark II.

Taking Mr. O'Brien's $386.8 million imprudent direct delay costs, plus $140.6 million Bechtel indirect costs and PECO's $27.5 million indirect costs, we arrive at a quantification of $554.9 million as the quantification of the effects of PECO's 1976 and 1978 imprudent decisions to delay the construction of Limerick 1 and 50% of common plant.

PECO's attempt through voluminous testimony on the issues involving the prudent cost of Limerick 1 fails to override the OCA testimony in this matter.

We find the recommendation of OCA, as adjusted, to be reasonable. Since we have allowed only 50% of common plant for PECO's rate base inclusion, we adjust PECO's cost of Limerick and 50% of common plant downward by $554.9 million for exclusion in rate base.

I. Excess Capacity

The OCA, PAIEUG and UUC/UP allege that Limerick 1 contains excess capacity, and request the Commission to deny base rate recognition to such excess capacity. OCA requests the Commission deny the Company an equity return on at least 450 megawatts of such excess capacity. GEC supports such disallowance. UUC/UP recommends a base load reduction of $3,535,734. PAIEUG would place such excess capacity at 962 megawatts.

They assert that PECO seeks to evade the regulatory consequences of adding enormously excess capacity simply by prematurely retiring extremely low cost existing capacity.

APPENDIX F

THE COMMISSION'S AUGUST 27, 1982 ORDER IN DOCKET NO. I-80100341

alleges that: (1) by complaint, at A-00085916C811, the commission has asserted that the transportation of bricks owned by Heavener in vehicles also owned by Heavener is subject to commission certification; (2) Heavener's motion to dismiss is intended to fix and determine Heavener's operations as a masonry supply dealer, insofar as those operations involve the utilization of motor vehicle equipment used also in Heavener's common carrier business.

Heavener argues that the commonwealth court, in Makovsky Bros., Inc. v Pennsylvania Pub. Utility Commission (1980) 55 Pa Cmwlth 435, 423 A2d 1089, created a concept previously nonexistent in Public Utility Law — the concept of "certificated vehicles." It is Heavener's position that Makovsky was incorrectly decided, contradicted previous case law, and was clearly contrary to the intent of the general assembly when it enacted the Public Utility Code. Heavener also argues that the transportation proposed by this application does not fall within the parameters of the Makovsky decision and the principles enunciated in Makovsky should not be applied in the instant proceeding.

Although Heavener's legal arguments may be persuasive as to why Makovsky was incorrectly decided by commonwealth court, the commission is legally bound to accept the decisions of the courts of Pennsylvania. It is not within the commission's powers to ignore, or attempt to administratively alter, court decisions and orders. Furthermore, Heavener has failed to present any factual distinction between its own proposed service and the type of service that was being performed by Makovsky Brothers, Inc.; therefore,

It is ordered: That the motion to dismiss for lack of jurisdiction is hereby denied, with prejudice.

Re Limerick Nuclear Generating Station

Intervenors: City of Philadelphia, Consumer Education and Protective Association, Philadelphia Area Industrial Energy Users Group, Limerick Ecology Action, and Keystone Alliance et al.

I-80100341
48 PUR4th 190
May 7, 1982

INVESTIGATION *of need to continue construction of nuclear generating station; cancellation or suspension of construction ordered.*

Electricity, § 3 — Generating plant — Management prudence — Need for capacity.

The commission found that an electric company's initial decision to build a nuclear generating station was reasonable at the time it was made and was a valid exercise of managerial

discretion where load forecasts indicated a need for the capacity, the company had constantly reviewed its decision as to capacity type giving consideration to changing capital, fixed costs, and fuel costs, and where the company's financial condition at the time did not indicate its future difficulties nor that the units were not economically feasible. [1] p. 53.

Electricity, § 3 — Generating plant — Prudence of construction delays — Reasonable care standard.

In establishing a standard by which to judge the reasonableness of the actions taken by a utility's management in delaying the construction of a nuclear power plant, the commission rejected a rational basis standard, whereby a management decision would not be criticized so long as there existed a rational basis for rendering that decision, in favor of a standard of reasonable care, under which the commission would determine how reasonable people would have performed the tasks that confronted the company, for the reason that the latter standard balanced the right of the ratepayers to be treated fairly and the inherent right of the utility to manage its own affairs. [2] p. 58.

Electricity, § 3 — Generating plant — Prudence of construction delays — Reasonable care standard.

Upon application of a reasonable care standard, and by placing itself in the position of a utility's management (with the facts and trends available at the time), the commission was unable to conclude that management was imprudent and unreasonable in its first decision to delay construction of a nuclear plant where there was no indication that the decrease in demand experienced at the time of that decision (due to higher oil prices and rapid inflation) would continue. [3] p. 58.

Electricity, § 3 — Generating plant — Prudence of construction delays — Reasonable care standard.

Considering an electric company's continuing precarious financial condition, its ever decreasing load growth, and rising interest rates at the time of the postponements, the commission found that the company's management did not exercise judgement sufficient to meet the commission's reasonable person standard in delaying construction at a nuclear plant site in 1976 and 1978. [4] p. 58.

Electricity, § 3 — Generating plant — Completion not in public interest — Adverse financial effect.

Given the commission's inability and unwillingness to provide rate base recognition of construction work in progress related to a nuclear generating facility and the resultant probability that an electric company's bond rating would not improve and might slide further, the commission found that completion of the second unit of the facility would not be in the public interest since the impact of that construction on the company's finances would occasion further slippage in coverages and likely altogether preclude the company's access to the financial markets. [5] p. 67.

Electricity, § 3 — Generating plants — Curtailed construction program — Customer savings.

The commission found that it was in the public interest to order a utility to complete as rapidly as possible the first unit of a proposed two-unit nuclear facility, leaving to management the decision whether to suspend or cancel the second unit where the simultaneous construction of both units would continue to cause construction delays and cost overruns such that the ultimate cost of the facility could be excessive, could result in unjust and unreasonable rates, and could further erode, if not extinguish, any remaining customer savings. [6] p. 67.

Electricity, § 3 — Generating plants — Suspension or cancellation of construction — Management discretion.

Although, upon finding that the simultaneous construction of both units of a nuclear facility was not in the public interest, the commission left to the discretion of management the decision of whether to suspend or cancel the construction of the second unit, it declared that prior to completion of the first unit it would not approve any security issues, the proceeds of which would be used for the construction of the second unit, and would deny recovery of allowance for funds used during construction on any additional investment in the second unit pending completion of the first unit, however, should the utility opt for suspension, it would be permitted to finance and accrue allowance for funds used during construction on the incremental costs of construction shutdown and on maintenance of the second unit in a safe condition until construction could be resumed. [7] p. 67.

Commissions, § 11 — Jurisdiction and powers — Generally — Authority to order construction shutdown.

Discussion of legal authority upon which commission grounded its decision to order a utility to suspend or cancel construction of a nuclear facility, completion of which was found not to be in the public interest. p. 62.

Valuation, § 224 — Property used or useful — Construction work in progress — Arguments for and against.

Discussion by concurring commissioner of the corresponding arguments for and against inclusion of construction work in progress in rate base. p. 71.

(CAWLEY, commissioner, issues preliminary statement, p. 71; CAWLEY, commissioner, concurs, p. 74; TALIAFERRO, commissioner, concurs in part and dissents in part, p. 75.)

Before Shanaman, chairman, and Johnson, Cawley (concurring), Taliaferro (concurring in part and dissenting in part), and Jones, commissioners.

Opinion and Order

By the COMMISSION: Before us for disposition is the Initial Decision of Administrative Law Judge (ALJ) Joseph J. Klovekorn in the above captioned proceeding, wherein the ALJ makes several findings regarding, inter alia, the construction of the Limerick nuclear generating station. For the reasons stated below, we disagree with several of these findings and shall modify the ALJ's Initial Decision.

Prior to the discussion of the positions advocated by the parties and our disposition of the issues presented, we note that this fact-finding investigation and this opinion and order is the result of countless hours of preparation on the part of the parties and of the ALJ. We commend the parties and the ALJ on their fine efforts in dealing with the complex issues raised.

In rendering a decision in this investigation, we are aware that our options are limited. Unlike a traditional ratemaking case, in this proceeding, we are not presented with any claim which would affect current rates or rates for the immediate future. Rather, we have undertaken this investigation to ascertain the appropriateness of the decisions underlying the construction of the Limerick nuclear generating station and the need to continue construction at this time, given the potential for load growth in Philadelphia Electric Company's (PECO) service territory, alternative means of meeting that load growth, and the financial ability of PECO to continue construction of this station. In performing our analysis, we are cognizant of the fact that many of the calculations and figures presented in the context of this proceeding are somewhat speculative. Although no one can perfectly see the future, we are convinced that those estimates represent more than educated guesswork on the part of the witnesses.

I. *Background*

On August 7, 1980, the Office of Consumer Advocate (OCA) filed a petition, docketed at P-80080236, seeking (1) an order to show cause why the continued construction of the Limerick nuclear generating station (Limerick) of Philadelphia Electric Company (PECO or the company) is in the public interest and (2) a commission investigation into the need for and economy of Limerick.

On August 26, 1980, an answer was filed by the company opposing the OCA's request for an order to show cause, taking no position on the request for an investigation, and petitioning that any investigation be consolidated with PECO's then pending rate investigation at R-80061225.

By order entered October 10, 1980, we concluded that an investigation should be opened "so that information can be gathered in an orderly and expeditious manner, *before* PECO seeks to include Limerick in its rate base as used and useful property." Further, we concluded that an independent investigation of Limerick was appropriate so as to prevent the then pending rate investigation from becoming burdened with additional issues which would have had to be decided within the statutory period set forth in § 1308 of the Public Utility Code. In initiating the investigation, we ordered:

1. That the issue we incorporated into the rate proceeding at R-80061225 on August 28, 1980, concerning an estimate of the additional costs occasioned by deferrals of the Limerick construction schedule, be eliminated from that proceeding.

2. That an investigation be, and is hereby, undertaken to determine:

(a) The cost of construction delays at Limerick and whether those delays were reasonable;

(b) The escalation of cost estimates for Limerick and whether those costs for the plant are reasonable; and

(c) The eventual impact of Limerick on PECO's capacity and reserve margins and the reasonableness thereof.

3. That the petition filed by the OCA, and docketed at P-80080236, be denied, except to the extent that it is granted by the opening of this investigation.

4. That commission staff, Philadelphia Electric Company, and the Office of Consumer Advocate are hereby made parties to this investigation proceeding.

5. That copies of this order be served on all parties to the proceeding at R-80061225, Pennsylvania Pub. Utility Commission v Philadelphia Electric Co.

6. That the office of administrative law judge assign this matter to an administrative law judge for prompt hearing and initial decision.

By letter dated November 8, 1980, believing that our initial order may have been too restrictive, we directed that the investigation address, but not be limited to, the following issues:

(a) The costs of construction delays at Limerick and whether those delays were reasonable.

(b) The escalation of cost estimates for Limerick and whether those costs for the plant are reasonable.

(c) The eventual impact of Limerick on PECO's capacity and reserve margins and the reasonableness thereof.

(d) What alternatives PECO considered at the time the decision was made to build the plant and the projected cost of each alternative.

(e) Could any currently available alternate sources of energy, conservation/load management activities, improvements in existing power plants' performance, etc. [to], replace Limerick at a lower cost to the consumer assuming that:

(1) expended costs are amortized over a reasonable period; or

(2) expended costs are not amortized or collected from ratepayers; or

(3) expended costs are shared among stockholders and ratepayers.

(f) The potential of large electric consumers directly buying the capacity and/or energy associated with Limerick.

Thirty-eight days of evidentiary hearings and three nonevidentiary hearings were held in Philadelphia, Harrisburg, Doylestown, and Pottstown. Briefs have been filed by PECO, the OCA, the Pennsylvania Public Utility Commission's trial staff (trial staff), the city of Philadelphia

(city), the Consumer Education and Protective Association et al. (CEPA), the Philadelphia Area Industrial Energy Users Group (PAIEUG), Limerick Ecology Action (LEA), and the Keystone Alliance (Keystone). Reply briefs were filed on February 3, 1982, by the above parties as well as Mr. Marvin Lewis. On March 26, 1982, Administrative Law Judge Klovehorn issued the initial decision currently before us. Exceptions have been filed by the OCA, CEPA, Keystone, the city, PECO, trial staff, and thirty-two individuals. Reply exceptions have been filed by OCA, CEPA, PECO, and trial staff.

After an extensive review of the record, the initial decision and all briefs, exceptions, and reply exceptions we find and conclude:

1. That based upon all of the facts presented in the proceedings before us, particularly the commission's inability and unwillingness to provide the necessary revenues to complete both units at the Limerick nuclear generating station as proposed, the completion of Limerick II by 1987 is not financially feasible. In order to ensure the continued maintenance of reliable and safe service to the public, this commission finds that either the cancellation or suspension of construction at Limerick Unit II would be in the public interest.

2. That should the company choose to cancel Limerick Unit II then the future treatment of any sunk costs associated therewith shall be determined at such time as the company specifically requests recovery of such costs.

3. That should Philadelphia Electric Company choose not to suspend construction of Limerick II, then the commission, pending completion of Unit I: (a) shall not approve any new securities issuances, the proceeds of which will be used, in whole or in part, for construction at Unit II, and (b) shall deny recovery of AFUDC (allowance for funds used during construction) on any additional investment in Unit II at such time as recovery is sought.

4. That Philadelphia Electric Company shall inform this commission of its decision regarding the implementation of par 1 above within 120 days of the entry of the final opinion and order in this proceeding.

5. That it would be in the public interest for the company to pursue an aggressive conservation program designed to substantially offset the cancellation or suspension of Limerick II.

6. That the commission immediately open a general investigation designed to implement a policy, applicable to all electric utilities, whereby regulatory incentives would be afforded to any conservation-inducing investment designed to lower a utility's need to install additional capacity.

Further, at a minimum the investigation should address: conservation financing programs for residential and small commercial customers, joint customer/company financed alternate supply projects, rate-induced or company-controlled load management programs with corresponding investment programs, appropriate company informational activities required to support the company's programs, any necessary changes in existing service regulations in order to ensure efficient utilization of electricity, and any legislation which may be necessary to implement or enhance conservation or provide alternative supply opportunities.

That the commission invite all interested electric utilities or other parties to participate and shall direct the commission's bureau of conservation, economics and energy planning to actively participate in the investigation.

The initial issue to be addressed is an examination of the decision by PECO to begin construction of the Limerick nuclear generating station. PECO witness, Vincent Boyer, senior vice president, nuclear power, and Emil Kasum, chief system planning engineer, system planning division, testified at length to the planning process and decisions to build Limerick (PECO Statements 1 and 2). Mr. Boyer begins by expressing the view shared by many utilities in the late 1960s and early 1970s; that regulatory measures enacted during that period encouraged utilities to add new capacity. He cites the prospect of PECO being faced with a capacity shortage which, in turn, could lead to brownouts and blackouts. Specifically, he recites regulatory actions taken in 1966 when PECO and other companies, parties to the Pennsylvania–New Jersey–Maryland interconnection agreement (PJM) were told by their respective regulatory commissions to increase reserve capacity from the then existing 12 to 15 per cent to a point where the reserve margin equaled 20 per cent. To indicate the commission's concern, PECO points to our March 12, 1972, order instituting an investigation to determine the need for additional generating and transmission facilities. In light of this regulatory concern, and PECO's forecast of future annual sales peak demands,[1] PECO, in 1967, determined that additional capacity was necessary.

Having reached the conclusion that additional capacity was necessary, PECO analyzed the options available. A 1965 study claimed that the levelized cost of nuclear power was 3.63 mills per kilowatt hour as compared to a levelized cost of 4.71 mills per kilowatt hour of coal.[2] Moreover, an analysis of the capital costs of coal and nuclear units indicated that the capital costs of nuclear plants, $206 to $230 million, exceeded coal plant capital costs, $176 to $205 million. However, it was anticipated that the initially higher capital costs of the nuclear unit would be recaptured within three years because of the operating savings derived from the lower cost of nuclear fuel compared to coal. It was anticipated that over its life, the nuclear plant would produce a levelized annual revenue savings to the ratepayers of $6.5 million over the coal alternative.

Having decided that a nuclear plant was the best alternative, PECO was faced with the prospect of choosing a site. In choosing the existing site, PECO considered topography, access to road and rail facilities, availability of water supply, land procurement costs, general geology and seismology, population density and proximity, meteorology, costs of transmission rights of way and facilities, and improvements to roads and bridges necessary for the transport of the reactor vessel and other superheavy components to the site. In this proceeding, the primary objection to the site chosen was raised by Limerick Ecology Action which pointed out that the plant's construction permit is contingent upon the units being operated as a "river follower";

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[1] PECO's 1967–68 forecast projected reserve margins of 11.5 per cent in 1975, 6 per cent in 1976, and 0.9 per cent in 1977 even including Peach Bottom nuclear generating Unit Nos. 2 and 3 then under construction.

[2] In further support of its position PECO points to a 1976 study by Leonard Reichle, senior vice president of Ebasco Service, Inc., which concluded that nuclear power was 27 per cent cheaper than a comparable coal alternative (PECO St. 1C, p. 10); testimony by Gordon Casey of Commonwealth Edison which concluded that nuclear generation was 20 per cent cheaper than coal in its service territory; and a 1979 report published by the National Academy of Sciences which endorsed the need to develop nuclear energy given its "competitive economics" (PECO St. 1B, p. 5).

i.e., would only be permitted to operate providing the Schuylkill River contained sufficient water to service the plant in addition to meeting the needs of those downstream which would cause the kilowatt-hour output of the units to fluctuate depending upon the flow of the Schuylkill River. While we are convinced that PECO appropriately considered relevant options in choosing the plant site, we acknowledge that there may be occasions when the supply of water will be such as to affect the simultaneous operation of Limerick Units I and II at full capacity. However, even with this possible infirmity, we agree with the finding of the Nuclear Regulatory Commission, that the site chosen was the best available. Further, it should be relatively simple to chart the rise and fall of the river and adjust usage accordingly. We also note that construction of the Point Pleasant pumping station and the Merrill Creek reservoir will be necessary to provide Limerick with the necessary water. We cannot speak for the Neshaminy Water Resources Authority's ability to finance such projects, but based upon the record before us, we do not foresee any long-term inability to secure water from these projects.

Having determined that construction of a nuclear facility at Limerick was appropriate, PECO selected General Electric (GE) as the vendor for nuclear equipment and the turbine generator.[3] In August, 1969, PECO awarded a contract to Bechtel Corporation to perform architectural/engineering and construction work on the proposed stations.

For the purpose of our discussion of the construction and any delays in that construction, we shall divide the construction schedule into three parts: (1) the planning and early construction phase; (2) the 1974–77 phase; and (3) 1978 to the present.

A. *Planning and Early Construction*

[1] At the heart of PECO's decision to build the Limerick station was PECO's perception, shared by many in the industry, that the high rate of load growth experienced in the 1960s and early 1970s would continue unabated. As was stated earlier, PECO's forecasts which assumed the continuation of high load growth and a need to increase its reserves from 15 per cent to 20 per cent showed an ever decreasing reserve during the 1975–77 period. Concerned about preserving the general one-in-ten-year service interruption rule,[4] PECO committed itself to build baseload plant.

Primary criticism of the company's actions prior to 1974 comes from the OCA. The OCA points to the deterioration of PECO's financial condition in the late 1960s (PECO Statement 9, p. 4) concomitant with a $500 million production plant construction program for the two Peach Bottom units,[5] the Croydon combustion turbines, and the Eddystone No. 3 oil-fired unit (Id., p. 5; OCA Exh 1, IR-2, 7–30), and the construction budget associated with the Salem[6] and Limerick units. The OCA considers the estimated $3.3 billion construction budget for the 1974 through 1978 period, forecast in 1974 and amounting to 165 per cent of the 1974 rate base, to be indicative of potential future financial difficulties by creating, at this early date, cash-flow constraints and virtually eliminat-

[3]It should be noted that GE presented PECO with the lowest capital costs of three bidders and furnished equipment similar to PECO's Peach Bottom units.

[4]The one-in-ten rule represented a desire to only permit a service interruption due to a forced outage once in a ten-year period.

[5]PECO owned a 42.59 per cent interest in these plants.

[6]Forty-two and fifty-nine hundredths per cent owned by PECO.

ing any financial flexibility. Compounding PECO's difficulties was the escalation in the price of oil,[7] high interest rates, general inflation, and a sharp reduction in the rate of growth of sales. Although the OCA admits that many of these factors were beyond the control of PECO, the OCA opines that these factors should have indicated to PECO that it had vastly underestimated the costs and subsequent construction periods of its incomplete nuclear units and should have caused PECO to question any financial planning which was based upon a reliance on the 1974 architect/engineer estimates.

Second, the OCA faults PECO for its lack of a detailed generation planning study, pointing out that the most detailed comparison of nuclear and alternative forms of generation was carried out in 1965 "prior to the commitment decision for the Peach Bottom and Salem units." (PECO Statement 1a p. 16.)

In his initial decision, ALJ Klovekorn finds that PECO's "actions in the 1968–74 period were reasonable and its decision at that time to construct a nuclear unit at Limerick was a valid exercise of managerial discretion." We agree.

In addressing these concerns, initially, we note that PECO's financial condition in the late 1960s and early 1970s was not as precarious as it is at present. While it is true that PECO embarked upon an ambitious construction program, it could not have foreseen the extent of those factors which influenced the entire economy; i.e., the OPEC oil embargo, rapid inflation, etc. — which served to exacerbate PECO's financial condition. Further, PECO constantly reviewed its decision as to capacity type considering changing capital, fixed costs, and fuel costs (PECO Exh VSB-2, § B). We find that although PECO's construction plans may have been somewhat optimistic, its financial condition was not such as to indicate its future difficulties or that the units were not economically feasible.

As further support for PECO's construction plans, during this period of time, we granted PECO's application for a finding of necessity associated with certain construction at Limerick. We stated:

"In this connection, the commission is of the opinion that it is of paramount importance that applicant proceed forthwith with all such construction as it may lawfully undertake preliminary to the final AEC determination with respect to the nuclear facilities involved. Applicant is faced with the necessity of expending many millions of dollars to augment its electric generation within the next several years in order to provide adequate and reliable service to its patrons. The proposed Limerick generating station is one of several important power production facilities which applicant must complete on schedule in order to meet its ever growing customer demands for electric service." Re Philadelphia Electric Co. (1971) 45 Pa PUC 142.

As is readily apparent, even at this early date, we foresaw the need for the rapid construction of the units.

Similarly, the Atomic Energy Commission, directorate of licensing found, in its November, 1973, final environmental statement, PECO's expansion of plant capacity to be a prudent and necessary action to satisfy the growth requirements of its service area (PECO Exh VSB-2 § D).

In view of the foregoing, we are of the opinion that PECO's initial decision to build a nuclear station at Limerick, was reason-

[7] As PECO was a heavy oil user for generating purposes, the company was particularly vulnerable to oil price increases and the 1973 OPEC oil embargo.

able at the time it was made, and was a valid exercise of managerial discretion.

B. *The 1974 Extension*

Due primarily to a delay in the receipt of a construction permit from the Atomic Energy Commission,[8] construction on the station did not begin until the summer of 1974. In October, 1974, PECO announced a delay in Limerick's construction schedule, postponing the projected in-service dates by two years.

As stated by Joseph F. Paquette, Jr., vice president of finance and accounting, the decision to delay construction was due to adverse financial factors affecting the company. Mr. Paquette noted that during the 1950s and 1960s, PECO's financial condition improved considerably resulting in regular increases in its dividend. Beginning in the late 1960s, increasing inflation caused PECO's financial condition to deteriorate. For example, PECO's return on equity, approximately 12 per cent from 1965 to 1967, dropped to 9.4 per cent in 1970 and remained in the range of 10 per cent to 11 per cent for the next three years. PECO's pretax interest coverage ratio decreased from 5.1 times in 1968 to 2.6 times in 1970, and remained in the range of 2.7 to 2.9 times through 1973. Further, PECO's mortgage coverage ratio declined from 5.8 times in 1965 to 2.4 times in 1973. PECO's stock dropped in price from $40.50 per share to $17.00 in 1973. As a result of this deteriorating condition, PECO's credit rating was lowered by Standard & Poor's from AAA to AA in 1968 and to A in 1974.

Compounding PECO's financial problems was the 1973 Arab oil embargo. The experienced price increases in oil, which caused PECO's fuel adjustment surcharge to increase substantially, the general recession then in progress, and increased consumer awareness of conservation methods, led to reduction in energy consumption.[9] Concurrently, PECO placed into service approximately $500 million of new plant,[10] increasing its rate base from $1.5 to $2 billion. Further depletion of PECO's earning was occasioned by the cessation of the accrual of AFUDC (allowance for funds used during construction).[11]

Although PECO was confident that it could complete its five-year construction financing,[12] Consolidated Edison Company's omission of its dividend in April, 1974, significantly shook investors' confidence in the electric industry, causing common stock prices to drop.[13] In addition, AA utility bond interest rates changed significantly, rising from about 8 per cent to 11 per cent. Of greater significance to the company specifically, was the decline of PECO's interest coverage ratio below 2.0 times, foreclosing the possibility of PECO issuing new

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[8]The permit was received June, 1974.

[9]PECO's peak load for 1974 was 5,431 megawatts, a reduction of about 6 per cent from 1973. Further kilowatt-hour sales decreased in 1974 by approximately 3 per cent from 1973.

[10]New plant consisted of the two Peach Bottom units, the Croydon combustion turbines, and the Eddystone No. 3 oil-fired unit.

[11]Accrual of AFUDC is an accounting treatment recognizing the cost of the carrying charges associated with plant investment. This amount is added to the basic cost of the plant when included in rate base to be recovered from ratepayers over the life of the plant.

[12]In 1974, PECO predicted that its five-year construction expenditures would amount to $3.3 billion for the period 1974 through 1978 and that it would have to finance about $2.5 billion of that with new securities.

[13]The price of PECO's stock decreased from over $19 per share to below $10 per share immediately after the Con Ed action and fluctuated between $10 and $12 a share approximately 50 per cent of book value, for the rest of the year.

mortgage bonds.[14] Mr. Paquette testified that as conditions deteriorated, the company decided to cut its near term construction expenditures. The obvious method of cutting costs, according to Mr. Paquette, was to reduce spending at Limerick, as that project represented the major portion of PECO's construction budget. PECO claims that the 1974 decision to delay construction cost $36.6 million, while the OCA estimates the cost at $372 million.

The OCA and staff, while not disputing the fact that the preceding events have occurred, both point to 1974 as the turning point in Limerick's construction. The OCA argues that the company should have been aware then of the quagmire of direct construction cost escalations and in-service d .lays experienced by PECO at its other principal construction sites (OCA main brief, p. V-11). The trial staff argues that PECO should have either canceled the units at this time or built the plant as quickly as possible. Staff criticizes the company for choosing the worst possible path — not canceling before the bulk of construction was begun, but not pressing forward in completing the plant in light of the optimistic economic forecasts for 1976–78 (OCA Exh 23, N.T. 1, 9).

C. *The 1976 Extension*

In 1976, to match growth in capacity additions with a lower spring 1976 load forecast, PECO further delayed construction and revised the in-service dates for the Limerick Unit Nos. I and II from April, 1981/April, 1982 to April, 1983/April, 1985, respectively.

According to Mr. Paquette, the decision to further delay construction was based upon a continued deterioration of PECO's return on common equity, the price of its stock, and a further reduction in its bond rating to A−. Additionally, the wave of conservation continued to reduce PECO's peak load.[15] At this time, PECO revised its forecast growth rate from its pre-1974 level of 7 per cent per year downward to 5 per cent, a revision which effectively lowered PECO's estimated peak load by almost 1,000 megawatts. As a further delay of the Limerick units would lower its projected capacity by 1,055 megawatts in the years 1981 to 1984 inclusive, construction was delayed.

Mr. Paquette stressed that in evaluating the 1976 postponement, "it is important to appreciate the context within which these decisions were being made." (PECO Statement No. 9, p. 10.) He noted that concern about bringing a unit on line prior to its being necessary, creating excess capacity, was brought to the fore in the company's 1975 and 1976 rate proceedings. Although any excess capacity adjustment was rejected in that proceeding, we required PECO to justify its installed capacity in its next proceeding. According to Mr. Paquette, in such an environment the company concluded that the public interest did not warrant a speedy completion of Limerick. It appears that the company felt that there was some risk that if the Limerick units were brought on line in 1981 and 1982, the commission might deem the plants to be unnecessary for the service of its customers and exclude any costs from rate base and prohibit recovery of any expenses associated with the operation of the units with dire financial consequences to

[14]Under the terms of PECO's indenture, when the interest coverage ratio falls below 2.0 times, new bonds could be issued only upon retirement of older bonds.

[15]PECO's peak load was 5,530 megawatts, again below the 1973 record.

11).

The OCA raises two major objections to PECO's 1976 decision to delay Limerick's construction schedule, arguing that the slippage evidences a corporate attitude to react to load growth by building more and more capacity instead of attempting to control such growth (OCA main brief, p. V-15) and criticizes the company for failing to analyze what capacity would be needed if load growth continued to deescalate. The OCA contends that it would have been appropriate for PECO to consider cancellation of one or both units at this time. The OCA sets the cost of this delay at $202 million of direct costs (OCA Exh No. 20, IR-2, 1–3).

Trial staff criticizes the delay, contending, through testimony of witness Donald Muth, that PECO's financial condition was such that it would have been able to issue sufficient additional mortgage bonds in 1976–78 to eliminate the need for the postponement (T.S. Statement DHM-2, pp. 2, 3). In addition, Mr. Muth concludes that the company could have financed the construction in a variety of ways in 1976; i.e., the issuance of a combination of common stock, short-term debt, and long-term debt — rather than delaying construction. In addressing PECO's argument that construction was delayed because of a reduction in load, trial staff opines that if this were the case, construction at Limerick would still be delayed, as load has not grown significantly in recent years. If, however, financial considerations were foremost, staff suggests that instead of postponing construction in 1976 and 1978, PECO should have either canceled in 1974 when PECO's financial position was bleakest, or it should have built the plant as quickly as possible.

In rebuttal, PECO maintains that trial not fiscally sound. If its suggested financing proposals were added to the amounts actually issued by the company through the same period, PECO would have been left with an indenture coverage below 2.0 times in 1979, precluding further mortgage bond financing (PECO Statement 11D, p. 5). PECO claims that in the 1975 to 1979 period, it could have issued only a total of about $30 to $40 million in additional mortgage bonds while maintaining a 2.0 times mortgage ratio in 1979. Finally, PECO argues that the issuance of common stock as suggested by staff would merely have diluted earnings to a level insufficient to cover PECO's dividend. (PECO Statement 11D, p. 5.)

D. *1978 Extension*

In May, 1978, PECO announced a decision to reschedule Units I and II from 1983–85 to 1985–87 respectively. Although PECO witness Paquette testified that from 1978 to 1980 the company authorized and spent moneys to maintain the 1983–85 service dates, the record indicates that direct expenditures during that period were reduced from the budgeted amount of $529 million to $479 million (OCA Exh 23, N.T. 1, 7). According to the witness, the 1978 delay was caused by the same factors as the 1976 delays; i.e., no load growth, inadequate rate relief increasing financial constraints, and a concern about a possible excess capacity adjustment.

PECO, however, maintained its options with regard to its construction timetable due to the fact that escalating oil costs made it appear that completion of Limerick at an early date might be advantageous to customers, even if the capacity was not required, since the fuel cost savings resulting from Limerick's operations would more

than offset the carrying costs of the plant (PECO Statement No. 9, p. 14).

Unlike the 1976 delay (N.T. 502), PECO performed an analysis to determine the level of short-term savings versus long-term costs attributable to deferring completion of the plant.

The OCA points out, in response, that PECO's concern over an excess capacity adjustment should not have entered into PECO's planning picture, in that ALJ Matuschak's decision in R.I.D. 438 recommending an excess capacity adjustment, came months after the decision to delay was announced. OCA also claims that PECO failed to adequately analyze the economic and financial implications of the delay and the possible cancellation of at least one unit (OCA brief p. V-24-26).

Trial staff takes the same position with regard to this delay as the 1976 delay.

E. *Discussion*

[2–4] We note at the outset of our discussion, that to adopt any proposed adjustments or calculations presented to us, at this time, would be inappropriate. The record presented is inadequate to accurately gauge the costs of delay. Nor is the issue ripe for decision. Only when the plants are complete and the attendant cost claimed will the costs of delay be susceptible to accurate assessment. Accordingly, we shall not attempt to quantify the costs of the various delays at this time.

In order to judge the reasonableness of the actions taken by PECO's management in delaying the construction of the Limerick plants, we must initially establish a standard by which we can measure PECO's actions.

PECO would have us apply a standard of management imprudence arguing that so long as there exists a *rational basis* for the rendering of any of its decisions, those decisions may not be criticized. We are guided by Coplay Cement Manufacturing Co. v Pennsylvania Pub. Service Commission, 271 Pa 58, PUR1921E 597, 114 Atl 649 wherein the Pennsylvania supreme court stated:

"It was not intended by the legislature that the commission should be a board of managers to conduct and control the affairs of public service companies, but it was meant that where certain of their powers and obligations had intimate relation to the public through fairness, accommodation, or convenience, the commission should have an inquisitorial and corrective authority to regulate and control the utility in the field specifically brought within the commission's jurisdiction."

While it is not our duty to become PECO's board of directors, it is our duty to ascertain what the conduct of a prudent management would have been under a given set of circumstances and utilize that standard to determine whether actions taken by a particular utility, resulting in costs to be borne by ratepayers, are reasonable. Pennsylvania Power & Light Co. v Pennsylvania Pub. Service Commission (1937) 128 Pa Super Ct 195, 216, 217, 19 PUR NS 433, 193 Atl 427. Our process may be analogized to that of a court of law when it applies a reasonable man standard to proceedings before it. We find the opinion of the New York Public Service Commission is appropriate to utilize in determining whether management practices were reasonable. In Re Consolidated Edison Co. of New York, Inc., Case 27123, Opinion No. 79-1, Jan. 16, 1979, the New York Public Service Commission stated:

". . . the company's conduct should be judged by asking whether the conduct was

reasonable at the time, under all the circumstances, considering that the company had to solve its problems prospectively rather than in reliance on hindsight. In effect, our responsibility is to determine how reasonable people would have performed the tasks that confronted the company."

See also, Case 27565, Re Niagara Mohawk Power Corp. Opinion No. 80-25, June 24, 1980; Case 27869, Re Consolidated Edison Co. of New York, Inc. (1982) — NY PSC —, 45 PUR4th 325, Opinion No. 82-2. Thus, a standard of "reasonable care" rather than a "rational basis," as suggested by PECO, appears appropriate. Perhaps the ALJ summed up this approach best when he stated that "PECO's conduct in delaying construction shall be judged on the basis of how reasonable people would have responded to the events of 1974–78 and whether PECO's response was satisfactory in light of all those conditions and circumstances. By utilizing such a standard we are attempting to balance the right of the ratepayers to be treated fairly and the inherent right of PECO to manage its own affairs.

With this standard in mind, the ALJ concluded that PECO's 1974 delay was reasonable and that the 1976 and 1978 delays may have been unreasonable. As previously noted, the ALJ did not find it appropriate to recommend any specific action regarding the 1976 and 1978 delays be taken at this time. However, he did conclude that the risk of large units should be shared by stockholders (R.D. at p. 54). He states: "Consumers should not be expected to pay for delay which results from a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interests. To these findings, PECO, the OCA, and the Keystone Alliance except.

In its exceptions, the OCA argues that if, in a future rate proceeding, the commission determines that an adjustment is appropriate, "then in all fairness to ratepayers the effect on stockholders should be assessed and compared to the approximate $200–300 million loss spread over ten years that would result from stockholders' absorption of one-half of the aftertax sunk cost of Limerick Unit No. II."

Keystone Alliance excepts to that portion of the initial decision wherein the ALJ found PECO's pre-1974 actions to be prudent, arguing that PECO was committed to nuclear powerplant construction rather than viewing nuclear generation with prudence. They also argue, that the ALJ erred in not finding that construction should have been halted in 1974.

PECO, in its exceptions, initially lends its support to the ALJ's conclusion that we lack authority to order prospective rate base adjustments and that such an adjustment, if adopted at this time, would interfere with PECO's ability to finance plant completion on the least cost Forecast 5 schedule and would increase financial costs. However, PECO excepts to the ALJ's criticisms of its 1976 and 1978 scheduling decisions. Briefly, PECO argues that we should reject the ALJ's conclusions:

"because (1) the initial decision has erroneously summarized PECO's evidence as to the reasons for its scheduling decisions, (2) has failed entirely to discuss or describe a material and substantial part of PECO's evidence in support of those decisions and (3) has erroneously accepted unproven and erroneous cost-benefit assumptions presented by trial staff."

Initially, we disagree with Keystone's assertions that the 1974 construction extension decision was not prudently undertaken. As noted previously, at the time the

construction permit was issued, PECO had no firm indication that demand would be reduced substantially. It is readily apparent that the decrease in demand was due primarily to the increased price of oil and rapid inflation, which in turn resulted in ever increasing rates. As there was no indication that this demand decrease would continue, we cannot conclude, as did Keystone, that construction should have been halted at this point in time. If anything, we would have concluded, as did trial staff, that in light of subsequent developments, the Limerick construction schedule should have been advanced. However, placing ourselves in the position of PECO's management with the facts and trends available to it at that time, we cannot conclude that management was imprudent and unreasonable in its decision in 1974 to delay construction.

With regard to the OCA's exception, we reiterate our position that as no claim has been made for inclusion or exclusion of costs associated with Limerick, we deem it inappropriate to allocate those costs. The issue of any allocation or sharing of costs is properly reserved for a future rate proceeding.

Turning to the 1976 and 1978 extensions, we note that at the time of these decisions, PECO had two and four years of additional information indicating that the decline in demand was continuing, and despite increases in rates approved by us, further deterioration of PECO's financial condition had occurred.

The ALJ has found that the 1976 postponement was "made without careful analysis of the impact of such delay on ratepayers" and that "[c]onsumers should not be expected to pay for delay which results [from] a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest." To the ALJ's finding of imprudence PECO has excepted, arguing that the initial decision fails to provide an assessment of the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion, in addition to disregarding the evidence of PECO's precarious financial condition during the 1974–80 period and evidence that the reduced load growth permitted delaying completion of Limerick without threatening service reliability.

It appears, from the record before us, that PECO's 1976 and 1978 construction delays were caused by PECO's financial difficulties, which in turn were caused by its ambitious construction program and its ever decreasing load growth; conditions similar to those causing the 1974 delay. While it is true that PECO's financial condition deteriorated from its 1974 levels, we are of the opinion that, at the least, PECO's ambitious construction plans exacerbated its financial difficulties. We are convinced that PECO's financial difficulties, proffered as a reason for delaying construction, would have been less acute if construction at Limerick had been terminated.

PECO now argues that one of the prime considerations in delaying construction was a continued reduction in PECO's load growth. Although PECO's spring 1976 load forecast projected a lower load growth than earlier anticipated, it appears that even this projection was overly optimistic. We note that in PECO's 1977–78 rate proceeding, PECO reduced its forecasted growth rate from 5 per cent to 3 per cent. Pennsylvania Pub. Utility Commission v Philadelphia Electric Co. (1978) 52 Pa PUC 772, 31 PUR4th 15. Apparently, this 1978 reduction was an acknowledgement that the trend evidenced in 1974 was continuing. Despite this now obvious trend, PECO delayed

improve.

PECO's final argument, that the relative economic benefits and detriments to ratepayers and shareholders of earlier versus later plant completion favored delay, is unpersuasive. We find this argument curious in light of the fact that PECO stresses that, because load growth has declined, the Limerick units' main purpose is to replace oil-fired generating capacity. If Limerick can be economically justified when compared to a combination of alternative sources of power and the retirement of oil-fired plants, which by now have been extensively depreciated, the relative benefit to current ratepayers would have been greater if the oil capacity, and their associated costs, had been retired earlier by way of compressing rather than expanding the construction schedule. Further, as the nation as a whole experienced a period of double digit inflation and rising interest rates, delaying the necessary financing did and will continue to increase the ultimate costs of the plant financing.

Considering the foregoing, we are of the opinion that PECO management did not exercise judgement sufficient to meet our reasonable man standard in delaying construction at Limerick in 1976 and 1978. Having so found, we are requested by staff and the OCA to quantify the cost of the delay to ratepayers. We are of the opinion that to do so at this time is inappropriate. We have not been presented, in this proceeding, with a claim for recovery of any of the costs associated with the construction of the plants. Consequently, we can make no adjustment to any claim. Further, should PECO sell all or part of the Limerick plant or its capacity to other utilities, the deduction of all or part of the costs of delay from PECO's claim, if any, would be materially affected. We therefore find it unnecessary to quantify, at this time and in this proceeding, the costs associated with the 1976 and 1978 delays.

III. *Management Oversight of the Project*

Following the selection of Bechtel Power Corporation as the architect/engineer and contractor for Limerick, and General Electric to provide the steam generator, PECO management assigned responsibility for planning, scheduling, and cost control to its engineering and research (E&R) department.

The management of this department holds weekly meetings with the heads of the six divisions comprising the department. Individual divisions have biweekly meetings to review Limerick activities. A departmental report is prepared and sent monthly to PECO's chairman of the board. The vice president of PECO's E&R department reports significant events to top management at weekly and biweekly meetings. In addition, a major project coordination meeting is held monthly, usually at the construction site and is attended by PECO and Bechtel personnel. Additional periodic meetings are held between General Electric, Bechtel, and PECO management groups to review the overall project status (PECO Statement No. 1B, p. 2).

As noted above, PECO's E&R department is composed of six divisions. As described by PECO, the overall coordination and administration of the project rests in the mechanical engineering division, and the designated project manager, Richard A. Mulford, is located in that division. This division also follows the mechanical design aspects of the plant, reviews and interacts with the piping and instrument system diagrams and plant layouts prepared by Bechtel, reviews and approves equipment specifications and drawings, and reviews

ommendations. The division also performs a similar monitoring function for General Electric, the vendor of the nuclear steam supply system. Following the start of construction, a PECO resident project manager was assigned to Bechtel in San Francisco; there are now three PECO employees situated there.

The electrical engineering division follows the electrical aspects of the plant's design. Personnel in this division perform functions parallel to their counterparts in the mechanical engineering division, working through an electrical project engineer who coordinates his activities and reports through Mr. Mulford.

The construction division is responsible for monitoring the actual construction of the project and as such, works closely with Bechtel. A project manager — construction, James Clarey, is assigned to directly supervise site activities.

IV. *Future Construction and the Need for Limerick*

A. *The Need and Justification for Limerick*

The central focus of this investigation has been whether continued construction and completion of the Limerick units is in the best interest of the company and its ratepayers from the perspective of reasonable rates and system reliability. Large investments have already been made in the two units. As of April 30, 1982 (hearings were completed on November 13, 1981), PECO estimated that $2,230,000,000 would be spent at the Limerick site. Approximately $1.8 billion of that amount represents the investment in Unit I, which would be 76 to 79 per cent complete. The remaining $410 million is attributable to Unit II, which PECO forecasts would be 42 to 43 per cent complete.

When originally conceived and proposed, the Limerick project was considered necessary to meet system demand, which was growing at 6 per cent annually and forecasted to be 7 per cent. However, since approximately 1974, load growth has severely diminished. In this proceeding PECO has projected system load growth of 2.3 to 2.8 per cent and the OCA's growth figures for PECO range from 1.1 per cent (base case) to −0.5 per cent (conservation case).

Generally, declining growth rates may translate into "excess" capacity of no response to reduce planned capacity additions is made by the utility. For PECO the late 1970s have been a period of large reserve capacity (PECO St. 2, p. 14). In 1973 PECO's reserve capacity was 10.7 per cent. By 1977 the reserve margin was 39.3 per cent, declining to 26.3 per cent in 1980. The company anticipates growth in peak demand of 100 megawatts annually or an average growth factor of approximately 1.6 per cent. Assuming the addition of Limerick Units I and II (1,055 megawatts per unit) in 1985 and 1987, respectively, and Salem 2 in 1985 (474 megawatts), as well as the retirement of 1,215 megawatts of various oil and gas turbines, the company anticipates reserves of 36 per cent in 1985 and 37 per cent in 1988, declining slightly to 33 per cent by 1990 (PECO St. Table II). These margins would be much higher without the retirement of the fossil fuel plants prematurely, prior to the end of their useful life. Prior to 1966 a reserve margin of 12 to 15 per cent was considered adequate. Concern in the 1960s about blackouts triggered a revised requirement of a 20 per cent margin. PJM's present reliability standard of one day in ten years requires a reserve margin of 26.5 per cent (See footnote 4, *supra*). The commission held at R.I.D. 865 that an average reserve

of 18 per cent (range of 14 to 22 per cent) was reasonable. Pennsylvania Pub. Utility Commission v Philadelphia Electric Co. (1980) 54 Pa PUC 220, 226, 37 PUR4th 381.

No party to this investigation has attempted to justify the continued construction and completion of Limerick on the basis of growing system demand and the need to add new capacity. The central controversy turns on whether the Limerick units are the most reliable and economic method of replacing PECO's fossil fuel fired generation. The cost of continued use of the company's fossil fuel plants, as contrasted to replacement of these units with Limerick or some other alternative; e.g., conservation, smaller coal-fired units, purchase of capacity at PP&L's Susquehanna steam station, has been extensively debated by the parties.

Both PECO and the OCA, as well as the other parties, have performed extensive analysis of the many options available to determine which is the most cost effective. The conclusions reached by the parties vary widely depending upon the assumptions made regarding the capital and operating costs of Limerick, outage rates, capacity factors, future cost of fuel, PJM wholesale rates, and a host of other factors. Administrative Law Judge Klovekorn has performed an admirable job of distilling and discussing the various proposals, and we shall not attempt to repeat his detailed discussion here, but shall instead summarize the positions of the parties.

Analyzing the 1980 through 1994 time frame, PECO witness Lawrence claimed that completion of both units would result in savings ranging from S1.9 to S7.5 billion depending upon the alternative studied. Completion of Limerick Unit I and cancellation of Limerick Unit II without replacement would "cost" consumers S1,930,000,000 relative to completion of both units, whereas cancellation of both Limerick units without replacement would cost ratepayers an additional S7,470,000,000 in revenue requirements. Analysis of the alternatives to Limerick does not include recognition of the additional capital costs associated with Limerick's sunk investment of approximately S2,230,000,000 billion at April 30, 1982. Dr. Perl performed a second PECO study focusing on the coal alternative only. The results of his statistical analysis are that the "most likely" levelized cost of Limerick will be 13 cents per kilowatt-hour. The cost of replacement by coal is forecasted at 19.4 cents per kilowatt-hour. Over the life of Limerick, Dr. Perl claims, savings of S5.7 billion will accrue to ratepayers compared to reliance upon the coal capacity alternative.

Due to the computational and other errors discovered during the hearings, the OCA presented a progressive series of analyses. The "bottom line" of the OCA's positions, however, is a SOBIG computer run by PECO witness Hieronymus which includes OCA assumptions regarding the capital and operating costs of Limerick, capacity factor, PJM wholesale rates, and all other factors (PECO Exh WWH-3, Schedule G). The results indicate savings ranging from S21 million to S364 million (present value) under the conservation scenario,[16] *if* one agrees with a prospective average load growth rate of *negative* 0.5 per cent. All other growth scenarios indicate

[16]It should be noted that the estimates under the conservation case include savings to nonelectric heating customers (oil and gas customers) of approximately S2.3 billion and assumes ratepayers pay all costs of conservation.

that completion of both units is the cheapest alternative.

The city of Philadelphia presented a conservation study modeled after programs undertaken by the Tennessee Valley Authority and several west coast electric utilities and claimed that if an aggressive conservation program were implemented by PECO with expenditures of $45–60 million annually, the need for Limerick Unit II would be offset with attendant savings of $445 million. This analysis covers the time frame 1982 through 1989.

After hearing and considering all of the evidence presented, ALJ Klovekorn concluded:

"[T]here can be no doubt as to the economics of and need for the completion of both Limerick units. There has been no analysis presented which, using plausible assumptions, has shown Limerick to be uneconomic. Rather, all reasonable analyses have shown that Limerick will produce economic benefits to ratepayers over any proposed alternative." Recommended Decision at p. 238. The ALJ recommended that the plants be brought on line as soon as possible and that the commission monitor the company's progress.

As the above brief recitation of the evidence illustrates, the range of forecasted savings is broad depending upon the assumptions made and the alternatives studied. While we generally agree with the conclusions of Administrative Law Judge Klovekorn, a short review of the appropriateness of some of these adjustments is proper. Several of PECO's assumptions, specifically the $4.6 billion cost of Limerick, a 70 per cent capacity factor, and a future load growth of 2.3 per cent/2.6 percent (PECO/PJM) seem exaggerated. Limerick will likely cost more in the range of $5 to $6 billion with a midpoint of $5.5 billion. A capacity factor of 60 to 65 percent is more realistic, although all nuclear power plants, as Pennsylvania painfully learned at Three Mile Island, carry the potential for lengthy and unpredictable shutdowns. The ESRG (OCA) base case load growth factor for PECO of 1.1 per cent is reasonable, as is their PJM forecast. On the other hand, the OCA's forecast of a 14.7 per cent discount rate, 14 per cent inflation in O&M expense, and $6.6 billion cost of Limerick seems high, although the latter is not at all impossible. Our discussion of the conservation issue may be found in a subsequent section.

Recovery of the existing investment at Limerick (sunk costs) and the question of whether amortized expenses should be given rate base treatment is a decision to be made by this commission. Depending upon the position taken, completion of one or both units may or may not be economic, due to the magnitude of capital already invested at Limerick. The treatment of sunk costs is, therefore, a key input assumption. PECO's total sunk investment in Limerick at April 30, 1982, was estimated to be approximately $2,230,000,000 billion (PECO Statement 11G, pp. 1, 2). Approximately $410 million of that total represents PECO's investment in Limerick Unit II. It should be noted that *recovery of sunk costs is an issue only if one (or both) of the units is canceled.*

At this time, prior to the presentation of any claim by the company for recovery of the sunk costs, the commission is not prepared to definitively state how it will treat such costs. To do so might be construed as prejudicial to the resolution of any claim the company might make in the future. We have no such desire and repudiate any such intent. Further, an insufficient record exists to adjudge the issue here. For the pur-

poses of their analysis all parties have assumed sunk costs in Unit II of approximately $410 million as of April 30, 1982. This figure, however, is a projection and does not include any additional losses; e.g., cost to modify Limerick to a single unit station and to terminate unit II — or gains; e.g., salvage — which may be attendant to cancellation. Further, the tax effect of abandonment is an important factor which should be considered. Undoubtedly, there are other items which are also relevant. The absence of these adjustments renders the present record incomplete.

B. *Financial Condition*

The greatest impediment to a timely and, hence, economic completion of the Limerick units is the financial condition of the company. As the preceding discussion makes clear, the continued and repeated delays of the project undertaken *largely for financial reasons* has resulted in massive cost overruns and the resultant loss of savings which consumers might have realized. While there still do exist potential savings which we desire to retain for the benefit of consumers, we are concerned that, given the present financial straits of PECO and the prospective improbability that such stress will abate until Unit I is on line and in reflected rates, the cost savings claimed in this proceeding will be diminished and deferred.

PECO's financial condition has deteriorated to a grossly substandard level. As we noted in PECO's recent base rate proceeding, Pennsylvania Pub. Utility Commission v Philadelphia Electric Co. R-811626, May 21, 1982, "PECO's most recent mortgage debt issue (April, 1982) sold for 18.2 per cent" and currently carries a BBB rating. In that proceeding it was projected that without substantial rate relief earnings per share would decrease from $2.26 in 1981 to $2.09 in 1982, and $1.75 in 1983, which would be insufficient to cover PECO's current $2 dividend. More importantly, interest coverage (with AFUDC) would fall to 2.03 times and 1.76 times in 1982 and 1983, respectively, and to 1.42 times and 1.08 times without AFUDC. Despite our recent allowance of an increase in annual operating revenues of approximately $221,708,000, PECO's interest coverage is less than 2.7 times with AFUDC and is dangerously close to those levels which will prevent the issuance of the bonds necessary for the continued construction of both units. In light of PECO's BBB rating, issuance of the amount of new bonds required to finance construction on both units would certainly be at a high cost and at great risk, which in turn would lead to a further downgrading of its securities. PECO's current rate precludes inclusion of PECO's bonds in various institutional portfolios and any further downgrading would further restict the population of investors willing or able to purchase those bonds.[17] Indeed, in 1974, 1975, and 1980, BBB-rated securities could not be sold by a number of companies (PECO Statement 13, p. 17).[18]

For 1981, the company's achieved equity return was approximately 12 per cent, although the commission authorized return

[17]PECO's current rating by Standard & Poor's of BBB represents a corporate bond of the lowest investment grade rating. A decrease in rating to BB represents a speculative bond considered below investment grade.

[18]Unless otherwise noted, statement and exhibit references in this section are from Pennsylvania Pub. Utility Commission v Philadelphia Electric Co. R-811626, May 21, 1982.

was 15.5 per cent (PECO Statement 1A, Table 4). The company's actual returns during the latter part of the 1970s and early 1980s place PECO "at or near the bottom of the actual returns within the utility industry" (PECO Statement 1, p. 7). Cash coverage of its dividend in 1980 was only 1.06 times. In 1981 the company increased its dividend to $2 per share, only the second increase in ten years (PECO Statement 1, p. 8). PECO's 1981 equity offerings sold at a mere 65 per cent of book value per share (PECO Exh JFB 1, Schedule 12, p. 13). Should the market-to-book ratio fall much further, PECO may be unable to issue additional equity shares because the cost, in terms of dilution to existing shareholders, would be prohibitive.

The single most important reason for PECO's present financial ills is the large magnitude of its construction program. AFUDC represented a staggering 84 per cent of PECO's 1981 earnings (PECO Statement 1A, Table 4). Over the five-year period ended 1980, cash as a percentage of construction expenditures averaged only 26 per cent and in 1980 fell to 12 per cent (PECO Statement 13, pp. 5, 6). In 1981 this figure dropped to a dismal 5.2 per cent. Nor will the pressure of construction abate in the near future. PECO has budgeted an $876 million construction budget for 1982, with an additional $870 million planned for 1983 (PECO Statement 1A, pp. 1, 2).

The company's financial plight endangers its construction program. Mr. Paquette stated on behalf of PECO that:

"The company has an *urgent need* for substantial rate relief which is required to achieve an adequate rate of return on our investment in electric facilities serving the public and improve our extremely low levels of internal cash flow and interest coverage ratios. Unless we are able to substantially improve our financial performance, I believe we will be unable to continue to finance our planned construction program. If that occurs, it could have severe, long-run adverse effects on our customers and the entire Delaware Valley." (Emphasis in original.) (PECO Statement 1, pp. 3, 4.)

In the rate case at R-811626 a major element of the "substantial rate relief" referred to by Mr. Paquette was in the form of PECO's request to include $500 million of Limerick-related CWIP in rate base. The company further stressed that allowance of the CWIP claim was necessary to improve its bond rating above the BBB level.[19]

"If the company cannot improve its bond rating above BBB, I believe there is a serious possibility that we would have to delay the Limerick project because of our inability to sell additional securities in a limited market." (PECO Statement 5, p. 5).

We denied the company's claim for inclusion of Limerick-related CWIP in our

[19]Mr. Paquette stated that with a revenue allowance of $238 million at R-811626, substantially above that increase the commission actually allowed PECO, "we would be able to temporarily delay another downgrading. However, we would not expect to see an improvement in our rating for some time to come" (PECO St. 1A, p. 5). The company also stated that the ALJ's allowance of almost $210 million would most likely occasion a downgrading, because PECO's financial indicators for 1982 at that level of revenues would be only marginally within indicators achieved by other BBB companies. PECO Exceptions, at 1–27.

As was stated in the Moody's bond survey of February 8, 1982, with regard to PECO specifically:

"Without CWIP in rate base, it would be difficult to achieve adequate financial measurements and internally generated funds for the continuing heavy capital needs expected to total almost $3.5 billion over the next four years . . . Maintenance of the current "baa" rating is highly doubtful if Limerick construction proceeds according to the present schedule without CWIP in rate base." *See, also,* PECO Sts. 13 and 14.

order at R-811626 for the reasons stated there.

C. *Commission Conclusion*

[5–7] We find that continued construction of both Limerick units simultaneously is not in the public interest. The public interest requires:

(a) Preservation of PECO's financial integrity;

(b) Protection of the public from unjust and unreasonable rate increases;

(c) Protection of adequate service; and

(d) Timely completion of Limerick Unit I.

For these reasons, we find that either the cancellation or suspension of construction at Limerick Unit II is in the public interest.

Given our inability and unwillingness to provide rate base recognition of Limerick-related CWIP at R-811626 and the resultant probability that the company's bond rating will not improve above its present BBB and may in fact slide further, it would not be in the public interest for the company to continue present construction of Limerick Unit II. Were the company to attempt the impossible feat of continuing to build both units as scheduled, we believe the impact on PECO's finances would be catastrophic and would occasion further slippage in coverages and a downgrading of PECO's bond rating. This slide downward into a financial abyss would in all likelihood preclude PECO's access to the financial markets altogether. Even were the BBB rating maintained, construction of both units could be accomplished only at an exorbitant cost of capital, as evidenced by PECO's most recent debt issuance at a cost of 18.2 per cent.

The only other meaningful alternative to adjusting the Limerick construction schedule is to recognize the capital costs of construction in present rates by including the construction work in progress (CWIP) in rate base. For the reasons we stated in our rate order at R-811626, based upon the record adduced there, our statutory duty to protect the public from unjust and unreasonable rate increases precludes this avenue for PECO.

If we were to do nothing, allowing the company to continue the Sisyphean task of building both units simultaneously with endless delays and attendant cost overruns, the ultimate cost of the plant could well be excessive and the resultant tariff charges, were the plant included in rates, unjust and unreasonable. As of this point in time, customer savings associated with the completion of the units still do exist, albeit smaller in magnitude than if the original construction schedules had been adhered to. Further delays of both units will only further erode, and might possibly extinguish, the remaining savings.[20]

To sanction the continued construction of both Limerick units under these circumstances could jeopardize PECO's ability to adequately fund its continuing operations thereby resulting in a deterioration of service. We find the completion of both units by 1985 and 1987 is not financially feasible if PECO is to ensure the continued maintenance of safe and reliable service to the public.

On the other hand, we are of the opinion that sufficient funds at reasonable cost are available to allow PECO to complete construction of *Unit I* on schedule[21] and we encourage the company to complete this

[20]The company has estimated that a six-month delay in completion of the Limerick units as a result of financial pressure would add $250 million in costs (Tr. 1113).

[21]We deem PECO's currently scheduled in-service date for Unit I of 1985 to be appropriate.

unit as rapidly as possible consistent with the public safety. In reaching this conclusion we are driven by the desire to retain for ratepayers the lower future revenue requirements and customer savings which both the company and the OCA have identified in their various computer models relative to any plausible alternative, including continued reliance on fossil fuel fired capacity.

Having decided that continued construction of Unit II at the present time is not in the public interest, we are of the opinion that it is proper to defer to company management the decision as to whether construction on Unit II should be suspended or canceled. This decision is properly within the domain of management and an area into which we do not desire to intrude.

However, in view of the above findings, at the present time and before Unit I is completed, we declare that we shall not approve any new securities issuances, the proceeds of which would be used, in whole or part, for construction at Unit II and, further, we shall deny recovery of AFUDC on any *additional* investment in Unit II (at such time as recovery is sought)[22] pending completion of Unit I. We will also permit the company to finance and accrue AFUDC on the incremental costs attendant to shutting down construction at Unit II and maintaining that unit in a safe condition pending the resumption of construction should the company opt to suspend construction at that unit. The former may include items such as: the cost of terminating presently effective construction contracts; protecting the site from the elements; or completing certain portions of the project so that construction may be resumed efficiently. The latter would encompass any additional investment necessary to protect the safety of the public or the construction employees.

D. *Legal Authority*

In view of the unique nature of these proceedings, we deem it appropriate to clearly set forth the legal authority upon which this decision is grounded. It has been repeatedly held that the commission has exclusive, original jurisdiction over the reasonableness, adequacy, and sufficiency of public utility service. Elkin v Bell Teleph. Co. of Pennsylvania (1980) 491 Pa 123, 420 A2d 371; Duquesne Light Co. v Borough of Monroeville (1972) 449 Pa 573, 98 PUR3d 97, 298 A2d 252; Allport Water Authority v Winburne Water Co. (1978) 258 Pa Super Ct 555, 393 A2d 673; Elkin v Bell Teleph. Co. of Pennsylvania (1977) 247 Pa Super Ct 505, 372 A2d 1203.

The commission's jurisdiction to supervise the operations of public utilities is clearly expressed in the Public Utility Code. Section 501 of the code, 66 Pa CS § 501, provides in pertinent part:

"(a) Enforcement of provisions of part. In addition to any powers expressly enumerated in this part, *the commission shall have full power and authority, and it shall be its duty to enforce, execute, and carry out, by* its regulations, orders, or otherwise, all and singular, *the provisions of this part, and the full intent thereof*; and shall have the power to rescind or modify any such regulations or orders. The express enumeration of the powers of the commission in this part shall

[22]We will allow PECO to continue to accumulate AFUDC on the existing CWIP balance at the unit, if it elects to suspend construction. Under our Uniform System of Accounts AFUDC may not be accumulated if Unit II is canceled and, hence, no longer under construction.

not exclude any power which the commission would otherwise have under any of the provisions of this part.

"(b) Administrative authority and regulations. *The commission shall have general administrative power and authority to supervise and regulate all public utilities doing business within this commonwealth.* The commission may make such regulations, not inconsistent with law, as may be necessary or proper in the exercise of its powers or for the performance of its duties." (Emphasis added.)

The character of the service which must be provided by a public utility is defined in § 1501 of the code, 66 Pa, CS § 1501, which provides in pertinent part:

"*Every public utility shall furnish and maintain adequate, efficient, safe, and reasonable service and facilities*, and shall make all such repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as shall be necessary or proper for the accommodation, convenience, and safety of its patrons, employees, of the public. *Such service also shall be reasonably continuous and without unreasonable interruptions or delay.* Such service and facilities shall be in conformity with the regulations and orders of the commission. . . ." (Emphasis added.)

The standards by which the rates charged by a utility must be evaluated by the commission are set forth in § 1301 of the code, 66 Pa CS, § 1301, which provides:

"*Every rate made, demanded, or received by any public utility*, or by any two or more public utilities jointly, *shall be just and reasonable, and in conformity with regulations or orders of the commission.* Only public utility service being furnished or rendered by a municipal corporation, or by the operating agencies of any municipal corporation, beyond its corporate limits, shall be subject to regulations and control by the commission as to rates, with the same force, and in like manner, as if such service were rendered by a public utility." (Emphasis added.)

Taken together, these sections provide the commission with the power and authority to supervise and regulate the rates and service of all public utilities subject to its jurisdiction. Each utility is required to provide service which is adequate, efficient, safe, and reasonably continuous. At the same time, the rates charged for that service must be just and reasonable.

It is our view that this investigation goes to the very core of PECO's ability to fulfill its obligation to render adequate service at reasonable rates at present, while the company is involved in the construction of both Limerick units, and later, after the units have been completed. The findings set forth in this order clearly support this conclusion. We would be derelict in our duty to protect the ratepayer, if we declined to act.

Having undertaken this investigation and having made the various findings alluded to, we find it appropriate to issue this order in accordance with § 331(f) of the code, 66 Pa CS § 331(f), which authorizes us to issue a declaratory order to terminate a controversy or remove uncertainty.

Section 1903 of the code, 66 Pa CS § 1903, requires this commission to register a securities certificate if we find the issuance of the securities proposed therein is necessary or proper for the present and probable future capital needs of the public utility filing the certificate. Based on the record established in this proceeding, which we believe reflects the present and possible future capital needs of PECO in regard to the simultaneous construction of Units I and II, we declare that at this time the approval of new securities issuances to finance construction of Unit II would be neither necessary, proper, nor in the pub-

lic interest. Therefore, no new securities issuances should be approved to finance Unit II, and further, we must deny recovery of AFUDC on any *additional* investment in Unit II pending completion of Unit I.

We are of the opinion that we would be remiss if we did not declare these conclusions in this order. We believe that the public interest demands that we exercise our discretion and issue this declaratory order so that PECO can take appropriate action in response.

V. *Conservation*

As was stated earlier, a portion of PECO's experienced decline in consumption and load growth has been due to a commendable effort on the part of PECO's customers to conserve electricity. Several parties to this proceeding, OCA, the city, and CEPA, have set forth conservation and alternate energy source programs which they claim are feasible and lower cost alternatives to the completion of Limerick. However, the record developed on these programs is not sufficient for us to initiate specific programs at this time. There are still too many unanswered questions regarding the potential costs and benefits of the proposed conservation options and alternate energy sources, as well as unforeseen institutional barriers. We must be confident that these programs are the most desirable supply options available.

Throughout this proceeding, PECO has been criticized for failing to pursue an active conservation program (e.g. city M.B. pp. 21–26; OCA M.B. pp. IV 34–45; CEPA M.B., pp. 60–63; Keystone M.B., pp. 14–25), and unfavorable comparisons have been drawn between PECO's expenditures in this area and those of several other utilities. We did not intend to reach a conclusion as to the adequacy of PECO's past and current conservation programs. However, we strongly urge PECO to develop and implement aggressive conservation and alternate energy programs to offset future energy demands.

To these ends we will direct PECO to pursue an aggressive conservation program designed to substantially offset the suspension or cancellation of Limerick Unit II. Further, we will direct the secretary to open an investigation docket in order to develop a commission policy, applicable to all electric utilities, whereby regulatory incentives would be afforded to any cost-effective conservation inducing investment designed to lower a utility's need to install additional capacity; therefore,

It is ordered:

1. That the Philadelphia Electric Company inform us of its decision to suspend or cancel construction at Limerick Unit II, in light of the conclusions of this opinion and order, within 120 days of the entry of this opinion and order and provide an explanation thereof.

2. That the Philadelphia Electric Company pursue an aggressive conservation program designed to substantially offset the suspension or cancellation of Limerick Unit II in consultation with our Bureau of Conservation, Economics and Energy Planning. The company shall submit an initial conservation program plan within 120 days of the entry of this opinion and order.

3. That the secretary immediately open an investigation docket the purpose of which is to develop a commission policy, applicable to all electric utilities, whereby regulatory incentives would be afforded to any *cost-effective* conservation inducing investment designed to lower a utility's need to install additional capacity.

4. That at a minimum the aforemen-

tioned investigation should address: conservation financing programs for residential and small commercial customers, joint customer/company financed alternate supply projects, rate induced or company controlled load management programs with corresponding investment programs, appropriate company informational activities required to support the company's programs, any necessary changes in existing service regulations in order to ensure efficient utilization of electricity, and any legislation which may be necessary to implement or enhance conservation or provide alternative supply opportunities.

5. That the secretary invite all interested electric utilities or other parties to participate and direct the commission's Bureau of Conservation, Economics and Energy Planning to actively participate in the investigation.

6. That the initial decision of Administrative Law Judge Joseph Klovekorn is adopted to the extent consistent with this opinion and order.

CAWLEY, commissioner, issuing preliminary statement concerning construction work in progress (May 7, 1982): When discussing the subject of construction work in progress (CWIP), I am reminded of a conversation between California Governor Jerry Brown and Robert Batinovich. Brown was trying to persuade Batinovich to accept a position on the California Public Utilities Commission. As Batinovich recalls it, Brown said, "It is a terrible job. You will not please anybody, but it has to be done and I want you to do it."

Should CWIP be included in an electric utility's rate base?

Using the premise that a primary objective of rate regulation is assuring that utility companies are able to pursue all capital programs necessary to assure reliable electricity supply at a minimum cost, CWIP should be considered as one of several regulatory tools that can be used to this end. A decision on CWIP can only be evaluated in the context of the commission's entire set of regulatory policies, including policies on allowed rate of return, rate base assessment, suspension periods, etc.

The arguments on both sides of the CWIP issue have matured to a point where new perspectives are infrequent. The opposition of CWIP is generally on the grounds of:

1. Intergenerational inequities — Current consumers should not pay for a plant from which they may not be around to benefit.

2. "Used and useful" criterion — Strict interpretation of this regulatory principle can lead one to a conclusion that because construction programs are not yet "used and useful" they should not be allowed in the rate base.

3. Averch-Johnson phenomenon — This concept, developed in the early 1960s, maintains that the utilities will invariably seek to overbuild their systems. The financial disincentive of not allowing CWIP in the rate base is seen as counteracting this tendency.

4. Antinuclear and anticentral station bias — Antinuclear interests have used the CWIP issue to retard construction of new nuclear plants. The relatively lengthy construction cycles of nuclear power plants make them more subject to problems of inadequate internal cash generation if the utility constructing the plant does not have CWIP in the rate base. This explains much of the opposition to CWIP in jurisdictions with nuclear power plants planned or under construction.

5. CWIP increases rates — A switch to CWIP on a given system will generally cause rates to rise for some period of time. Although the early rate increases associated with *any* particular plant will be offset by decreases in subsequent years, this causes CWIP to be perceived as anticonsumer.

For each of these arguments against CWIP there are corresponding arguments in favor of CWIP:

1. New construction serves existing ratepayers — The intergenerational inequity and "used and useful" objections to CWIP are generally countered with arguments that the need to meet the power demands of current ratepayers leads to the need for new plants, and, therefore, current ratepayers should shoulder their share of the burden. Others make statistical arguments that the majority of ratepayers will stay on the system through a normal construction cycle.

2. The Averch-Johnson phenomenon is no longer applicable — Even if it did apply in the early 1960s, there is little current credibility to the A-J phenomenon given the current depressed financial condition of the industry.

3. CWIP does not increase rates over time — Even though it can increase rates in the short term, CWIP will not increase rates in the long term or increase the net present value of all future rates paid.

4. Inclusion of CWIP lowers the cost of capital — This argument augments the point that CWIP does not increase rates on a net present value basis and has been the focus of substantial statistical analysis.

5. CWIP gives a more "market-like" signal to consumers — With CWIP in the rate base, electricity prices are a closer surrogate to marginal cost pricing in many circumstances. This is an interesting argument in concept, but its validity is a function of the particular circumstances of any given utility. It is probably most appropriate for utilities which do not have oil and natural gas generation in base load since this can cause long-run marginal cost to be less than average cost.

It is unlikely that these arguments will ever lead to a satisfactory resolution of whether CWIP is innately fair and equitable. It is far more important not to lose sight of the vital issue of how necessary future system expansion will be accomplished. We could better spend our time focusing on whether undue and unnecessary financial constraints are leading us toward a future of insufficient electricity supply and the attendant problems of unnecessarily high electricity prices, unnecessarily high oil consumption, and reduced economic growth. These questions transcend the closein arguments on CWIP that turn on relatively technical points of consumer discount rates and impacts on cost of capital.

If current financial constraints will prevent utilities from making prudent investments in the best interest of ratepayers, the rate regulatory policy must adjust. Clearly, such change is in the best interest of both the consumer and the investor. CWIP is one of several tools that can and should be used to make this judgement.

I believe that an electric utility should finance its construction program without charging current customers for the financing of construction as long as such financing is cost effective. However, in recent years, the costs of construction programs have increased to the point that continued reliance only on internally generated funds (without CWIP and with a reasonable return on equity), borrowed funds, and stock sales, is often unsatisfactory. When this occurs, necessary construction projects are either postponed or

the utility's security rating falls, driving borrowing costs up.

When utilities face coverage problems, we are forced to choose between increasing the utility's allowed rate of return to an unrealistically high level or including CWIP (or some portion of CWIP) in the rate base.

Given a need to improve cash flow or coverage, including CWIP in the rate base benefits consumers in two ways, relative to arbitrarily increasing the allowed return on common equity. First, upon completion of the asset, it will be put in the rate base at a lower amount than if AFUDC had been accrued. This should lead to lower future rates. Second, there is an income tax advantage associated with interest payments. Since current ratepayers are providing a return on the CWIP, they should also benefit from any available tax deductions for interest expense.

Alternatively, we could improve an electric utility's financial rating by increasing the overall rate of return. Since the coupon rate on both bonds and preferred stock is fixed, increases in the overall rate of return can only be accomplished by allowing substantial increases in the return on common equity. Allowing unreasonably high returns on common equity violates the regulatory principle that calls for only reasonable returns on invested capital.

To the extent that ratepayers pay financing costs on uncompleted projects, they are paying for assets that are not at that moment used and useful. However, as noted previously, inclusion of CWIP in the rate base may be the best remedy for a cash-flow or coverage problem, a cure for which ultimately benefits ratepayers.

The regulatory process works best when all considerations to an issue are weighed. We should not be restricted with mandated requirements. We should have flexibility to rule as circumstances and the record before us dictate.

However, before this regulatory tool can be used with any effectiveness in Pennsylvania, important legislation is needed.

This commission (or some other appropriate agency) should be given the authority to approve large construction projects at their inception — so called "certificate of need" legislation.

Then, as the project progresses, periodic reapprovals should be required. A commonwealth-appointed (and paid) construction engineer should be onsite at all times so that the commission could be independently assured of the accuracy of completion estimates, the necessity for cost overruns, and the like.

As the quid pro quo, the utility would be permitted a percentage of CWIP depending on the percentage of construction completed.

Projects presently underway would require special treatment.

This proposal has several advantages.

The principal point is this: It is in everyone's best interest to complete needed plant as quickly as possible in times of inflation.

Investor capital (if the project is not to be entirely financed with CWIP, which is probably the more prudent course) will be more easily obtained at lower cost if ratepayers demonstrate financial resolve to speed completion of the project.

If CWIP is utilized, less money will be borrowed and therefore less interest will be paid.

When the plant is completed and allowed in rate base, its value for purposes of return *on* the investment will be far less, as will the returns *of* the investment (depreciation expense) and tax expense.

In short, there will not be the sudden and dramatic jump in rates as presently occurs when

the actual construction costs plus accumulated and compounded carrying charges go into the rate base upon completion of a project.

Perhaps most importantly, if, because of a decline in growth or customer usage, or because of a lack of Nuclear Regulatory Commission approval, or because of many other unforeseen difficulties, the plant is no longer needed or capable of operating, this proposal would detect such an eventuality sooner in order to stop, postpone, or end the project before any more money is poured into it.

Thoughtful consideration to the details of this proposal is required, and legislative hearings before drafting legislation is essential. This would provide an opportunity for comments and suggestions from interested parties.

Unless this kind of legislation is forthcoming, I cannot support CWIP for major project construction, even though I firmly believe that CWIP can be very beneficial to ratepayers and utilities alike.

As was said in a utility regulation treatise in 1941: "It should be borne in mind, by those in charge of the administration of the laws, that the course which may be popular at the moment may be neither just nor for the best interest of the public in the long run."

For these reasons, my position is this:

1. Whenever their financial position permits, we should require utilities to finance construction programs without the inclusion of CWIP in rate base.

2. However, when the use of these traditional financing methods creates severe financial problems for a utility, proposals to include some CWIP in the rate base — without corresponding offsets for AFUDC — should not be rejected out of hand. However, certificate of need/CWIP legislation must exist before major project CWIP can be utilized in order to mitigate or prevent financial calamity.

3. In instances where a utility cannot meet financial tests without including a portion of CWIP or being allowed an inordinately high rate of return, it is preferable to include some CWIP in the rate base without AFUDC offsets.

4. CWIP should not be used as a technique to cure all utility ills, but rather should be applied judiciously in concert with a determination of a realistic rate of return on equity. Rates should be designed and perform so that a utility can maintain its bond rating and be able to sell common stock without dilution of the ownership of present stockholders (meaning the market-book ratio of the company's shares must equal at least one; if the shares are selling for less than the book value of a share, the ratio will be less than one).

5. Utility rate-making practices should not be adopted that would tend to absolve utility management from pursuing improvements in performance. It is the responsibility of utility management to pursue construction project completion and general operations in an effective, efficient manner.

6. Statutes should not be enacted that prescribe the rate-making treatment of CWIP for utilities. CWIP treatment should remain a matter of regulatory discretion, which should not be foreclosed by legislation.

CAWLEY, commissioner, concurring (August 27, 1982): I supported the chairman's motion in this case, the intent of which is carried out in this order, but I feel compelled to express my misgivings about this action.

I believe that if we were to base our determination in this proceeding strictly upon

the record evidence, this commission should have reached the same conclusion as the administrative law judge. At p. 245 of his recommended decision the judge states, "the timely completion of Limerick Units I and II is in the best interests of PECO and its ratepayers." No one knows what the future will bring, but based upon the information available to us today, there does not appear to be an economical alternative to Limerick.

Unfortunately, we cannot make decisions of this magnitude in a vacuum. The company's ability to proceed with this project is inextricably linked to the amount of rate relief which it receives. The company has stated on the record here that maintenance of its construction schedule assumes adequate rate allowances.

This commission, in the company's last rate case, voted to disallow the company's claim for major project construction work in progress (CWIP) related to the Limerick project (my views on the subject of CWIP, as stated in that rate case, are attached hereto as an appendix). By so doing the commission rejected a significant portion of the company's total rate increase request.

It would be foolish for this commission not to consider the potential impact of this disallowance in its deliberations on the Limerick investigation. Likewise, I believe it would be foolish for the company not to carefully weigh this action in its decision to either cancel, suspend, or proceed with the construction of Unit II.

TALIAFERRO, commissioner, concurring in part and dissenting in part: When I began my term as a commissioner, I was given some advice, namely, to never compromise principles but where and if necessary, to compromise only on questions of tactics.

One of the principles in which I strongly believe is maintaining the integrity of the administrative process and procedural safeguards followed by this commission for our investigations, and rate cases, and rulemaking procedures, and informal investigations. All of these proceedings are done in accordance with publicly available, published rules and regulations which are largely modeled upon the practices of the judiciary.

The controversy presently surrounding this investigation into Limerick is, in my view, largely still a reflection of strong feelings existing in this state as in other parts of this nation about using nuclear power to generate electricity. As I see it, this is primarily because of most people's safety-related questions or concerns. The feelings run strong for both the pro- as well as the antinuclear positions. However, the safety question or questions are not before this commission — cannot legally be reviewed and ruled upon by this commission and, properly, were not addressed by the administrative law judge. Nor shall I address such issues. The "jury" for these pressing question(s) concerning nuclear safety and reliability, namely — the NRC and the U.S. Congress, are still out . . . debating. I join many of you in wishing that this country could get on with the business of *doing* something about these questions, rather than debating.

However, be that as it may, I set aside the safety-related questions to only focus on the issues before this commission as a result of our initiated investigation into Limerick. The questions this commission asked are spelled out on pp. 1–3 of the initial decision. As usual, all interested groups were free to participate in this investigation, to have their say regardless of age, race, creed, financial status. Several thousand pages of transcript and docu-

ments exchanged hands among parties, [and] were reviewed by them and our administrative law judge, Joseph Klovekorn.

The hearings for this investigation into Limerick station were conducted by one of the best administrative law judges at the PUC. His opinion has been written and the record he compiled I have reviewed. Beginning at p. 30 of that decision and continuing as on p. 54, and at p. 70 and at p. 147 and again at pp. 153, 154, and 155, this administrative law judge answers each question carefully, thoughtfully, reasonably.

I have reviewed his answers and I hope both he and I are proven wrong — I really do. But I can find no legal reason to arbitrarily set aside his decision, developed carefully and in accordance with the existing regulatory law, rules, and procedures. Therefore, while I can support wholeheartedly Par 6 of the motion and do vote "yes" as to that part, I cannot support Pars 1–4, and I cannot do so for the following reasons:

As to Motion Paragraph 1

The United States Supreme Court has long established the legal guidelines, which are consistent with relevant, applicable economic principles. I am referring to the Hope and Bluefield cases[1] which spelled out that the criteria of reasonableness to be followed and applied by state public utility commissions requires that the returns allowed to utility equity owners be sufficient:

"— to maintain the credit of the enterprise and confidence in its financial integrity;

"— to permit the enterprise to attract the required capital on reasonable terms; and

"— to provide the enterprise and its investors an opportunity to earn a return on the value of the property used and useful in providing the utility service commensurate with the returns available on investments in other enterprises having corresponding risks."

The three tests telling independent utility regulatory bodies what we must do are all interrelated and stand in direct contradiction to line one, Par 1 of the motion which says ". . . particularly the commission's inability and unwillingness to provide necessary revenues to complete both units. . . ." In my opinion this could clearly be viewed as to constitute a basis for reversible error by the courts; let alone to be against our oath of office.

As to Motion Paragraph 2

In my view, there is little dispute as to the proper treatment to be accorded by this commission for all sunk costs associated therewith. I refer particularly to the initial decision of the administrative law judge at pp. 202–209, wherein the strong position of the consumer advocate's office on these points is closely scrutinized.

The ALJ says:

"The carrying costs associated with sunk investment are not avoided or made to disappear simply because (this) commission nonrecognition upon Limerick termination.

"As the OCA witness, Mr. Czahar stated these costs are very substantial and very real. (TR 3495).

"If not recognized in the revenue re-

[1]Federal Power Commission v Hope Nat. Gas Co. (1944) 320 US 591, 51 PUR NS 193, 200, 201, 88 L Ed 333, 64 S Ct 281. Bluefield Water Works & Improv. Co. v West Virginia Pub. Service Commission, 262 US 679, 692, 693, PUR1923D 11, 67 L Ed 1176, 43 S Ct 675.

quirement analysis, these costs are simply as borne by the investors. However, the commission is obligated, both under Pennsylvania statute law and the federal Constitution, to consider the interests of investors as well as those of ratepayers. Commission action (see motion Par 1) which would threaten a utility's financial integrity as would, . . . disallowance of carrying costs on sunk investment . . . would not be in the public interest."

As to the sunk costs themselves, at p. 208 the ALJ shows how the consumer advocate's own position is pierced by the consumer advocate's own expert witness' words taken from the transcript at (TR 2111–2113).

Finally, there is the additional comparison developed by OCA's expert witness which established that when one compared the revenue requirements necessary for completing both Units I and II and even OCA assumed the inclusion of an allowance of 60 per cent CWIP for the 1982–86 period, with the 1979 present revenue requirements for only completing Unit I. (Schedule E, OCA Statement 2-B.) The results were $22,340 and $22,341, respectively. Translated into plain English, the total revenue requirements are approximately equal. So, in my view, anyone who has the mistaken impression that cancellation saves ratepayers or investors money, or is in any way an economic advantage to someone is, in my view, mistaken. However, I can hope that I am proven wrong. For all Pennsylvania ratepayers of any Pennsylvania utility, I hope that I am wrong.

As to Motion Paragraph 3

As for this paragraph, in my view, it is redundant, merely restating the obvious fact that if Unit II is suspended, no new securities for it will be needed. However, the AFUDC — so-called "funny money" to investors continues to accrue.

For the above reasons, I dissent from Paras 1–3 but I support Par 6 of the motion.

Re Limerick Nuclear Generating Station Investigation

Respondents: Office of Consumer Advocate and City of Philadelphia

I-80100341
49 PUR4th 165
October 15, 1982

PETITION *by electric company for stay or supersedeas of prior commission order to defer or cancel construction of a nuclear generating unit; denied. For prior commission order, see (1982) 56 Pa PUC 47, 48 PUR4th 190.*

APPENDIX G

THE ADMINISTRATIVE LAW JUDGE'S INITIAL DECISION IN DOCKET NO. I-80100341

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK NUCLEAR GENERATING

STATION INVESTIGATION

I-80100341

INITIAL DECISION

OF

JOSEPH J. KLOVEKORN

Administrative Law Judge

March 26, 1982

Procedural History

This proceeding had its genesis in a petition filed August 7, 1980 by the Office of Consumer Advocate (OCA), requesting that this Commission order the Philadelphia Electric Company (PECO or the Company) to show cause why continued construction of the Limerick Nuclear Generating Station (Limerick) is in the public interest and that the Commission order an investigation into the need for and economy of the Limerick Nuclear Generating Station.

On August 26, 1980 an answer was filed by the Company opposing the OCA's request for an order to show cause; taking no position on the request for an investigation; and petitioning that such an investigation be consolidated with the company's then pending rate investigation at R-80061225.

The OCA petition was considered at the Commission's Public Meeting of October 9, 1980. The Commission concluded that an investigation of certain issues concerning Limerick should be opened so that information can be gathered before PECO seeks to include Limerick in its rate base. The Commission did not agree with the OCA that a rule to show cause was appropriate, stating "We must first proceed to gather facts. We can then reach conclusions and enter whatever orders we deem to be appropriate." (Order, entered October 10, 1980.) The Commission did not agree that this investigation should be included in the pending PECO rate case, but rather believed that an independent investigation should be conducted.

Initially, the Commission order directed that this investigation be undertaken to determine:

(a) the reasonableness of the cost of Limerick construction delays,

(b) the reasonableness of the escalation of cost estimates,

(c) the eventual impact and reasonableness of Limerick on Philadelphia Electric Company's reserve margins.

At its public meeting of October 30, 1980, the Commission, believing that its original order might be incorrectly interpreted to be too restrictive, amended its earlier order and directed that an investigation be undertaken to determine the need for and economy of the Limerick Nuclear Generating Station. By letter dated November 8, 1980, the Commission directed that the investigation address, but not be limited to, the following issues:

(a) The cost of construction delays at Limerick and whether those delays were reasonable.

(b) The escalation of cost estimates for Limerick and whether those costs for the plant are reasonable.

(c) The eventual impact of Limerick on PECO's capacity and reserve margins and the reasonableness thereof.

(d) What alternatives PECO considered at the time the decision was made to build the plant and the projected cost of each alternative.

(e) Could any currently available alternate sources of energy, conservation/load management activities, improvements in existing power plants' performance, etc. replace Limerick at a lower cost to the consumer assuming that:

(1) expended costs are amortized over a reasonable period; or

(2) expended costs are not amortized or collected from ratepayers; or

(3) expended costs are shared among stockholders and ratepayers.

(f) The potential of large electric consumers directly buying the capacity and/or energy associated with Limerick.

On October 15, 1980, the proceeding was assigned to the undersigned Administrative Law Judge and on December 10, 1980, a prehearing conference was held in Harrisburg for the purpose of establishing dates for the filing of testimony and the examination of witnesses. A further prehearing conference was held on March 5, 1981.

Formal evidentiary hearings, began on March 24, 1981 in Philadelphia.[1/] Hearings concluded on November 13, 1981. In total there were 38 days of evidentiary hearings and three non-evidentiary hearings held in Philadelphia, Harrisburg, Doylestown, and Pottstown. Approximately 4,000 pages of testimony were taken from over thirty witnesses. This does not include the prefiled testimony and exhibits of these witnesses which should be measured by the pound and not the page. In addition, over 1,275 discovery requests were made by the parties.

As previously noted, the record in this proceeding closed on November 13, 1981. Briefs were filed on January 12, 1982 by the Company, the OCA, the Pennsylvania Public Utility Commission's Trial Staff (Trial Staff), the City of Philadelphia (City), the Consumer Education and Protective Association, et al. (CEPA), the Philadelphia Area Industrial Energy Users Group (PAIEUG), Limerick Ecology Action (LEA) and the

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1/ All but one of the formal evidentiary hearings in this proceeding were held in Philadelphia.

Keystone Alliance (Keystone). Reply Briefs were filed on February 3, 1982 and were received from the above parties as well as Mr. Marvin Lewis.

Introduction

The Limerick Nuclear Generating Stations currently under construction will, if completed, consist of two 1,055 megawatt turbo-generator units, each of which operating at 1,800 rpm's and served by its own nuclear steam supply system--a single cycle, forced circulation, boiling water reactor system--capable of producing 14,800,000 pounds/hour of steam at 1,000 psig and 550° F. The major features of the station will include the main generating station building which will house the turbo-generator units, the reactors, and their associated equipment, and administrative and maintenance areas; two cooling towers; a river water intake and pumping structure; and a circulating water pump structure. Adjacent to the generating facilities there will also be two electric substations, one of 500 KV and the other of 220 KV, each with conventional substation equipment such as circuit breakers, buses and supporting structures, switch gear, transformers, and a control building. (PECO Statement 1A, pp. 4-5).

PECO's management approved this project in concept in its 1968 construction budget. In August 1969, it awarded a contract to Bechtel Corporation to design and build the Limerick Station and, in October 1969, the Limerick project was formally announced to the public (PECO Statement 1A, p. 23). Formal capital authorization for the units' construction was approved by PECO's management in January 1971. It authorized the construction of the two units at a total direct cost

(exclusive of AFUDC) of $618 million, based on a preliminary estimate by Bechtel.[2/]

Since that time, construction costs have increased dramatically to a minimum of $4.23 billion and on-line service dates have been delayed from 1976-1977 to 1985-1987.

It was this dramatic escalation in cost, compounded by declines in load growth, which caused the Commission to institute this investigation. It was the public controversy over the safety of nuclear power, heightened by the incident at General Public Utilities' Three Mile Island Nuclear Generating Station, which initially focused public attention on this proceeding.

Before going further it must be stated that this investigation was not constituted to consider the health and safety aspects of nuclear power. There are other, more appropriate forums for such purposes. This proceeding was directed to investigate the economics of, and the need for, the partially constructed generating stations at Limerick. Its purpose was to gather facts for the Commission so that the necessary information regarding Limerick would be available before PECO seeks to have Limerick included in rate base.

If this investigation demonstrated one thing it was that the number of hard facts concerning this plant are limited. We know the background of Limerick, we know the decisions which led up to its construction, we know how we got to where we are. These areas are relatively free from controversy. The central issues in this proceeding concern,

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2/ AFUDC accounted for an additional $98 million (Trial Staff Exhibit D-1A, Sch. 4).

however, not the past but the future. But unlike the typical rate case, here we are dealing not in future test years, but in decades. The historical data base which is normally available to the Commission is not present here. In the typical rate case there are a relatively limited number of projections, normally restricted to the 12-18 months that prospective rates will be in effect. Here the number are increased many times over and these projections must be extended well into the twenty-first century.

In summary, we are dealing with a vast amount of data, all of which is projected and, all therefore, necessarily subject to criticism as speculative. The choices among competing alternatives are many, the arguments pro and con each choice are complicated. One thing is clear--the degree of precision normally associated with rate case findings is not present here. One can only weigh the various alternatives and attempt to decide which is the most reasonable, the most plausible.

It is with the uncertainty always attendent on the future that we proceed to set forth for the Commission the results of this investigation.

Summary of Positions

The following is a summary of the overall positions taken by the active parties in this proceeding.

Philadelphia Electric Company

PECO claims that the record in this proceeding supports the completion of the both Limerick Units on its present 1985/1987 schedule.

The 1968 study made by the Company was not, according to the OCA, a full and detailed system-wide production costing analysis, but rather a plant-to-plant comparison of a nuclear unit versus a fossil unit (OCA Ex. No. 8, Table 1).

In summary, OCA claims that when PECO approved Limerick in concept, no detailed formal study had been done to determine the economic consequences of the decision.

PECO, in response, notes that the assertions made by the OCA in brief are not based on any testimony by any witness in this proceeding. The company is correct. No expert has stated that, in light of the appropriate standard for prudent generation studies in the late sixties, the 1968 or 1971 evaluations were inadequate.

It should also be noted that in 1974 the AEC affirmed PECO's determination of Limerick's economics and necessity and that in 1971 this Commission made a similar ruling. PECO cannot be faulted because the computerized technology in generation planning was not available in the 1968-1974 period. The record here shows that PECO's actions in the 1968-1974 period were reasonable and its decision at that time to construct a nuclear unit at Limerick was a valid exercise of managerial discretion.

1974 Extension

As previously noted, the two units of Limerick were initially scheduled for completion in 1975 and 1977. Due to various delays,

especially in obtaining regulatory permit from the Atomic Energy Commission[6/], construction did not begin until summer of 1974. At that time the anticipated in-service dates were July 1979 and December 1980. In October 1974, PECO announced a delay in Limerick's construction schedules by two years, so that Unit I would come into commercial operation in April 1981 instead of July 1979 and the second unit in April 1982 instead of December 1980. (PECO Statement No. 9, p. 3).

As stated by Mr. Joseph F. Paquette, Jr., Vice President of Finance and Accounting, that decision was due to the adverse financial factors affecting PECO at that time. As background, Mr. Paquette noted that during the 1950's and 1960's, PECO's financial results improved steadily and its dividend was increased on a regular basis. In the late 1960's inflation accelerated as interest rates increased above 6%. While PECO's return on equity was approximately 12% in the period 1965-1967, it dropped to 9.4% in 1970. It remained in the range of 10%-11% for the next three years. PECO's pre-tax interest coverage ratio dropped from 5.1 times in 1968 to 2.6 times in 1970. It remained in the range of 2.7 to 2.9 times through 1973. Its mortgage coverage ratio declined from 5.8 times in 1965 to 2.4 times in 1973. PECO's stock dropped in price from $40.50 per share to $17.00 in 1973.

As a result, PECO's credit rating was lowered by Standard & Poor's from AAA to AA in 1968 and to A in 1974. Mr. Paquette stated that, in retrospect, 1974 was a turning point in PECO history. (PECO Statement No. 9, p. 5) Since the end of World War II, its electric

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6/ The construction permit was not received from the AEC until June 1974.

business had shown almost uninterrupted strong growth every year and in 1973 PECO's kilowatthour sales increased 7% with demand reaching an all time peak of 5,760 megawatts. However, late in 1973, the Arab oil embargo occurred which doubled the price of oil almost overnight. As 1974 progressed, its fuel adjustment charge increased substantially which, together with the recession that was then in progress, led to reductions in energy usuage. PECO's peak load for 1974 was 5,431 megawatts, a reduction of about 6% from 1973. That was the first time since the 1930's that it had seen a significant reduction in the peak load. Furthemore, kilowatthour sales decreased in 1974 by about 3% from the prior year's level.

In addition, PECO was placing into service about $500 million of new plant consisting of the two new Peach Bottom units, the Croydon combustion turbines and the Eddystone No. 3 oil-fired unit which would increase its electric rate base from $1.5 to $2.0 billion or 33%. When the units were placed into commercial operation, AFUDC terminated, thus decreasing PECO's earnings.

PECO filed for a three-part $136 million electric rate increase in January 1974. The first part ($24 million) was allowed by the Commission to go in effect on April 1st. The company had requested that a second step, amounting to $54 million, be allowed to go into effect on June 1, 1974 when Peach Bottom No. 2 was expected to go in service. The final part, amounting to $58 million, was not expected to become effective until the end of the nine-months suspension period which would have been January 1975.

In the spring of 1974 PECO predicted that its five-year construction expenditures would amount to $3.3 billion for the period 1974

through 1978 and that it would have to finance about $2-1/2 billion of that with new securities. While, Mr. Paquette stated, PECO had confidence that it could complete that program, when the year began, as the year progressed, a number of events occurred which raised increasingly compelling doubts about its ability to raise this amount of new capital. (PECO Statement No. 9, p. 6)

The first event was Consolidated Edison's omission of its dividend in April 1974 which significantly shook investors' confidence in the entire electric utility industry. As a result, the price of PE's stock dropped from over $19.00 per share to below $10.00, right after the Con Ed action, and then fluctuated between $10.00 and $12.00 a share for the rest of the year. In addition, AA utility bond interest rates, instead of decreasing, rose significantly from about 8% to 11% by October.

In addition, the second step of its rate increase was not allowed to go into effect in June. In fact, the Commission took no action prior to the end of the maximum suspension period (January 1, 1975), so that all of the remaining increase ($112 million) became effective by law subject to refund. This was later reduced by $31 million when the final order was issued on March 25, 1975, requiring retroactive refunds.

PECO had planned to sell $100 million of common stock in the fall of 1974. However, in late summer the price of its stock was still below $11.00, or just above 50% of book value. An issue at that price would have caused prohibitive dilution to shareholders' equity. Furthermore, this issue was cancelled.

In addition, because of the declining earnings of the company and the significant rise in interest rates, its interest coverage ratio

dropped below 2.0 times and it had no further ability to issue mortgage bonds under the earnings coverage test, after selling an issue of bonds in October 1974. In November 1974, a $65 million bond issue matured which enabled the company to sell that amount of bonds in April 1975.

With PECO's financial condition already deteriorated, its sales decreasing, its costs increasing, with very little prospect for immediate rate relief, and with no ability to raise equity or mortgage debt capital, the company had decided to cut back on its near-term construction expenditures to meet the financial conditions that existed. According to Mr. Paquette, the obvious way to do this of course was to reduce spending at Limerick since that project represented the major portion of PECO's construction budget. (PECO Statement No. 9, p. 7).

The Limerick delay announced in the fall of 1974 and other changes enabled PECO to reduce its five-year spending by about $600 million and lowered its financial needs accordingly. At the time of the delay some $223 million, exclusive of AFUDC had been spent on Limerick (PECO Statement No. 1B, p. 6)

Mr. Paquette stated that PECO's primary objective was to adjust its financing needs in the immediate years ahead. It was too late to make a material change in financing requirements for 1974, but it was able to make significant reductions for the years 1975, 1976 and 1977. PECO reduced its outside financing needs for constuction by $154 million or 38% in 1975, by $174 million (38%) in 1976 and by $129 million (26%) in 1977 (PECO Statement No. 9, Table B).

According to PECO, its efforts to reduce financing needs proved to be correct since conditions did not improve in 1975. In 1975 PECO raised about $284 million for its construction program. It sold

over 10.8 million shares of common stock in 1975 at an average price of $12.31 per share. This increased the number of shares outstanding by 20% in just one year.

No party disputes that these events occurred. The OCA notes, however, that the company should have been aware then of the quagmire of direct construction cost escalations and in-service delays experienced by PECO at its other principal construction sites. (OCA M.B., p. V-11). The cost of this delay has been estimated at $36.6 million by the company. (PECO Statement 1B, pp. 6-7)[7/] and $372 million by the OCA.[8/]

Trial Staff argues that PECO should have either cancelled the units at this time or built the plant as quickly as possible. Instead, it criticizes the company for choosing the worst possible path-not cancelling before the bulk of construction was begun, but not pressing forward to get the plant finished in light of optimistic economic forecasts for 1976-1978. (OCA Ex. 23, Tr-1, 9; T.S. M.B. pp. 8-9).

1976 Extension

In 1976 PECO announced a further delay in the commercial operation of Limerick. Unit I was now to start in April 1983 and Unit II

7/ This is the additional carry-charge which would be experienced on the existing investment as the result of the deferral. It neglects, however, to reflect inflation in the costs of construction due to the delay.

8/ This is arrived at by comparing the July 1972 PECO estimates of total direct Limerick cost ($923 million) with the October 1974 estimate of $1.295 billion (OCA Ex. 1, IR 2, 1-3). This rough approximation cannot be relied on, since, of course, it reflects all post-July 1972 inflation, not just that portion related to the delay.

in April 1985. According to PECO, this rescheduling was made primarily to match growth in capacity additions with a new lower load forecast which was made in the spring of 1976. According to the company Witness Paquette, the rescheduling was desirable from a financial standpoint. The company had not been able to improve its financial performance to a satisfactory level and, therefore, any lightening of the construction program enabled it to reduce the financing burden that it was facing.

During 1974 and 1975, PECO's return on common equity was in the range of 8.9% to 9.4%, its SEC interest coverage decreased further to 2.3-2.4 times and the price of its stock remained in the area of $10 to $15 per share, which was only 50% to 70% of book value. Also, in 1976, Standard & Poor's reduced its bond rating again, this time to A-.

In the summer of 1975 PECO's electric peak load was 5,530 megawatts, again below the 1973 record. This gave PECO further indications that energy conservation was having a significant effect and that it could expect a permanent adjustment in customers' usage of energy. Therefore, at that time the company changed its forecasted growth rate from its pre-1974 level of 7% per year down to 5%. The effect of this reduced growth rate was to lower its estimated 1980 peak load by almost 1,000 megawatts. This meant that it could reduce its capacity accordingly. Therefore, it delayed the Limerick units by two years, which lowered its projected capacity by 1,055 megawatts in the years 1981 to 1984 inclusive.

PECO had filed for another rate increase in November 1975 for a total of $95 million, or 10%. It requested $47 million to go into effect on January 19, 1976 on an interim basis, but the Commission allowed only $24 million of the increase, a 2.5% increase, to go into

effect in February 1976. Another $23 million increase became effective in August of that year on an interim basis.

In the spring of 1976, PECO lowered its five-year construction program by about $750 million. On average, PECO was able to reduce its outside financings in those years by about $60 million per year, or about 20%.

Mr. Paquette also testified that in evaluating the 1976 postponement, "it is also important to appreciate the context within which these decisions were being made". (PECO Statement No. 9, p. 10).

When growth forecasts began to level off and it became apparent that it would not need Limerick's capacity in 1981 and 1983, Mr. Paquette stated, it was entirely consistent with corporate and regulatory policy to slow down the construction of that plant in order to avoid bring it on line in advance of its need. This concern about excess capacity came to the surface in the company's 1975 and 1976 rate proceedings, when questions were raised by the Commonwealth of Pennsylvania concerning reserve margins and the possibility that the company then had "excess capacity" which should be eliminated from its rate base. Although the PUC rejected the Commonwealth's arguments in that case, it did indicate that the company would be required to justify its installed capacity in the next rate case. According to Mr. Paquette, in such an environment the company concluded that the public interest did not warrant a speedy completion of Limerick. Indeed, the company felt that there was some risk that if it brought on the Limerick units in 1981 and 1983, this Commission might exclude it from rate base with very dire financial consequences to the Company (PECO Statement No. 9, p. 11).

According to the testimony the company recognized that such a delay could result in a higher cost for Limerick, although the amount of this increase could not be accurately determined. PECO stated that balancing these factors, it was clear that rates would be greatly reduced in the short term from a postponement of Limerick since customers would not have to pickup the carrying costs for the plant in 1981 and 1983.

PECO believed, based on a review of Commission actions at that time, that the Commission's preference would be to have lower rates in the short term, even though that might result in some long term increases. During the proceeding, PECO estimated the cost of this delay at $68 million. (PECO Statement 1B, p. 7).

The OCA is highly critical of PECO's 1976 decision to slip Limerick's construction schedule, stating that it evidences a corporate attitude to react to load growth by building more and more capacity and not attempting to control such growth. (OCA M.B., p. V-15). It also criticized the company for failing to analyze what capacity would be needed if load growth continued to deescalate. It rejects the company's expressed concern about excess capacity. Under such circumstances, OCA maintains, the appropriate consideration, if not necessarily, would be whether it was reasonable, possible and responsible to stockholders and ratepayers to cancel one or both units. OCA notes that no analysis of this type was made. The only generation planning analysss during this period were plant-to-plant, coal versus nuclear, studies. Furthermore, OCA argues, PECO's load forecasts were fundamentally flawed in their methodological failure to capture the changing consumption patterns. In May of 1976, $284 million direct construction costs had been expended on Limerick. (OCA Ex. No. 6, IR-2, 8-12). The delay announced in 1976

added, according to the OCA, some $202 million to the direct cost of Limerick. (OCA Ex. No. 20, IR-2, 1-3).

Trial Staff was also highly critical of the 1976 delay. It estimated the cost of this postponement to be approximately $506 million (T.S. Ex. REN-1A, Sch. 2, p. 1). Trial Staff's witness Dr. Donald L. Birx, noted that PECO's originally stated reason for the delay was reduced load forecast. (T.S. Statement DLB-1, pp. 3-4). A press release issued at the time, however, also referred to financial constraints. (PECO Statement 11-B, App. A).

Trial Staff Witness Donald H. Muth testified, that according to the company, the 1976 delay reduced PECO's financing requirements by $56 million (1976), $44 million (1977) and $76 million (1978). (PECO Statement No. 9, Table C).

Mr. Muth concluded that PECO would have been able to issue sufficient additional mortgage bonds in 1976-1978 to eliminate the reason for this postponement. (T.S. Statement DHM-2, pp. 2-3). Although these debt issues would have increased rates by increasing the cost of debt, Trial Staff admits, this is true whenever any debt is issued at greater than the embedded cost. It should also be noted that long term bond rates were lower in 1976-1978 than in 1974-1975 (Tr. 509).

Mr. Muth, however, would have had the company using some debt mixed with equity issues to finance the additional capital investment. In 1977 and 1978, according to the witness, PECO passed up an unparalleled opportunity to issue more common stock at close to book value. In fact, he noted such an issuance would have been closer to book value than the stock has attained since 1974 (T.S. Statement DHM-2, pp. 4-5 and T.S. Ex. DHM-2A, Sched. 8). In 1978, when the proceeds/book ratio was 90.6%

(Sched. 8), PECO did not even make a stock issue. The 1.9 million shares issued during this time were only through the ongoing dividend reinvestment and employee stock ownership programs (Tr. 510). Trial Staff argues that PECO should have been eager to issue common stock in 1978 after observing conditions in 1977, during which the average proceeds/book ratio was 101.5% (T.S. Ex. DHM-2A, Sched. 8). The increase in equity ratio would also have tended to increase rates in R.I.D. 438 and R-79060865, thus further improving PECO's interest coverage. Trial Staff maintains that 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. (T.S. Statement No. DHM-2, p. 4).

Trial Staff argues that PECO could also have financed the $56,000,000 of construction on an interim basis through short-term debt. PECO reduced its short-term debt by $100,728,000 during 1976 and there was only $7,226,000 of short-term debt outstanding on its balance sheet at December 31, 1976.

According to Trial Staff, 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 10,866,340 shares it issued in 1975 at $12.31 per share.

Trial Staff also argues that PECO could have financed the additional $44 million needed to maintain its construction schedule in 1977 through the issue of more 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 10,866,340 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). 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 2.5 times to 2.2 times.

Trial Staff argues that PECO could also have financed the $44,000,000 of additional 1977 construction through short-term debt. PECO only increased its short-term debt by $7,649,000 in 1977, meaning there was only $14,875,000 of short-term debt outstanding on its balance sheet at December 31, 1977.

PECO could have financed its 1978 construction expenditures by issuing additional common stock. PECO had no public stock offering in 1978. The 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. 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 been even greater than $17.46.

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).

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.

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.

PECO argues that Trial Staff's position is not supportable. First, it claims Trial Staff employs hindsight to construct a set of hypothetical financings allowed by circumstances about which the company could not have known when faced with the need to make its decision. Trial Staff is able to construct this hypothetical financing program because, as Trial Staff points out, long term bond rates were at a lower level between 1976 and 1978 than they were in 1976, because the rate of inflation decreased in the period 1976 through 1978, and because the value of PECO common stock increased between 1976 and 1978.

According to PECO, the second deficiency of Trial Staff's hypothetical financing program is that, even with the benefit of hindsight, it is impractical. Trial Staff insists that, while PECO common was still selling below book in 1976, the company could have sold $56 million of common to finance Limerick since the 1976 market price exceeded the 1975 market price. In addition, common stock sales of $44 million in 1977 and $76 million in 1978 were recommended. As an alternative, Trial Staff suggested that PECO could have issued $56 million in mortgage debt in 1976 because the company's coverage ratio was 2.5 times, that PECO could have issued $44 million in mortgage debt in 1977 with a coverage ratio of 2.35 times, or that PECO could have issued $76 million in 1978 because the company's mortgage ratio stood at 2.37 times. If sales of common stock or mortgage debt failed, Trial Staff suggests the use of short term debt "on an interim basis" to finance $56 million in 1976 and/or $44 million in 1977, and/or $76 million in 1978.

PECO maintains that Trial Staff's hypothetical financing program is not fiscally sound. If its suggestions were added to the amounts actually issued by the Company through the same period, PECO would have been left with an indenture coverage below 2.0 times in 1979, and further mortgage bond financing would have been precluded. (PECO Statement 11D, p. 5).

PECO claims that in the 1975 to 1979 period it could only have issued a total of about $30 to $40 million in additional mortgage bonds while maintaining a 2.0 times mortgage coverage ratio in 1979 (PECO Statement 11B, p. 6).

Trial Staff also hypothesized common stock offerings in 1976 ($56 million), 1977 ($44 million), and 1978 ($76 million), but PECO claims, ignored the cumulative effect of such offerings. If as Trial Staff suggested, PECO had issued an additional $176 million in common stock, the company would have been left with earnings of $1.70 per share in 1978, an amount insufficient to cover the company's common stock dividend. (PECO Statement 11D, p. 5).

Trial Staff's suggestion that PECO could have financed all or some of their 1976-78 requirements through short-term debt, PECO claims, ignores the fact that short term debt must be constantly refinanced. It also ignores the fact that use of large amounts of short term debt for immediate construction needs would sacrifice all of the financial flexibility inherent in short term debt reserves which are necessary to protect against capital market disruptions and unanticipated operating needs. (PECO Statement 11D, p. 5).

1978 Extension

In May 1978 PECO announced a decision to reschedule Units I and II from 1983-85 to 1985-87. PECO Witness Mr. Paquette testified that PECO did not in fact change the critical path of the construction schedule from 1978 through 1980, and that in those years PECO authorized and spent the additional dollars to maintain the 1983-85 service dates in the event that it became desirable to complete the units earlier than 1985-1987 (PECO Statement No. 9, p. 12; Tr. 495). The record shows, however, that PECO reduced its direct expenditures from 1978-1980 from the budgeted amount of $529 million to $479 million (OCA Exh. 23, Tr-1, 7). PECO explains, however, that it funded all major construction activities

required to maintain the earlier completion dates, but not activities of lesser importance (PECO R.B., p. 96, fn. 7).

The reasons for announcing a delay in 1978, according to PECO witness Paquette, were similar to those which were involved in the 1976 decision. In other words, by 1978 there were two more no-growth years. PECO's load forecasters lowered peak load estimates from 5% to 3% per year. In addition, PECO claims, the Commission permitted inadequate rate relief during this period. One important factor in this decision to postpone was apparently the recommendation of Administrative Law Judge Joseph Matuschak at R.I.D. 438 that an adjustment be made to PECO's rate base for "excess capacity." This was viewed as a message to the company not to optimize installed capacity but to minimize current costs and rates.

PECO, however, continued to preserve its options to maintain the earlier timetable due to the fact that escalating oil costs now made it appear that completion of Limerick at an early date might be advantageous to customers even if the capacity was not required, since the fuel cost savings resulting from Limerick's operations would more than offset the carrying costs of the plant (PECO Statement No. 9, p. 14).

Unlike the 1976 delay (Tr. 502), however, PECO this time performed an analysis to determine the level of short-term savings vs. long-term costs attributable to deferring completion of the plant. In 1978 PECO estimated that a one-year delay would reduce revenue requirements in the first year by $190 million. This would come about through a $350 million savings in base rates offset by higher operating expenses of about $160 million due to continued energy purchases. However, beginning in the second year and every year thereafter for the life of

the plant customers' bills would be approximately $47 million higher so that it would take approximately five years before the savings would be offset. No present value analysis was made (Tr. 502-503).

OCA points out, in response, that Judge Matuschak's decision in R.I.D. 438 came months after the decision to delay was announced. OCA also claims that the company failed to adequately analyze the economic and financial implications of the delay and the possible cancellation of at least one unit (OCA M.B., p. V-24-26).

Trial Staff estimates the cost of the 1978 delay to be $597 million (T.S. Ex. REN-1A, Sch. 2, p. 1).

1980 Schedule Extension

In 1980 PECO abandoned its option of maintaning the earlier 1983/1985 completion dates. This was made necessary when it became obvious that manpower availability and labor productivity in the installation of bulk commodities such as conduit and pipe were not meeting the target values. The manhours necessary to install the seismic design of pipe hangers and restraints turned out to be greater than estimated, and interferences introduced by these hangers to duct work and cable trays also required additional manhours to resolve. In addition, the NRC action items resulting from Three Mile Island were issued, adding additional manhours of job effort (PECO Statement 1B, p. 7).

Reasonableness of the Delays

Having discussed the various delays in the Limerick construction schedule, we now turn to the reasonableness of PECO management's various decisions to postpone the commercial operation dates of these units.

Initial consideration should be given to the standard of prudence against which these decisions should be measured. PECO argues (PECO M.B. pp. 296-299), that Trial Staff has actually ignored the legal standard establishing the requirements for a showing of management imprudence. PECO notes that the "prudent investment" theory is not new to the regulatory process. It was first articulated by Justice Brandeis nearly sixty years ago in Missouri ex. rel. Southwestern Bell Tel. Co. v. Missouri Public Service Commission, 262 U.S. 276, 67 L.Ed. 981 (1923). In defining the appropriate standard to be applied by regulatory agencies in their review of utility expenditures, Justice Brandeis stated as follows:

> The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. Every investment may be assumed to have been made in the exercise of reasonable judgement, unless the contrary is shown. Southwestern Bell, supra (dissenting opinion), 262 U.S. at 289, n. 1. (Emphasis added).

An assessment of management's prudence is not properly premised upon hindsight. As stated by the Michigan Public Service Commission in Re Consumers Power Co., 14 P.U.R. 4th 1 (Mich. P.S.C. 1976):

> It has also become well established that in applying the prudent investment theory to particular management decisions, the commission must determine that there existed a reasonable need and basis for the utility to commit funds for the construction of utility plant in light of the circumstances which prevailed when the decisions were made and, further, that the expenditures were reasonably incurred. . . . [T]he Commission reviews these questions, not with hindsight, but based upon the circumstances that existed at the time those decisions were made. (At pp. 15-16). (Emphasis added.)

Accord, Wisconsin Telephone Co. v. Public Service Commission, 232 Wis. 274, 287 N.W. 122, 148 & 157 (1939).

According to PECO mere speculation as to potential cost savings will not support a finding of managerial imprudence. Re Consolidated Edison Co., 54 P.U.R. 3d 43, 103-114 (N.Y.P.S.C. 1964); Re Consolidated Edison Co., 96 P.U.R. NS 194 (N.Y.P.S.C. 1952). Nor will evidence that certain claimed expenditures are unusually high alone justify their disallowance. Boise Water Corp. v. Idaho Public Utility Commission, 578 P.2d 1089 (1978).

Further, it is not sufficient that such testimony simply question the wisdom of management's decision. As stated by the New York Public Service Commission in Re Consolidated Edison Company, 54 P.U.R. 3d 43, 112 (N.Y.P.S.C. 1964):

> A determination of prudence of imprudence calls for an inquiry into the reasonableness of management's judgment, i.e. whether there was a rational basis for it, but not an inquiry into its wisdom. In short, it is not for a commission to determine prudence by reference to what it would have done if it had been exercising the powers of management. (Emphasis added.)

Also, it is not sufficient that opponents to rate base inclusion of the claimed investment show that management could have made other decisions which would have had equal economic or other decisions which would have had equal economic or other benefit. As stated by the Supreme Judicial Court of Maine in Central Maine Power Company v. Public Utilities Commission, 405 A.2d 153, 178 (Me. 1979):

> Where, as here, the road chosen by management is arguably at least as economical as any alternative, and the benefit (i.e. cost) does not clearly appear to be 'excessive, or unwarranted, or incurred in bad faith,' management's judgment must be respected.

PECO argues that the Courts of this Commonwealth have applied these same principles as the legal standard which must be satisfied before a ratemaking disallowance may be justified on the basis of "management imprudence." Pennsylvania Power & Light Co. v. Public Service Commission, 128 Pa. Super. 195, 210, 216-17, 193 A. 427, 433-34 & 436-37 (1937); Pittsburgh v. Pa. P.U.C., 370 Pa. 305, 318 (1952); Pittsburgh v. Pa. P.U.C., 173 Pa. Super. 87, 92 (1953).

PECO concludes that an analysis of its various scheduling decisions relative to Limerick, demonstrates that, at the time and in the circumstances, its decisions were prudent. It claims that only by ignoring the circumstances surrounding each of its decisions and by using instead hindsight and strained comparision that one is able to argue otherwise.

The standard by which PECO seeks to have its actions measured appears to this administrative law judge to be inappropriate. In effect, the company is saying that as long as there is a rational basis for its action, any decision that it makes cannot be criticized. While that may have been the rule in the past, more recent decisions by regulatory agencies have held that:

> ...the company's conduct should be judged by asking whether the conduct was reasonable at the time, under all the circumstances, considering that the company had to solve its problems prospectively rather than in reliance on hindsight. In effect, our responsibility is to determine how reasonable people would have performed the tasks that confronted the company. Case 27123, Consolidated Edison Company of New York, Inc. (Opinion 79-1, issued January 16, 1979, pages 5-6). (N.Y.P.S.C.) See also, Case 27565, Niagara Mohawk Power Corp. (Opinion 80-25 issued June 24, 1980), Case 27869, Consolidated Edison Company of New York, Inc. (Opinion 82-2, issued January 21, 1982, pp. 11-14).

This standard of "reasonable care" rather than "rational basis" appears to be more appropriate here, primarily because it reflects the need to recognize the economic impact of delays in construction on the company's ratepayers. The rational basis standard might well be appropriate where one is dealing with a single routine item of plant which may cost several millions or the selection of one transmission line route over another. Certainly, this Commission should not take it upon itself to review every management decision. But where, as here, a company decision will have a substantial, if not overwhelming impact on rates for many years, this Commission must judge that action by some standard other than its rationality. PECO's conduct in delaying construction shall be judged on the basis of how reasonable people would have responded to the events of 1974-1978 and whether PECO's response was satisfactory in light of all those conditions and circumstances.

On this basis PECO's action in 1974 was reasonable by any standard. The oil embargo of late 1973 resulted in higher energy prices and recessionary economic conditions throughout the country. For the just time since World War II, energy sales and peak loads decreased. In addition the market for utility securities was poor due to the omission of Consolidated Edison's dividend. Under these circumstance, the company's decision to slip its construction schedule by two years was a reasonable response to an extraordinary series of events.

By 1976, however, the reduced load and financial constraints experienced by the company two years earlier continued. PECO's decision in the Spring of 1976 to delay Limerick for another two years might well have been reasonable, had it been based on a thorough evaluation of

economic consequences, not only to it but also to its ratepayers. The record, however, indicates that no such thorough evaluation was made.

As Trial Staff and OCA noted, PECO witness Paquette did not recall any analysis of the long-term economic costs to customers of this delay (Tr. 502). Although an exact determination of this increased cost could not be made, some sort of analysis should have been done. Similarly no analysis of alternatives to Limerick was made, neither did the company analyze its capacity requirements if load growth continued to decline.

In 1978 PECO did analyze the effect of its schedule extension on ratepayers and computed that a one-year postponement would reduce revenue requirements by $190 million for the first year, but would increase bills by $47 million per year the second year and each year thereafter for the life of the plant. Whether this was a good bargain for ratepayers is subject to discussion.

Although there can be no doubt that these postponements were caused in large part by financial factors, Mr. Paquette has offered another insight into management thinking when he testified (PECO Statement No. 9, pp. 10-13):

> In evaluating the 1976 postponement based on capacity and financial factors, it is also important to appreciate the context within which these decisions were being made. A public utility such as Philadelphia Electric has a duty to provide service and to build the facilities which are necessary to do so. Conversely, it has been historically recognized that no utility should build additional facilities which will not be useful within a least a reasonable time following their completion. Based on such an historic regulatory concept, it was clearly the view of the Company that Limerick should not be completed well in advance of the need for it. Accordingly, when our growth forecasts began to level off and it became apparent that we would not need Limerick's capacity in 1981 and 1983, it was entirely consistent with corporate and regulatory policy to slow down the construction of that plant in order to

avoid bringing it on line in advance of its need. This policy appeared to be confirmed when in the rate proceedings of 1975 and 1976 questions were raised by the Commonwealth of Pennsylvania concerning reserve margins and the possiblity that the Company then had "excess capacity" which should be eliminated from its rate base. Although the PUC rejected the Commonwealth's arguments in that case, it did indicate that the Company would be required to justify its installed capacity in the next rate case. In such an environment the Company concluded that the public interest did not warrant a speedy completion of Limerick. Indeed the questions concerning the Company's "excess capacity" indicated that there weas certainly some risk that if the Company brought on the Limerick plant in 1981 and 1983, the Public Utility Commission might exclude it from rate base with very dire financial consequences to the Company.

Offsetting all of these factors dictating a delay in the Limerick construction schedule, there was, of course, recognition by the Company of the possibility that such a delay could result in a higher ultimate cost for the Limerick station. The amount of this increased cost could, of course, not be accurately determined on any of the postponement dates. However, there was little question that additional AFUDC would be accrued as a result of the postponement, and it was also clear that the maintenance of the construction staff for a longer period at the site would increase overhead costs.

Balancing these factors, it was clear that the cost to the customers would be greatly reduced in the short term from a postponement of Limerick since they would not have to pick up the carrying costs for the plant in 1981 and 1983 but would have these costs postponed for at least two years. In other words, the delay decision involved clear short-term benefits to customers offset by possible long-term burdens, although the exact amount of those long-term burdens could not be precisely determined at the time.

In evaluating this question, the Company was of the view that the Pennsylvania Commission's preference would be to have lower rates in the short term even though that might result in some increases long term. Our judgment in this respect was based on a review of Commission actions and orders at that time. For examples, the Commission had refused the Company's request in include some CWIP in rate base and to normalize additional deferred taxes. Each of these PUC actions produced lower rates in the short

term, but higher rates in the long term and delay of Limerick seemed to fit in with this concept.

Because of continuing high inflation and low earnings, we requested another increase of $119 million in August 1977. We requested that approximately $50 million be allowed as interim rate belief to permit recovery of the carrying charges on Salem #1 which went into service on July 1977. However, the PUC granted an interim increase of only $11.8 million in March 1978. The final order for this case was not issued until March 1979, 19 months after we filed, and it granted an additional $67 million increase retroactive to July 4, 1978.

In the decision of the ALJ in connection with this rate increase, theres was a recommendation that the Commission adjust rate base for "excess capacity". We viewed this as another "message" from the public sector directing us not to optimize the installed capacity of our generating facilities, but to minimize current costs and rates. The regulatory philosophy for constructing additional capacity and the prefereuce of short-term cost savings over long-term cost increases discussed in connection with the 1976 delay were all present in causing the delay announcement which was made in 1978.

It appears therefore that PECO's decision to postpone construction was influenced in part by the fear of an excess capacity adjustment by the Commission in a subsequent rate case. Rather than run the risk of such a revenue loss, the company chose to delay construction while at the same time continuing to accrue AFUDC on this plant-costs that will eventually be borne by the ratepayers.

In the past this Commission has held that there should be some sharing of the risk associated with bringing large plants on line and the resultant excess capacity which typically results. See Pa. P.U.C. v. Pennsylvania Power Co., R-77110521; Pa. P.U.C. v. Philadelphia Electric Co., R-79060865. This risk should not be effectively placed entirely on the ratepayer by permitting a utility delay the commercial operation of

a plant until the optimal time, while still allowing the company to earn a return, albeit non-cash, on its investment during this interregnum.

In summary, it appears that the company's action in postponing Limerick in 1976 and 1978 was made without careful analysis of the impact of such delay on its ratepayers.

In addition, the record shows that a factor in these decisions was the potential impact of Limerick on the company's capacity and reserve margins[9/] and the adverse effect this would have on the company's rate allowances. Consumers should not be expected to pay for delay which results form a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest.

Trial Staff, although arguing that some adjustment is warranted as a result of PECO's decisions to postpone Limerick in 1976 and 1978, recommends that no final decision on this subject be made by the Commission at this time for the following reasons:

(1) A prospective rate base adjustment is arguably not within the Commission's power when PECO has not yet claimed the plant in rate base.

(2) A prospective rate base or other adjustment such as a four year stoppage of AFDC would give the consumers no immediate benefits in terms of lower rates; such a decision at this time might well lead to a bond downrating or higher cost of debt or equity which would have a

---

9/ If Limerick were in service in 1981, PECO would have a summer reserve margin of 66% (PECO Statement No. 9, p. 18).

short range negative impact both on PECO and its ratepayers. Trial Staff suggests that this issue should therefore be considered again and more fully at the time PECO seeks to include Limerick in rate base. (T.S.M.B. p. 11).

I agree with Trial Staff that any decision now would be advisory only. This Commission cannot bind the future Commission that must decide PECO's claim for rate base treatment of these plants when they become commercially operable. Furthermore, this proceeding is a fact-gathering one. For purposes here, it is sufficient to note that the decisions to postpone Limerick were, in part, the result of management's discretion as well as financial circumstances. In a subsequent proceeding consideration can be given to the extent to which these delays were caused by financial and other external constraints and the extent to which management's fear of Commission sanctions entered into these decisions. Such a proceeding would also be an appropriate forum to quantify the effects of these delays. Such a record does not exist at the present time.

MANAGEMENT OF THE LIMERICK CONSTRUCTION PROJECT

Having followed the progress of Limerick up to the present it might be appropriate to discuss the management of the project as detailed on this record.

As noted earlier Bechtel Power Corporation was selected as the architect/engineer and constructor for Limerick, and General Electric was selected to provide the steam generator. Following the selection of these companies, PECO assigned responsibility for planning, scheduling

require greater future financing. It appears that PECO financial assumptions are reasonable for use here.

Conclusion

Having reviewed the various analyses, there can be no doubt as to the economics of and need for the completion of both Limerick units. There has been no analysis presented which, using plausible assumptions, has shown Limerick to be uneconomic. Rather, all reasonable analyses have shown that Limerick will produce substantial economic benefits to ratepayers over any proposed alternative. The exact amount of the future financial benefits to ratepayers varies, depending on the assumptions one wishes to make.

Using Mr. Lawrence's analysis, adjusted for an increase in Limerick's cost to $5 billion, a 60% load factor, the ESRG base case growth levels and existing investment as of April 30, 1982 included in base rates, completion of Limerick saves ratepayers some $230 million annually over no replacement (Scenario 4) during the period 1980 - 1994. And this analysis is highly conservative since it assumes completion of all presently planned PJM capacity additions -- including Hope Creek -- even at a 1.7% growth rate for the power pool. It is due to this assumption, and the presumed availability of substantial base load coal generation for purchased power, that the benefits of Scenario 4 improve relative to Limerick during the period 1990-94. Otherwise, the benefits of Limerick completion would be even greater (PECO Statement No. 11G, p.3; Sch. BBB).

On the basis of Dr. Perl's most conservative analysis, if the PECO energy growth rate is reduced to -0.5% per year and the growth rate for for the rest of the PJM system is reduced to half its forecast

growth (1.22% per year), and using OCA's witness Czahar's financial assumptions, Limerick would save ratepayers some $1.8 billion (PECO Statement No. 12P, p. 84; CEPA Exh. 12, Table 3) over the life of the plant.

Using Dr. Hieronymus' Schedule G (PECO Exh. WWH-3), which according to the OCA is the most accurate production costing analysis on this record, and which, in my opinion contains several inaccurate and unsupported assumptions to the detriment of Limerick's completion, it is clear that completion of both Limerick units is favored by a substantial margin under the ESRG Base Scenario. For example, Base Case T-4, which anticipates completion of Limerick Unit I, two 615 MW coal plants in 1990 and 1994 and a 800 MW coal plant in 1986, would cost ratepayers some $500 million more than completion of both Limerick units. This does not include $265 million of carrying costs associated with the abandoned Unit II. (PECO Statement 15A, p. 4). Similarly under the ESRG Base Scenario, Case U1, which calls for purchase of Susquehanna Power in 1983 and 1984 and construction of two 615 coal plants in 1990 and 1991 respectively and construction in 1996 of a 800 MW coal plants, there is an $87 million difference in favor of completion of both units. This also does not reflect the $1,200 million of carrying costs associat with these abandoned units.

Finally, even using the ESRG Conservation Scenario, the result of which are sheerest speculation since there is no program to support it, and, assuming that a substantial reduction in PJM growth will have no effect on PJM capacity planning, an assumption which is clearly in error, there is no substantial advantage in cancelling the Limerick units. Under Case N1, which calls for cancellation of Units I and II,

purchases from Susquehanna in 1983 and 1984 and a 615 MW coal plant in 1990, a savings of $364 million over completion of Limerick is projected. These savings evaporate quickly if even part of the carrying costs ($1,200 million) of these abandoned units were allowed.

It should also be noted that cancellation of Limerick will require an increase in base rates during 1982-1984 to recover cancellation-related costs. These have been estimated variously at $69-132 million, using OCA numbers and $358 million, using company figures (PECO Statement No. 11G, p. 6).

Therefore, on the basis of this record, under any reasonable set of assumptions, the completion of Limerick has been shown to be in the public interest.

MISCELLANEOUS

Motions to Exclude and Strike Testimony

PECO at various times throughout this proceeding moved to exclude and strike certain testimony. Rulings on these motions were deferred until the issuance of the Initial Decision (Tr. 3966).

At Tr. 3873, PECO's counsel moved to strike that portion of Keystone Alliance Statement No. 2, which is located from page 6 through page 19 of that document, on the grounds that the witness lacks the appropriate qualifications to compare the potential risks of coal generation, nuclear generation and conservation. In addition, the company complains that much of the data contained in this section is hearsay (PECO R.B., p. 115).

In this jurisdiction, the standard for qualification of a witness as an expert is a liberal one. "If a witness has any reasonable-

1.	REPORT DATE: July 24, 1986	2.	BUREAU AGENDA NO. JULY-86-OSA-72*
3.	BUREAU: Office of Special Assistants		
4.	SECTION(S):	5.	PUBLIC MEETING DATE:
6.	APPROVED BY: CWP Director: Cheryl Walker Davis Supervisor:		JULY 24, 1986
7.	MONITOR:		
8.	PERSON IN CHARGE: Joe Noel		
9.	DOCKET NO: R-850152		

10. (a) CAPTION (abbreviate if more than 4 lines)
(b) Short summary of history & facts, documents & briefs
(c) Recommendation

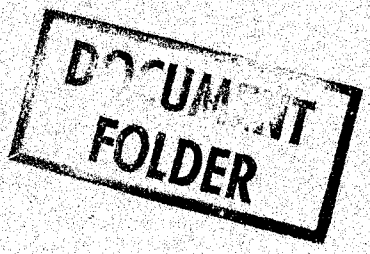
(a) PENNSYLVANIA PUBLIC UTILITY COMMISSION v. PHILADELPHIA ELECTRIC COMPANY

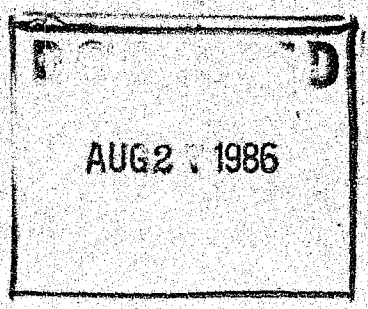
(b) Before the Commission for consideration is a Petition for Reconsideration ("Petition") of our Opinion and Order entered on June 27, 1986 in this proceeding, filed by the City of Philadelphia ("City") on July 11, 1986, pursuant to 52 Codes §§5.572. Philadelphia Electric Company ("PECO") filed an Answer to the Petition on July 23, 1986.

(c) The Office of Special Assistants recommends that the Commission adopt a proposed Opinion and Order denying the Petition.

11. MOTION BY: Commissioner Chm. Taliaferro Commissioner Shane - Abstaining
Commissioner
SECONDED: Commissioner Fischl Commissioner

CONTENT OF MOTION: Staff recommendation adopted.





PENNSYLVANIA PUBLIC UTILITY COMMISSION
Uniform Cover and Calendar Sheet

1. REPORT DATE: July 18, 1986	2. BUREAU AGENDA NO. JULY-86-OSA-68*
3. BUREAU: Office of Special Assistants	
4. SECTION(S):	5. PUBLIC MEETING DATE:
6. APPROVED BY: Director: Cheryl Walker Davis Supervisor: Joe Noel	JULY 24, 1986
7. MONITOR:	
8. PERSON IN CHARGE: Paul Aleva 3-1034	
9. DOCKET NO: R-850152	

10. (a) CAPTION (abbreviate if more than 4 lines)
(b) Short summary of history & facts, documents & briefs
(c) Recommendation

(a) PENNSYLVANIA PUBLIC UTILITY COMMISSION et al v PHILADELPHIA ELECTRIC COMPANY

(b) Before the Commission are two Petitions for Reconsideration which request that the Commission reconsider certain portions of its Opinion and Order entered June 27, 1986 at Docket No. R-850152, et al. The Petitions were filed by Utility Users Committee/University of Pennsylvania on July 1, 1986, and by the Pennsylvania Business Utility Users Group on July 7, 1986.

Answers to the Petitions have been filed by the Philadelphia Area Industrial Energy Users Group on July 9, 1986, by Southeastern Pennsylvania Transportation Authority and the National Railroad Passenger Corporation on July 10, 1986, and by PECO on July 11, 1986.

(c) It is recommended that the Commission adopt the proposed Opinion and and Order which would deny the Petitions for Reconsideration.

11. MOTION BY: Commissioner Chm. Taliaferro Commissioner Shane - Abstaining
Commissioner
SECONDED: Commissioner Fischl Commissioner

CONTENT OF MOTION: Staff recommendation adopted.

DOCUMENT FOLDER

RECEIVED
AUG 27 1986

1. REPORT DATE: July 24, 1986

2. BUREAU AGENDA NO. JULY-86-OSA-71*

3. BUREAU: Office of Special Assistants

4. SECTION(S):

5. PUBLIC MEETING DATE: JULY 24, 1986

6. APPROVED BY:

Director: Cheryl Walker Davis
Supervisor: Joe Noel

7. MONITOR:

8. PERSON IN CHARGE: Paul Aleva

9. DOCKET NO: R-850152

10. (a) CAPTION (abbreviate if more than 4 lines)
(b) Short summary of history & facts, documents & briefs
(c) Recommendation

(a) PENNSYLVANIA PUBLIC UTILITY COMMISSION v. PHILADELPHIA ELECTRIC COMPANY

(b) By Opinion and Order entered June 27, 1986, the Commission authorized Philadelphia Electric Company to file a tariff supplement increasing annual operating revenues by approximately $351 million. Petitions for Reconsideration have been filed by the Office of Consumer Advocate and the Governor's Energy Council, and Supplemental Petitions for Reconsideration have been filed by the Office of Consumer Advocate and the Utility Users Committee/University of Pennsylvania, all of which request that the Commission reconsider a portion of its Opinion and Order in this proceeding.

(c) It is recommended that the Commission adopt a proposed Opinion and Order which would deny the Petitions and Supplemental Petitions for Reconsideration.

DOCUMENT FOLDER

D[illegible]ED AUG2 . 1986

11. MOTION BY: Commissioner Fischl — Commissioner Shane - No Commissioner

SECONDED: Commissioner Chm. Taliaferro — Commissioner

CONTENT OF MOTION: Staff recommendation adopted.

Dissenting Opinion of Commissioner Bill Shane attached.

DISSENTING OPINION OF COMMISSIONER BILL SHANE

RE: Pa. PUC v. Philadelphia Electric Company
R-850152
JUL-86-OSA-71*

The Commission's Order states two reasons for denying the Petitions for Reconsideration filed by the Office of Consumer Advocate, the Governor's Energy Council, and the Utility User's Group/University of Pennsylvania. First, the Commission rules that the excess capacity section (66 Pa. C.S. §1323) of the recent revisions to the Public Utility Code does not apply here because the case was not "pending before the Commission" on the date the law was signed. Second, the Commission finds that even if the new law does apply, it does not require reversal of the Commission's prior conclusion that Limerick I does not represent excess capacity. For the following reasons, I dissent.

The Commission's decision to apply or not apply the new law should not hinge on technical arguments over whether the case is "pending before the Commission." The General Assembly, after exhaustive debate, established a new policy on excess capacity, and the Governor signed that policy into law. Since this Commission is a creation of the Legislature, it ought to seek to effectuate the Legislature's intent by grasping this opportunity to apply the new policy. Instead, the Commission reveals its hostility toward the policy by examining only whether it is required

to apply the new law to this case. I submit that the Commission's refusal to apply the new excess capacity standards constitutes an abuse of discretion.

The Commission's Order could stop here, however, recognizing the weakness of its position that the new law should not be applied to this case, the Commission next attempts to reconcile its ruling with the new standards. Section 1323 states, in relevant part:

> . . . . [A] rebuttable presumption is created that a unit or units or portion thereof shall be determined to be excess capacity unless found to be needed to meet the utility's customer demand plus a reasonable reserve margin in the test year or the year following the test year, or, if it is a base load unit, it is also found to produce annual economic benefits which will exceed the total annual cost of the plant during the test year or within a reasonable period following the test year.

This language was clearly intended to protect ratepayers by tightening the Commission's standards on excess capacity; however, the Commission's strained interpretation fails to honor this intent. The Commission concludes that Limerick I's projected annual economic benefits beginning in 1994 satisfy the requirement that the unit provide annual economic benefits "during the test year or within a reasonable period following the test year." The obvious intent of this language was to synchronize, roughly, the inclusion of the new unit in rates with the realization of economic benefits by the ratepayers. The Commission's decision refuses to effectuate this intent by granting rate base recognition to a plant which will not provide economic benefits for at least eight years. The factors which the Commission relies upon in concluding that this is a reasonable period are the usual circumstances surrounding a base-load

plant. If the Legislature believed that the plant should be included in rates in such a case, it would not have attempted to change the Commission's standards on excess capacity.

In a nutshell, the Commission's Order frustrates the policy of the General Assembly. First, the Commission relies upon a technical loophole and refuses to apply the new law to this case. Second, the Commission eviscerates the new law by interpreting it in a manner which does not carry out the legislative intent. I dissent from this arrogant decision.

Bill Shane

BILL SHANE
COMMISSIONER

DATED: 7/24/86

PUC - 77

PENNSYLVANIA PUBLIC UTILITY COMMISSION
Uniform Cover and Calendar Sheet

1. REPORT DATE: July 21, 1986	2. BUREAU AGENDA NO. JULY-86-OSA-62*
3. BUREAU: Office of Special Assistants	
4. SECTION(S):	5. PUBLIC MEETING DATE: July 24, 1986
6. APPROVED BY: Director: Cheryl Walker Davis (C W D) Supervisor:	
7. MONITOR:	
8. PERSON IN CHARGE: J. M. Noel	
9. DOCKET NO.: R-850152	

10. (a) CAPTION (abbreviate if more than 4 lines)
(b) Short summary of history & facts, documents & briefs
(c) Recommendation

(a) Pennsylvania Public Utility Commission v. Philadelphia Electric Company ("PECO").

(b) In the recently concluded rate proceeding of PECO, the Commission, on June 12, 1986, polled certain of the issues in the then pending rate proceeding.

On June 20, 1986, Philadelphia Area Industrial Energy Users Group ("PAIEUG") filed a Motion Requesting Clarification of the Commission's Polling Session on June 12, 1986. Answers to the PAIEUG Motion were filed by Trial Staff, Office of Consumer Advocate and the Utility Users Committee, University of Pennsylvania.

(c) The Office of Special Assistants recommends that the Commission reject the PAIEUG Motion as being improperly filed and adopt the draft Opinion and Order.

mr

11. MOTION BY: Commissioner Chm. Taliaferro — Commissioner Shane - Yes
SECONDED: Commissioner Fischl — Commissioner
Commissioner

CONTENT OF MOTION: Staff recommendation adopted.

DOCUMENT FOLDER

FILED
AUG 2 . 1986

ORIGINAL

Original

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-5762

THOMAS P. HILL, JR.
MANAGER - RATE DIVISION

DOCUMENT FOLDER

March 31, 1987

Mr. Jerry Rich
Pennsylvania Public Utility Commission
North Office Building
P. O. Box 3265
Harrisburg, PA 17120

RECEIVED

APR 1 1987

SECRETARYS OFFICE
Public Utility Commission

SUBJECT: Tariff Electric - PaPUC No. 26
ENERGY COST RATE FACTOR NO. 2
PRELIMINARY ESTIMATE

Dear Mr. Rich:

The Commission Order at Docket R-850152 dated June 26, 1986, allowed the Company to put into effect Energy Cost Rate Factor (ECRF) No. 1. ECRF No. 1 became effective June 27, 1986 and will continue in effect until June 30, 1987. The same order also required the Company to file, 90 days prior to the effective date of each proposed ECRF, a tentative estimate of the ECRF for the next computation year. Accordingly, this letter transmits to the Commission four copies of Attachment A, which is our preliminary estimate of ECRF No. 2 to become effective on July 1, 1987. Our final proposed annual ECRF will be submitted on or before June 1, 1987.

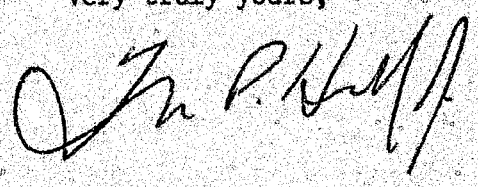
During the 12-month period ended April 30, 1987, the Company's nuclear units produced significantly higher output than projected for the period. As a result of this excellent nuclear performance, the Company has overcollected, through April 30, 1987, over $105 million in total energy costs from our customers. With this filing, the Company is proposing to return one-half of the experienced net overcollection, including the reconciliable portion of its current overcollection, the "E" factor reconciliation and adjustments with interest during the application period of July 1, 1987 through June 30, 1988; and to return the second-half of the experienced net overcollection, together with appropriate interest, to our customers in the following year. Over the two-year period, the Company will receive no additional benefits, nor will our customers be disadvantaged since we will accumulate and refund additional interest to reflect the extended refund period.

The purpose of this proposal for refund over a two year period is to minimize volatility in the rates to our customers when the effects of the Energy Cost Rate Factor are combined with the Commission ordered phase-in plan covering base rates at Docket No. R-850152. If the entire overcollection is returned over a one-year period commencing July 1, 1987, there will be a negligible change in total bills on that date since the second step of the phase-in plan will be offset by the ECRF refund. However, in July 1988, when the overcollection refund expires, our customers will face an increase in the ECRF, even with no increase in fuel costs, at approximately the same time as the third step of the phase-in plan.

We believe that the Commission instituted the phase-in plan to provide an orderly progression in rates while insulating the customers from the economic consequences of either up-and-down swings or unduly large one-time increases. The Company's proposal for an ECRF refund over two years conforms to and supports this intent. Conversely, a one year refund period would negate the anticipated benefits of the Commission ordered phase-in plan. Attachment B depicts the impact on a 500 kWh per month customer over the next two years with a traditional refund over a one-year period and over a two-year period as proposed. For the purpose of this demonstration no change in energy costs during the ECRF No. 3 period was assumed. Review of this attachment highlights the significance of the Company's proposal.

Would you please acknowledge receipt of the foregoing on the enclosed copy of this letter.

Very truly yours,



copy: C. F. Hoffman, Director, OTS
Office of Consumer Advocate

ESTIMATED

ENERGY COST RATE FACTOR

DOCUMENT FOLDER

Energy Cost Rate Factor Applicable to Service Rendered on July 1, 1987 and Thereafter*

DOCKETED
APR 03 1987

Credit: 8.739 mills per kilowatt-hour

or

Credit: $0.008739 per kilowatt-hour

* Use prior to July 1, 1987 will be billed under Energy Cost Rate Factor No. 1

PHILADELPHIA ELECTRIC COMPANY

J. H. Austin, Jr., President

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
COMPUTATION OF ENERGY COST RATE FACTOR
APPLICATION PERIOD: JULY 1, 1987 THROUGH JUNE 30, 1988
COMPUTATION PERIOD: JULY 1, 1987 THROUGH JUNE 30, 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-1
SHEET 1 OF 1

1. ENERGY COST RATE FACTOR = $\left(\frac{F}{ST} - B - \frac{E}{SA}\right) \times \frac{1}{1-T}$

2. F = COST OF ENERGY (SCH. E-2, SHEET 2 OF 3)	$427,436,375	
3. E = EXPERIENCED NET OVER-COLLECTION (SCH. E-4, SHEET 4 OF 5)	$115,758,059	
4. E' = APPLICABLE EXPERIENCED NET OVERCOLLECTION (LINE 3 X 50%)	$57,879,029	
5. ST = PROJECTED SALES FOR COMP. PERIOD (SCH. E-2, SHEET 3 OF 3)	29,254,866	MWH
6. SA = PROJECTED RETAIL SALES FOR COMP. PERIOD (SCH. E-2, SHEET 3 OF 3)	28,612,456	MWH
7. $\frac{F}{ST} - \frac{E'}{SA}$ PROJECTED COST PER KWH	12.588	M/KWH
8. B = BASE COST	20.823	M/KWH
9. EXCESS COST (LINE 6 - LINE 7)	(8.235)	M/KWH
10. $\frac{1}{1-T}$ (T = 4.5%)	1.04712	
11. ENERGY COST RATE FACTOR (LINE 8 X LINE 9)	(8.623)	M/KWH
12. TRANSMISSION LINE REFUND CREDIT (*)	(0.116)	M/KWH
13. ADJUSTED ENERGY COST RATE FACTOR	(8.739)	M/KWH

(*) REFUND PLAN ADOPTED BY THE COMMISSION AT DOCKET NO. R-822291, ORDER ENTERED AUGUST 27, 1986, APPROVING COMPANY REFUND PLAN FILED WITH COMMISSION ON JULY 25, 1986.

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-2
Sheet 1 of 3

ELECTRIC GENERATION AND FUEL COST ESTIMATES

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
MWH						
OIL-PE STM.	165,000	151,000	155,000	162,000	213,000	224,000
COAL-PE STM.	280,000	321,000	297,000	356,000	252,000	205,000
COAL-MINEMTH	397,000	351,000	304,000	302,000	349,000	406,000
INT.COMB.	28,700	33,680	27,980	41,990	39,000	53,810
TOTAL FOSSIL	870,700	856,680	783,980	861,990	853,000	888,810
MWH NUCLEAR	1,144,881	1,461,465	1,372,564	1,241,591	1,112,408	1,237,827
NET HYDRO	37,000	14,000	19,000	50,000	92,000	161,000
OTHER	0	0	0	0	0	0
RECEIVED PJM	700,000	499,000	242,000	206,000	325,000	339,000
DELIV'D PJM	(5,000)	(46,000)	(84,000)	(113,000)	(125,000)	(133,000)
STEAM-INT PP	3,300	6,000	5,700	11,300	20,500	31,100
ME,PPL & DPL	16	16	16	16	16	16
CUST COGEN	1,500	2,500	4,600	7,900	14,000	10,000
2PARTY TRANS	149,000	149,000	145,000	150,000	144,000	150,000
INTCH & PUR	848,816	610,516	313,316	262,216	378,516	397,116
TOTAL OUTPUT	2,901,397	2,942,661	2,488,860	2,415,797	2,435,924	2,604,753
$						
OIL-PE STM	5,575,887	5,282,931	5,441,285	5,890,750	7,368,920	7,525,223
COAL-PE STM	5,176,378	5,907,179	5,486,652	6,507,680	4,677,098	3,698,978
MINEMOUTH	5,295,751	4,639,308	3,945,267	4,107,288	4,765,238	5,486,308
INT.COMB	1,147,973	1,348,378	1,108,808	1,773,170	1,636,150	2,200,329
TOTAL FOSSIL	17,195,989	17,177,796	15,985,012	18,358,888	18,447,406	18,990,838
(NUCLEAR EXCLUDING INTEREST, BUT INCLUDING OIL)						
NUCLEAR.	7,922,976	9,730,424	8,625,587	7,650,934	6,938,285	7,750,052
OTHER	0	0	0	0	0	0
RECEIVED PJM	18,233,237	14,217,706	6,915,480	5,920,103	8,092,597	9,746,990
DELIV'D PJM	(192,004)	(1,230,890)	(2,829,405)	(4,441,584)	(5,097,180)	(5,442,730)
STEAM-INT PP	87,100	163,800	164,200	325,700	596,300	948,600
PURCH. POWER	1,806	1,806	1,806	1,806	1,806	1,806
CUST COGEN	43,937	72,637	136,037	232,037	411,637	309,437
2PARTY TRANS	3,474,247	3,492,971	3,380,007	3,535,578	3,414,809	3,536,862
INTCH & PUR	21,648,323	16,710,030	7,768,933	5,573,640	7,419,969	9,100,965
INFORMATION FOR RATE DIVISION ($'S EXCLUDE FUEL HANDLING)						
$-FUEL CHGS	46,767,288	43,626,250	32,379,532	31,503,462	32,805,660	35,041,855

ELECTRIC GENERATION AND FUEL COST ESTIMATES

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	TOTAL
MWH							
OIL-PE STM.	406,000	212,000	292,000	205,000	65,000	127,000	2,377,000
COAL-PE STM.	227,000	193,000	219,000	174,000	172,000	243,000	2,939,000
COAL-MINEMTH	389,000	359,000	398,000	288,000	298,000	318,000	4,159,000
INT.COMB.	151,870	62,730	80,870	13,000	6,580	15,290	555,500
TOTAL FOSSIL	1,173,870	826,730	989,870	680,000	541,580	703,290	10,030,500
MWH NUCLEAR	1,345,850	1,285,942	1,174,109	1,117,805	1,280,446	1,241,912	15,016,800
NET HYDRO	90,000	135,000	222,000	213,000	160,000	83,000	1,276,000
OTHER	0	0	0	0	0	0	0
RECEIVED PJM	247,000	227,000	263,000	262,000	280,000	474,000	4,064,000
DELIV'D PJM	(272,000)	(159,000)	(277,000)	(143,000)	(51,000)	(28,000)	(1,436,000)
STEAM-HT PP	33,900	30,800	31,000	17,000	5,900	5,300	201,000
NE,PPL & DPL	16	16	16	16	16	16	192
CUST COGEN	20,200	12,300	15,700	13,900	11,700	11,200	125,500
2PARTY TRANS	186,000	174,000	186,000	180,000	186,000	180,000	1,979,000
INTCH & PUR	215,116	284,316	218,716	329,916	432,616	642,516	4,933,692
TOTAL OUTPUT	2,824,836	2,531,988	2,604,695	2,340,721	2,414,642	2,670,718	31,256,992
$							
OIL-PE STM	14,912,318	8,048,823	10,552,937	7,305,729	2,670,113	4,837,595	85,415,511
COAL-PE STM	4,175,634	3,555,961	4,038,847	3,206,856	3,182,913	4,624,060	54,238,236
MINEMOUTH	5,334,734	4,933,673	5,411,356	3,815,637	4,157,624	4,456,992	56,429,176
INT.COMB	7,542,517	2,997,951	3,779,969	586,077	290,367	682,925	25,174,614
TOTAL FOSSIL	31,965,203	19,536,408	23,783,109	14,914,299	10,301,017	14,601,572	221,257,537
(NUCLEAR EXCLUDING INTEREST, BUT INCLUDING OIL)							
NUCLEAR.	8,377,652	8,064,730	7,359,581	6,749,576	7,670,134	7,447,442	94,295,373
OTHER	0	0	0	0	0	0	0
RECEIVED PJM	8,443,793	7,441,382	7,827,779	7,721,047	6,795,081	12,669,232	114,024,435
DELIV'D PJM	(13,688,541)	(6,477,681)	(12,175,782)	(5,198,655)	(1,721,283)	(1,306,389)	(59,810,104)
STEAM-HT PP	1,373,000	1,009,000	1,068,600	531,400	153,500	147,300	6,569,300
PURCH. POWER	1,887	1,887	1,887	1,887	1,887	1,887	22,158
CUST COGEN	822,732	418,632	545,732	439,032	308,932	315,732	4,057,314
2PARTY TRANS	4,460,671	4,172,886	4,460,095	4,316,710	4,459,798	4,315,728	47,020,362
INTCH & PUR	1,413,542	6,566,906	1,728,311	7,811,421	9,997,925	10,143,490	111,883,465
INFORMATION FOR RATE DIVISION ($'S EXCLUDE FUEL HANDLING)							
$-FIN.CHGS	41,756,397	34,168,044	32,871,001	29,475,296	27,969,086	38,192,504	427,436,375

ADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
TEM SALES - MWH
IMATED JULY 1987 - JUNE 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-2
SHEET 3 OF 3

TH	APPLICABLE SALES	RESALE (PECO TO CPCO)	BLI (PP&L AND MET ED)	INTER-DEPARTMENT USE	RESALE (SECO TO CPCO)	TOTAL PROJECTED SALES
	MWH (1)	MWH (2)	MWH (3)	MWH (4)	MWH (5)	MWH (6)=(1)+(2)+(3)+(4)+(5)
1987	2,561,213	44,887	7	5,200	8,020	2,619,327
ST 1987	2,599,313	43,052	2	5,200	7,310	2,654,877
EMBER 1987	2,505,013	36,470	5	5,700	5,990	2,553,178
BER 1987	2,328,913	38,672	3	5,400	7,410	2,380,398
MBER 1987	2,158,113	36,165	6	4,500	7,620	2,206,404
MBER 1987	2,372,113	45,313	10	5,600	9,240	2,432,276
ARY 1988	2,626,613	47,772	7	6,800	10,070	2,691,262
UARY 1988	2,450,413	40,466	7	5,600	8,530	2,505,016
H 1988	2,381,413	42,046	7	5,900	8,730	2,438,096
L 1988	2,244,813	35,823	4	5,200	6,580	2,292,420
1988	2,115,213	36,505	1	5,200	6,580	2,163,499
1988	2,269,313	37,117	3	5,000	6,680	2,318,113
ONTH TOTALS	28,612,456	484,288	62	65,300	92,760	29,254,866

ENERGY COST RATE FACTO
STATEMENT NO. 2
SCHEDULE E-3
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MENT OF OPERATIONS - ELECTRIC PRODUCTION 1 OF 5

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
TING STATISTICS - MWH OUTPUT						
DELPHIA AREA STATIONS						
E STM.	280,000	321,000	297,000	356,000	252,000	205,000
STM.	165,000	151,000	155,000	162,000	213,000	224,000
STEAM	445,000	472,000	452,000	518,000	465,000	429,000
UTH						
NE STA	198,000	189,000	190,000	107,000	162,000	191,000
UGHSTA	199,000	162,000	114,000	195,000	187,000	215,000
INEMTH	397,000	351,000	304,000	302,000	349,000	406,000
STEAM	842,000	823,000	756,000	820,000	814,000	835,000
R						
BOT#2	290,270	297,416	289,377	287,591	272,408	243,827
BOT#3	287,611	279,049	117,187	0	0	0
1	297,000	293,000	132,000	0	0	109,000
#2	270,000	297,000	195,000	266,000	281,000	254,000
ICK #1	0	295,000	639,000	688,000	559,000	631,000
ICK #2	0	0	0	0	0	0
CLEAR	1,144,881	1,461,465	1,372,564	1,241,591	1,112,408	1,237,827
AL COMBUSTION						
	110	80	30	240	40	210
URBINE	9,990	13,200	8,250	10,450	8,960	13,000
N	18,600	20,400	19,700	31,300	30,000	40,600
B.	28,700	33,680	27,980	41,990	39,000	53,810
FOSSIL, NUCLEAR & I. C.						
F&N	2,015,581	2,318,145	2,156,544	2,103,581	1,965,408	2,126,637

ING STATISTICS - MWH OUTPUT

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
ELPHIA AREA STATIONS							
E STM.	227,000	193,000	219,000	174,000	172,000	243,000	2,939,000
STM.	406,000	212,000	292,000	205,000	65,000	127,000	2,377,000
STEAM	633,000	405,000	511,000	379,000	237,000	370,000	5,316,000
UTH							
NE STA	182,000	181,000	204,000	187,000	121,000	133,000	2,045,000
UGHSTA	207,000	178,000	194,000	101,000	177,000	185,000	2,114,000
INEMTH	389,000	359,000	398,000	288,000	298,000	318,000	4,159,000
STEAM	1,022,000	764,000	909,000	667,000	535,000	688,000	9,475,000
R							
BOT#2	201,850	267,942	233,109	285,805	280,446	284,912	3,234,953
BOT#3	0	0	0	0	0	0	683,847
1	237,000	289,000	221,000	264,000	280,000	269,000	2,391,000
#2	287,000	246,000	247,000	0	0	0	2,343,000
ICK #1	620,000	483,000	473,000	568,000	720,000	688,000	6,364,000
ICK #2	0	0	0	0	0	0	0
CLEAR	1,345,850	1,285,942	1,174,109	1,117,805	1,280,446	1,241,912	15,016,800
AL COMBUSTION							
	0	70	110	150	170	30	1,240
URBINE	61,470	17,760	23,860	3,150	1,210	3,360	174,660
N	90,400	44,900	56,900	9,700	5,200	11,900	379,600
MB.	151,870	62,730	80,870	13,000	6,580	15,290	555,500
FOSSIL, NUCLEAR & I. C.							
F&N	2,519,720	2,112,672	2,163,979	1,797,805	1,822,026	1,945,202	25,047,300

ENERGY COST RATE FACTOR
STATEMENT NO. 2
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ATING STATISTICS - MWH OUTPUT (CONTINUED)

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
RCHANGE & PURCHASE						
RCHANGE POWER						
VED PJM	700,000	499,000	242,000	206,000	325,000	339,000
D PJM	(5,000)	(46,000)	(84,000)	(113,000)	(125,000)	(133,000)
NTCH	695,000	453,000	158,000	93,000	200,000	206,000
ASED POWER						
-HT PP	3,300	6,000	5,700	11,300	20,500	31,100
L & DPL	16	16	16	16	16	16
COGEN	1,500	2,500	4,600	7,900	14,000	10,000
ARTY TRANSACTIONS						
Y PWR	149,000	149,000	145,000	150,000	144,000	150,000
HDS'N	0	0	0	0	0	0
INTERCHANGE & PURCHASE						
& PUR	848,816	610,516	313,316	262,216	378,516	397,116
-RIVER FLOW GENERATION						
INGO	78,000	56,000	49,000	83,000	131,000	181,000
STORAGE GENERATION						
RUN	89,000	78,000	65,000	80,000	73,000	74,000
STORAGE INPUT						
PUT	(130,000)	(120,000)	(95,000)	(113,000)	(112,000)	(94,000)
DRO	37,000	14,000	19,000	50,000	92,000	161,000
PRODUCTION (PRECOMMERCIAL)	0	0	0	0	0	0
OUTPUT	2,901,397	2,942,661	2,488,860	2,415,797	2,435,924	2,684,753
	2,611,200	2,650,200	2,553,700	2,374,300	2,201,400	2,424,400
Y USE	2,723	2,635	2,926	2,323	3,324	4,231
	287,474	289,826	(67,766)	39,174	231,200	256,122
OUTPUT	9.91	9.85	(2.72)	1.62	9.49	9.54

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
Sheet 4 of 20

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
ATING STATISTICS - MWH OUTPUT (CONTINUED)							
RCHANGE & PURCHASE							
RCHANGE POWER							
IVED PJM	247,000	227,000	263,000	262,000	280,000	474,000	4,064,000
V'D PJM	(272,000)	(159,000)	(277,000)	(143,000)	(51,000)	(28,000)	(1,436,000)
INTCH	(25,000)	68,000	(14,000)	119,000	229,000	446,000	2,628,000
IASED POWER							
1-HT PP	33,900	30,000	31,000	17,000	5,900	5,300	201,000
L & DPL	16	16	16	16	16	16	192
COGEN	20,200	12,300	15,700	13,900	11,700	11,200	125,500
ARTY TRANSACTIONS							
Y PWR	186,000	174,000	186,000	180,000	186,000	180,000	1,979,000
HDS'N	0	0	0	0	0	0	0
INTERCHANGE & PURCHASE							
& PUR	215,116	284,316	218,716	329,916	432,616	642,516	4,933,692
-RIVER FLOW GENERATION							
INGO	135,000	175,000	259,000	250,000	203,000	116,000	1,716,000
STORAGE GENERATION							
RUN	76,000	94,000	105,000	65,000	102,000	85,000	986,000
STORAGE INPUT							
PUT	(121,000)	(134,000)	(142,000)	(102,000)	(145,000)	(118,000)	(1,426,000)
DRO	90,000	135,000	222,000	213,000	160,000	83,000	1,276,000
PRODUCTION (PRECOMMERCIAL)	0	0	0	0	0	0	0
OUTPUT	2,824,836	2,531,988	2,604,695	2,340,721	2,414,642	2,670,718	31,256,992
	2,686,400	2,505,600	2,434,600	2,292,400	2,159,100	2,314,000	29,207,300
/ USE	4,950	5,153	5,464	4,640	3,423	2,723	44,515
	133,486	21,235	164,631	43,681	252,119	353,995	2,005,177
UTPUT	4.73	0.84	6.32	1.87	10.44	13.25	6.42

ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
Sheet 5 of 20

STRIBUTION 1 OF 4

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
EAT OIL						
KILL#1	16,000	24,000	14,000	12,000	21,000	20,000
ONE#3	38,000	46,000	57,000	61,000	55,000	56,000
ONE#4	48,000	53,000	57,000	61,000	61,000	56,000
#2	43,000	0	0	0	44,000	64,000
RE#7	11,000	15,000	14,000	19,000	22,000	18,000
RE#8	9,000	13,000	13,000	9,000	10,000	10,000
L	165,000	151,000	155,000	162,000	213,000	224,000
L						
ONE#1	107,000	123,000	112,000	131,000	108,000	0
ONE#2	123,000	136,000	131,000	154,000	126,000	140,000
#1	50,000	62,000	54,000	71,000	18,000	65,000
AL	280,000	321,000	297,000	356,000	252,000	205,000
AREA OIL AND COAL.						
STEAM	445,000	472,000	452,000	518,000	465,000	429,000
STATION TOTALS						
ONE	316,000	358,000	357,000	407,000	350,000	252,000
	93,000	62,000	54,000	71,000	62,000	129,000
RE7&8	20,000	28,000	27,000	28,000	32,000	28,000

REFERENCE:
ENERGY COST RATE FACTO
STATEMENT NO. 2
SCHEDULE E-3
Sheet 6 of 20

DISTRIBUTION 1 OF 4

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
EHEAT OIL							
YLKILL#1	50,000	24,000	30,000	21,000	8,000	11,000	251,000
STONE#3	112,000	48,000	77,000	49,000	10,000	34,000	643,000
STONE#4	105,000	41,000	70,000	49,000	6,000	35,000	642,000
BY#2	78,000	70,000	68,000	54,000	34,000	35,000	490,000
NARE#7	32,000	16,000	28,000	20,000	5,000	11,000	211,000
NARE#8	29,000	13,000	19,000	12,000	2,000	1,000	140,000
OIL	406,000	212,000	292,000	205,000	65,000	127,000	2,377,000
OAL							
STONE#1	0	0	103,000	129,000	119,000	116,000	1,048,000
STONE#2	149,000	123,000	34,000	0	0	76,000	1,192,000
BY#1	78,000	70,000	82,000	45,000	53,000	51,000	699,000
COAL	227,000	193,000	219,000	174,000	172,000	243,000	2,939,000
A. AREA OIL AND COAL.							
A STEAM	633,000	405,000	511,000	379,000	237,000	370,000	5,316,000
- STATION TOTALS							
STONE	366,000	212,000	284,000	227,000	135,000	261,000	3,525,000
BY	156,000	140,000	150,000	99,000	87,000	86,000	1,189,000
NARE7&8	61,000	29,000	47,000	32,000	7,000	12,000	351,000

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
Sheet 7 of 20

DISTRIBUTION 2 OF 4

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
MOUTH (PE SHARE)						
TONE#1	95,000	113,000	99,000	107,000	102,000	93,000
TONE#2	103,000	76,000	91,000	0	60,000	98,000
TONE STA	198,000	189,000	190,000	107,000	162,000	191,000
AUGH#1	109,000	54,000	24,000	91,000	98,000	109,000
AUGH#2	90,000	108,000	90,000	104,000	89,000	106,000
AUGHSTA	199,000	162,000	114,000	195,000	187,000	215,000
OUTH	397,000	351,000	304,000	302,000	349,000	406,000
. AREA OIL & COAL, AND MINEMOUTH COAL.						
L STEAM	842,000	823,000	756,000	820,000	814,000	835,000
AR (PE SHARE)						
BOT#2	290,270	297,416	289,377	287,591	272,408	243,827
BOT#3	287,611	279,049	117,187	0	0	0
OT STA	577,881	576,465	406,564	287,591	272,408	243,827
#1	297,000	293,000	132,000	0	0	109,000
#2	270,000	297,000	195,000	266,000	281,000	254,000
STA	567,000	590,000	327,000	266,000	281,000	363,000
	0	295,000	639,000	688,000	559,000	631,000
	0	0	0	0	0	0
A	0	295,000	639,000	688,000	559,000	631,000
CLEAR	1,144,881	1,461,465	1,372,564	1,241,591	1,112,408	1,237,827
(PRECOMMERCIAL)						
CK 1	0	0	0	0	0	0
CK 2	0	0	0	0	0	0
	0	0	0	0	0	0

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
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STRIBUTION 2 OF 4

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
UTH (PE SHARE)							
NE#1	91,000	100,000	106,000	102,000	31,000	50,000	1,089,000
NE#2	91,000	81,000	98,000	85,000	90,000	83,000	956,000
NE STA	182,000	181,000	204,000	187,000	121,000	133,000	2,045,000
UGH#1	109,000	100,000	106,000	101,000	98,000	107,000	1,106,000
UGH#2	98,000	78,000	88,000	0	79,000	78,000	1,008,000
UGHSTA	207,000	178,000	194,000	101,000	177,000	185,000	2,114,000
UTH	389,000	359,000	398,000	288,000	298,000	318,000	4,159,000
. AREA OIL & COAL, AND MINEMOUTH COAL.							
L STEAM	1,022,000	764,000	909,000	667,000	535,000	688,000	9,475,000
AR (PE SHARE)							
BOT#2	201,850	267,942	233,109	285,805	280,446	284,912	3,234,953
BOT#3	0	0	0	0	0	0	683,847
OT STA	201,850	267,942	233,109	285,805	280,446	284,912	3,918,800
I#1	237,000	289,000	221,000	264,000	280,000	269,000	2,391,000
I#2	287,000	246,000	247,000	0	0	0	2,343,000
I STA	524,000	535,000	468,000	264,000	280,000	269,000	4,734,000
	620,000	483,000	473,000	568,000	720,000	688,000	6,364,000
	0	0	0	0	0	0	0
STA	620,000	483,000	473,000	568,000	720,000	688,000	6,364,000
NUCLEAR	1,345,850	1,285,942	1,174,109	1,117,805	1,280,446	1,241,912	15,016,800
R (PRECOMMERCIAL)							
RICK 1	0	0	0	0	0	0	0
RICK 2	0	0	0	0	0	0	0
R	0	0	0	0	0	0	0

REFERENCE:
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DISTRIBUTION 3 OF 4

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
ELS						
BY D 1&2	110	40	30	240	0	40
HARE D	0	0	0	0	40	170
YLKILL D	0	40	0	0	0	0
IESELS	110	80	30	240	40	210
TONE D	0	0	0	0	0	0
MAUGH D	0	0	0	0	0	0
EL	110	80	30	240	40	210
URBINES						
GE CT	6,530	8,000	5,980	6,960	6,730	9,940
HARK CT	170	600	170	220	0	120
TONE CT	340	630	230	320	100	260
ARE CT	560	600	260	700	580	500
LKILLCT	220	480	50	320	290	170
ER CT	100	290	100	190	0	120
CT	1,150	1,230	500	500	140	380
CT	280	590	380	320	220	210
OTAL	9,350	12,420	7,670	9,530	8,060	11,700
GARRETT	9,400	11,200	11,500	16,500	16,000	22,200
HARRISN	9,200	9,200	8,200	14,800	14,000	18,400
N	18,600	20,400	19,700	31,300	30,000	40,600
RBINES	27,950	32,820	27,370	40,830	38,060	52,300
CT	640	780	580	920	900	1,300
CT	28,590	33,600	27,950	41,750	38,960	53,600
CT AND DIESEL						
IC	28,700	33,680	27,980	41,990	39,000	53,810
CYCLE (INC. SALEM CT)						
AL	9,990	13,200	8,250	10,450	8,960	13,000

REFERENCE:
ENERGY COST RATE FACT
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DISTRIBUTION 3 OF 4

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
LS							
Y D 1&2	0	0	30	110	0	10	610
ARE D	0	30	0	0	0	0	240
LKILL D	0	40	80	40	170	20	390
ESELS	0	70	110	150	170	30	1,240
ONE D	0	0	0	0	0	0	0
AUGH D	0	0	0	0	0	0	0
L	0	70	110	150	170	30	1,240
URBINES							
GE CT	29,810	14,110	18,820	2,360	1,180	2,580	113,000
HARK CT	3,480	120	260	130	0	100	5,370
TONE CT	3,880	170	210	130	0	100	6,370
ARE CT	3,510	330	350	130	0	80	7,600
LKILLCT	2,240	250	200	40	0	50	4,310
ER CT	3,480	120	180	60	0	70	4,710
CT	6,130	760	1,510	110	0	200	12,610
CT	5,920	840	870	70	0	110	9,810
TOTAL	58,450	16,700	22,400	3,030	1,180	3,290	163,780
GARRETT	44,100	24,200	28,800	6,200	3,300	7,700	201,100
HARRISN	46,300	20,700	28,100	3,500	1,900	4,200	178,500
ON	90,400	44,900	56,900	9,700	5,200	11,900	379,600
URBINES	148,850	61,600	79,300	12,730	6,380	15,190	543,380
CT	3,020	1,060	1,460	120	30	70	10,880
CT	151,870	62,660	80,760	12,850	6,410	15,260	554,260
CT AND DIESEL							
IC	151,870	62,730	80,870	13,000	6,580	15,290	555,500
E CYCLE (INC. SALEM CT)							
TAL	61,470	17,760	23,860	3,150	1,210	3,360	174,660

REFERENCE:
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	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
STEAM	165,000	151,000	155,000	162,000	213,000	224,000
AL STEAM	280,000	321,000	297,000	356,000	252,000	205,000
MOUTH	397,000	351,000	304,000	302,000	349,000	406,000
IL STEAM	842,000	823,000	756,000	820,000	814,000	835,000
NUCLEAR	1,144,881	1,461,465	1,372,564	1,241,591	1,112,408	1,237,827
R	0	0	0	0	0	0
EL	110	80	30	240	40	210
. CT	28,590	33,600	27,950	41,750	38,960	53,600
INTCH	695,000	453,000	158,000	93,000	200,000	206,000
POWER	4,816	8,516	10,316	19,216	34,516	41,116
Y TRANS	149,000	149,000	145,000	150,000	144,000	150,000
NINGO	78,000	56,000	49,000	83,000	131,000	181,000
RUN	89,000	78,000	65,000	80,000	73,000	74,000
NPUT	(130,000)	(120,000)	(95,000)	(113,000)	(112,000)	(94,000)
OUTPUT	2,901,397	2,942,661	2,488,860	2,415,797	2,435,924	2,684,753

REFERENCE:
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	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
TEAM	406,000	212,000	292,000	205,000	65,000	127,000	2,377,000
L STEAM	227,000	193,000	219,000	174,000	172,000	243,000	2,939,000
OUTH	389,000	359,000	398,000	288,000	298,000	318,000	4,159,000
L STEAM	1,022,000	764,000	909,000	667,000	535,000	688,000	9,475,000
CLEAR	1,345,850	1,285,942	1,174,109	1,117,805	1,280,446	1,241,912	15,016,800
	0	0	0	0	0	0	0
	0	70	110	150	170	30	1,240
CT	151,870	62,660	80,760	12,850	6,410	15,260	554,260
TCH	(25,000)	68,000	(14,000)	119,000	229,000	446,000	2,628,000
HER	54,116	42,316	46,716	30,916	17,616	16,516	326,692
TRANS	186,000	174,000	186,000	180,000	186,000	180,000	1,979,000
NGO	135,000	175,000	259,000	250,000	203,000	116,000	1,716,000
RUN	76,000	94,000	105,000	65,000	102,000	85,000	986,000
UT	(121,000)	(134,000)	(142,000)	(102,000)	(145,000)	(118,000)	(1,426,000)
UTPUT	2,824,836	2,531,988	2,604,695	2,340,721	2,414,642	2,670,718	31,256,992

MARCH 25, 1987 PRELIM. 80/20 ECR PROJECTION

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	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
O.6 & NO. 2)						
#1-6	470,558	696,230	408,075	379,494	621,057	598,360
#1-2	1,972	2,271	1,256	2,069	2,492	2,609
KILL#1	472,530	698,501	409,331	381,563	623,549	600,969
5	90,985	85,949	85,557	80,270	85,037	77,597
2	59,337	39,952	47,837	30,190	62,494	29,984
3	3,073,818	3,495,766	3,983,095	4,430,905	4,293,769	4,077,351
4	24,709	28,347	32,969	41,535	45,301	40,303
ONE1&2	150,322	125,901	133,394	110,460	147,531	107,581
ONE3&4	3,098,527	3,524,113	4,016,064	4,472,440	4,339,070	4,117,654
2,3,4	3,248,849	3,650,014	4,149,458	4,582,900	4,486,601	4,225,235
FUR)	29,308	33,162	31,413	43,047	36,973	22,692
NE	3,278,157	3,683,176	4,180,871	4,625,947	4,523,574	4,247,927
1-6	6,966	5,208	7,760	4,375	1,648	3,365
2-6	1,222,327	32,114	22,294	23,507	1,232,964	1,799,931
FUR)	46,939	58,304	50,858	69,224	17,523	63,481
&2-2	5,151	1,994	2,985	1,836	1,935	3,284
	1,281,383	97,620	83,897	98,942	1,254,070	1,870,061
	601,005	874,528	833,632	877,934	1,001,196	871,975
E 7&8	19,059	20,572	18,825	18,635	21,027	20,464
	620,064	895,100	852,457	896,569	1,022,223	892,439
IL	5,652,134	5,374,397	5,526,556	6,003,021	7,423,416	7,611,396
IE#1	1,847,341	2,111,603	1,923,667	2,216,050	1,855,337	0
IE#2	2,107,736	2,321,481	2,249,706	2,610,129	2,135,354	2,342,832
IE	3,955,077	4,433,084	4,173,373	4,826,179	3,990,691	2,342,832
	835,894	1,033,227	901,856	1,172,441	305,963	1,076,183
COAL	4,790,971	5,466,311	5,075,229	5,998,620	4,296,654	3,419,015
SCRUBBER						
E#1	142,979	165,711	150,653	181,706	150,179	0
E#2	166,181	183,691	178,499	215,083	175,769	193,790
S	309,160	349,402	329,152	396,789	325,948	193,790
., TOTAL COAL & TOTAL GAS						
EAM	10,752,265	11,190,110	10,930,937	12,398,430	12,046,018	11,224,201

NO.6 & NO. 2)	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
.#1-6	1,678,000	818,103	965,502	662,273	249,043	359,992	7,906,687
:#1-2	2,706	3,777	3,568	2,573	2,331	1,806	29,430
LKILL#1	1,680,706	821,880	969,070	664,846	251,374	361,798	7,936,117
-6	89,771	84,350	94,034	84,038	82,935	93,643	1,034,166
-2	42,486	40,322	61,011	45,247	32,555	63,309	554,724
-6	8,454,116	3,782,460	5,702,567	3,789,907	937,209	2,771,008	48,791,971
-2	73,104	34,261	50,833	35,824	7,446	23,956	438,588
ONE1&2	132,257	124,672	155,045	129,285	115,490	156,952	1,588,890
ONE3&4	8,527,220	3,816,721	5,753,400	3,825,731	944,655	2,794,964	49,230,559
,2,3,4	8,659,477	3,941,393	5,908,445	3,955,016	1,060,145	2,951,916	50,819,449
LFUR)	27,696	22,905	23,864	20,832	19,228	27,211	338,331
ONE	8,687,173	3,964,298	5,932,309	3,975,848	1,079,373	2,979,127	51,157,780
#1-6	3,381	4,062	3,831	3,057	7,670	7,748	59,071
#2-6	2,456,319	2,219,465	2,080,384	1,611,041	1,063,385	1,099,862	14,863,593
LFUR)	86,229	77,092	88,732	46,078	54,135	52,165	710,760
1&2-2	3,087	4,081	4,014	3,690	6,050	5,687	43,794
	2,549,016	2,304,700	2,176,961	1,663,866	1,131,240	1,165,462	15,677,218
6	2,081,744	1,026,852	1,556,139	1,042,698	270,832	402,557	11,441,092
2	27,604	31,090	31,054	25,381	10,657	8,027	252,395
RE 7&8	2,109,348	1,057,942	1,587,193	1,068,079	281,489	410,584	11,693,487
OIL	15,026,243	8,148,820	10,665,533	7,372,639	2,743,476	4,916,971	86,464,602
ONE#1	0	0	1,757,092	2,194,432	2,045,879	2,024,588	17,975,989
ONE#2	2,522,468	2,094,371	578,868	0	0	1,369,086	20,332,031
ONE	2,522,468	2,094,371	2,335,960	2,194,432	2,045,879	3,393,674	38,308,020
#1	1,305,699	1,168,369	1,382,426	758,705	891,109	869,595	11,701,467
PECOAL	3,828,167	3,262,740	3,718,386	2,953,137	2,936,988	4,263,269	50,009,487
R SCRUBBER							
NE#1	0	0	154,603	186,809	172,562	169,465	1,474,667
NE#2	233,542	193,224	53,262	0	0	111,950	1,704,991
AS	233,542	193,224	207,865	186,809	172,562	281,415	3,179,658
IL, TOTAL COAL & TOTAL GAS							
TEAM	19,087,952	11,604,784	14,591,784	10,512,585	5,853,026	9,461,655	139,653,747

REFERENCE:
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COST 2 OF 4

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
MOUTH (PE SHARE)						
TN1 COAL	1,132,044	1,340,411	1,178,203	1,288,341	1,230,279	1,121,204
TN2 COAL	1,223,043	912,105	1,081,896	0	726,913	1,176,312
TONE C	2,355,087	2,252,516	2,260,099	1,288,341	1,957,192	2,297,516
T1&2 OIL	10,611	15,916	0	0	17,308	5,769
TONE	2,365,698	2,268,432	2,260,099	1,288,341	1,974,500	2,303,285
COAL	1,602,956	786,675	351,786	1,347,610	1,454,221	1,612,669
COAL	1,322,713	1,584,201	1,319,848	1,541,803	1,322,216	1,570,354
IAUGH C	2,925,669	2,370,876	1,671,634	2,889,413	2,776,437	3,183,023
2 OIL	4,384	0	13,534	9,534	14,301	0
IAUGH	2,930,053	2,370,876	1,685,168	2,898,947	2,790,738	3,183,023
OUTH	5,295,751	4,639,308	3,945,267	4,187,288	4,765,238	5,486,308
AR (PE SHARE)						
UCLEAR	1,845,313	1,890,736	1,839,635	1,828,279	1,731,755	1,550,063
UCLEAR	1,974,663	1,922,656	807,690	0	0	0
INTREST	921,374	894,381	867,389	853,422	839,455	825,488
OMIC	4,741,350	4,707,773	3,514,714	2,681,701	2,571,210	2,375,551
OILER	17,778	17,778	17,278	18,622	18,022	18,622
ESEL	2,742	2,742	2,674	2,982	2,886	2,982
1	2,119,321	2,092,880	939,866	0	0	779,889
2	1,908,420	2,099,811	1,378,658	1,882,890	1,991,395	1,799,915
NTEREST	266,232	253,861	241,491	241,491	241,491	241,491
NTEREST	327,095	312,877	298,659	284,441	270,223	256,005
AUXBLR	0	0	0	0	0	0
DIESEL	133	133	131	145	141	145
UCLEAR	0	1,657,082	3,586,400	3,858,635	3,136,621	3,539,055
UCLEAR	0	0	0	0	0	0
C TOTAL	0	1,657,082	3,586,400	3,858,635	3,136,621	3,539,055
KBOILER	46,961	46,961	45,799	51,068	49,420	51,068
IESEL	7,645	7,645	7,456	8,313	8,045	8,313
AR	9,437,677	11,199,543	10,033,126	9,030,288	8,289,454	9,073,036
(PRECOMMERCIAL)	0	0	0	0	0	0

REFERENCE:
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COST 2 OF 4

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
OUTH (PE SHARE)							
N1 COAL	1,107,106	1,219,642	1,292,578	1,243,955	380,885	619,110	13,153,758
N2 COAL	1,114,292	987,384	1,195,331	1,043,194	1,103,054	1,021,452	11,584,976
ONE C	2,221,398	2,207,026	2,487,909	2,287,149	1,483,939	1,640,562	24,738,734
1&2 OIL	6,456	19,368	0	12,468	6,234	18,351	112,481
ONE	2,227,854	2,226,394	2,487,909	2,299,617	1,490,173	1,658,913	24,851,215
COAL	1,635,725	1,506,802	1,601,554	1,516,020	1,469,138	1,613,090	16,498,246
COAL	1,471,155	1,179,140	1,316,559	0	1,188,011	1,180,128	14,996,128
AUGH C	3,106,880	2,685,942	2,918,113	1,516,020	2,657,149	2,793,218	31,494,374
2 OIL	0	21,337	5,334	0	10,302	4,861	83,587
AUGH	3,106,880	2,707,279	2,923,447	1,516,020	2,667,451	2,798,079	31,577,961
OUTH	5,334,734	4,933,673	5,411,356	3,815,637	4,157,624	4,456,992	56,429,176
AR (PE SHARE)							
UCLEAR	1,283,202	1,703,366	1,481,928	1,816,923	1,782,856	1,811,245	20,565,301
UCLEAR	0	0	0	0	0	0	4,705,009
INTREST	811,522	797,555	783,588	769,621	755,654	741,687	9,861,136
OMIC	2,094,724	2,500,921	2,265,516	2,586,544	2,538,510	2,552,932	35,131,446
OILER	21,036	19,678	20,502	18,854	19,482	18,822	226,474
ESEL	3,336	3,122	3,298	3,118	3,222	3,096	36,200
1	1,493,902	1,823,267	1,393,916	1,664,466	1,764,070	1,693,824	15,765,401
2	2,029,691	1,742,470	1,742,780	0	0	0	16,576,030
NTEREST	241,491	443,356	427,771	412,185	396,599	381,013	3,788,472
NTEREST	241,787	227,568	213,350	199,132	199,132	199,132	3,029,401
AUXBLR	0	0	0	0	0	0	0
DIESEL	163	152	161	152	157	151	1,764
UCLEAR	3,479,874	2,710,514	2,651,333	3,183,966	4,036,180	3,858,635	35,698,295
UCLEAR	0	0	0	0	0	0	0
C TOTAL	3,479,874	2,710,514	2,651,333	3,183,966	4,036,180	3,858,635	35,698,295
XBOILER	57,145	53,458	56,470	53,403	55,184	53,035	619,972
IESEL	9,303	8,703	9,193	8,694	8,983	8,634	100,927
AR	9,672,452	9,533,209	8,784,290	8,130,514	9,021,519	8,769,274	110,974,382
(PRECOMMERCIAL)							
	0	0	0	0	0	0	0

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
ELS						
BY D 1&2	4,103	1,512	1,080	9,260	0	1,644
NARE D	0	0	0	0	1,643	6,572
YLKILL D	0	1,510	0	0	0	0
TONE D	164	164	0	0	0	0
MAUGH D	0	0	0	0	0	0
EL	4,267	3,186	1,080	9,260	1,643	8,216
TURBINES						
HWARK CT	8,251	29,415	8,238	11,925	0	6,399
STONE CT	16,991	31,007	11,463	17,175	5,239	13,792
NARE CT	27,405	29,492	12,372	36,628	30,179	27,544
YLKILLCT	10,571	23,555	2,363	17,012	15,053	9,251
TER CT	4,734	14,202	4,734	10,269	0	6,450
S CT	55,994	60,096	23,919	26,652	7,680	21,001
R CT	13,696	28,784	18,666	17,181	11,568	11,717
GE CT	261,303	319,831	244,953	302,553	292,657	437,733
GARRETT	325,142	387,247	406,520	623,045	601,912	847,735
HARRISN	387,773	383,035	344,671	652,069	622,212	821,691
DON	712,915	770,282	751,191	1,275,114	1,224,124	1,669,426
EM CT	31,846	38,528	29,829	49,401	48,007	68,800
TURBINES	1,143,706	1,345,192	1,107,728	1,763,910	1,634,507	2,272,113
AL IC	1,147,973	1,348,378	1,108,808	1,773,170	1,636,150	2,280,329

REFERENCE:
ENERGY COST RATE FACTO
STATEMENT NO. 2
SCHEDULE E-3
Sheet 18 of 20

EL COST 3 OF 4

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
SELS							
MBY D 1&2	0	0	1,269	4,592	0	483	23,943
AHARE D	0	1,313	0	0	0	0	9,528
UYLKILL D	0	1,838	3,612	1,774	7,351	1,014	17,099
STONE D	200	0	0	0	0	0	528
EMAUGH D	0	0	0	0	0	0	0
SEL	200	3,151	4,881	6,366	7,351	1,497	51,098
TURBINES							
THHARK CT	207,056	7,161	15,092	7,388	0	5,556	306,481
YSTONE CT	231,957	10,106	12,252	7,472	0	6,100	363,554
AHARE CT	211,177	20,342	20,758	7,643	0	4,422	427,962
UYLKILLCT	135,696	15,464	11,689	2,056	0	3,016	245,726
STER CT	207,845	7,218	10,946	3,728	0	4,218	274,344
LS CT	375,070	47,002	91,086	6,225	0	11,208	725,933
ER CT	364,043	52,443	52,714	4,166	0	6,536	581,514
N GE CT	1,466,626	695,703	908,381	111,051	55,460	119,185	5,215,436
Y GARRETT	1,883,375	1,034,777	1,201,615	251,301	134,709	308,068	8,005,446
Y HARRISN	2,280,761	1,041,386	1,365,029	171,580	91,213	209,065	8,370,485
YDON	4,164,136	2,076,163	2,566,644	422,881	225,922	517,133	16,375,931
EM CT	178,711	63,198	85,526	7,101	1,634	4,054	606,635
TURBINES	7,542,317	2,994,800	3,775,088	579,711	283,016	681,428	25,123,516
AL IC	7,542,517	2,997,951	3,779,969	586,077	290,367	682,925	25,174,614

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
Sheet 19 of 20

. COST 4 OF 4 (SUMMARY)

	JULY 1987	AUGUST 1987	SEPTEMBER 1987	OCTOBER 1987	NOVEMBER 1987	DECEMBER 1987
AL OIL	5,652,134	5,374,397	5,526,556	6,003,021	7,423,416	7,611,396
AL PECOAL	4,790,971	5,466,311	5,075,229	5,998,620	4,296,654	3,419,015
AL GAS	309,160	349,402	329,152	396,789	325,948	193,790
EMOUTH	5,295,751	4,639,308	3,945,267	4,187,288	4,765,238	5,486,308
AL IC	1,147,973	1,348,378	1,108,808	1,773,170	1,636,150	2,280,329
LEAR	9,437,677	11,199,543	10,033,126	9,030,288	8,289,454	9,073,036
ER	0	0	0	0	0	0
INTCH	18,041,233	12,978,816	4,086,083	1,478,519	2,995,417	4,304,260
POWER	132,843	238,243	302,843	559,543	1,009,743	1,259,843
RTY TRANS	3,474,247	3,492,971	3,380,007	3,535,578	3,414,809	3,536,862
TRACT CAP	0	0	0	0	0	0
L HANDL'G	872,393	882,110	852,334	832,348	921,452	966,068
, COAL, GAS, MINEMOUTH AND IC AL FOSSIL	17,195,989	17,177,796	15,985,012	18,358,888	18,447,406	18,990,838
SSIL AND NUCLEAR AL FUEL	26,633,666	28,377,339	26,018,138	27,389,176	26,736,860	28,063,874
TERCHANGE AND PURCHASE CH & PUR	21,648,323	16,710,030	7,768,933	5,573,640	7,419,969	9,100,965
SSIL, NUCLEAR, INTERCHANGE, PURCHASE AND OTHER FIN.CHGS	48,281,989	45,087,369	33,787,071	32,962,816	34,156,829	37,164,839
TAL ENERGY AND CONTRCT CAPACITY BTOT	48,281,989	45,087,369	33,787,071	32,962,816	34,156,829	37,164,839
ERGY, CONTRACT CAPACITY AND FUEL HANDLING AND TOTAL	49,154,382	45,969,479	34,639,405	33,795,164	35,078,281	38,130,907

MARCH 25, 1987 PRELIM. 80/20 ECR PROJECTION

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-3
Sheet 20 of 20

UEL COST 4 OF 4 (SUMMARY)

	JANUARY 1988	FEBRUARY 1988	MARCH 1988	APRIL 1988	MAY 1988	JUNE 1988	
TAL OIL	15,026,243	8,148,820	10,665,533	7,372,639	2,743,476	4,916,971	86,464,602
TAL PECOAL	3,828,167	3,262,740	3,718,386	2,953,137	2,936,988	4,263,269	50,009,487
TAL GAS	233,542	193,224	207,865	186,809	172,562	281,415	3,179,658
NEMOUTH	5,334,734	4,933,673	5,411,356	3,815,637	4,157,624	4,456,992	56,429,176
AL IC	7,542,517	2,997,951	3,779,969	586,077	290,367	682,925	25,174,614
LEAR	9,672,452	9,533,209	8,784,290	8,130,514	9,021,519	8,769,274	110,974,382
ER	0	0	0	0	0	0	0
INTCH	(5,244,748)	963,701	(4,348,003)	2,522,392	5,073,818	11,362,843	54,214,331
POWER	2,197,619	1,430,319	1,616,219	972,319	464,319	464,919	10,648,772
TY TRANS	4,460,671	4,172,886	4,460,095	4,316,710	4,459,798	4,315,728	47,020,362
RACT CAP	0	0	0	0	0	0	0
HANDL'G	923,562	922,372	886,188	868,578	868,896	1,009,324	10,805,625
COAL, GAS, MINEMOUTH AND IC FOSSIL	31,965,203	19,536,408	23,783,109	14,914,299	10,301,017	14,601,572	221,257,537
L AND NUCLEAR FUEL	41,637,655	29,069,617	32,567,399	23,044,813	19,322,536	23,370,846	332,231,919
CHANGE AND PURCHASE & PUR	1,413,542	6,566,906	1,728,311	7,811,421	9,997,935	16,143,490	111,883,465
, NUCLEAR, INTERCHANGE, PURCHASE AND OTHER CHGS	43,051,197	35,636,523	34,295,710	30,856,234	29,320,471	39,514,336	444,115,384
ENERGY AND CONTRCT CAPACITY	43,051,197	35,636,523	34,295,710	30,856,234	29,320,471	39,514,336	444,115,384
CONTRACT CAPACITY AND FUEL HANDLING OTAL	43,974,759	36,558,895	35,181,898	31,724,812	30,189,367	40,523,660	454,921,009

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ACTUAL MAY 1986 THROUGH FEBRUARY 1987
ESTIMATED MARCH AND APRIL 1987

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-4
SHEET 1 OF 5

MONTH	TOTAL SYSTEM SALES	ENERGY COST	ACTUAL TOTAL ENERGY COST (A)	ALLOC. FACTOR	ACTUAL ENERGY COST PECO RETAIL CUSTOMER	APPLICABLE SALES	ACTUAL ENERGY COST RECOVERED IN BASE RATES (B)	ENERGY COST OVER BASE
	KWH (1)	M/KWH (2)=(3)/(1)	$ (3)	(4)=(27)	$ (5)=(3)X(4)	KWH (6)	$ (7)=(6)XBASE	$ (8)=(5)-(7)
MAY'86	2,126,311,649	16.947	36,035,218	0.9806	35,336,135	2,079,813,457	58,604,984	(23,268,849)
JUN'86	2,437,657,093	17.663	43,055,947	0.9813	42,250,801	2,389,154,593	67,077,344	(24,826,543)
JUL'86	2,617,302,310	16.687	43,674,659	0.9807	42,831,738	2,560,616,548	59,402,885	(16,571,147)
AUG'86	2,651,564,516	14.826	39,312,723	0.9802	38,534,331	2,598,755,071	54,113,877	(15,579,546)
SEP'86	2,394,844,853	11.962	28,648,243	0.9803	28,083,873	2,348,505,837	48,902,937	(20,819,064)
OCT'86	2,233,174,149	13.031	29,100,922	0.9787	28,481,072	2,182,685,178	45,450,053	(16,968,981)
NOV'86	2,117,891,979	10.688	22,635,608	0.9785	22,148,942	2,066,945,876	43,040,014	(20,891,072)
DEC'86	2,497,334,829	9.920	24,773,638	0.9767	24,196,412	2,435,975,998	50,724,328	(26,527,916)
JAN'87	2,604,299,155	10.950	28,517,361	0.9766	27,850,055	2,539,984,515	52,890,098	(25,040,043)
FEB'87	2,503,319,789	10.455	26,172,354	0.9769	25,567,773	2,446,253,810	50,938,343	(25,370,570)
MAR'87	2,417,143,000	9.930	24,003,424	0.9775	23,463,347	2,361,313,000	49,169,621	(25,706,274)
APR'87	2,222,016,000	10.827	24,057,025	0.9794	23,561,450	2,176,013,000	45,311,119	(21,749,669)
	28,822,859,322		369,987,122		362,305,929	28,186,016,883	625,625,603	(263,319,674)

(A) ACTUAL TOTAL ENERGY COST = FUEL COST + NET INTERCHANGE - SUPPLEMENTAL ENERGY

(B) BASE FUEL PRIOR TO 6/27/86: 28.178 M/KWH
BASE FUEL ON AND AFTER 6/27/86: 20.823 M/KWH

JUNE 1986 SALES FOR USE PRIOR TO 6/27/86: 2,355,945,344 KWH
JUNE 1986 SALES FOR USE ON AND AFTER 6/27/86: 33,209,249 KWH
JULY 1986 SALES FOR USE PRIOR TO 6/27/86: 827,079,145 KWH
JULY 1986 SALES FOR USE ON AND AFTER 6/27/86: 1,733,537,403 KWH

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ACTUAL MAY 1986 THROUGH FEBRUARY 1987
ESTIMATED MARCH AND APRIL 1987

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-4
SHEET 2 OF 5

MONTH	GROSS RATE	FUEL REVENUE EXCL. GRT	HT TIME OF USE ADJUST.	TOTAL REVENUE	100% CURRENT PERIOD O/(U) RECOVERY	20% CURRENT PERIOD O/(U) RECOVERY	80% CURRENT PERIOD O/(U) RECOVERY	INT. RATE (C)	INT. FACTOR	CURRENT PERIOD INTEREST
	M/KWH	$	$	$	$	$	$			$
	(9)	(10)=(6)X(9)	(11)	(12)=(10)+(11)	(13)=(12)-(8)	(14)=(13)X20%	(15)=(13)X80%	(16)	(17)	(18)=(15) X(16)X(17)
MAY'86	(5.205)	(10,824,719)	(294,393)	(11,119,112)	12,242,512	0	12,242,512	10.75%	26/12	2,851,485
JUN'86	(5.204)	(12,433,496)	445,220	(11,988,276)	12,838,267	35,690	12,802,577	10.00%	25/12	2,667,204
JUL'86	(5.540)	(14,185,236)	532,242	(13,652,994)	2,918,153	395,118	2,523,035	10.50%	24/12	529,837
AUG'86	(5.703)	(14,821,376)	584,942	(14,236,434)	1,343,112	268,622	1,074,490	10.75%	23/12	221,390
SEP'86	(5.703)	(13,394,139)	518,132	(12,876,007)	7,943,057	1,588,611	6,354,446	10.25%	22/12	1,194,106
OCT'86	(5.703)	(12,448,421)	(283,010)	(12,731,431)	4,237,550	847,510	3,390,040	10.25%	21/12	608,088
NOV'86	(5.703)	(11,788,330)	(250,827)	(12,039,157)	8,851,915	1,770,383	7,081,532	10.50%	20/12	1,239,268
DEC'86	(5.703)	(13,893,004)	(339,676)	(14,232,680)	12,295,236	2,459,047	9,836,189	10.50%	19/12	1,635,266
JAN'87	(5.703)	(14,486,192)	(340,898)	(14,827,090)	10,212,953	2,042,591	8,170,362	10.25%	18/12	1,256,193
FEB'87	(5.703)	(13,951,622)	(299,121)	(14,250,743)	11,119,827	2,223,965	8,895,862	10.25%	17/12	1,291,753
MAR'87	(5.703)	(13,467,182)	0	(13,467,182)	12,239,092	2,447,818	9,791,274	10.00%	16/12	1,305,503
APR'87	(5.703)	(12,410,368)	0	(12,410,368)	9,339,301	1,867,860	7,471,441	10.25%	15/12	957,278
		(158,104,085)	272,611	(157,831,474)	105,580,975	15,947,215	89,633,760			15,757,371

ADJUSTMENT FOR PRIOR PERIOD OVERPAID INTEREST, DURING THE PERIOD FROM MARCH 1984 THROUGH MAY 1985 (D) (6,826,987)

APPLICABLE INTEREST DUE CUSTOMER 8,930,384

(C) PENNSYLVANIA RESIDENTIAL MORTGAGE LENDING RATE

(D) COMPANY BOOKS ADJUSTED DECEMBER 1985

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ACTUAL MAY 1986 THROUGH FEBRUARY 1987
ESTIMATED MARCH AND APRIL 1987

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-4
SHEET 3 OF 5

MONTH	SYSTEM GENERATION	BLI TO PECO	PECO TO CPCO SALES	INTERDEP'T SALES	SECO TO CPCO SALES	SALES APPLICABLE TO LOSS FACTOR	CALCULATED GENERATION	NUMERATOR	ALLOCATION FACTOR
	KWH (19)	KWH (20)	KWH (21)	KWH (22)	KWH (23)	KWH (24)=(21) +(22)+(23)	KWH (25)=(24)/ (1-0.03587)	KWH (26)=(19) +(20)-(25)	(27)=(26)/ (19)
MAY'86	2,485,882,000	736	34,072,520	4,973,564	7,452,108	46,498,192	48,228,135	2,437,654,601	0.9806
JUN'86	2,689,608,000	814	35,739,000	5,237,338	7,526,162	48,502,500	50,307,013	2,639,301,801	0.9813
JUL'86	3,039,828,000	1,148	42,219,000	5,933,290	8,533,472	56,685,762	58,794,729	2,981,034,419	0.9807
AUG'86	2,769,073,000	1,493	39,143,000	5,765,275	7,901,170	52,809,445	54,774,195	2,714,300,298	0.9802
SEP'86	2,439,913,000	1,298	33,905,000	5,418,922	7,015,094	46,339,016	48,063,037	2,391,851,261	0.9803
OCT'86	2,454,916,000	1,815	37,172,000	5,598,914	7,718,057	50,488,971	52,367,389	2,402,550,426	0.9787
NOV'86	2,453,736,000	1,906	37,259,208	5,088,378	8,598,517	50,946,103	52,841,529	2,400,896,377	0.9785
DEC'86	2,729,545,000	1,062	46,173,000	5,480,375	9,705,456	61,358,831	63,641,657	2,665,904,405	0.9767
JAN'87	2,849,238,000	6,941	47,926,000	6,074,205	10,314,435	64,314,640	66,707,436	2,782,537,505	0.9766
FEB'87	2,567,650,000	3,264	42,208,406	5,734,191	9,123,382	57,065,979	59,189,092	2,508,464,172	0.9769
MAR'87	2,575,871,000	7,000	41,393,000	5,800,000	8,630,000	55,823,000	57,899,868	2,517,978,132	0.9775
APR'87	2,315,197,000	4,000	34,499,000	5,000,000	6,500,000	45,999,000	47,710,371	2,267,490,629	0.9794

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
RECONCILIATION OF CORRECTION FACTOR
ACTUAL MAY 1986 THROUGH FEBRUARY 1987
ESTIMATED MARCH AND APRIL 1987

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-4
SHEET 4 OF 5

MONTH	RETAIL SALES	PRIOR PERIOD ADJUST. RATE	INTEREST REFUND RATE	TOTAL "E" FACTOR RATE	PRIOR PERIOD ADJUST.	INTEREST REFUND	"E" FACTOR RECOVERY
	KWH	M/KWH	M/KWH	M/KWH	$	$	$
	(28)=(6)	(29)	(30)	(31)=(29) +(30)	(32)=(28) X(29)	(33)=(28) X(30)	(34)=(32) +(33)
BEGINNING BALANCE 5-1-86 (ECRF STATEMENT NO. 1)					837,350	3,182,692	4,020,042
MAY 1986	25,578,342	6.130145	0.000000	6.130145	156,799	0	156,799
	2,054,235,115	2.790510	0.000000	2.790510	5,732,364	0	5,732,364
JUNE 1986	2,355,945,344	2.790510	0.000000	2.790510	6,574,289	0	6,574,289
	33,209,249	(0.029605)	(0.115555)	(0.145160)	(983)	(3,837)	(4,821)
JULY 1986	827,079,145	2.790510	0.000000	2.790510	2,307,973	0	2,307,973
	1,733,537,403	(0.029605)	(0.115555)	(0.145160)	(51,321)	(200,319)	(251,640)
AUGUST 1986	2,598,755,071	(0.029605)	(0.115555)	(0.145160)	(76,936)	(300,299)	(377,235)
SEPTEMBER 1986	2,348,505,837	(0.029605)	(0.115555)	(0.145160)	(69,528)	(271,382)	(340,909)
OCTOBER 1986	2,182,685,178	(0.029605)	(0.115555)	(0.145160)	(64,618)	(252,220)	(316,839)
NOVEMBER 1986	2,066,945,876	(0.029605)	(0.115555)	(0.145160)	(61,192)	(238,846)	(300,038)
DECEMBER 1986	2,435,975,998	(0.029605)	(0.115555)	(0.145160)	(72,117)	(281,489)	(353,606)
JANUARY 1987	2,539,984,515	(0.029605)	(0.115555)	(0.145160)	(75,196)	(293,508)	(368,704)
FEBRUARY 1987	2,446,253,810	(0.029605)	(0.115555)	(0.145160)	(72,421)	(282,677)	(355,098)
MARCH 1987	2,361,313,000	(0.029605)	(0.115555)	(0.145160)	(69,907)	(272,862)	(342,768)
APRIL 1987	2,176,013,000	(0.029605)	(0.115555)	(0.145160)	(64,421)	(251,449)	(315,870)
					14,092,784	(2,648,888)	11,443,896
"E" FACTOR RECONCILATION					14,930,134	533,804	15,463,938
80% OF CURRENT PERIOD OVERCOLLECTION (SCHEDULE E-4, SHEET 2 OF 5)					89,633,760		89,633,760
APPLICABLE INTEREST DUE CUSTOMER (SCHEDULE E-4, SHEET 2 OF 5)						8,930,384	8,930,384
ADJUSTMENTS (SCHEDULE E-4, SHEET 5 OF 5)					1,729,977		1,729,977
ENDING BALANCE 4-30-87 (ECRF STATEMENT NO. 2)					$106,293,871	$9,464,188	$115,758,059

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ADJUSTMENTS TO CORRECTION FACTOR
MAY 1986 THROUGH APRIL 1987

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-4
SHEET 5 OF 5

REASON FOR ADJUSTMENT	ADJUSTMENT
1. TO RETURN OVERSTATED SALEM UNIT 2 PRECOMMERCIAL SAVINGS TO CUSTOMERS ASSOCIATED WITH ITS OPERATIONS FROM ITS INCLUSION IN BASE RATES THROUGH MARCH 31, 1986. COMPANY BOOKS ADJUSTED IN JUNE, 1986.	$328,600
2. TO RETURN OVERSTATED LIMERICK UNIT 1 PRECOMMERCIAL SAVINGS TO CUSTOMERS ASSOCIATED WITH ITS OPERATIONS FROM SEPTEMBER THROUGH DECEMBER, 1985. COMPANY BOOKS ADJUSTED IN JULY, 1986.	$1,462,923
3. TO REFLECT THE INCREASE IN FUEL COSTS RECOVERABLE FROM ALL CUSTOMERS SINCE NYPA SAVINGS MUST BE PASSED ON TO RESIDENTIAL CUSTOMERS ONLY. COMPANY BOOKS ADJUSTED MONTHLY BEGINNING AUGUST 1986 THROUGH FEBRUARY	($61,546)
TOTAL ADJUSTMENTS	$1,729,977

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED MAY 1987 THROUGH APRIL 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5

MONTH	TOTAL SYSTEM SALES	ENERGY COST	ACTUAL TOTAL ENERGY COST	ALLOC. FACTOR	ACTUAL ENERGY COST PECO RETAIL CUSTOMER	RETAIL CUSTOMER SALES	ACTUAL ENERGY COST RECOVERED IN BASE RATES	ENERGY COST OVER BASE
	KWH (1)	M/KWH (2)=(3)/(1)	$ (3)	(4)=(27)	$ (5)=(3)X(4)	KWH (6)	$ (7)=(6)XBASE	$ (8)=(5)-(7)
MAY'87	2,086,347,000	15.384	32,096,165	0.9797	31,445,619	2,039,713,000	42,472,944	(11,027,325)
JUN'87	2,301,460,000	17.569	40,435,302	0.9811	39,670,602	2,253,313,000	46,920,737	(7,250,135)
JUL'87	2,619,327,000	17.855	46,767,288	0.9792	45,795,902	2,561,213,000	53,332,138	(7,536,236)
AUG'87	2,654,877,000	16.432	43,626,250	0.9804	42,771,917	2,599,313,000	54,125,495	(11,353,578)
SEP'87	2,553,178,000	12.682	32,379,532	0.9799	31,729,748	2,505,013,000	52,161,886	(20,432,138)
OCT'87	2,380,398,000	13.268	31,583,462	0.9779	30,885,490	2,328,913,000	48,494,955	(17,609,465)
NOV'87	2,206,404,000	14.868	32,805,660	0.9794	32,131,286	2,158,113,000	44,938,387	(12,807,101)
DEC'87	2,432,276,000	14.736	35,841,855	0.9768	35,009,020	2,372,113,000	49,394,509	(14,385,489)
JAN'88	2,691,262,000	15.516	41,756,397	0.9763	40,765,420	2,626,613,000	54,693,962	(13,928,542)
FEB'88	2,505,016,000	13.640	34,168,044	0.9776	33,403,939	2,450,413,000	51,024,950	(17,621,011)
MAR'88	2,438,096,000	13.482	32,871,001	0.9774	32,129,158	2,381,413,000	49,588,163	(17,459,005)
APR'88	2,292,420,000	12.858	29,475,296	0.9789	28,853,596	2,244,813,000	46,743,741	(17,890,145)
	29,161,061,000		433,806,252		424,591,696	28,520,956,000	593,891,867	(169,300,171)

BASE = 20.823 MILLS/KWH (EXCL. GRT)

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED MAY 1987 THROUGH APRIL 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5

MONTH	GROSS RATE	FUEL REVENUE EXCL. GRT	100% CURRENT PERIOD O/(U) RECOVERY	20% CURRENT PERIOD O/(U) RECOVERY	80% CURRENT PERIOD O/(U) RECOVERY	INT. RATE	INT. FACTOR	CURRENT PERIOD INTEREST
	M/KWH	$	$	$	$			$
	(9)	(10)=(6)X(9)	(11)=(10)-(8)	(12)=(11)X20%	(13)=(11)X80%	(14)	(15)	(16)=(13) X(14)X(15)
MAY'87	(5.703)	(11,633,014)	(605,689)	(121,138)	(484,551)	10.25%	20/12	(82,777)
JUN'87	(5.703)	(12,851,230)	(5,601,095)	(1,120,219)	(4,480,876)	10.25%	19/12	(727,209)
JUL'87	(5.982)	(15,322,118)	(7,785,882)	(1,557,176)	(6,228,706)	10.25%	18/12	(957,664)
AUG'87	(5.968)	(15,511,435)	(4,157,857)	(831,571)	(3,326,285)	10.25%	17/12	(483,004)
SEP'87	(6.212)	(15,561,695)	4,870,443	974,089	3,896,354	10.25%	16/12	532,502
OCT'87	(6.212)	(14,467,723)	3,141,742	628,348	2,513,393	10.25%	15/12	322,028
NOV'87	(6.212)	(13,406,675)	(599,574)	(119,915)	(479,659)	10.25%	14/12	(57,359)
DEC'87	(6.212)	(14,736,091)	(350,602)	(70,120)	(280,481)	10.25%	13/12	(31,145)
JAN'88	(6.212)	(16,317,101)	(2,388,559)	(477,712)	(1,910,847)	10.25%	12/12	(195,862)
FEB'88	(6.212)	(15,222,508)	2,398,503	479,701	1,918,802	10.25%	11/12	180,287
MAR'88	(6.212)	(14,793,864)	2,665,141	533,028	2,132,113	10.25%	10/12	182,118
APR'88	(6.212)	(13,945,275)	3,944,870	788,974	3,155,896	10.25%	9/12	242,610
		(173,768,729)	(4,468,558)	(893,711)	(3,574,847)			(1,075,475)

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED MAY 1987 THROUGH APRIL 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5
SHEET 3 OF 6

MONTH	SYSTEM GENERATION	BLI TO PECO	PECO TO CPCO SALES	INTER-DEPART. USE	SECO TO CPCO SALES	SALES APPLICABLE TO LOSS FACTOR	CALCULATED GENERATION	NUMERATOR	ALLOCATION FACTOR
	KWH (17)	KWH (18)	KWH (19)	KWH (20)	KWH (21)	KWH (22)=(19) +(20)+(21)	KWH (23)=(22)/ (1-0.03587)	KWH (24)=(17) +(18)-(23)	(25)=(24) /(17)
MAY'87	2,385,996,000	7,000	35,133,000	5,000,000	6,500,000	46,633,000	48,367,959	2,337,635,041	0.9797
JUN'87	2,640,335,000	2,000	36,644,000	4,900,000	6,600,000	48,144,000	49,935,175	2,590,401,825	0.9811
JUL'87	2,901,397,000	5,000	44,887,000	5,200,000	8,020,000	58,107,000	60,268,843	2,841,133,157	0.9792
AUG'87	2,942,661,000	3,000	43,052,000	5,200,000	7,310,000	55,562,000	57,629,158	2,885,034,842	0.9804
SEP'87	2,488,860,000	6,000	36,470,000	5,700,000	5,990,000	48,160,000	49,951,770	2,438,914,230	0.9799
OCT'87	2,415,797,000	10,000	38,672,000	5,400,000	7,410,000	51,482,000	53,397,363	2,362,409,637	0.9779
NOV'87	2,435,924,000	7,000	36,165,000	4,500,000	7,620,000	48,285,000	50,081,421	2,385,849,579	0.9794
DEC'87	2,684,753,000	7,000	45,313,000	5,600,000	9,240,000	60,153,000	62,390,964	2,622,369,036	0.9768
JAN'88	2,824,836,000	7,000	47,772,000	6,800,000	1.007E+07	64,642,000	67,046,975	2,757,796,025	0.9763
FEB'88	2,531,988,000	4,000	40,466,000	5,600,000	8,530,000	54,596,000	56,627,218	2,475,364,782	0.9776
MAR'88	2,604,695,000	1,000	42,046,000	5,900,000	8,730,000	56,676,000	58,784,604	2,545,911,396	0.9774
APR'88	2,340,721,000	3,000	35,823,000	5,200,000	6,580,000	47,603,000	49,374,047	2,291,349,953	0.9789

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED JULY 1987 THROUGH JUNE 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5

MONTH	TOTAL SYSTEM SALES	ENERGY COST	ACTUAL TOTAL ENERGY COST	ALLOC. FACTOR	ACTUAL ENERGY COST PECO RETAIL CUSTOMER	RETAIL CUSTOMER SALES	ACTUAL ENERGY COST RECOVERED IN BASE RATES	ENERGY COST OVER BASE
	KWH	M/KWH	$		$	KWH	$	$
	(1)	(2)=(3)/(1)	(3)	(4)=(27)	(5)=(3)X(4)	(6)	(7)=(6)XBASE	(8)=(5)-(7)
JUL'87	2,619,327,000	17.855	46,767,288	0.9792	45,795,934	2,561,213,000	53,332,138	(7,536,204)
AUG'87	2,654,877,000	16.432	43,626,250	0.9804	42,771,902	2,599,313,000	54,125,495	(11,353,593)
SEP'87	2,553,178,000	12.682	32,379,532	0.9799	31,729,735	2,505,013,000	52,161,886	(20,432,151)
OCT'87	2,380,398,000	13.268	31,583,462	0.9779	30,885,399	2,328,913,000	48,494,955	(17,609,556)
NOV'87	2,206,404,000	14.868	32,805,660	0.9794	32,131,272	2,158,113,000	44,938,387	(12,807,115)
DEC'87	2,432,276,000	14.736	35,841,855	0.9768	35,009,060	2,372,113,000	49,394,509	(14,385,449)
JAN'88	2,691,262,000	15.516	41,756,397	0.9763	40,765,420	2,626,613,000	54,693,962	(13,928,542)
FEB'88	2,505,016,000	13.640	34,168,044	0.9776	33,403,980	2,450,413,000	51,024,950	(17,620,970)
MAR'88	2,438,096,000	13.482	32,871,001	0.9774	32,129,233	2,381,413,000	49,588,163	(17,458,930)
APR'88	2,292,420,000	12.858	29,475,296	0.9776	28,816,171	2,244,813,000	46,743,741	(17,927,570)
MAY'88	2,163,499,000	12.928	27,969,086	0.9774	27,337,935	2,115,213,000	44,045,080	(16,707,145)
JUN'88	2,318,113,000	16.476	38,192,504	0.9811	37,468,765	2,269,313,000	47,253,905	(9,785,140)
	29,254,866,000		427,436,375		418,244,806	28,612,456,000	595,797,171	(177,552,365)

BASE = 20.823 MILLS/KWH (EXCL. GRT)

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED JULY 1987 THROUGH JUNE 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5

MONTH	GROSS RATE	FUEL REVENUE EXCL. GRT	100% CURRENT PERIOD O/(U) RECOVERY	20% CURRENT PERIOD O/(U) RECOVERY	80% CURRENT PERIOD O/(U) RECOVERY	INT. RATE	INT. FACTOR	CURRENT PERIOD INTEREST
	M/KWH	$	$	$	$			$
	(9)	(10)=(6)X(9)	(11)=(10)-(	(12)=(11)X2	(13)=(11)X8	(14)	(15)	(16)=(13) X(14)X(15)
JUL'87	(5.982)	(15,322,118)	(7,785,914)	(1,557,183)	(6,228,731)	10.25%	18/12	(957,667)
AUG'87	(5.968)	(15,511,435)	(4,157,842)	(831,568)	(3,326,274)	10.25%	17/12	(483,003)
SEP'87	(6.212)	(15,561,695)	4,870,456	974,091	3,896,365	10.25%	16/12	532,503
OCT'87	(6.212)	(14,467,723)	3,141,833	628,367	2,513,467	10.25%	15/12	322,038
NOV'87	(6.212)	(13,406,675)	(599,560)	(119,912)	(479,648)	10.25%	14/12	(57,358)
DEC'87	(6.212)	(14,736,091)	(350,642)	(70,128)	(280,513)	10.25%	13/12	(31,149)
JAN'88	(6.212)	(16,317,101)	(2,388,559)	(477,712)	(1,910,847)	10.25%	12/12	(195,862)
FEB'88	(6.212)	(15,222,508)	2,398,462	479,692	1,918,770	10.25%	11/12	180,284
MAR'88	(6.212)	(14,793,864)	2,665,066	533,013	2,132,053	10.25%	10/12	182,113
APR'88	(6.212)	(13,945,275)	3,982,295	796,459	3,185,836	10.25%	9/12	244,911
MAY'88	(6.212)	(13,140,171)	3,566,974	713,395	2,853,579	10.25%	8/12	194,995
JUN'88	(6.212)	(14,097,474)	(4,312,334)	(862,467)	(3,449,867)	10.25%	7/12	(206,273)
		(176,522,130)	1,030,235	206,047	824,190			(274,468)

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
ENERGY COST RATE FACTOR RECONCILIATION
ESTIMATED JULY 1987 THROUGH JUNE 1988

REFERENCE:
ENERGY COST RATE FACTOR
STATEMENT NO. 2
SCHEDULE E-5
SHEET 6 OF 6

MONTH	SYSTEM GENERATION	BLI TO PECO	PECO TO CPCO SALES	INTER-DEPART. USE	SECO TO CPCO SALES	SALES APPLICABLE TO LOSS FACTOR	CALCULATED GENERATION	NUMERATOR	ALLOCATION FACTOR
	KWH (17)	KWH (18)	KWH (19)	KWH (20)	KWH (21)	KWH (22)=(19)+(20)+(21)	KWH (23)=(22)/(1-0.03587)	KWH (24)=(17)+(18)-(23)	(25)=(24)/(17)
JUL'87	2,901,397,000	7,000	44,887,000	5,200,000	8,020,000	58,107,000	60,268,843	2,841,135,157	0.9792
AUG'87	2,942,661,000	2,000	43,052,000	5,200,000	7,310,000	55,562,000	57,629,158	2,885,033,842	0.9804
SEP'87	2,488,860,000	5,000	36,470,000	5,700,000	5,990,000	48,160,000	49,951,770	2,438,913,230	0.9799
OCT'87	2,415,797,000	3,000	38,672,000	5,400,000	7,410,000	51,482,000	53,397,363	2,362,402,637	0.9779
NOV'87	2,435,924,000	6,000	36,165,000	4,500,000	7,620,000	48,285,000	50,081,421	2,385,848,579	0.9794
DEC'87	2,684,753,000	10,000	45,313,000	5,600,000	9,240,000	60,153,000	62,390,964	2,622,372,036	0.9768
JAN'88	2,824,836,000	7,000	47,772,000	6,800,000	10,070,000	64,642,000	67,046,975	2,757,796,025	0.9763
FEB'88	2,531,988,000	7,000	40,466,000	5,600,000	8,530,000	54,596,000	56,627,218	2,475,367,782	0.9776
MAR'88	2,604,695,000	7,000	42,046,000	5,900,000	8,730,000	56,676,000	58,784,604	2,545,917,396	0.9774
APR'88	2,340,721,000	4,000	35,823,000	5,200,000	6,580,000	47,603,000	49,374,047	2,291,350,953	0.9789
MAY'88	2,414,642,000	1,000	36,505,000	5,200,000	6,580,000	48,285,000	50,081,421	2,364,561,579	0.9793
JUN'88	2,670,718,000	3,000	37,117,000	5,000,000	6,680,000	48,797,000	50,612,469	2,620,108,531	0.9811

STATEMENT OF REASONS

The ECRF No. 2 value of (8.729) mills per kilowatt is a decrease of 2.499 mills per kilowatt in comparison to the current ECRF No. 1 (Revised) value of (6.240) mills per kilowatt. The reasons for this decrease are as follows:

1. A reduction in the cost of energy of 0.533 mills per kilowatt-hour as a result of the lower estimated energy cost during the twelve months ending June 30, 1988, due to decreased fuel costs.

2. A reduction in the "E" factor value of 1.966 mills per kilowatt-hour as a result of overcollection and resulting interest during the period from May 1986 through April 1987.

EFFECT ON RESIDENTIAL BILL

Effective for service on and after July 1, 1987, the energy cost adjustment has been reduced from a credit of $0.006240 per kilowatt-hour to a credit of $0.008739 per kilowatt-hour, or a decrease of $0.002499 per kilowatt-hour.

Also effective for service on and after June 27, 1987, is a net base rate change which reflects the second step of the Limerick Unit No. 1 rate phase-in as approved by the Commission on June 26, 1987 at Docket No. 850152.

For a typical residential customer using 500 kilowatt-hours per month, the monthly bills will change as follows:

	Before 6/27/87	On and After 7/1/87	Change $	Change %
Base Charge	59.13	62.02	2.89	4.9
State Tax Adj. Chg.	2.61	2.74	0.13	5.0
Sub-Total	61.74	64.76	3.02	4.9
Energy Cost Adj.	(3.12)	(4.37)	(1.25)	(40.1)
Monthly Bill	58.62	60.39	1.77	3.0

ADDITIONAL DATA

(1) (ii) Production Cost Model

a) Description
b) Unit Performance, Cost and Load Data
c) Report Showing Changes

Data Request (1) (ii) (a)

Production Cost Model - Narrative Description

DESCRIPTION OF TWO AREA PRODUCTION COST PROGRAM

INTRODUCTION

This report describes a long range system generation simulation computer program which calculates production costs such as fuel, startup, for a pool composed of one, two or three areas over any number of years. Fossil fuel, nuclear, run of river, pondage and pumped hydro units can be individually or jointly owned. A maximum of 490 units may be modeled with pumped storage hydro units counting as two (pumping and generating modes). Maintenance can be scheduled on a pool or individual area basis. Costs are developed on a weekly basis from a chronological sequence of daily load cycles.

The weekly load shape is divided into 84 bi-hourly intervals and each interval is economically dispatched. Each interval on the pool demand is dispatched using incremental cost curves adjusted for penalty factors. Spinning reserve can be checked each interval on a pool or an individual area basis. If two or three areas are to be analyzed, an interconnection tie limit can be designated. Then the area generation will be adjusted if the interconnection tie flow exceeds the limit. Economy interchange and its cost, based on the true split saving, are calculated for each interval. Costs are accumulated on an monthly basis.

DEMANDS

An annual Company megawatt peak demand and weekly, daily, and bi-hourly per unit load shapes are used to develop the bi-hourly megawatt loads of each company. A maximum of 41 companies may be represented individually within the three areas. Each one requires a bi-hourly load model.

Weekly Company Peaks

Fifty-four weekly Company peak megawatt loads are calculated from the annual Company megawatt peak demand and fifty-four weekly values in per-unit of the annual peak demand. Since all weeks must start at 8 a.m. Monday, the calendar must be stretched into the previous or next year.

Daily Company Peaks

The weekly peak Company demands are used to calculate daily Company peak megawatt demands through the use of typical monthly/weekly load shapes and the seven values in per-unit of the weekly Company peak demand.

Bi-Hourly Company Demands

The daily Company peak demands for the week are used to calculate bi-hourly Company megawatt demands. Typical seasonal average weekday, Saturday and Sunday load shapes consisting of twelve bi-hourly values in per-unit of the daily area peak demands are used.

The bi-hourly pool megawatt demands are determined by summing the individual area bi-hourly loads.

MAINTENANCE SCHEDULING

Up to 125 maintenance cycles may be used. Each of these cycles contains up to 12 entries. Each entry represents the number of consecutive weeks that maintenance is to be scheduled each year. The last (non zero) entry in any cycle is the signal to repeat this maintenance cycle.

Each existing unit can be assigned a maintenance cycle and a year to start the maintenance. This information is used to determine the number of consecutive weeks the unit is to be put on maintenance in a particular year.

For example, assume a typical maintenance cycle is made up of the following entries: 2 3 1 0 0 0. The first year maintenance begins, a two-week outage is required. The second and third year, a three and one-week outage is required respectively. The fourth year, the cycle is repeated and two weeks of maintenance are required.

When new units are installed, the maintenance cycles are not used in the first year of service. In the second year, a special number of maintenance weeks is provided. The first entry in the maintenance cycle assigned to the new unit takes control in the third year of service.

Maintenance can be scheduled on a pool or on an individual area basis. A group of weeks can be designated as non-maintenance weeks for the pool.

If desired, particular weeks for particular units can be specified and the manual maintenance option used.

The actual maintenance scheduling is done in the following manner. The capacity of those units to be taken out of service under the manual maintenance option is added to the peak demand of those weeks that the units will be out of service. The generating unit of those remaining having the largest capacity is selected for scheduling first. The available maintenance weeks are searched to find the one with the lowest peak demand plus

capacity on planned outage. The generating unit is assigned one week of maintenance for that week. If more than one consecutive week of maintenance is required, the adjacent week with the next lowest peak demand plus generating capacity on planned outage is selected. This process is continued until all weeks of maintenance for this unit are accounted for. The peak megawatt demands of the weeks selected for this unit's maintenance are modified temporarily by adding the generating units capacity to them. The next largest unit has its maintenance scheduled on this modified load shape and the process is repeated until all units requiring maintenance are scheduled. This technique insures the proper levelized distribution of maintenance scheduling for all units over the weeks available for maintenance during the year.

FORCED OUTAGE REPRESENTATION

Forced outages are recognized for hydro units by modifying the megawatt values by the factor (1 - forced outage rate). Fossil steam, combustion turbines and nuclear generating units are forced out by a "Monte Carlo" routine. This routine operates as follows: for each available unit a random number is generated. The random number, having a value between zero and one, is compared to the forced outage rate of the unit. If the random number is equal to or less than the forced outage rate, the unit is considered as forced out for the period selected. The period of time covered by one forced outage can be one bi-hourly interval.

INCREMENTAL COST CURVES

Up to five points (four straight line segments) can be used to represent a thermal unit's power curve. Each week for each thermal unit, the incremental cost vs. megawatt output curve is developed from the fuel cost, minimum heat input and the incremental heat rate vs. megawatt output curve. Then the costs are modified by the unit penalty factor. This modified curve is then entered into an economic schedule point by point.

ECONOMIC SCHEDULE

The economic loading schedule steps can be specified. By default, the program will use a schedule covering the range from 2 mills/kwhr to 175 mills/kwhr. For all thermal units, each incremental cost point is compared to each specified schedule value until they match. When this occurs, the associated mw

value is stored in the schedule. Totals are accumulated by pool area and individual Company (owned and internal) generation.

Each week the schedule is modified to account for capacity maintenance outages, additions and retirements. The schedule is also adjusted for any must run units.

HYDRO DISPATCH

All hydro scheduling is done on a weekly basis on the pool load shape.

Run-of-River

Run-of-river hydro is scheduled first. A maximum of five different seasonal megawatt capacities are allowed for each installation. The appropriate capacity for the current week is subtracted from the (bi-hourly) pool load shape.

Pondage

Pondage hydro is scheduled after the run-of-river hydro. A maximum of five different seasonal weekly energies are allowed for each installation. These energies represent the megawatt-hour output for a full week during any season.

Pondage hydro is dispatched in the following manner. The appropriate energy for the current week is divided by five to obtain the maximum available energy per day (based on a five day week). The number of hours of scheduling per day is found by dividing the daily energy by the capacity. If the number of hours of scheduling per day exceeds 18, scheduling will not be done on a five day week, but on a seven day week to prevent generation during the lowest off-peak hours.

Assuming conditions call for seven day scheduling, the number of hours of scheduling per day is calculated as above. If this number exceeds 24 hours per day, the installation is run at full capacity, 24 hours per day, seven days per week.

Whether scheduling on a five or seven day week, peak shaving is done to assure that the largest bi-hourly pool demand of each day are reduced by the capacity of the installation.

Variable generation can be simulated by allowing the user to specify the number of smaller units he wishes to assign to the installation. The capacity of each of these smaller units must equal the installation capacity/number of units. In this case the pool load shape is now peak shaved in several passes (equal to the number of units specified) giving a smoother load shape modification.

Pumped Storage

Pumped storage hydro is scheduled after pondage hydro. It is scheduled in order of decreasing efficiency and if two units have the same efficiency, then in order of decreasing size.

Pumped storage scheduling is based on developing economic megawatt levels over intervals of time from the pool incremental cost curve developed for the week (Economic Schedule) and the cycle efficiency of the installation. These megawatt levels, the chronological bi-hourly load shape for the week, and the physical constraints of the installation are used to optimize the economic generation and pumping schedule for the week.

The dispatch of the pumped hydro is made on the basis of the following constraints and assumptions.

1. The pond is full at the beginning and end of each week.

2. The influence of variable head will not be considered.

3. It is not economic to use pumped hydro generation unless the ratio of the average incremental cost of the demand to be increased by pumping, to the average incremental cost of the load to be decreased by generation, is less than or equal to the hydro cycle efficiency.

The basic idea shown is that certain economic mw levels exist above which the savings incurred by generation must be greater than or equal to the cost incurred by pumping. If these conditions do not exist, then operation will not occur.

GAS TURBINE DISPATCH

Gas turbines not designated as peak shaving are entered into the economic table for dispatch on an equal incremental cost basis or where they may be started to supply adequate spinning reserve. Peak shaving gas turbines are designated by the user entering the number of hours of daily operation desired. The hours are converted to bi-hourly intervals by dividing by two and rounding to the next highest number. The pool load shape is peak shaved Monday through Friday by subtracting the capacity from the highest intervals.

INTERCONNECTION TIE LINES

After the economic schedule for area and pool generating capacity has been modified for the week and all the hydro and peak shaving gas turbines have been dispatched, each bi-hourly interval is dispatched. The thermal generation equal to the modified bi-hourly pool demand is found in the economic table. This pool generation is composed of the internal generation components of each of the areas being studied.

The bi-hourly tie line flow between areas is calculated as the differences between each area's modified demand and its internal generation.

When three areas are modeled, the transmission limitations among areas are defined by a polygon shaped curve. If a tie limit is specified between areas and the calculated tie flow exceeds it, then the logic will adjust the generation of each area by an amount equal to the difference between the tie flow and the limit.

SPINNING RESERVE

Spinning reserve can be determined bi-hourly on a pool or individual area basis. The spinning reserve requirement is specified in the input data as a percentage of the unmodified pool or individual area loads, a fixed mw value, or the higher of the previous two.

If the pool option is selected, the process is as follows:

1. If a tie-line limit is not specified, then the difference between the pool thermal capacity associated with the thermal generation found in the economic schedule is the excess capacity on-line. If this excess capacity is enough to cover the spinning percentage (converted to megawatts) then the program goes on to the next interval. If it is not sufficient, then additional units are started to satisfy the spinning reserve requirements.

2. If a tie-line limit is specified and the area generation has been modified to the limit the flow between areas, than the pool thermal capacity is the sum of the individual area on-line capacities associated with the internal generation of each area. If the excess capacity is enough to cover the pool spinning percentage (converted to megawatts), the program continues. If it is not enough, the program schedules additional units.

If the area reserve option is selected, the area megawatt requirements is determined from the bi-hourly area demand and the area percentage spinning reserve required. Each area's internal generation is scheduled to meet the demand. If enough excess capacity does not exist to cover each individual area requirement, the program schedules additional units in that particular area. If an area reserve requirement has not been corrected after all available units have been exhausted, then the generation in each area will be adjusted within the tie line limits.

COSTS

The fuel cost associated with the megawatt-hour output of each unit is calculated bi-hourly. Once all the bi-hourly intervals have been considered for the entire week, the start-up cost based on the number of starts the unit had during the week are calculated.

INTERCHANGE

Bi-hourly interchange energy between companies is calculated as the difference between each company's demand and its owned component of the pool generation.

The cost of the interchange energy is determined in the following manner:

1. The 'incremental' cost of the interchange energy supplied by the exporting companies is determined.

2. The incremental cost of the interchange energy if it was supplied by the import companies is determined.

3. The savings resulting from coordinated economic dispatch is the cost difference between item 1 and 2 above times the energy.

4. The cost of the interchange to the import companies is equal to the cost of the export companies incurred supplying the energy (item 1 x energy) plus one-half the savings (item 3).

SEASONAL FUEL COST FACTORS

Fuel costs for any one unit may be changed a maximum of four times a year. For each unit, four (4) beginning week numbers and seasonal fuel cost factors associated with each week number may be specified.

The fuel cost used by the program will equal the original input fuel cost times the annual fuel escalation times the seasonal fuel cost factor in effect.

```
 15 DATA CARD                1.671 1.788 1.913 2.047 2.190 2.344 2.508                  HEAVY
 16 DATA CARD              2 1.000 1.000 1.000 1.000 1.538 1.689 1.857 2.007 2.188 2.385 1%
 17 DATA CARD                2.599 2.833 3.088 3.366 3.669 3.999 4.359 4.752 5.179 5.645
 18 DATA CARD              3 1.000 1.000 1.000 1.000 1.312 1.445 1.590 1.969 2.146.2.340 LIGHT
 19 DATA CARD                2.550 2.780 3.030 3.303 3.600 3.924.4.277 4.662 5.081 5.539
 20 DATA CARD              4 1.000 1.000 1.000 1.000 1.538 1.689 1.857 2.007 2.188 2.385 GAS
 21 DATA CARD                2.599 2.833 3.088 3.366 3.669 3.999 4.359 4.752 5.179 5.645
 22 DATA CARD              5 1.000 1.000 1.000 1.000 1.636 1.796 1.982 2.154 2.348 2.560 HEAVY
 23 DATA CARD                2.790 3.041 3.315 3.613 3.938 4.293 4.679 5.100 5.559 6.060 .5&.3%
 24 DATA CARD              6 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
 25 DATA CARD                1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
 26 DATA CARD              7 1.070 1.140 1.210 1.280 1.350 1.420 1.490 1.560 1.630 1.700
 27 DATA CARD                1.770 1.840 1.910 1.980 2.050 2.120 2.190 2.260 2.330 2.400
 28 DATA CARD 999

 30 DATA CARD 41     VOM ESCULATION CURVES
 31 DATA CARD              1 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 32 DATA CARD
 33 DATA CARD              2 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 34 DATA CARD
 35 DATA CARD              3 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 36 DATA CARD
 37 DATA CARD              4 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 38 DATA CARD
 39 DATA CARD              5 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 40 DATA CARD
 41 DATA CARD              6 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 42 DATA CARD
 43 DATA CARD              7 1.000 1.000 1.035 1.082 1.136 1.193 1.252
 44 DATA CARD
 45 DATA CARD 999
 418 DATA CARD 13          EXISTING  UNIT DATA
6424 DATA CARD     LIMERCK1     5  06    917    1 56              .16     1. 1.000 7853      2.0539PE
6425 DATA CARD      1985         700  900    917 1100                                        1
6426 DATA CARD 999

 223 DATA CARD     PCHBOT2     5   1  1051   1                  .16  1.   1.000 7853      2.0525PLJ
 224 DATA CARD PS4249PE4249AE0751DP0751
 225 DATA CARD      1974         700  900  1051 1100                                        1
 226 DATA CARD     PCHBOT3     5   1   880   1                  .16  1.   1.000 7853      2.0625PLJ
 227 DATA CARD PS4249PE4249AE0751DP0751
 228 DATA CARD      1975         700  900   880 1100                                        1
 229 DATA CARD     SALEM1      5      1095   1                  .18  1.04 1.000 5385      5.35 1PSJ
 230 DATA CARD PS4259PE4259AE0741DP0741
 231 DATA CARD      1977         455  939   900  956   968  980  1095  986                 1
 232 DATA CARD     SALEM2      5      1095   1                  .18  1.04 1.000 5385      4.68 1PSJ
 233 DATA CARD PS4259PE4259AE0741DP0741JC0000
 234 DATA CARD      1982         455  939   900  956   968  980  1095  986                 1
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260 DATA CARD     1985   2     1  950   190 1050
261 DATA CARD    CROMBY1     7       150   1 79 1983       .163 .94  1.598  477     10.2023PE
262 DATA CARD    11985  1    42  914    80  951   130  973   150 1037                 1
263 DATA CARD             2
264 DATA CARD    CROMBY2     1       211   1 78 1981       .211 1.03 2.315  409     4.2821PE
265 DATA CARD    11985  2    34  883   105  891   172  922   211  943                 2
266 DATA CARD             2
267 DATA CARD    DELAWRE7    1       127   1 80 1984       .190 .980 2.250  255     6.8821PE
268 DATA CARD    11985  5    22  941   115  950   127 1005                          5
269 DATA CARD             2        2
270 DATA CARD    DELAWRE8    1       130   1 80 1983       .251 .98  2.250  256     7.9721PE
271 DATA CARD    11985  5    22  947   101  959   130  992                          5
272 DATA CARD             2        2
273 DATA CARD    EDDYSTN1   730      265   1 76 1985       .30  2.0001.618 1348     0.0023PE
274 DATA CARD    11985  1    77  163   152  640   153  884   260  885   265  964   1
275 DATA CARD             2
276 DATA CARD    EDDYSTN2   730 1    273   1 37 1985       .280 2.0001.618 1190     0.0023PE
277 DATA CARD    11985  1    79  354   111  355   112  895   273  901                 1
278 DATA CARD             2
279 DATA CARD    EDDYSTN3    1       376   1 78 1985       .133 .99002.250  536     4.7121PE
280 DATA CARD    11985  5    38 1026   247 1038   346 1070   376 1116                 5
281 DATA CARD             2
282 DATA CARD    EDDYSTN4    1       376   1 78 1980       .133 .99002.250  536     4.7121PE
283 DATA CARD    11985  5    38 1026   247 1038   346 1070   376 1116                 5
284 DATA CARD             2
285 DATA CARD    RICHMND9    1       177   1               .110   1. 2.250  900     5.8321PE
286 DATA CARD    11985  5    76 1166   165 1197   177 1386                          5
287 DATA CARD             2       -1
288 DATA CARD    SCHUYLL1    1       172   1 78 1980       .353 1.0  2.276  317     6.5221PE
289 DATA CARD    11985  5    26  893    60  904    90  933   172  963                 5
290 DATA CARD             2        5
291 DATA CARD    SCHUYLL3    1        53   1 45 1985       .056 1.5002.276  254     0.2721PE
292 DATA CARD     1985  5    53  480                                                 5
293 DATA CARD    SOUTHWK1    1       178   1               .199   1. 2.250  355     7.5721PE
294 DATA CARD    11985  5    20 1110    61 1238   125 1415   178 1632                 5
295 DATA CARD             2
296 DATA CARD    SOUTHWK2    1       178   1               .182   1. 2.250  389     7.8221PE
297 DATA CARD    11985  5    25 1102    66 1340   134 1497   178 1702                 5
298 DATA CARD             2
299 DATA CARD    DELAPW09    6        18   1 44 1985       .138  .98 3.548  244     8.32926PE
300 DATA CARD    11985  3    18 1353                                                 3
301 DATA CARD             1
302 DATA CARD    DELAPW10    6        16   1 44 1985       .082  .98 3.548  224     9.27826PE
303 DATA CARD    11985  3    16 1398                                                 3
304 DATA CARD             1
305 DATA CARD    DELAPN11    6        16   1 44 1985       .231  .98 3.548  224     9.27826PE
306 DATA CARD    11985  3    16 1398                                                 3
307 DATA CARD             1
308 DATA CARD    DELAPN12    6        16   1 44 1985       .173  .98 3.548  224     9.27826PE
309 DATA CARD    11985  3    16 1398                                                 3
310 DATA CARD             1
311 DATA CARD    EDDYPW10    6        16   1 44 1985       .099  .9753.551  224     9.27826PE

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314 DATA CARD    EDDYPW20      6          16    1 44 1985        .114  .9753.551  224      9.27826PE
315 DATA CARD    11985   3    16 1398                                                    3
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317 DATA CARD    EDDYPW30      6          16    1 44 1985        .073  .9753.551  223      9.27626PE
318 DATA CARD    11985   3    16 1395                                                    3
319 DATA CARD          1
320 DATA CARD    EDDYPW40      6          16    1 44 1985        .143  .9753.551  223      9.27626PE
321 DATA CARD    11985   3    16 1395                                                    3
322 DATA CARD          1
323 DATA CARD    MOSERPW1      6          18    1 44 1985        .051  .98 3.593  244      8.32926PE
324 DATA CARD    11985   3    18 1353                                                    3
325 DATA CARD          1
326 DATA CARD    MOSERPW2      6          18    1 44 1985        .057  .98 3.593  244      8.32926PE
327 DATA CARD    11985   3    18 1353                                                    3
328 DATA CARD          1
329 DATA CARD    MOSERPW3      6          18    1 44 1985        .065  .98 3.593  244      8.32926PE
330 DATA CARD    11985   3    18 1353                                                    3
331 DATA CARD          1
332 DATA CARD    CROYGE11      6          48    1 44 1985        .229  1.153.386  559      5.04126PE
333 DATA CARD    11985   3    48 1165                                                    3
334 DATA CARD          1
335 DATA CARD    CROYGE12      6          48    1 44 1985        .163  1.153.386  559      5.04126PE
336 DATA CARD    11985   3    48 1165                                                    3
337 DATA CARD          1
338 DATA CARD    CROYGE21      6          54    1 44 1985        .237  1.153.386  560      4.48126PE
339 DATA CARD    11985   3    54 1036                                                    3
340 DATA CARD          1
341 DATA CARD    CROYGE22      6          43    1 44 1985        .423  1.153.386  522      5.61026PE
342 DATA CARD    11985   3    43 1213                                                    3
343 DATA CARD          1
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345 DATA CARD    11985   3    48 1165                                                    3
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348 DATA CARD    11985   3    54 1036                                                    3
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350 DATA CARD    CROYGE41      6          48    1 44 1985        .274  1.153.386  559      5.04126PE
351 DATA CARD    11985   3    48 1165                                                    3
352 DATA CARD          1
353 DATA CARD    CROYGE42      6          54    1 44 1985        .228  1.153.386  560      4.48126PE
354 DATA CARD    11985   3    54 1036                                                    3
355 DATA CARD          1
356 DATA CARD    RICHGE81      6          59    1 44 1985       1.00   1.203.381  708      2.66726PE
357 DATA CARD    11985   3    59 1200                                                    3
358 DATA CARD          1
359 DATA CARD    RICHGE91      6          59    1 44 1985        .093  1.203.381  708      2.66726PE
360 DATA CARD    11985   3    59 1200                                                    3
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362 DATA CARD    RICHGE92      6          59    1 44 1985        .103  1.203.381  708      2.66726PE
363 DATA CARD    11985   3    59 1200                                                    3

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364 DATA CARD   .0        1
365 DATA CARD   RICHNE41    6        26   1 44 1985      .059  1.0 3.381  394     5.18926PE
366 DATA CARD   11985   3    26 1515
367 DATA CARD             1
368 DATA CARD   RICHNE42    6        26   1 44 1985      .250  1.0 3.381  394     5.18926PE
369 DATA CARD   11985   3    26 1515                                               3
370 DATA CARD             1
371 DATA CARD   RICHNE43    6        26   1 44 1985      .260  1.0 3.381  394     5.18926PE
372 DATA CARD   11985   3    26 1515                                               3
373 DATA CARD             1
374 DATA CARD   RICHNE44    6        26   1 44 1985      .449  1.0 3.381  394     5.18926PE
375 DATA CARD   11985   3    26 1515                                               3
376 DATA CARD             1
377 DATA CARD   RICHNE71    6        26   1 44 1985      .154  1.0 3.381  394     5.18926PE
378 DATA CARD   11985   3    26 1515                                               3
379 DATA CARD             1
380 DATA CARD   RICHNE72    6        26   1 44 1985      .159  1.0 3.381  394     5.18926PE
381 DATA CARD   11985   3    26 1515                                               3
382 DATA CARD             1
383 DATA CARD   RICHNE73    6        26   1 44 1985      .063  1.0 3.381  394     5.18926PE
384 DATA CARD   11985   5    26 1515                                               5
385 DATA CARD             1
386 DATA CARD   RICHNE74    6        26   1 44 1985      .824  1.0 3.381  394     5.18926PE
387 DATA CARD   11985   3    26 1515                                               3
388 DATA CARD             1
389 DATA CARD   RICHNO21    6        36   1 44 1985      .179  1.0 3.381  526     7.80126PE
390 DATA CARD   11985   3    36 1460                                               3
391 DATA CARD             1
392 DATA CARD   RICHNO22    6        36   1 44 1985      .037  1.0 3.381  526     7.80126PE
393 DATA CARD   11985   3    36 1460                                               3
394 DATA CARD             1
395 DATA CARD   RICHNO31    6        36   1 44 1985      .029  1.0 3.381  526     7.80126PE
396 DATA CARD   11985   3    36 1460                                               3
397 DATA CARD             1
398 DATA CARD   RICHNO32    6        36   1 44 1985      .165  1.0 3.381  526     7.80126PE
399 DATA CARD   11985   3    36 1460                                               3
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402 DATA CARD   11985   3    36 1460                                               3
403 DATA CARD             1
404 DATA CARD   RICHNO52    6        36   1 44 1985      .037  1.0 3.381  526     7.80126PE
405 DATA CARD   11985   3    36 1460                                               3
406 DATA CARD             1
407 DATA CARD   RICHNO61    6        36   1 44 1985      .885  1.0 3.381  526     7.80126PE
408 DATA CARD   11985   3    36 1460                                               3
409 DATA CARD             1
410 DATA CARD   RICHNO62    6        36   1 44 1985      .108  1.0 3.381  526     7.80126PE
411 DATA CARD   11985   3    36 1460                                               3
412 DATA CARD             1
413 DATA CARD   FALLSPN1    6        18   1 44 1985      .032  .98 3.578  244     8.32926PE
414 DATA CARD   11985   3    18 1353                                               3
415 DATA CARD             1

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416 DATA CARD    FALLSPN2     6        18   1 44 1985       .190  .98 3.578  244      8.32926PE
417 DATA CARD    11985  3    18 1353                                                   3
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419 DATA CARD    FALLSPN3     6        18   1 44 1985       .042  .98 3.578  244      8.32926PE
420 DATA CARD    11985  3    18 1353                                                   3
421 DATA CARD             1
422 DATA CARD    SCHUPN10     6        16   1 44 1985       .162  .98 3.546  224      9.27826PE
423 DATA CARD    11985  3    16 1398                                                   3
424 DATA CARD             1
425 DATA CARD    SCHUPN11     6        18   1 44 1985       .360  .98 3.546  244      8.32926PE
426 DATA CARD    11985  3    18 1353                                                   3
427 DATA CARD             1
428 DATA CARD    SOUTHPN3     6        16   1 44 1985       .178  .98 3.547  224      9.27826PE
429 DATA CARD    11985  3    16 1398                                                   3
430 DATA CARD             1
431 DATA CARD    SOUTHPN4     6        16   1 44 1985       .068  .98 3.547  224      9.27826PE
432 DATA CARD    11985  3    16 1398                                                   3
433 DATA CARD             1
434 DATA CARD    SOUTHPN5     6        16   1 44 1985       .037  .98 3.547  224      9.27826PE
435 DATA CARD    11985  3    16 1398                                                   3
436 DATA CARD             1
437 DATA CARD    SOUTHPN6     6        16   1 44 1985       .074  .98 3.547  224      9.27826PE
438 DATA CARD    11985  3    16 1398                                                   3
439 DATA CARD             1
440 DATA CARD    CHESTPN7     6        16   1 44 1985       .065  .98 3.552  224      9.27826PE
441 DATA CARD    11985  3    16 1398                                                   3
442 DATA CARD             1
443 DATA CARD    CHESTPN8     6        16   1 44 1985       .172  .98 3.552  224      9.27826PE
444 DATA CARD    11985  3    16 1398                                                   3
445 DATA CARD             1
446 DATA CARD    CHESTPN9     6        16   1 44 1985       .090  .98 3.552  224      9.27826PE
447 DATA CARD    11985  3    16 1398                                                   3
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449 DATA CARD    PLYMNO09     6        35   1 44 1985       .317  1.0 3.552  515      8.14526PE
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451 DATA CARD             1
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453 DATA CARD    11985  3    35 1472                                                   3
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455 DATA CARD    CROMBYD1     6         3   1 44 1985        .99 .26 3.550   31      35.6026PE
456 DATA CARD     1985  3     3 1045                                                   3
457 DATA CARD    CROMBYD2     6         3   1 44 1985        .99 .26 3.301   31      35.6026PE
458 DATA CARD     1985  3     3 1045                                                   3
459 DATA CARD    DELAHRED     6         3   1 44 1985        .99 .26 3.548   31      35.6026PE
460 DATA CARD     1985  3     3 1045                                                   3
461 DATA CARD    SCHYKILD     6         3   1 44 1985        .99 .26 3.546   31      35.6026PE
462 DATA CARD     1985  3     3 1045                                                   3
463 DATA CARD    SOUTHKD      6         3   1 44 1985        .99 .26 3.547   31      35.6026PE
464 DATA CARD     1985  3     3 1045                                                   3
465 DATA CARD    CONOX        3       350   1                      1.                    28PE
466 DATA CARD      121210 1038570 41 9660 4519460          5
467 DATA CARD    CONOY        3        60   1                      1.                    28PE

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                            1         2         3         4         5         6         7         8


468 DATA CARD        110080 10 8790 14 8655 27 4950 4910080  4                                    1.                    28PE
469 DATA CARD      CONOZ       3         30   1                                                                        28PE
470 DATA CARD        1 2610 49 1030                                                  1
471 DATA CARD      CONON       3         60   1                                                    1.                  28PE
472 DATA CARD        110080                                                          5
473 DATA CARD      MDYRN1&2    4         220  1 82 1985          .094  1.                        28PLJ
474 DATA CARD PE1.00
475 DATA CARD          2775   232  .691  2
476 DATA CARD      MDYRN3&4    4         220  1 82 1984          .094  1.                        28PLJ
477 DATA CARD PE1.00
478 DATA CARD          2775   232  .691  2
479 DATA CARD      MDYRN5&6    4         220  1 82 1985          .094  1.                        28PLJ
480 DATA CARD PE1.00
481 DATA CARD          2775   232  .691  2
482 DATA CARD      MDYRN7&8    4         220  1 82 1984          .094  1.                        28PLJ
483 DATA CARD PE1.00

6322 DATA CARD 24              1987 NUCLEAR SEASONAL FUEL FACTOR
6323 DATA CARD      EDDYSTN1     01 1.000
6324 DATA CARD      EDDYSTN2     01 1.000
6325 DATA CARD      CROMBY1      01 1.000
6326 DATA CARD      PCHBOT2      01 .6438 15 .5880
6327 DATA CARD      PCHBOT3      01 .6343
6328 DATA CARD      3MILE1       01 .3290
6329 DATA CARD      3MILE2       01 .7928
6330 DATA CARD      CALCLFS1     01 .5418
6331 DATA CARD      CALCLFS2     01 .5367 18 .5298
6332 DATA CARD      OYCRK1       01 .7057
6333 DATA CARD      SALEM1       01 .6800
6334 DATA CARD      SALEM2       01 .6600
6335 DATA CARD      HPCRK1       01 .8100
6336 DATA CARD      HPCRKPC1     01 .8100
6337 DATA CARD      LIMERCK1     01 .8163 30 .5190
6338 DATA CARD      SUSQ1        01 .3905
6339 DATA CARD      SUSQ2        01 .3829
6340 DATA CARD 999
6341 DATA CARD 12      1987 SEASONAL FUEL COST FACTORS
6342 DATA CARD               01 01 .9480 13 .9851 27 1.010 40 1.022 COAL
6343 DATA CARD               02 01 1.300 13 1.197 27 1.179 40 1.235 HEAVY OIL 1% SULF.

                  12345678901234567890123456789012345678901234567890123456789012345678901234567890
                            1         2         3         4         5         6         7         8


6344 DATA CARD               03 01 1.087 13 1.046 27 .9812 40 1.067 LIGHT OIL
6345 DATA CARD               04 01 1.300 13 1.197 27 1.179 40 1.235 GAS
6346 DATA CARD               05 01 1.392 13 1.276 27 1.258 40 1.316 HEAVY OIL 5% SULF
6347 DATA CARD 999
```

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4967 DATA CARD 20
4968 DATA CARD 20          1987  PE
4969 DATA CARD 20
4970 DATA CARD 21  2       1987  6100 PECO
4971 DATA CARD             1.0003 1.0025 1.0007 1.0001 1.0034 1.0071
4972 DATA CARD             0.9997 1.0049 0.9948 1.0010 1.0005 0.9994
4973 DATA CARD             0.7426 0.7426 0.8148 0.7902 0.7787 0.7541 0.7672 0.7459 0.7115
4974 DATA CARD             0.7180 0.7295 0.7066 0.6918 0.6623 0.6705 0.6639 0.7082 0.6885
4975 DATA CARD             0.6787 0.6689 0.6984 0.7623 0.7344 0.7705 0.8000 0.8738 0.9197
4976 DATA CARD             0.8148 0.9525 1.0000 0.8951 0.9344 0.9541 0.8951 0.7967 0.8639
4977 DATA CARD             0.8492 0.7869 0.7115 0.6590 0.6820 0.6508 0.6607 0.6721 0.6918
4978 DATA CARD             0.7000 0.7262 0.7131 0.7459 0.7574 0.7705 0.7902 0.7279 0.7508

5171 DATA CARD 09  2   PEC  1987
5172 DATA CARD  10.92250.96431.00000.99050.90660.80930.8294          0.00000.9817
5173 DATA CARD  60.94500.97861.00000.99360.95200.83340.8202          0.00001.0124
5174 DATA CARD 100.96810.97641.00000.95450.92690.81450.8311          0.00001.0032
5175 DATA CARD 140.96431.00000.98020.95600.92350.75710.7963          0.00000.9878
5176 DATA CARD 190.93131.00000.94950.93640.93340.76120.7401          0.00000.9959
5177 DATA CARD 230.88201.00000.96000.92430.86050.77040.6982          0.00001.0287
5178 DATA CARD 270.88840.92621.00000.83470.79920.68280.6936          0.00000.9643
5179 DATA CARD 320.87631.00000.98280.92090.86110.71240.6982          0.00001.0058
5180 DATA CARD 360.87351.00000.94680.88340.81200.66970.7325          0.00000.9624
5181 DATA CARD 400.96590.97831.00000.98240.96390.81440.7984          0.00001.0164
5182 DATA CARD 450.99621.00000.98830.96450.91040.83190.8430          0.00001.0064
5183 DATA CARD 490.93460.92091.00000.97050.89760.83710.8285          0.00000.9826
5184 DATA CARD 999
5185 DATA CARD 10  2   PEC  1987
5186 DATA CARD  10.96790.98330.95020.92400.97090.98090.90100.82790.69700.65040.66470.8306
5187 DATA CARD  10.88090.96250.92580.87760.93320.98330.91950.91330.79100.72700.71620.7498
5188 DATA CARD  10.82410.89270.90530.88850.94740.98330.95220.88240.77200.72040.73980.9553
5189 DATA CARD  60.98950.99440.96670.94640.95800.98150.92500.82860.70560.66510.68050.8399
5190 DATA CARD  60.93740.99440.95820.91490.93330.99050.94410.88530.79510.74000.73250.7583
5191 DATA CARD  60.85490.90530.90780.88600.91570.97180.94860.89190.80580.75700.77870.9944
5192 DATA CARD 100.98710.99660.97140.95080.94400.97130.92470.82380.68960.64710.66140.8192
5193 DATA CARD 100.94010.99660.96190.91400.91730.98060.94770.88700.78760.72740.71460.7338
5194 DATA CARD 100.81380.86660.86870.84660.86310.93260.92230.85860.80080.75480.77810.9966
5195 DATA CARD 140.97020.99850.97900.96020.93150.92140.90410.80750.65600.60210.60850.7782
5196 DATA CARD 140.91670.99850.96900.92130.91330.95040.95620.91270.80050.72390.70070.7200
5197 DATA CARD 140.79900.87080.88250.86490.87200.91120.94500.86870.79450.73390.74960.9985
5198 DATA CARD 190.95040.99460.98960.97910.94640.88930.89830.79810.64670.58820.58990.7546
5199 DATA CARD 190.90350.99460.97200.93350.92570.91830.95220.88820.76200.68960.66250.6725
5200 DATA CARD 190.80960.89900.92000.90740.90860.90260.96730.89230.81240.74160.75110.9946
5201 DATA CARD 230.93140.98880.99790.99730.97280.91580.90970.79910.66960.61600.60920.7269
5202 DATA CARD 230.90880.99790.99630.97560.97450.95780.97210.87570.75040.68520.65680.6616
5203 DATA CARD 230.83880.93250.96700.96400.96780.95570.99790.94070.84510.78110.77930.9547
5204 DATA CARD 270.85010.95050.98330.99970.97780.89030.86430.81400.65240.58380.57140.6825
5205 DATA CARD 270.82730.96920.99540.99160.99970.96020.96160.95420.77580.68290.63910.6354
5206 DATA CARD 270.75410.88600.95170.96260.98350.96090.99970.93720.85810.77150.75770.9200
5207 DATA CARD 320.88010.96220.98880.99980.97650.90780.89660.79900.66330.60420.59700.7015
5208 DATA CARD 320.87650.98630.99980.99230.99260.96660.98480.90960.79290.71830.68680.6816
5209 DATA CARD 320.79540.89830.95110.96370.97660.95910.99980.92800.83550.76650.76070.9189
5210 DATA CARD 360.91970.98880.99680.99470.96210.92830.90400.80770.63480.57290.57550.7581
5211 DATA CARD 360.87790.99680.97670.93840.93450.96400.97660.93480.81510.72550.69560.7061
5212 DATA CARD 360.76440.87290.91290.91170.92200.95060.99680.87570.76350.69230.70460.9759
5213 DATA CARD 400.97290.99820.98490.97200.96810.97970.93310.79620.65880.61340.62330.7921
5214 DATA CARD 400.92990.99820.96350.92100.94130.99380.96650.86640.73980.67570.66330.6892
5215 DATA CARD 400.80890.88040.89230.87960.91090.96330.96110.85820.79110.74050.75780.9982
5216 DATA CARD 450.95170.96710.94360.92730.96950.97310.90350.79630.66050.61550.62610.7841
5217 DATA CARD 450.86760.93080.89730.86300.93680.97310.91830.85410.73130.67520.67280.7363
5218 DATA CARD 450.83430.88400.88580.87910.94690.97310.93060.83720.75250.70470.72550.9539
5219 DATA CARD 490.94020.95710.93190.91400.97290.96860.90260.82390.67680.62550.63710.8009
5220 DATA CARD 490.86600.92820.89600.86470.94570.97290.92220.88300.74470.68060.66910.7023
5221 DATA CARD 490.80460.86860.87400.86120.94580.97290.94020.86230.76550.70750.72640.9325
```

INPUT DATA CARD EXPLANATIONS

#5 CARD - ANNUAL FOSSIL FUEL ESCALATION CURVES

These numbers are multiplied by the input base fuel prices on the unit data cards.

Column 12 - Fuel Type Number
1 = Coal
2 = #6 Oil (1%)
3 = #2 Oil
4 = Gas
5 = #6 Oil (.5%)

Column 14-72 - Annual factors used to multiply base fuel prices by the first number is 1985 and the last is 1995.

#9 CARD - DAILY LOAD SHAPE

There is one card for each month and each card represents the typical week of that month (Monday - Sunday)

Column 1- 2 - Week Number
Column 3- 8 - Monday Factor
Column 9-14 - Tuesday Factor
Column 15-20 - Wednesday Factor
Column 21-26 - Thursday Factor
Column 27-32 - Friday Factor
Column 33-38 - Saturday Factor
Column 39-44 - Sunday Factor
Column 45-80 - Not Used By Program - Comments Only

#10 CARD - BI-HOURLY LOAD SHAPE

There are three cards for each month. The first card represents a typical weekday, the second card shows a typical Saturday and the third card is a typical Sunday. The days begin at 8:00 AM.

Column 1- 2 - Week Number
Column 3-74 - Bi-Hourly Factors

#12 CARD - SEASONAL FUEL COST FACTOR

Factor to reflect seasonal price changes of fossil fuels. This number is multiplied by the annual escalation factor and the fuel price on the unit data card to obtain the projected fuel price.

Column 13-14 - Fossil Fuel Type
1 = Coal
2 = #6 Oil (1%)
3 = #2 Oil
4 = Gas
5 = #6 Oil (.5)

Column 16-17 - Week Number
Column 19-23 - Factor (Winter)
Column 25-26 - Week Number
Column 28-32 - Factor (Spring)
Column 34-35 - Week Number

Column 37-41 - Factor (Summer)
Column 43-44 - Week Number
Column 46-50 - Factor (Fall)
Column 52-80 - Fuel Type (Comment - Not Used By Program)

#13 CARD - UNIT DATA CARDS

These cards supply the basic data input for each of the units.

1st Card

Column 4-11 - Unit Name
Column 16 - Type Of Unit
1 = Fossil Steam - Oil
2 = Run Of River Hydro
3 = Pondage Hydro
4 = Pumped Storage Hydro
5 = Nuclear
6 = Internal Combustion
7 = Fossil Steam - Coal
Column 17-18 - For CT's - Number of hours during the Monday - Friday period that the unit must run. For all others number of years that the unit is must run.
Column 19-20 - Week number that unit goes into service (for new units only)
Column 21-26 - Net capacity of the unit.
Column 30 - Interconnection Accounting selector switch = 1 - normal unit.
Column 3 - Maintenance cycle number.
Column 34-38 - Maintenance cycle starting year.
Column 39-40 - Number of weeks of maintenance during the first year after installation.
Column 41-45 - Immature forced outage rate for new units. The program decreases this number over five years until it reaches the mature forced outage rate.
Column 46-50 - Mature forced outage rate for all years.
Column 51-55 - Transmission penalty factor adjustment to model transmission losses.
Column 56-60 - Fuel cost - ($/MBTU).
Column 61-65 - Minimum load heat requirement total heat (MBTU) at the first incremental MW level.
Column 71-75 - Variable O&M cost ($/MWH) represents an estimate of the maintenance cost in proportion to the generation. This is used only for ordering the units for dispatching purposes only.
Column 76-77 - Fuel accumulation number - references type of fuel used.
Column 78-79 - Company abbreviation.

Column 80 - Joint-Owned Switch
- J = Joint Owned Unit - If this is used, then the next card is the percentages owned by each company.

2nd Card

Column 4 - Third Card Switch blank no third unit data card
=1 third unit data card

Column 5- 8 - First year to begin of fuel esculation for nuclear units - year of installation (not used).

Column 10-12 - Escalation curve number applies to the curve numbers on the annual and seasonal curves.

Column 14-18 - Net MW at a point on the unit's incremental energy curve.

Column 19-23 - Incremental heat rate at the same point on the energy curve.

Column 25-29, 30-34, 36-40, 41-45, 47-51, 52-56, 58-62, 63-67 Repeat of Column 14-18, 19-23

Column 72 - Variable O&M escalation curve number provided on #41 card

3rd Card

Column 4- 8 - Maintenance Outage Rate Added to forced outage rate at night and on weekends.

Column 9-13 - Hot Start Curve Number Selects a cool-down rate curve.

Column 14-18 - Immature outage year. Year to start immature forced outage rate if different than the installation year.

Column 19-23 - Daytime Outage Rate Added to forced outage rate during daytime hours.

Column 24-25 - Minimum number of bi-hours that the unit must run if started.
Default - 3 bi-hours - steam
24 bi-hours - nuclear
0 bi-hours - IC

#16 CARD ANNUAL PEAKS

This number is multiplied by the factor on the 9, 10 and 21 cards to obtain the bi-hourly load.

Column 1- 2 - Company abbreviation
Column 6- 9 - Company projected peak.

#21 CARD - MONTHLY AND WEEKLY LOAD SHAPE

The first two cards represent the typical month and the next six cards are the factors to model the typical week.

1st 2 Cards
Column 12-52 - Monthly Factors

Next 6 Cards
Column 12-73 - Weekly Factors

#24 CARD - NUCLEAR SEASONAL FUEL FACTOR

Fuel cost for nuclear units in $/MBTU multiplied by fuel cost on unit data cards, which is set to 1.00 for all nuclear units.

Column 4-11 - Unit Name.
Column 16-17 - Week Number - Week 1 unless the unit is an addition during year.
Column 19-23 - Fuel Price ($/MBTU)
Column 25-26 - Week Number - For a price change during the year.
Column 29-32 - New Fuel Price ($/MBTU)

#28 CARD - PERFORMANCE FACTOR

This card is used for a performance factor or as a factor to re-rate the capacity to allow for seasonal changes due to ambient conditions.

Column 4-11 - Unit Name.
Column 13 - Negative or blank.
Blank - Factor is to be used as a performance factor.
Negative - Re-ration factor for the capacity shown in the unit data cards.
Column 14 - Week Number.
Column 15-19 - Performance factor or re-ration factor.
Columns 20-27, 28-35, 36-43, 44-51 - Repeat of Columns 13-19

#41 CARD - VARIABLE O&M ESCALATION CURVES

These numbers are multiplied by the input variable O&M costs on the unit data cards.

Column 12 - Escalation Curve Number.
Columns 14-72 - Annual factors used to multiply base variable O&M numbers by. The first number is for 1985.

Changes in Prod Cost Data

The following changes have been made to the Prod Cost Data:

1) Capacity Additions and Retirements

   a) Added Limerick No. 1
   b) Retired Chester, Richmond and Southwark Steam Units
   c) Retired selected Combustion Turbines
   d) Increased Capacity of Salem No. 1 in conformance with revised NRC license

2) Changed load shape to reflect latest data.

3) Updated unit performance to reflect latest projection.

4) Changed fuel costs to reflect latest projection.

5) Instituted use of transmission limitation polygram in conjunction with three area dispatching application.

6) In addition, capacity additions and retirements of the other PJM members have been updated, as well as their unit performance, fuel costs and load data.

(2) Actual Unit Data Report
and
(3) Comparison of Unit Performance Data Report

Actual Data Report

Unit Name	Cromby	Eddystone	Schuylkill	Conema
Unit Number	1	1	1	2
Date of Commercial Operation	1954	1960	1958	197
Fuel Type	Coal & Oil	Coal	Oil	Coal
Name Plate Capacity (KW)	187,500	353,600	190,400	193,9
Architect/Engineer	PECO	PECO	PECO	Gilbe
Constructor	UE&C	UE&C	UE&C	Ebas
Steam System Supplier	B & W	C. E.	C. E.	C.
Turbine Supplier	G. E.	West.	G. E.	G.

Unit Name	Cromby	Eddystone	Keystone	Peach
Unit Number	2	2	1	2
Date of Commercial Operation	1955	1960	1967	197
Fuel Type	Oil	Coal	Coal	Nucle
Name Plate Capacity (KW)	230,000	353,600	196,466	489,4
Architect/Engineer	PECO	PECO	Gilbert	Becht
Constructor	UE&C	UE&C	Ebasco	Becht
Steam System Supplier	C. E.	C. E.	C. E.	G. E
Turbine Supplier	West.	G. E.	West.	G. E

Unit Name	Delaware	Eddystone	Keystone	Peach
Unit Number	7	3	2	3
Date of Commercial Operation	1953	1974	1968	197
Fuel Type	Oil	Oil	Coal	Nucle
Name Plate Capacity (KW)	156,250	391,000	196,466	489,4
Architect/Engineer	PECO	UE&C	Gilbert	Becht
Constructor	UE&C	UE&C	Ebasco	Becht
Steam System Supplier	B & W	C. E.	C. E.	G.
Turbine Supplier	G. E.	West.	West.	G.

Unit Name	Delaware	Eddystone	Conemaugh	Sal
Unit Number	8	4	1	1
Date of Commercial Operation	1953	1974	1970	197
Fuel Type	Oil	Oil	Coal	Nucle
Name Plate Capacity (KW)	156,250	391,000	193,939	498,3
Architect/Engineer	PECO	UE&C	Gilbert	PSE&
Constructor	UE&C	UE&C	Ebasco	UE&
Steam System Supplier	B & W	C. E.	C. E.	Wes
Turbine Supplier	G. E.	West.	G. E.	Wes

Unit Name	Salem	Muddy Run
Unit Number	2	1,2,3,4,5,6
Date of Commercial Operation	1981	1967
Fuel Type	Nuclear	Hydro
Name Plate Capacity (KW)	498,303	100,000 EA.
Architect/Engineer	PSE&G	PECO
Constructor	UE&C	Arundel
Steam System Supplier	West.	N/A
Turbine Supplier	West.	B.L.H.

Unit Name	Limerick	Muddy Run
Unit Number	1	7,8
Date of Commercial Operation		1968
Fuel Type	Nuclear	Hydro
Name Plate Capacity (KW)	1,152,000	100,000 EA.
Architect/Engineer	Bechtel	PECO
Constructor	Bechtel	Arundel
Steam System Supplier	G. E.	N/A
Turbine Supplier	G. E.	B.L.H.

Unit Name	Eddystone	Schuylkill	Delaware	Salem
Unit Number	10,20	10	9	3
Date of Commercial Operation	1967	1969	1970	1971
Fuel Type	Oil	Oil	Oil	Oil
Name Plate Capacity (KW)	18,600 EA	18,600	21,250	17,824
Architect/Engineer	PECO	PECO	PECO	PSE&G
Constructor	PECO	PECO	PECO	UE&C
Steam System Supplier	N/A	N/A	N/A	N/A
Turbine Supplier	P&W	P&W	P&W	P&W

Unit Name	Eddystone	Schuylkill	Falls	Croydon
Unit Number	30,40	11	1,2,3	11,12,21,2 31,32,41,4
Date of Commercial Operation	1970	1971	1970	1974
Fuel Type	Oil	Oil	Oil	Oil
Name Plate Capacity (KW)	21,250 EA.	21,250 EA.	21,250 EA.	68,300 E
Architect/Engineer	PECO	PECO	PECO	PECO
Constructor	PECO	PECO	PECO	PECO
Steam System Supplier	N/A	N/A	N/A	N/A
Turbine Supplier	P&W	P&W	P&W	G. E.

Unit Name	Southwark	Chester	Moser
Unit Number	3,4,5	7,8,9	1,2,3
Date of Commercial Operation	1967	1969	1970
Fuel Type	Oil	Oil	Oil
Name Plate Capacity (KW)	18,600 EA.	18,600 EA.	21,250 EA.
Architect/Engineer	PECO	PECO	PECO
Constructor	PECO	PECO	PECO
Steam System Supplier	N/A	N/A	N/A
Turbine Supplier	P&W	P&W	P&W

Unit Name	Southwark	Delaware	Richmond
Unit Number	6	10,11,12	81,91,92
Date of Commercial Operation	1968	1969	1973
Fuel Type	Oil	Oil	Oil
Name Plate Capacity (KW)	18,600 EA.	18,600 EA.	65,300 EA.
Architect/Engineer	PECO	PECO	PECO
Constructor	PECO	PECO	PECO
Steam System Supplier	N/A	N/A	N/A
Turbine Supplier	P&W	P&W	G. E.

Actual Unit Data Report

Item 2(ii)

Nuclear Units

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	5 yr avg	test year ending 6/30/88
Peach Bottom 2							
Net Winter Capacity (MW)	1065	1065	1065	1065	1065		
Net Summer Capacity (MW)	1051	1051	1051	1051	1051		
Planned Outage Factor %	0	17.5	100	2.2	24.9	11.2	0
Unit Derating Factor %	2.4	0.9	0	5.3	4.0		
Equiv. Avail. Factor %	85	36.4	0	64.0	59.6	61.3	82.5
Net Capacity Factor %	82.9	33.7	0	62.7	59.4	59.7	82.4
Equiv. Forced Out. Rate %	7.0	53.9	0	22.7	NA		
Avg. Net Oper. Heat Rate	10747	10961		10916	10669	10823	10825
Avg. Net Oper. Cost	0.244	0.424		0.71	0.688	0.517	0.640
Peach Bottom 3							
Net Winter Capacity (MW)	1065	1065	1065	1065	1065		
Net Summer Capacity (MW)	1035	1036	1035	1035	1035		
Planned Outage Factor %	21.2	21.2	7.5	66.5	0	23.3	79.8
Unit Derating Factor %	2.6	0.9	2.2	4.0	6.1		
Equiv. Avail. Factor %	59.4	66.3	82.8	24.1	73.8	61.3	18.2
Net Capacity Factor %	57.9	57.8	76.3	22.6	73.5	57.6	17.7
Equiv. Forced Out. Rate %	0.6	7.6	6.3	12.3	NA		
Avg. Net Oper. Heat Rate	10811	10666	10818	11428	10827	10910	10912
Avg. Net Oper. Cost	0.244	0.418	0.608	0.719	0.688	0.535	0.707
Salem 1							
Net Winter Capacity (MW)	1100	1100	1100	1100	1120		
Net Summer Capacity (MW)	1081	1081	1079	1079	1106		
Planned Outage Factor %	19.5	24.7	2.2	12.9	0	11.9	30.1
Unit Derating Factor %	1.1	0.9	4.2	3.3	4.3		
Equiv. Avail. Factor %	38.7	59.8	60.9	76.8	84.7	64.2	58.3
Net Capacity Factor %	36.6	59.3	59.8	76.4	84.4	63.3	57.8
Equiv. Forced Out. Rate %	42.6	20.0	36.7	6.7	NA		
Avg. Net Oper. Heat Rate	10918	10517	10580	10685	10550	10650	10510
Avg. Net Oper. Cost	0.468	0.538	0.744	0.743	0.720	0.643	0.660
Salem 2							
Net Winter Capacity (MW)	1120	1120	1120	1120	1120		
Net Summer Capacity (MW)	1107	1107	1106	1106	1106		
Planned Outage Factor %	34.8	0	19.7	0	22.5	15.4	19.5
Unit Derating Factor %	14.9	0.8	2.0	3.6	7.9		
Equiv. Avail. Factor %	38.3	26.5	30.5	78.9	51.3	45.1	59.0
Net Capacity Factor %	37.5	23.8	28.7	79.0	51.0	44.0	56.6
Equiv. Forced Out. Rate %	22.3	71.9	61.8	14.7	NA		
Avg. Net Oper. Heat Rate	11430	11122	10988	10739	11833	11222	10719
Avg. Net Oper. Cost	0.506		0.597	0.626	0.752	0.496	0.707

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	5 yr avg	test year ending 6/30/88
Limerick 1							
Net Winter Capacity (MW)				1062	1062		
Net Summer Capacity (MW)				1055	1055		
Planned Outage Factor %				32.0	12.6	22.3	12.3
Unit Derating Factor %				1.0	1.9		
Equiv. Avail. Factor %				67.3	77.1	72.2	72.1
Net Capacity Factor %				66.4	76.8	71.6	68.7
Equiv. Forced Out. Rate %				0.493	NA		
Avg. Net Oper. Heat Rate				10767	10761	10764	10806
Avg. Net Oper. Cost				0.895	0.888	0.892	0.573
Coal Fired Units							
Eddystone 1							
Net Winter Capacity (MW)	321	321	319	319	274		
Net Summer Capacity (MW)	301	304	311	311	265		
Planned Outage Factor %	28.5	22.6	0	26.6	0	15.5	27.6
Unit Derating Factor %	2.8	6.6	6.7	9.1	13.7		
Equiv. Avail. Factor %	18.6	21.3	68.8	37.6	75.9	44.4	52.9
Net Capacity Factor %	14.6	16.3	55.8	29.5	32.3	29.7	45.0
Equiv. Forced Out. Rate %	67.6	27.0	29.8	47.1	NA		
Avg. Net Oper. Heat Rate	12282	12526	11047	11706	12231	11958	11127
Avg. Net Oper. Cost	2.024	2.079	2.113	1.963	1.845	2.005	1.955
Eddystone 2							
Net Winter Capacity (MW)	343	343	333	333	283		
Net Summer Capacity (MW)	334	330	324	324	274		
Planned Outage Factor %	0	16.1	31.8	0	26.3	14.8	25.4
Unit Derating Factor %	8.0	2.5	11.0	8.0	8.3		
Equiv. Avail. Factor %	70.9	35.3	42.1	69.2	50.3	53.6	56.7
Net Capacity Factor %	57.6	27.3	35.4	39.7	27.7	37.5	49.5
Equiv. Forced Out. Rate %	25.2	37.8	36.3	35.9	NA		
Avg. Net Oper. Heat Rate	10663	11418	11097	11452	13048	11536	11025
Avg. Net Oper. Cost	2.024	2.079	2.113	1.963	1.845	2.005	1.927
Cromby 1							
Net Winter Capacity (MW)	153	153	147	147	147		
Net Summer Capacity (MW)	152	150	144	144	144		
Planned Outage Factor %	16.3	1.0	21.5	10.4	1.4	10.1	8.5
Unit Derating Factor %	1.7	5.2	2.5	2.0	5.2		
Equiv. Avail. Factor %	68.1	86.5	64.9	78.3	88.2	77.2	74.5
Net Capacity Factor %	55.8	72.2	47.8	47.7	41.4	53.0	55.2
Equiv. Forced Out. Rate %	16.6	6.2	15.5	10.9	NA		
Avg. Net Oper. Heat Rate	10452	10965	11052	11304	11814	11117	10600
Avg. Net Oper. Cost	1.938	1.928	2.046	1.974	1.764	1.930	1.790

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	5 yr avg	test year ending 6/30/88
Keystone 1							
Net Winter Capacity (MW)	850	850	850	850	850		
Net Summer Capacity (MW)	850	850	850	850	850		
Planned Outage Factor %	8.1	18.7	0	22.2	11.5	12.1	3.9
Unit Derating Factor %	1.3	1.3	0.9	2.1	3.9		
Equiv. Avail. Factor %	73.5	73.0	87.1	64.0	81.2	77.0	74.7
Net Capacity Factor %	69.4	75.5	83.9	61.1	77.2	73.4	69.4
Equiv. Forced Out. Rate %	18.5	10.8	12.8	10.0	NA		
Avg. Net Oper. Heat Rate	10239	9775	9563	9755	9702	9807	9479
Avg. Net Oper. Cost	1.230	1.165	1.213	1.227	1.204	1.208	1.212
Keystone 2							
Net Winter Capacity (MW)	850	850	850	850	850		
Net Summer Capacity (MW)	850	850	850	850	850		
Planned Outage Factor %	16.0	16.0	25.7	0	9.6	13.5	11.8
Unit Derating Factor %	2.8	1.4	1.7	3.3	5.5		
Equiv. Avail. Factor %	66.2	80.3	52.9	81.7	74.8	71.2	65.7
Net Capacity Factor %	60.9	76.5	50.4	78.5	70.8	67.4	61.0
Equiv. Forced Out. Rate %	18.3	17.2	22.2	18.1	NA		
Avg. Net Oper. Heat Rate	10526	9856	10053	10053	9934	10084	9496
Avg. Net Oper. Cost	1.230	1.165	1.213	1.227	1.204	1.208	1.220
Conemaugh 1							
Net Winter Capacity (MW)	850	850	850	850	850		
Net Summer Capacity (MW)	850	850	850	850	850		
Planned Outage Factor %	15.6	10.2	10.2	15.9	0	10.4	9.9
Unit Derating Factor %	3.8	2.3	2.5	1.9	6.1		
Equiv. Avail. Factor %	61.7	79.1	75.7	71.1	74.0	72.3	76.2
Net Capacity Factor %	56.4	74.8	71.2	64.6	70.0	67.4	71.5
Equiv. Forced Out. Rate %	19.2	10.8	15.5	14.5	NA		
Avg. Net Oper. Heat Rate	9759	9478	9572	9771	9719	9660	9409
Avg. Net Oper. Cost	1.565	1.270	1.509	1.499	1.467	1.462	1.497
Conemaugh 2							
Net Winter Capacity (MW)	850	850	850	850	850		
Net Summer Capacity (MW)	850	850	850	850	850		
Planned Outage Factor %	0	0	10.1	15.6	9.6	7.1	9.6
Unit Derating Factor %	5.3	4.9	4.2	4.3	4.8		
Equiv. Avail. Factor %	69.7	75.2	79.6	71.8	73.2	73.9	69.6
Net Capacity Factor %	64.1	70.6	74.7	66.0	69.2	68.9	65.2
Equiv. Forced Out. Rate %	26.8	16.0	11.5	13.7	NA		
Avg. Net Oper. Heat Rate	10019	9555	9779	9906	9851	9822	9413
Avg. Net Oper. Cost	1.565	1.270	1.509	1.499	1.467	1.462	1.493

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	5 yr avg	test year ending 6/30/88
Oil Fired Steam Units							
Schuylkill 1							
Net Winter Capacity (MW)	175	175	175	175	175		
Net Summer Capacity (MW)	166	166	166	166	166		
Planned Outage Factor %	13.3	31.4	0	17.8	8.8	14.3	6.3
Unit Derating Factor %	0.4	2.2	3.2	10.8	3.7		
Equiv. Avail. Factor %	28.8	46.3	60.3	55.3	63.6	50.9	66.8
Net Capacity Factor %	9.9	28.5	21.3	8.1	10.0	15.6	17.2
Equiv. Forced Out. Rate %	73.1	24.9	26.8	34.1	NA		
Avg. Net Oper. Heat Rate	10903	10747	10984	12333	12547	11503	10073
Avg. Net Oper. Cost	5.392	5.301	5.211	4.113	2.986	4.601	3.159
Eddystone 3							
Net Winter Capacity (MW)	380	380	380	380	380		
Net Summer Capacity (MW)	377	377	380	380	380		
Planned Outage Factor %	13.4	15.2	0	7.1	3.3	7.8	0
Unit Derating Factor %	0.7	0.9	0.6	3.4	4.4		
Equiv. Avail. Factor %	76.7	67.8	89.5	78.7	89.3	80.4	89.9
Net Capacity Factor %	13.8	26.4	24.3	12.8	14.7	18.4	19.2
Equiv. Forced Out. Rate %	11.8	13.9	11.6	13.7	NA		
Avg. Net Oper. Heat Rate	15158	12125	12840	13875	12936	13387	12463
Avg. Net Oper. Cost	7.423	6.154	6.405	4.978	3.274	5.647	3.844
Eddystone 4							
Net Winter Capacity (MW)	380	380	380	380	380		
Net Summer Capacity (MW)	378	378	380	380	380		
Planned Outage Factor %	5.1	0	29.4	3.6	8.8	9.4	0
Unit Derating Factor %	0.5	1.6	5.3	5.4	3.9		
Equiv. Avail. Factor %	78.5	91.7	61.7	89.7	81.6	80.6	92.4
Net Capacity Factor %	14.3	30.4	14.9	16.8	14.8	18.2	19.3
Equiv. Forced Out. Rate %	7.4	5.6	16.6	5.2	NA		
Avg. Net Oper. Heat Rate	14042	12349	12981	13233	13014	13124	12428
Avg. Net Oper. Cost	7.423	6.154	6.405	4.978	3.274	5.647	3.816
Cromby 2							
Net Winter Capacity (MW)	211	211	211	211	211		
Net Summer Capacity (MW)	210	210	201	201	201		
Planned Outage Factor %	0	8.5		35.6	0	8.8	29.0
Unit Derating Factor %	2.1	3.9	2.1	2.0	5.2		
Equiv. Avail. Factor %	74.8	76.8	73.8	48.5	85.1	71.8	60.1
Net Capacity Factor %	36.3	40.9	36.9	13.1	19.2	29.3	27.7
Equiv. Forced Out. Rate %	22.2	12.0	20.2	14.7	NA		
Avg. Net Oper. Heat Rate	10282	10372	10373	10949	11161	10627	10048
Avg. Net Oper. Cost	4.771	5.029	5.131	4.197	2.889	4.403	3.039

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	5 yr avg	test year ending 6/30/88
Delaware 7							
Net Winter Capacity (MW)	128	128	128	128	128		
Net Summer Capacity (MW)	124	124	126	126	126		
Planned Outage Factor %	19.7	2.9	10.1	0	5.8	7.7	0
Unit Derating Factor %	2.0	1.2	0.1	3.2	1.7		
Equiv. Avail. Factor %	38.1	74.0	80.4	79.3	82.5	70.9	80.4
Net Capacity Factor %	10.0	41.1	35.0	16.8	13.6	23.3	19.2
Equiv. Forced Out. Rate %	31.7	25.2	5.7	16.1	NA		
Avg. Net Oper. Heat Rate	11929	10604	10730	11409	11648	11264	10539
Avg. Net Oper. Cost	6.001	5.428	5.378	4.551	3.173	4.906	3.262
Delaware 8							
Net Winter Capacity (MW)	128	128	128	128	128		
Net Summer Capacity (MW)	124	124	124	124	124		
Planned Outage Factor %	4.9	8.4	11.3	0	5.8	6.1	0
Unit Derating Factor %	2.1	2.3	6.9	8.3	4.7		
Equiv. Avail. Factor %	68.9	67.8	65.4	90.0	82.7	75.0	70.0
Net Capacity Factor %	19.0	26.1	25.0	11.2	9.2	18.1	12.8
Equiv. Forced Out. Rate %	14.1	19.0	28.6	10.7	NA		
Avg. Net Oper. Heat Rate	11623	10924	10192	12158	12310	11441	10942
Avg. Net Oper. Cost	6.001	5.428	5.378	4.551	3.173	4.906	3.405

Actual Unit Data Report

Item 2(ii)

Description	Years 1982	1983	1984	1985	1986
Richmond 81					
Net Winter Capacity	66	66	66	66	66
Net Summer Capacity	58	58	58	48	48
Planned Outage Factor	0	0.1	0	0	0
Unit Derating Factor	0	0.3	0	0	1.2
Equiv. Avail. Factor	19.8	97.3	93.5	95.1	54.8
Net Capacity Factor	0.4	7.9	2.0	1.6	4.7
Equiv. Forced Out. Rate	99.2	7.4	64.0	5.8	44.3
Richmond 91					
Net Winter Capacity	66	66	66	66	66
Net Summer Capacity	56	58	58	48	48
Planned Outage Factor	0	4.5	0	0	0
Unit Derating Factor	0.3	1.5	0	0	1.1
Equiv. Avail. Factor	95.7	76.7	90.0	98.5	88.8
Net Capacity Factor	2.7	5.2	3.4	1.9	8.2
Equiv. Forced Out. Rate	35.4	64.4	18.4	6.2	4.3
Richmond 92					
Net Winter Capacity	66	66	66	66	66
Net Summer Capacity	55	58	58	48	48
Planned Outage Factor	23.1	0	0	0	0
Unit Derating Factor	0	0	0	0	1
Equiv. Avail. Factor	71.7	91.9	95.2	76.7	87.8
Net Capacity Factor	2.5	7.3	3.5	0.9	7.3
Equiv. Forced Out. Rate	41.3	36.9	21.1	20.1	14.1
Croydon 11					
Net Winter Capacity	63	63	58	58	58
Net Summer Capacity	56	58	51	39	39
Planned Outage Factor	3.1	0	0	7.7	0
Unit Derating Factor	16.5	31.5	16.5	0	0
Equiv. Avail. Factor	50.8	57.8	74.8	78.4	79.8
Net Capacity Factor	0.9	4.0	3.8	2.1	3.2
Equiv. Forced Out. Rate	375.1	279.2	165.3	3.3	10.7
Croydon 12					
Net Winter Capacity	63	63	58	58	58
Net Summer Capacity	55	57	51	39	39
Planned Outage Factor	8.6	0	7.0	0	0
Unit Derating Factor	18.3	38.5	17.3	3.1	2.1
Equiv. Avail. Factor	69.5	59.6	70.7	89.2	88.3
Net Capacity Factor	1.8	4.3	3.3	1.3	2.9
Equiv. Forced Out. Rate	424.3	335.8	255.5	12.8	14.9

Description	Years 1982	1983	1984	1985	1986
Croydon 21					
Net Winter Capacity	63	63	61	61	61
Net Summer Capacity	56	57	55	55	55
Planned Outage Factor	11.3	0	0	0	8.2
Unit Derating Factor	13.5	19.1	13.1	1.4	0
Equiv. Avail. Factor	62.8	67.5	78.7	77.2	73.6
Net Capacity Factor	3.1	10.4	11.1	8.1	8.5
Equiv. Forced Out. Rate	148.6	111.6	82.2	6.6	20.0
Croydon 22					
Net Winter Capacity	63	63	56	56	56
Net Summer Capacity	52	57	48	48	48
Planned Outage Factor	8.9	4.9	0	0	0
Unit Derating Factor	14.7	21.0	0.9	8.1	2.2
Equiv. Avail. Factor	74.9	29.1	53.7	80.6	85.6
Net Capacity Factor	1.4	1.3	2.2	1.2	1.6
Equiv. Forced Out. Rate	255.6	555.5	91.5	22.1	17.7
Croydon 31					
Net Winter Capacity	63	63	58	58	58
Net Summer Capacity	54	57	51	51	51
Planned Outage Factor	0.1	8.3	0	0	0
Unit Derating Factor	10.8	28.3	15.9	1.6	5.5
Equiv. Avail. Factor	74.4	59.2	70.2	87.4	88.1
Net Capacity Factor	1.5	4.5	4.0	1.8	2.2
Equiv. Forced Out. Rate	201.6	299.9	170.1	16.7	22.6
Croydon 32					
Net Winter Capacity	63	63	61	61	61
Net Summer Capacity	57	57	55	55	55
Planned Outage Factor	27.4	9.3	0	0	0
Unit Derating Factor	3.5	15.1	7.9	0	0
Equiv. Avail. Factor	65.1	62.2	76.0	87.1	95.9
Net Capacity Factor	2.4	11.6	10.6	8.2	12.3
Equiv. Forced Out. Rate	92.1	92.8	75.5	4.4	2.9
Croydon 41					
Net Winter Capacity	63	63	58	58	58
Net Summer Capacity	57	57	51	51	51
Planned Outage Factor	0	5.1	13.4	0	0
Unit Derating Factor	13.4	21.7	11.5	7.8	7.5
Equiv. Avail. Factor	36.9	57.8	67.4	77.3	59.0
Net Capacity Factor	0.5	4.4	3.9	1.7	1.2
Equiv. Forced Out. Rate	151.5	162.1	160.7	20.8	43.3

Description	Years 1982	1983	1984	1985	1986
Croydon 42					
Net Winter Capacity	63	63	61	61	61
Net Summer Capacity	55	57	55	55	55
Planned Outage Factor	17.3	0.1	0	18.4	0
Unit Derating Factor	14.0	15.9	9.7	1.4	0
Equiv. Avail. Factor	66.8	60.6	81.5	66.0	88.1
Net Capacity Factor	2.9	10.9	11.7	7.4	11.2
Equiv. Forced Out. Rate	257.6	98.4	67.3	12.1	12.6
Eddystone 10					
Net Winter Capacity	13	14	18	18	18
Net Summer Capacity	13	14	16	16	16
Planned Outage Factor	0	0.9	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	94.9	96.2	80.0	84.3	96.1
Net Capacity Factor	1.2	1.6	1.1	0.4	0.4
Equiv. Forced Out. Rate	68.5	45.1	90.6	23.6	0
Eddystone 20					
Net Winter Capacity	13	14	18	18	18
Net Summer Capacity	13	14	16	16	16
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	87.2	77.6	92.4	95.8	92.3
Net Capacity Factor	0.8	1.0	1.8	0.5	0.4
Equiv. Forced Out. Rate	81.4	95.5	57.8	9.8	7.7
Eddystone 30					
Net Winter Capacity	15	16	20	20	20
Net Summer Capacity	15	16	17	17	17
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	93.3	91.8	98.3	87.0	98.7
Net Capacity Factor	1.4	1.9	2.2	0.5	0.6
Equiv. Forced Out. Rate	69.8	66.7	35.2	17.5	3.3
Eddystone 40					
Net Winter Capacity	15	16	20	20	20
Net Summer Capacity	15	16	17	17	17
Planned Outage Factor	2	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	95.8	94.6	41.8	96.5	78.1
Net Capacity Factor	1.4	2.1	0.3	0.6	0.5
Equiv. Forced Out. Rate	25.9	51.2	93.4	11.4	31.3

Description	Years 1982	1983	1984	1985	1986
Southwark 3					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	15	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	91.2	69.2	63.3	94.0	76.4
Net Capacity Factor	0.8	0.9	0.9	0.7	0.3
Equiv. Forced Out. Rate	89.0	85.5	96.4	4.6	27.0
Southwark 4					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	16	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	92.3	99.0	87.7	89.4	87.8
Net Capacity Factor	0.7	1.3	1.2	0.7	0.9
Equiv. Forced Out. Rate	81.5	29.0	86.6	15.4	15.7
Southwark 5					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	15	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	89.4	96.6	97.0	99.8	77.1
Net Capacity Factor	1.1	1.2	1.7	0.7	0.8
Equiv. Forced Out. Rate	88.2	58.6	10.9	3.6	15.8
Southwark 6					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	15	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	83.6	94.1	91.9	99.7	96.8
Net Capacity Factor	0.8	1.1	1.1	0.6	0.8
Equiv. Forced Out. Rate	90.5	76.5	72.2	0	6.4
Chester 7					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	15	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	2.2	0	0
Equiv. Avail. Factor	97.6	94.0	88.5	87.8	44.1
Net Capacity Factor	0.8	0.9	0.9	0.7	0.1
Equiv. Forced Out. Rate	40.4	82.5	104.1	5.0	62.0

Description	Years 1982	1983	1984	1985	1986
Chester 8					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	16	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	97.1	68.9	70.3	81.1	87.4
Net Capacity Factor	0.7	0.4	1.0	0.6	0.3
Equiv. Forced Out. Rate	48.0	98.2	94.5	24.4	18.1
Chester 9					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	16	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	93.3	92.8	76.1	98.2	79.1
Net Capacity Factor	1.0	0.9	1.3	0.9	0.3
Equiv. Forced Out. Rate	68.5	76.4	92.5	5.8	24.0
Delaware 9					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	17	17	17	15	15
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	94.5	93.3	79.4	82.0	75.1
Net Capacity Factor	0.8	1.7	1.5	0.6	0.6
Equiv. Forced Out. Rate	68.5	2.1	88.9	26.9	30.8
Delaware 10					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	15	16	17	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0.2	0	0	0	0
Equiv. Avail. Factor	92.6	94.8	93.5	85.3	49.8
Net Capacity Factor	0.5	0.8	1.1	0.6	0.3
Equiv. Forced Out. Rate	88.3	72.6	82.2	25.5	58.4
Delaware 11					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	15	16	16	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	77.3	98.3	68.8	43.3	43.1
Net Capacity Factor	0.4	1.2	1.6	0.3	0.2
Equiv. Forced Out. Rate	92.6	42.9	93.8	61.0	64.9

Description	Years 1982	1983	1984	1985	1986
Delaware 12					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	17	13	13
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	94.8	94.4	70.3	95.1	91.6
Net Capacity Factor	0.5	1.1	0.6	0.5	0.4
Equiv. Forced Out. Rate	80.4	62.8	97.8	14.4	17.5
Schuylkill 10					
Net Winter Capacity	18	18	18	18	18
Net Summer Capacity	16	16	17	13	13
Planned Outage Factor	0.4	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	79.4	94.1	91.7	80.2	96.1
Net Capacity Factor	0.6	1.1	1.9	0.6	1.0
Equiv. Forced Out. Rate	78.4	75.8	73.8	25.9	6.5
Schuylkill 11					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	18	17	18	15	15
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	49.3	75.2	60.3	44.1	95.5
Net Capacity Factor	0.6	1.1	2.2	0.3	1.0
Equiv. Forced Out. Rate	98.4	93.2	91.7	58.4	10.9
Moser 1					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	19	18	19	15	15
Planned Outage Factor	0.1	1.2	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	97.0	93.6	86.4	97.8	92.8
Net Capacity Factor	1.6	2.3	1.8	0.9	1.2
Equiv. Forced Out. Rate	4.9	59.6	82.0	2.7	0
Moser 2					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	19	18	19	15	15
Planned Outage Factor	0.1	1.2	0	0	0
Unit Derating Factor	0.1	0	0	0	0
Equiv. Avail. Factor	94.0	94.2	89.9	96.7	93.3
Net Capacity Factor	1.6	1.7	1.0	0.9	0.8
Equiv. Forced Out. Rate	55.5	54.7	85.0	4.0	6.8

Description	Years 1982	1983	1984	1985	1986
Moser 3					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	19	18	19	15	15
Planned Outage Factor	0.1	0	0	0	0
Unit Derating Factor	0	0	0	0.6	0
Equiv. Avail. Factor	97.8	97.3	95.9	77.6	91.8
Net Capacity Factor	1.2	1.9	2.0	0.6	1.1
Equiv. Forced Out. Rate	43.9	46.0	43.2	28.7	16.6
Falls 1					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	17	18	18	15	15
Planned Outage Factor	2.3	0	0.8	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	95.5	96.6	95.5	94.9	97.5
Net Capacity Factor	0.6	0.1	1.9	1.0	0.9
Equiv. Forced Out. Rate	37.6	96.1	29.3	2.7	6.6
Falls 2					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	16	18	18	15	15
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	69.0	53.3	89.5	94.6	99.6
Net Capacity Factor	0.7	1.3	1.9	0.8	0.9
Equiv. Forced Out. Rate	97.0	96.3	76.6	6.1	3.1
Falls 3					
Net Winter Capacity	20	20	20	20	20
Net Summer Capacity	16	18	18	15	15
Planned Outage Factor	0.1	0	0	0	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	98.8	94.2	92.5	96.0	82.4
Net Capacity Factor	0.4	0.1	1.7	0.8	0.7
Equiv. Forced Out. Rate	58.5	94.7	68.5	0	17.7
Muddy Run 1					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	0	8	12.0	2.2	65.5
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	90.4	83.4	82.0	92.4	30.1
Net Capacity Factor	16.6	15.2	15.8	22.4	4.7
Equiv. Forced Out. Rate	16.7	10.3	2.3	0.5	8.6

Description	Years 1982	1983	1984	1985	1986
Muddy Run 2					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	0	8.0	12.0	2.2	65.5
Unit Derating Factor	0.1	0	0	0	0
Equiv. Avail. Factor	75.3	86.0	81.1	91.0	13.1
Net Capacity Factor	12.9	16.0	12.3	15.6	3.5
Equiv. Forced Out. Rate	57.9	0.6	17.8	3.2	61.1
Muddy Run 3					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	0	8.1	3.9	45.4	8.3
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	95.0	74.7	91.4	45.3	78.9
Net Capacity Factor	17.2	12.7	16.1	11.3	19.2
Equiv. Forced Out. Rate	1.2	4.6	8.0	10.5	11.1
Muddy Run 4					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	0	8.1	3.9	45.5	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	90.7	60.8	91.3	42.3	86.6
Net Capacity Factor	16.0	10.7	15.4	6.2	13.8
Equiv. Forced Out. Rate	5.9	33.5	5.5	19.5	0.5
Muddy Run 5					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	18.6	0	34.8	2.2	15.2
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	77.6	87.7	50.7	77.2	65.4
Net Capacity Factor	14.7	11.3	10.8	20.8	13.9
Equiv. Forced Out. Rate	2.5	36.4	2.2	1.0	19.6
Muddy Run 6					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	18.6	0	34.8	2.2	15.2
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	77.7	90.5	50.0	77.0	78.0
Net Capacity Factor	14.3	15.2	10.6	17.2	20.8
Equiv. Forced Out. Rate	0	4.2	9.6	4.4	0.6

Description	Years 1982	1983	1984	1985	1986
Muddy Run 7					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	21.6	7.7	0.9	11.8	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	72.9	53.0	93.9	84.8	95.1
Net Capacity Factor	12.1	10.3	15.5	16.7	28.7
Equiv. Forced Out. Rate	4.9	12.1	1.0	2.3	0.8
Muddy Run 8					
Net Winter Capacity	110	110	110	110	110
Net Summer Capacity	110	110	110	110	110
Planned Outage Factor	21.6	15.0	0.9	11.8	0
Unit Derating Factor	0	0	0	0	0
Equiv. Avail. Factor	72.0	48.1	94.8	84.0	95.3
Net Capacity Factor	13.1	10.2	17.3	15.8	18.3
Equiv. Forced Out. Rate	9.6	3.7	0.4	1.4	1.3
Salem 3					
Net Winter Capacity	48	48	48	48	48
Net Summer Capacity	43	43	43	43	43
Planned Outage Factor	0	0	0	0	0
Unit Derating Factor	3.1	1.0	1.1	2.8	1.9
Equiv. Avail. Factor	96.0	91.3	92.3	94.1	94.3
Net Capacity Factor	0.3	1.8	1.1	0.4	1.5
Equiv. Forced Out. Rate	139.8	77.2	66.7	21.8	22.1

Combustion Turbines

Historical Summary Report

	1982	1983	1984	1985	1986	5 year average
Schuylkill (2 units)						
Avg. Net Oper. Heat Rate	15522	15365	15265	14517	13495	14833
Avg. Cost	15.063	10.005	9.686	8.270	6.106	9.826
Eddystone (4 units)						
Avg. Net Oper. Heat Rate	14406	15062	15487	16320	15274	15310
Avg. Cost	9.963	9.331	9.579	9.430	6.466	8.954
Chester (3 units)						
Avg. Net Oper. Heat Rate	14461	15052	15329	15088	17139	15414
Avg. Cost	10.281	9.975	9.479	8.802	8.872	9.482
Delaware (4 units)						
Avg. Net Oper. Heat Rate	14402	15012	14338	14460	13960	14434
Avg. Cost	10.456	9.484	9.070	8.526	5.568	8.621
Southwark (4 units)						
Avg. Net Oper. Heat Rate	14856	15257	15876	15386	15010	15277
Avg. Cost	10.498	9.639	10.009	8.958	6.345	9.090
Falls (3 units)						
Avg. Net Oper. Heat Rate	14341	14694	14701	15106	15040	14776
Avg. Cost	10.014	9.867	9.350	9.036	7.587	9.171
Moser (3 units)						
Avg. Net Oper. Heat Rate	14709	14157	14647	14771	14655	14588
Avg. Cost	10.249	9.161	9.118	8.605	9.193	9.265
Salem (1 unit)						
Avg. Net Oper. Heat Rate	19164	25244	17207	15259	16340	18643
Avg. Cost	11.708	10.431	9.138	9.070	7.871	9.644
Richmond (3 units)						
Avg. Net Oper. Heat Rate	13058	12995	12637	15358	18893	14588
Avg. Cost	8.920	7.867	7.976	3.658	5.008	6.686
Croydon (8 units)						
Avg. Net Oper. Heat Rate	12582	11965	12091	12229	12219	12217
Avg. Cost	8.257	7.382	7.411	6.921	5.171	7.028

Combustion Turbine

Description	Historical Average	Future Test Year
Richmond:		
Average Net Oper. Heat Rate	14,588	12,137
Average Net Oper. Fuel Cost	6.686	4.615
Croyden:		
Average Net Oper. Heat Rate	12,217	11,355
Average Net Oper. Fuel Cost	7.028	4.314
Simple Cycle:		
Average Net Oper. Heat Rate	14,947	14,165
Average Net Oper. Fuel Cost	9.201	5.761

(4) Generating Unit Performance Improvements

Generating Unit Performance Improvements

The Company has implemented, is continuing to proceed with implementation, or is planning to implement the following programs to improve generating unit performance.

Nuclear

- The recirculating and RHR piping of Peach Bottom No. 2 unit has been replaced to minimize unit down time associated with IGSCC problems.
- The recirculating and RHR piping for Peach Bottom No. 3 unit will be replaced during the next end of cycle outage to minimize unit down time associated with IGSCC problems.
- The Company is installing Hydrogen Water Chemistry on Peach Bottom No. 2 unit during its current end of cycle outage and will install it on No. 3 unit during the next end of cycle outage. This will also help minimize down time associated with IGSCC problems.
- Salem Station is replacing the circulating water intake screens and auxiliary piping systems to reduce partial outages associated with river debris.
- Low pressure turbine rotors are being replaced on both Peach Bottom units - 2 rotors had been replaced and four more will be completed in future outages. This will minimize the probability of turbine rotor failure and should increase the heat rate since these rotors will have new blades.
- Feedwater heaters or tube bundles will be replaced as required to improve heat rate and reduce operating restrictions due to heater outages.

Fossil

- Conemaugh No. 1 will be replacing the 6B H.P. Feedwater Heater to reduce partial reductions and improve heat rate.
- Eddystone No. 2 will be replacing the 5A, 5B, 6A and 6B Feedwater Heaters to reduce partial reductions and improve heat rate.
- Keystone Station will be replacing the intermediate reheaters on both No. 1 and No. 2 unit to minimize unit down time due to tube failures.

- Eddystone is continuing the restoration program on No. 2 unit to increase unit reliability and performance.

- Eddystone Station has installed new combustion and feedwater controls on No. 2 unit and feedwater controls on No. 1 unit. The combustion controls on No. 1 unit will be completed during the next outage. These controls will give better pressure and temperature control at the various load levels and minimize deviations from desired conditions with a corresponding decrease in unit heat rates.

(5) Purchased and Interchange Power

Description	Years Ending 6/30/83	6/30/84	6/30/85	6/30/86	6/30/87	test year ending 6/30/88
Two Party Purchases						
MWH	3,199,753	3,025,651	2,940,236	2,342,446	1,956,654	1,979,000
Dollars	101,696,264	82,066,821	84,881,455	66,173,363	45,140,013	47,020,362
Two Party Sales						
MWH	0	(55,525)	(82,870)	(3,346)	(388)	0
Dollars	0	(1,467,485)	(2,184,093)	(82,802)	(8,434)	0
Interchange Purchases @ PJM						
MWH	8,004,535	8,550,338	8,942,974	5,670,781	2,763,327	4,064,000
Dollars	316,114,439	384,082,640	356,068,932	181,366,834	72,418,491	114,024,435
Interchange Sales @ PJM						
MWH	(65,668)	(178,112)	(34,867)	(533,313)	(1,542,886)	(1,436,000)
Dollars	(6,120,899)	(16,243,180)	(5,870,714)	(27,867,131)	(59,683,564)	(59,810,104)
Cogeneration Purchases						
MWH	0.188	0.176	8.140	852	7,507	125,500
Dollars	7	6	331	56,576	238,922	4,057,314
Borderline Interchange						
KWH	58,629	149,920	221,647	281,279	366,793	192,000
Dollars	4,703	10,301	13,739	19,866	26,362	22,158
Schuylkill #3 Cogeneration						
MWH	134,309	167,954	138,758	99,367	156,554	201,000
Dollars	6,077,039	8,078,975	6,128,853	3,692,292	4,394,282	6,569,300

ATTACHMENT B

COMPARISON OF PROPOSED TWO-YEAR AND TRADITIONAL ONE-YEAR REFUND METHODS

500 KWH RESIDENTIAL CUSTOMER'S MONTHLY BILL

